DEPARTMENT OF COMMERCE AND LABOR

COAST AND GEODETIC SURVEY

O. H. TITTMANN

SUPERINTENDENT

UNITED STATES COAST PILOT

ATLANTIC COAST

PART IV

FROM POINT JUDITH TO NEW YORK

FIFTH EDITION

PRICE, 50 CENTS

VK
981
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5th ed.
(1909)

WASHINGTON
GOVERNMENT PRINTING OFFICE
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DEPARTMENT OF COMMERCE AND LABOR,

COAST AND GEODETIC SURVEY,

WASHINGTON, D. C., *June 1, 1909.*

This volume covers the coast from Point Judith to New York, including Block Island Sound, Gardiners Bay, Fishers Island Sound, Long Island Sound, East River, the south coast of Long Island, and New York Bay and Harbor.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations, by a party on the Coast and Geodetic Survey steamer *Hydrographer* in 1908, in connection with its preparation.

The system adopted in this publication includes—

I. A tabular description of all lighthouses, light-vessels, and fog signals; lists of life-saving stations, Weather Bureau storm warning display stations, and seacoast telegraph stations; and information regarding tides, tidal currents, variation of the compass, etc.

II. General information concerning the several bodies of water and harbors, including notes relative to pilots and pilotage, towboats, depth of water, draft of vessels entering, harbor and quarantine regulations, supplies, facilities for making repairs, usual or best anchorages, and other matters of practical interest. In each case the information of this nature precedes the sailing directions and is printed in smaller type.

III. Sailing directions, with subordinate paragraphs treating of prominent objects, dangers, aids to navigation, etc. In the arrangement adopted the aim has been to conform, as far as practicable, to the order in which these matters would be considered in practice, and to render available such information as may be wanted promptly. For this purpose, and to afford a ready means of reference from one part to another, the sailing directions, where long, are divided into numbered or lettered sections, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Appendices.

The first edition of this volume was prepared by Lieut. George H. Peters, U. S. N., assisted by Ensign Edwin H. Tillman, U. S. N., and Mr. John Ross. In the present (fifth) edition the text has been revised and brought up to date by Mr. John Ross and Mr. Herbert C. Graves, under the direction of J. J. Gilbert, Assistant, Coast and Geodetic Survey, Inspector of Hydrography and Topography.

Great courtesy has been shown by the Corps of Engineers, U. S. A., and by local authorities in furnishing information desired for incorporation in this work.

The aids to navigation are correct to June 1, 1909.

As absolute accuracy in a work of this class is scarcely possible, navigators will confer a favor by notifying the Superintendent of the Coast and Geodetic Survey of errors which they may discover, or of additional matter which they think, for the good of mariners, should be inserted.

O. H. TITTMANN,

Superintendent.

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NOTE.

The courses and bearings given in degrees are *true*, reading clockwise from 0° at North to 360°, and are followed by the equivalent *magnetic* value in points in parentheses.

All distances and current velocities are in *nautical miles*, except where otherwise stated.

Except where otherwise stated, all depths are at *mean low water*.

In winter when whistling buoys, bell buoys, gas buoys, can buoys, and nun buoys are in danger of being carried away by ice, they are taken up and replaced by spar or spar-shaped buoys.

All charts referred to in this volume are published by the Coast and Geodetic Survey, and can be obtained at the agencies, a list of which is found on pages 7–8.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

In conformity with section 4678 of the Revised Statutes of the United States, the following order is observed in coloring and numbering the buoys in United States waters, viz:

1. In approaching the channel, etc., from seaward, RED BUOYS, with EVEN NUMBERS, will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.

2. In approaching the channel, etc., from seaward, BLACK BUOYS, with ODD NUMBERS, will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.

3. BUOYS painted with RED and BLACK HORIZONTAL STRIPES will be found on OBSTRUCTIONS, with channelways on either side of them, and may be left on either hand in passing in.

4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID-CHANNEL and must be passed close-to to avoid danger.

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, *a description of which is given in the printed list of buoys.*

Perches, with balls, cages, etc., will, when placed on buoys, be at turning points, the color and number indicating on what side they shall be passed.

Nun buoys, properly colored and numbered, are usually placed on the starboard side, and can buoys on the port side of channels.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be colored like buoys) are constructed and distinguished with special reference to each locality, and particularly in regard to the background upon which they are projected.

Wherever practicable, the towers, beacons, buoys, spindles, and all other aids to navigation are arranged in the buoy list in regular order *as they are passed by vessels entering from sea.*

The positions of the buoys mentioned in this volume are shown on the charts of the Coast and Geodetic Survey, which are kept corrected from information furnished by the Inspectors of the Lighthouse Districts, for the changes in the aids to navigation rendered necessary from time to time to indicate the best channels.

Under the name of each harbor, channel, fairway, or other navigable water mentioned in this list, is given the numbers of all the charts showing the aids to navigation described.

The following symbols and abbreviations are used on the charts of the Coast and Geodetic Survey:

Lighthouse.

Light-vessel.

Beacon, lighted.

Beacon, not lighted.

Beacon, not lighted.

or R., red buoys, with even numbers, to be left on starboard hand in entering.

or B., black buoys, with odd numbers, to be left on port hand in entering.

or HS., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

or PS., black and white perpendicular stripes, without numbers, mid-channel or fairway buoys.

Lighted buoys; with numbers and characteristic color.

WHISTLING buoys, with numbers and characteristic color.

BELL buoys, with numbers and characteristic color.

C., N., or S., signifies can, nun, or spar buoy.

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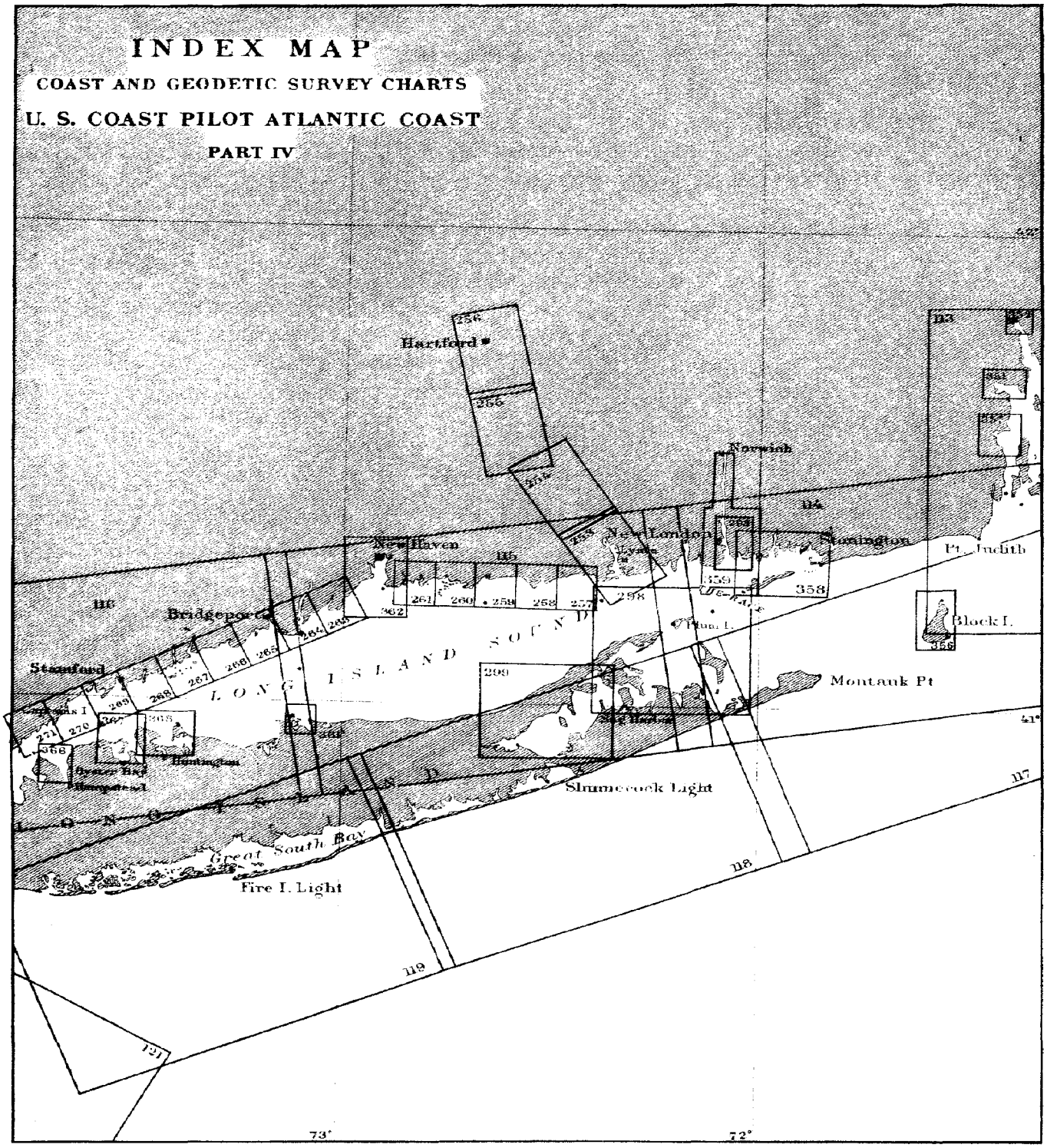
COAST AND GEODETIC SURVEY CHARTS

U. S. COAST PILOT ATLANTIC COAST

PART IV



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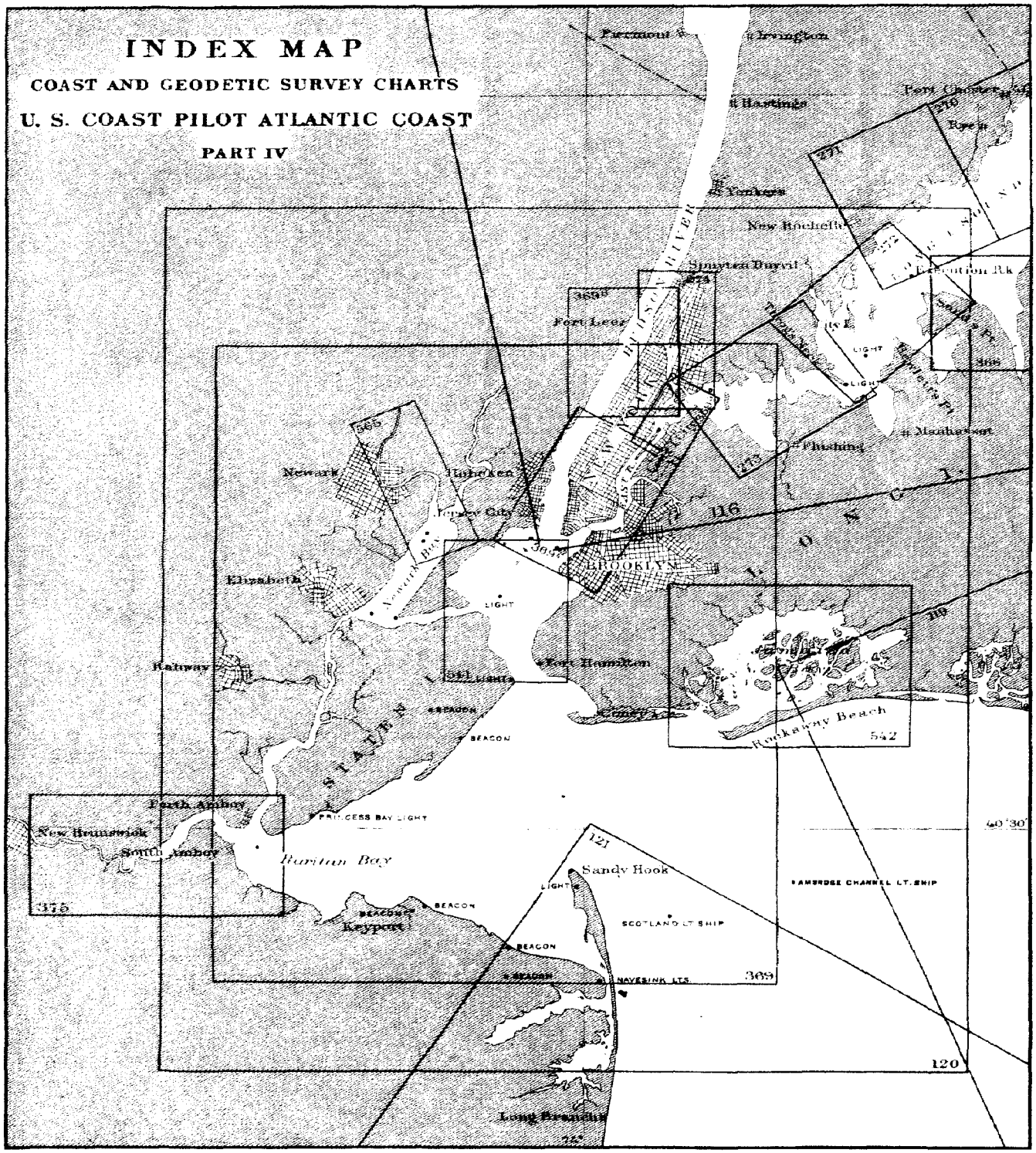

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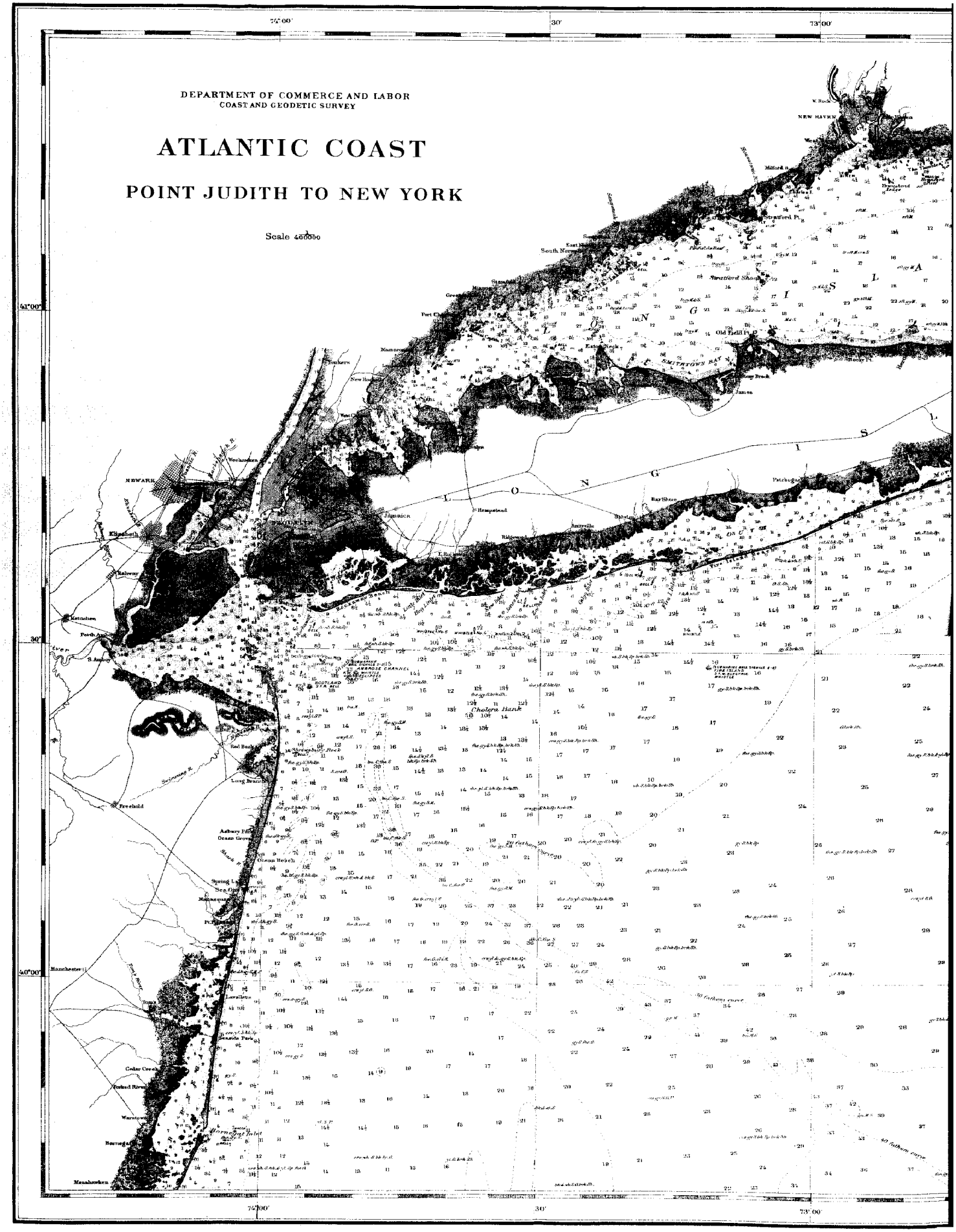
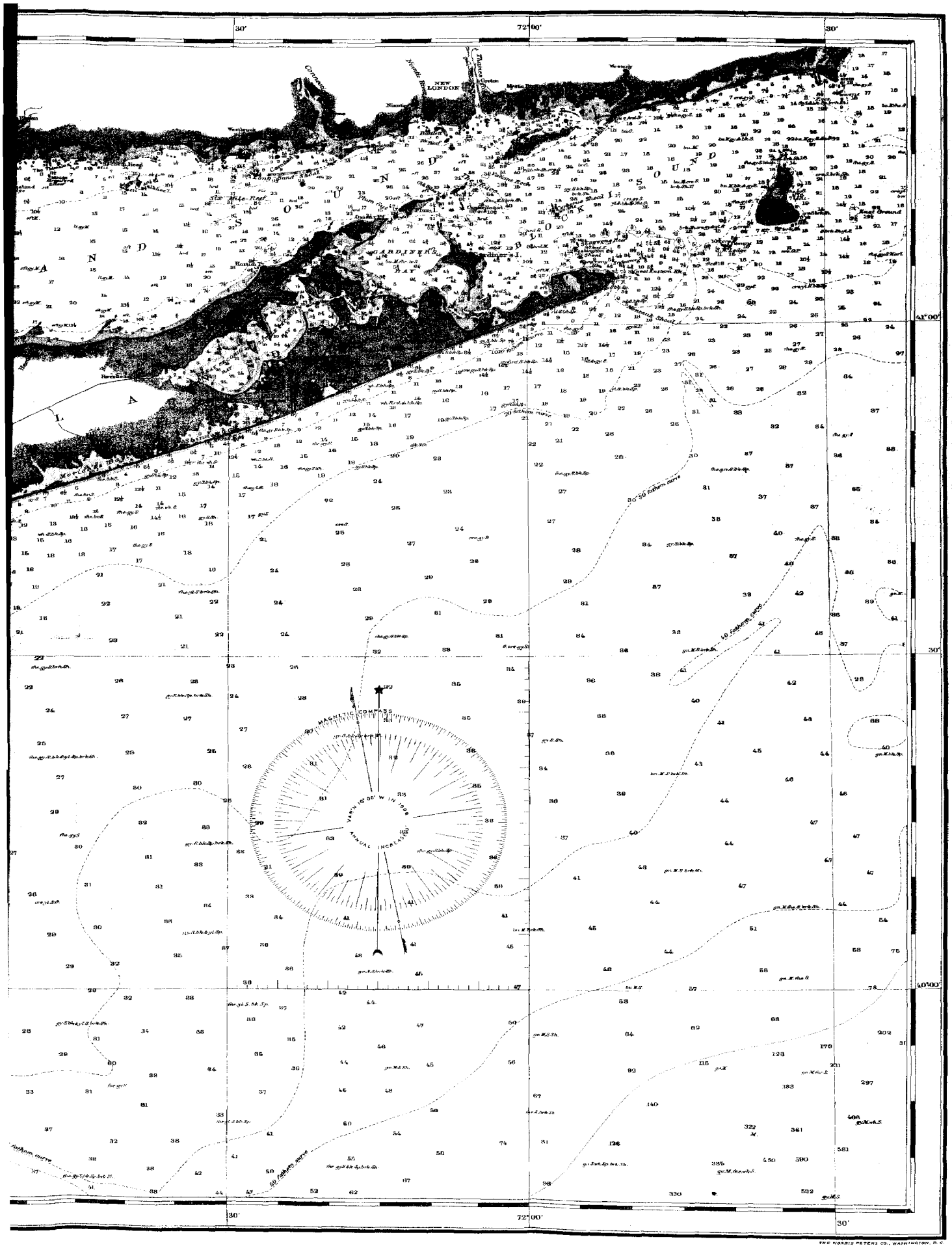
DEPARTMENT OF COMMERCE AND LABOR
COAST AND GEODETIC SURVEY

ATLANTIC COAST

POINT JUDITH TO NEW YORK

Scale $\frac{1}{400000}$





THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART IV.

FROM POINT JUDITH TO NEW YORK.*

LONG ISLAND SOUND, WITH APPROACHES AND ADJACENT WATERS.†

GENERAL REMARKS.

The waters included between Point Judith and the East River have comparatively few dangers which menace vessels standing through Block Island Sound and Long Island Sound, though the approaches to some of the harbors are much obstructed. The chief obstacles to navigation on this coast are the fogs and the tidal currents, the former being particularly prevalent in the vicinity of Point Judith—a locality known to coasters as the "fog hole." The tidal currents have considerable velocity in Block Island Sound, Fishers Island Sound, and Long Island Sound, though not forming any great hindrance to navigation; but in The Race, in Plum Gut, and through Hell Gate in the East River, the tidal currents have great velocity, and in the latter place are dangerous on account of the narrow channel and the number of vessels encountered. Sailing vessels approaching The Race with the current against them are frequently unable to get through until the tide turns; sailing vessels are generally towed through the East River.

Block Island Sound has but few dangers except in the vicinity of Montauk Point; its shores are bold-to as a rule. Gardiners Bay is an excellent natural harbor. Fishers Island Sound has many dangers, and the currents have considerable velocity; strangers should not pass through it when the buoys can not be seen readily. The Race, except for its strong current, is practically free from dangers for most of the vessels using it—Valiant Rock, in the middle of The Race, having 18 feet over it at mean low water. Long Island Sound has many shoals alongshore, but in mid-sound there are few dangers, and these are well marked or are easily avoided. In the East River strangers in sailing vessels should have a pilot or a towboat.

Rules of the Road.—The international and inland Rules of the Road are given in Appendix V.

Lines within which the Inland Rules of the Road apply.—*Nantucket Sound, Vineyard Sound, Buzzards Bay, Narragansett Bay, Block Island Sound, and easterly entrance to Long Island Sound.*—A line drawn from Chatham lighthouses, Mass., **S** by **E** ⅜ **E**, about 6 miles, to Northeast Slue Channel whistling buoy (Pollock Rip); thence **S** by **W** ⅝ **W**, about 11 miles, to Great Round Shoal light-vessel; thence **SSW** ⅝ **W**, 7⅝ miles, to Sankaty Head lighthouse; from the westerly end of Tuckernuck Island **NW** by **W** ½ **W**, about 5½ miles, to Wasque Point, Chappaquiddick Island; from Gay Head lighthouse, **W** ¾ **S**, 35 miles, to Block Island (SE) lighthouse; thence **W** ¾ **S**, 15 miles, to Montauk Point lighthouse, on the easterly end of Long Island, N. Y.

New York Harbor.—From Navesink (southerly) lighthouse **NE** ⅝ **E Easterly** to Scotland light-vessel; thence **NNE** ½ **E** through Gedney Channel whistling buoy to Rockaway Point life-saving station.

Marine Hospital.—There is a United States Marine Hospital at Stapleton, Staten Island, N. Y. There are relief stations of Class III of the United States Public Health and Marine-Hospital Service at New Haven and New London, Conn.; relief stations of Class IV at Bridgeport and Hartford, Conn., and an emergency relief station of Class IV at Sag Harbor, N. Y.

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* In this volume Long Island Sound with approaches and adjacent waters is first treated, then the south coast of Long Island, and New York Bay and Harbor and approaches.

† These waters fall within the limits of the following charts: **1000**, Sailing chart, Mercator projection, Deg. Lat. =3.7 inches; **8**, Approaches to New York, Gay Head to Cape Henlopen, scale $\frac{1}{400,000}$; and are also shown in part on the following charts: **52**, Montauk Point to New York and Long Island Sound, Mercator projection, Deg. Lat. = 21.6 inches; Long Island Sound in three sheets, charts **114, 115, 116**, scale $\frac{1}{80,000}$; south shore of Long Island in three sheets, charts **117, 118, 119**, scale $\frac{1}{80,000}$, price of each $0.50; and a number of harbor charts, on a larger scale, as noted under the several headings. All charts referred to in footnotes are issued by the Coast and Geodetic Survey.

Coast and Geodetic Survey charts can be obtained from the agents named in the list given on pages 7–8. Facing page 7 are index maps, showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts of the Survey also contains similar index maps; copies of this catalogue can be obtained, free of charge, on application at any of the sale agencies, or to the Coast and Geodetic Survey, Washington, D. C.

The prevailing winds are northwesterly and northerly in winter, and southwesterly and southerly in summer, but subject to many variations at all seasons.

Fogs are liable to occur at any season, but are more prevalent from April to October than during the rest of the year. They come most frequently with easterly and southeasterly winds, often with southerly winds, and occasionally with the wind westward of south. Off Montauk Point and Point Judith, winds between south and southwest are nearly as apt to bring fog as those from southeastward. Westerly and northerly winds clear away fog, this holding good for all parts of the Atlantic coast.

In Block Island Sound and in the eastern part of Long Island Sound, fogs are generally heaviest with southeast winds. In these waters the usual duration of a fog is from 4 to 12 hours, but periods of from 4 to 6 days have been known, with very short clear intervals. As already stated, the vicinity of Point Judith is known to coasters as the "fog hole!" In the autumn "land fogs," as they are termed locally, sometimes occur with northerly breezes, but they are generally "burnt off" before midday.

In Long Island Sound the north and south shores are equally subject to fog, except that on spring and summer mornings, when there is little or no wind, fog will often hang along the Connecticut shore when it is clear offshore and to the southward.

In the western end of Long Island Sound, although fogs are liable to occur at any season, they are not encountered so often, nor do they generally last so long as is the case farther eastward.

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate relative positions of certain aids to navigation. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

Point Judith lighthouse.—The following are bearings and distances from Point Judith lighthouse:

	Miles.
Nantucket Shoals light-vessel, 118° true (**SE ½ E Southerly** mag.)	95¾
Gay Head lighthouse, 91½° true (**ESE ⅞ E** mag.)	29
Vineyard Sound light-vessel, 87° true (**E ¾ S** mag.)	21¾
Hen and Chickens light-vessel, 75½° true (**E ¼ N** mag.)	21½
Sakonnet lighthouse, 67° true (**E by N** mag.)	13¾
Brenton Reef light-vessel, 49° true (**NE by E ⅜ E** mag.)	6¼
Watch Hill lighthouse, 258½° true (**W** mag.)	17¼
Race Rock lighthouse, 254½° true (**W ⅜ S** mag.)	26½
Little Gull Island lighthouse, 252° true (**W ⅝ S** mag.)	29¾
Montauk Point lighthouse, 235½° true (**SW by W** mag.)	24¼
Block Island (N.) lighthouse, 209° true (**SW ½ S** mag.)	9

Montauk Point lighthouse.—The following are bearings and distances from Montauk Point lighthouse:

	Miles.
Nantucket Shoals light-vessel, 105° true (**SE by E ⅝ E** mag.)	105½
Block Island (SE.) lighthouse, 71° true (**E ¾ N** mag.)	14½
Watch Hill lighthouse, 0° true (**N by E** mag.)	14
Race Rock lighthouse, 320° true (**NNW ½ W** mag.)	13½
Little Gull Island lighthouse, 305° true (**NW ⅛ N** mag.)	14
Orient Point lighthouse, 288° true (**NW by W ⅜ W** mag.)	17½
Five Fathom Bank light-vessel, 222½° true (**SW ¾ W** mag.)	185¾
Cape Charles light-vessel, 217° true (**SW** mag.)	299½
Diamond Shoal light-vessel (Cape Hatteras), 204½° true (**SSW ⅞ W** mag.)	394½

Little Gull Island lighthouse.—The following are bearings and distances from Little Gull Island lighthouse

	Miles.
Race Rock lighthouse, 51° true (**NE by E ½ E** mag.)	3½
North Dumpling lighthouse, 40° true (**NE ½ E** mag.)	6¼
New London lighthouse, 8° true (**N by E ⅝ E** mag)	6¾
Bartlett Reef light-vessel, 345° true (**N ¼ W** mag.)	4
Saybrook Breakwater lighthouse, 287½° true (**NW by W ½ W** mag.)	11¼
Cornfield Point light-vessel, 272½° true (**WNW ⅞ W** mag.)	12
Southwest Ledge lighthouse, 272½° true (**WNW ⅞ W** mag.)	36½
Falkner Island lighthouse, 270° true (**W by N** mag.)	24¾
Stratford Point lighthouse, 266° true (**W ½ N Northerly** mag.)	45
Greens Ledge lighthouse, 261° true (**W ⅛ N** mag.)	61¼
Stratford Shoal (Middle Ground) lighthouse, 259° true (**W Southerly** mag.)	45¾
Great Captain Island lighthouse, 259° true (**W Southerly** mag.)	70
Eatons Neck lighthouse, 255½° true (**W ⅜ S** mag.)	60¼
Cedar Island lighthouse, 215½° true (**SW ⅛ W** mag.)	12

Falkner Island lighthouse.—The following are bearings and distances from Falkner Island lighthouse:

	Miles.
Horton Point lighthouse, 129° true (**SE** ⅜ **S** mag.)	12
Orient Point lighthouse, 98° true (**ESE** ¼ **E** mag.)	19¾
Cornfield Point light-vessel, 89° true (**E** ⅞ **S** mag.)	12½
Race Rock lighthouse, 86° true (**E** ⅝ **S** mag.)	27½
Southwest Ledge lighthouse, 276° true (**WNW** ½ **W** mag.)	11¾
Branford Reef beacon, 274° true (**WNW** ¾ **W** mag.)	6¾
Stratford Point lighthouse, 260° true (**W** mag.)	20¾
Stratford Shoal (Middle Ground) lighthouse, 246° true (**WSW** ¾ **W Westerly** mag.)	22¼
Old Field Point lighthouse, 236½° true (**SW** by **W** ⅞ **W** mag.)	25¼

Stratford Shoal (Middle Ground) lighthouse.—The following are bearings and distances from Stratford Shoal lighthouse:

	Miles.
Horton Point lighthouse, 87° true (**E** ⅝ **S** mag.)	29¾
Plum Island lighthouse, 80° true (**E Southerly** mag.)	40¾
Race Rock lighthouse, 77° true (**E** ¼ **N Easterly** mag.)	49
Bartlett Reef light-vessel, 74° true (**E** ½ **N** mag.)	45¾
Cornfield Point light-vessel, 74° true (**E** ½ **N** mag.)	34
Southwest Ledge lighthouse, 40° true (**NE** ½ **E** mag.)	13½
Stratford Point lighthouse, 359° true (**N** ⅞ **E** mag.)	5½
Bridgeport lighthouse, 328° true (**NNW** mag.)	6¾
Penfield Reef lighthouse, 301° true (**NW** ¼ **W Westerly** mag.)	6½
Greens Ledge lighthouse, 266° true (**W** ½ **N** mag.)	15½
Stamford lighthouse, 262° true (**W** ⅛ **N** mag.)	20¼
Great Captain Island lighthouse, 259° true (**W** ⅛ **S Westerly** mag.)	24
Execution Rocks lighthouse, 249½° true (**W** by **S Westerly** mag.)	30¾
Eatons Neck lighthouse, 245° true (**WSW** ⅝ **W Westerly** mag.)	14¾
Old Field Point lighthouse, 189° true (**S** by **W** ¾ **W** mag.)	5

Execution Rocks lighthouse.—The following are bearings and distances from Execution Rocks lighthouse:

	Miles.
Stamford lighthouse, 48° true (**NE** by **E** ⅛ **E** mag.)	12
Greens Ledge lighthouse, 54° true (**NE** by **E** ⅝ **E** mag.)	16½
Penfield Reef lighthouse, 59° true (**ENE** ⅛ **E** mag.)	27½
Stratford Point lighthouse, 60½° true (**ENE** ¼ **E** mag.)	33
Stepping Stones lighthouse, 207° true (**SW** ¾ **S** mag.)	3¾
Throgs Neck lighthouse, 209° true (**SW** ½ **S Southerly** mag.)	5

Fire Island light-vessel.—The following are bearings and distances from Fire Island light-vessel:

	Miles.
Nantucket Shoals light-vessel, 98° true (**E** ¾ **S** mag.)	163½
Gay Head lighthouse, 64° true (**ENE** ⅝ **E** mag.)	119¼
Block Island (SE) lighthouse, 62° true (**ENE** ⅜ **E** mag.)	85
Montauk Point lighthouse, 60° true (**ENE** ¼ **E** mag.)	70½
Shinnecock lighthouse, 55° true (**NE** by **E** ¾ **E** mag.)	38½
Fire Island lighthouse, 352° true (**N** ⅛ **E** mag.)	9¼
Ambrose Channel light-vessel, 268° true (**W** ¾ **N Westerly** mag.)	29¼
Scotland light-vessel, 266° true (**W** ½ **N** mag.)	33¼
Navesink lighthouses, 262° true (**W** ⅛ **N** mag.)	36½
Sea Girt lighthouse, 242° true (**WSW** ⅜ **W** mag.)	43½
Barnegat lighthouse, 224½° true (**SW** ¾ **W** mag.)	60
Five Fathom Bank light-vessel, 212½° true (**SW** ⅜ **S** mag.)	120

TABLE OF LIGHTS.

Lighthouse District, Etc.—The coast and the waters covered by this volume lie within the **Third Lighthouse District** of the United States. This district extends from Elisha Ledge, off Warren Point, R. I., westward and southward as far as Shrewsbury Rocks, N. J. The Light list for the Atlantic and Gulf coasts of the United States and the Buoy list for the Third District give full descriptions of the aids to navigation at the date of publication.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
		° ′ ″				
1	POINT JUDITH	41 21 40 71 28 55	Flashing white every 15 sec. (i. o. v.)	4	65	13½
2	BLOCK ISLAND NORTH	41 13 40 71 34 35	Fixed white (i. o. v.)	4	58	13
3	Range. Block Island Breakwater Front		Fixed red	Post lantern.	9	
4	Range. Block Island Breakwater Rear		Fixed red	Post lantern.	57	
5	BLOCK ISLAND SOUTHEAST	41 09 10 71 33 08	Fixed white (i. o. v.)	1	201	20½
6	Great Salt Pond Breakwater Outer End	41 11 (54) 71 35 (35)	Fixed red	Lens lantern.	22	
7	Great Salt Pond Breakwater Inner End	41 11 (44) 71 35 (26)	Fixed white	Lens lantern.	28	
8	WATCH HILL	41 18 14 71 51 32	Fixed white (i. o. v.)	4	60¾	13¼
9	MONTAUK POINT	41 04 16 71 51 27	Flashing white every 10 sec.; duration of flash about $\frac{4}{10}$ sec. (i. o. v.)	3½	168¼	19
			Fixed red between 140° 50′ (SE ½ S) and 152° 20′ (SSE $\frac{7}{16}$ E).	Range lens.	161¼	
	FISHERS ISLAND SOUND:					
10	Stonington Outer Breakwater	41 18 59 71 54 31	Fixed red	Lens lantern.	22	
11	Stonington Breakwater	41 19 31 71 54 49	Fixed red	4	33¾	11
12	Latimer Reef	41 18 16 71 56 02	Flashing white every 10 sec.	4	55	12¾
13	*Ram Island Reef Light-Vessel, No. 23*	41 18 (10) 71 58 (31)	Fixed white	Refl'r.	43	11¾
14	Morgan Point	41 18 59 71 59 24	Fixed white	6	60	11
15	North Dumpling	41 17 16 72 01 11	Fixed white with a fixed red sector between 268° 20′ (W ⅛ S) and 34° (NE by N).	5	69¼	11¾
	LONG ISLAND SOUND AND TRIBUTARIES.					
16	Southwest Ledge		Fixed red	Post lantern.		
	THAMES RIVER.					
17	New London Harbor	41 19 00 72 05 25	Fixed white with a fixed red sector between 11° (N by E) and 52° 40′ (NE ¼ E). (i. o. v.)	4	88¾	15
18	Bailey Point, No. 2		Fixed red	Post lantern.	15	
	The lights in Thames River above the Naval Station are omitted.					
19	*Bartlett Reef Light-Vessel, No. 13*	41 16 (17) 72 07 (50)	Two fixed white	Refl'r.	28 28	10½
20	Race Rock	41 14 37 72 02 51	Flashing alternately red and white, interval between flashes 10 sec.	4	67	13¾
21	LITTLE GULL ISLAND	41 12 23 72 06 26	Fixed white (i. o. v.)	2	90¾	15¾
	GARDINERS BAY.					
22	Plum Island	41 10 25 72 12 43	Flashing white every 7½ sec. (i. o. v.)	4	74¾	14¼
23	Orient Point	41 09 49 72 13 27	Fixed red	4	64	11¼

POINT JUDITH TO NEW YORK.

These pamphlets, which are corrected and reprinted annually, are sent free of charge to any shipmaster on application to the office of the Light-House Board, Washington, D. C., or to the inspector of the Third Light-House District, Tompkinsville, N. Y. They can also be had on application at the U. S. Branch Hydrographic Office, Maritime Exchange, 78 Broad street, New York City.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Octagonal, pyramidal tower, lower half white, upper half brown, connected with dwelling; fog-signal building S'ly of tower.	46	1st-class compressed-air siren; blasts 5 sec., silent intervals 40 sec.
2	Brown tower on a gray granite dwelling	46	
3	Lantern on a white stake	12	
4	Lantern on a white mast near small white house	48	
5	Red-brick, octagonal, pyramidal tower, attached to red-brick dwelling with granite trimmings; black lantern; red-brick, fog-signal building 100 feet and white, wooden, fog-signal building 300 feet SE'ly.	52	1st-class, automatic, compressed-air siren; blasts 4 sec., silent intervals 30 sec.
6	White, square, pyramidal, wooden tower, on a square concrete block on breakwater.	19	
7	Lantern on shelf on black post; square wooden base	25	Compressed-air siren; blasts 3 sec., silent intervals 3 sec.
8	Gray-granite tower, attached to SE'ly corner of white building; red-brick fog-signal building 40 feet SE'ly from the light tower.	40	3rd-class, compressed-air Daboll trumpet; blasts 5 sec., silent intervals 25 sec.
9	White tower with a brown band about midway of its height; white dwelling on hill near by; fog-signal building about 100 feet E'ly of tower.	97	1st-class compressed-air siren; blasts 3 sec., silent intervals alternately 3 and 31 sec.
10	Lantern on shelf on red post with red oilhouse at base		
11	White, conical tower, with octagonal base, on masonry foundation forming end of breakwater; black lantern.	25	Bell struck by machinery a double blow every 30 sec.
12	White, conical tower, with brown band about midway of its height; on brown, cylindrical foundation; black lantern.	44	Bell struck by machinery a single blow every 15 sec.
13	Two masts, schooner-rigged; black, circular, cagework daymark at each masthead; red hull, with "RAM ISLAND REEF" in black on each side, and "23" in black on each quarter.		Bell struck by hand three blows in quick succession approximately every 30 sec.
14	White tower on granite dwelling; black lantern	44	
15	White tower on white dwelling with Mansard roof; black lantern	39½	Bell struck by machinery a single blow every 15 sec.
16	Temporary light on concrete foundation pier, 15½ feet high, for lighthouse and fog signal to be established.		
17	White, stone tower attached to white dwelling; fog-signal and other buildings N'ly of tower.	85	2d-class Daboll trumpet; blasts 3 sec., silent intervals 30 sec.
18	Red iron post		
19	Two masts, schooner-rigged; black, circular, cagework daymark at each masthead; black hull, with white streak; "BARTLETT REEF" in black on each quarter and "13" in black on each bow.		Bell struck by hand a double blow approximately every 30 sec.
20	Granite tower, square at base and octagonal above, black lantern; attached to granite dwelling, with gable roof; on conical granite pier, with a landing pier attached.	40	3d-class Daboll trumpet; blasts 3 sec., two silent intervals 3 sec., one silent interval 45 sec. If trumpet be disabled a bell will be struck by machinery a double blow every 20 sec.
21	Gray, granite tower, connected to red sandstone dwelling with Mansard roof and granite trimmings; fog-signal building to E'd of tower; buildings on a granite pier.	74	2d-class compressed-air siren; blasts 3 sec., silent intervals 27 sec.
22	White tower, on granite dwelling; black lantern	46	Bell struck by machinery a single blow every 15 sec.
23	Black, cylindrical, foundation pier, with white, vertical stripe, surmounted by a brown, conical tower; black lantern; gallery, with roof, surrounds base of tower; trumpet on gallery.		2d-class Daboll trumpet; blasts 3 sec., silent intervals 17 sec.

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	LONG ISLAND SOUND AND TRIBUTARIES—Continued.					
	GARDINERS BAY—Continued.	° ′ ″				
24	Long Beach Bar	41 06 33 72 18 23	Fixed red	5	53	8½
25	Cedar Island	41 02 27 72 15 41	Fixed white	6	44	11¼
26	Sag Harbor Breakwater	41 00 (34) 72 17 (43)	Fixed red	Lens lantern.	16	.....
27	Greenport Harbor	41 06 (12) 72 20 (52)	Fixed red	Lens lantern.	23	.....
28	Saybrook Breakwater	41 15 48 72 20 35	Fixed white with a fixed red sector between 84° 30′ (E ½ N) and 108° 45′ (ESE $\frac{5}{16}$ E).	4	58¾	13
29	Saybrook (Lynde Point)	41 16 17 72 20 37	Fixed white	5	71	13
	The lights in Connecticut River are omitted.					
30	*Cornfield Point Light-Vessel, No. 48*	41 12 (56) 72 22 (33)	Flashing white every 30 sec. (foremast) Fixed red (mainmast)	Refl'r. Refl'r.	37 37	11¼
31	HORTON POINT	41 05 07 72 26 46	Fixed white (i. o. v.)	3	102½	16
32	Duck Island Breakwater	41 15 (26) 72 29 (05)	Fixed red	Lens lantern.	23½	.....
33	Falkner Island	41 12 43 72 39 14	Flashing white every 15 sec (i. o. v.)	4	93½	15¼
34	SOUTHWEST LEDGE	41 14 04 72 54 45	Fixed white with a fixed red sector between 280° (W ⅞ N) and 293° (NW by W $\frac{1}{8}$ W).	4	54¼	12¾
35	New Haven Middle Breakwater East End	.....	Two fixed white	Post lantern.	30 22	.....
36	New Haven Middle Breakwater West End	.....	Fixed red	Post lantern.	30	.....
37	NEW HAVEN OUTER BREAKWATER	41 13 17 72 56 34	Flashing red every 5 sec	4	61	13.35
38	New Haven Long Wharf	41 17 34 72 54 56	Fixed red	Refl'r.	45½	.....
39	Milford Harbor	41 12 (36) 73 02 (56)	Fixed red	Post lantern.	24	.....
40	Housatonic River Breakwater	41 09 (53) 73 05 (54)	Fixed red	Post lantern.	20	.....
41	Stratford Point	41 09 07 73 06 13	Flashing white every 45 sec	3	52	12½
42	STRATFORD SHOAL (Middle Ground)	41 03 36 73 06 06	Flashing white every 10 sec	4	60	13¼
43	PORT JEFFERSON. East Breakwater	40 58 (21) 73 05 (31)	Fixed white	Lens lantern.	28	.....
44	PORT JEFFERSON. West	40 58 (00) 73 05 (29)	Fixed red	Post lantern.	30	.....
45	Old Field Point	40 58 37 73 07 09	Fixed white (i. o. v.)	4	76	14¼
46	Bridgeport East Breakwater	41 09 (21) 73 10 (40)	Fixed red	Post lantern.	14	.....
47	Bridgeport Harbor	41 09 24 73 10 49	Fixed red	4	52½	11¼
48	Bridgeport Breakwater	41 09 (58) 73 10 (35)	Fixed white	Lens lantern.	29	.....

POINT JUDITH TO NEW YORK—Continued.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
24	Screw-pile structure; piles, red; dwelling and tower, white; black lantern	.....	Bell struck by machinery a single blow every 15 sec.
25	Light on granite dwelling	35	Bell struck by machinery a single blow every 20 sec.
26	Lantern on black iron column with black lamp house	.....	.....
27	Red post, with shelf for lantern, red oilhouse at base, on rectangular, pyramidal, stone pier.	20	.....
28	White, conical, iron tower, on brown, cylindrical foundation; black lantern	44	Bell struck by machinery a single blow every 20 sec.
29	White stone tower attached to gray dwelling with lead-colored trimmings; black lantern.	64	Bell struck by machinery a single blow every 12 sec.
30	Two masts, schooner-rigged, no bowsprit, black mastheads with black, circular, cagework daymark at each; red hull, with "CORNFIELD POINT" in white on each side and "No. 48" in white on each bow; black smokestack and fog signal between the masts.	.....	12-inch steam whistle; blasts 3 sec., alternate silent intervals 1 and 30 sec. Submarine bell strikes the number of the vessel, "48," at regular intervals. If whistle be disabled the ship's bell will be struck by hand a single and a double blow alternately, intervals approximately 30 sec.
31	White, square, brick tower, with dwelling attached	35	.....
32	Red post with shelf and white top; red house at base	.....	.....
33	White, octagonal tower, with dwelling attached; fog-signal building 150 feet to the N'd.	46	1st-class compressed-air siren; blasts 3 sec., silent intervals 27 sec.
34	White, octagonal, one-story house with high Mansard roof; black lantern; brown, cylindrical foundation.	32	2d-class Daboll trumpet; blasts 3 sec., alternate silent intervals 3 and 11 sec. If trumpet be disabled a bell will be struck by machinery every 15 sec.
35	Lanterns on black pole with white top	.....	.....
36	Lantern on red post with white top	.....	.....
37	Black, cylindrical, foundation pier, expanding in trumpet shape at its upper end to form a gallery, surmounted by a conical, iron tower, lower half brown, upper half white, surrounded by a covered gallery at its base and surmounted by a black lantern.	.....	Compressed-air siren; blasts 3 sec., silent intervals 17 sec.
38	Red, square, skeleton, iron tower, with small house at base; black lantern	43½	Bell struck by machinery a single blow every 10 sec.
39	Red post, with shelf supporting lantern	16	.....
40	Red post with shelf at top, red oilhouse at base, and red ladder attached	.....	.....
41	White conical tower, with brown band about midway of its height; black lantern; white dwelling detached; fog-signal building, white.	35	Bell struck by machinery a single blow every 15 sec.
42	Gray-granite, octagonal tower, projecting from the S'ly side of a square, gray-granite house on a pier; black lantern.	40	3d-class Daboll trumpet; blasts 6 sec., silent intervals 21 sec.
43	White post with shelf for lantern, adjacent to white, square, fog-bell house, on rough stone foundation.	.....	Bell struck by machinery a double blow every 30 sec.
44	Pyramidal concrete pier supporting a red post with bracket at top, from which lantern is suspended.	.....	.....
45	White tower on gray two-story dwelling; black lantern	46	.....
46	Red post with shelf supporting lantern	.....	.....
47	Screw-pile structure; red piles; white tower and dwelling; slate-colored Mansard roof; black lantern.	34	Bell struck by machinery a single blow every 15 sec.
48	Cylindrical pier surmounted by a conical iron tower with lantern, entire structure black.	.....	Bell struck by machinery a single blow every 8 sec.

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	LONG ISLAND SOUND AND TRIBUTARIES—Continued.	° ′ ″				
49	Black Rock	41 08 33 73 13 04	Fixed white	5	39½	11½
50	PENFIELD REEF	41 07 02 73 13 21	Flashing red every 5 sec.	4	50½	12½
	NORWALK HARBOR—					
51	Pecks Ledge	41 04 (37) 73 22 (09)	Flashing white; intervals alternately 7½ and 22½ sec.; duration of flash ½ sec. (i. o. v.)	4	54	12¾
52	Grassy Hammock	41 04 (37) 73 23 (03)	Fixed red	Post lantern.	20	.....
53	Round Beach	41 04 (41) 73 24 (07)	Fixed white	Post lantern.	12½	.....
54	Fitchs Point	41 05 (28) 73 24 (26)	Fixed white	Post lantern.	12½	.....
55	White Rock Reef	41 04 (09) 73 24 (30)	Fixed red	Post lantern.	12½	.....
56	Long Beach	41 04 (24) 73 24 (22)	Fixed red	Post lantern.	23	.....
57	Greens Ledge	41 02 30 73 26 39	Fixed white varied by a red flash every 15 sec.	4	62	13½
58	EATONS NECK	40 57 14 73 23 45	Fixed white (i. o. v.)	3	143¾	18
59	Lloyd Harbor	40 54 54 73 26 06	Fixed red	5	37	8½
60	Cold Spring Harbor	40 54 (51) 73 29 (42)	Fixed white with a fixed red sector between 49° 40′ (NE $\frac{7}{16}$ E) and 128° 20′ (SE $\frac{3}{16}$ E).	4	40½	11¼
61	Stamford Harbor	41 00 49 73 32 35	Fixed red	4	56½	11¼
62	Pine Island	41 01 (55) 73 32 (17)	Fixed red	Post lantern.	29	.....
63	Great Captain Island	40 58 57 73 37 26	Fixed white (i. o. v.)	4	72½	14
64	Jones Rocks	40 59 (18) 73 38 (07)	Fixed white (a.)	Lens lantern.	27	.....
65	Port Chester	40 59 (04) 73 39 (24)	Fixed red	Post lantern.	27	.....
66	Glencove Breakwater	40 51 (41) 73 38 (58)	Fixed red	Post lantern.	19½	.....
67	Larchmont Harbor	40 55 (03) 73 43 (52)	Fixed red	Post lantern.	21	.....
68	Execution Rocks	40 52 41 73 44 17	Flashing white with a flashing red sector between 43° 30′ (NE ⅛ N) and 80° (E ⅞ N), interval between flashes 10 sec.	4	54½	12¾
69	Sands Point	40 51 57 73 43 48	Fixed white	4	64½	13½
70	Hart Island Fog-Signal Station	.....	.....	.....	.....	.....
71	Stepping Stones	40 49 28 73 46 31	Fixed red	5	45½	8½
72	Throgs Neck	40 48 (17) 73 47 (35)	Fixed white	4	69	12¾
	EAST RIVER:					
73	Whitestone Point	40 48 (02) 73 49 (12)	Fixed white	Lens lantern.	36½	.....
74	Flushing Bay	40 46 (13) 73 51 (12)	Fixed red	Post lantern.	10	.....
75	Flushing Bay Inner	.....	Fixed red	Post lantern.	10	.....
76	Rikers Island	40 47 (50) 73 53 (21)	Fixed red	Post antern.	32½	.....

POINT JUDITH TO NEW YORK—Continued.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
49	White stone tower; black lantern	33	
50	White tower on granite dwelling with red Mansard roof, on dark pier; black lantern.	37	3d class Daboll trumpet; blasts 3 sec., silent intervals 17 sec. If trumpet be disabled a bell will be struck by machinery a double blow every 20 sec.
51	Black, cylindrical foundation pier, conical tower, lower part white, middle brown, upper part white; black lantern; base of tower surrounded by white gallery with roof.		Compressed-air siren; blasts 2 sec., silent intervals 6 sec.
52	Red, pyramidal structure, surmounted by small house with red post with white top.		
53	Black, five-pile dolphin with white top		
54	Black, five-pile dolphin with white top		
55	Red, five-pile dolphin with white top		
56	Gray, square, stone base, surmounted by a red post with white top; red, spherical, latticework daymark on side of post, below lantern.		
57	Black, cylindrical, foundation pier, expanding in trumpet shape at its upper end to form a gallery, surmounted by a conical, iron tower, lower half brown, upper half white, surrounded by a covered gallery at its base; black lantern.		3d-class Daboll trumpet; blasts 3 sec., silent intervals alternately 2 and 32 sec.
58	White, stone tower, dwelling attached; black lantern; red-brick fog-signal building about 300 feet NNW'ly from tower.	63	1st-class, automatic, compressed-air siren; blasts 4 sec., silent intervals 40 sec.
59	White, square, brick tower, dwelling attached	34	
60	White, square, pyramidal, wooden tower on black, cylindrical, foundation pier; black lantern.		Bell struck by machinery a single blow every 30 sec.
61	White conical tower, on red cylindrical foundation; black lantern	60	Bell struck by machinery a single blow every 20 sec.
62	Triangular, wooden platform surmounted by a red, iron column, from which lantern is suspended, red oilhouse at base.	25	
63	White tower on S'ly gable of granite dwelling; brick fog-signal building about 125 feet E'ly from tower.	46	1st-class compressed-air siren; blasts 3 sec. silent intervals 27 sec.
64	Iron columns, with square daymark and bracket from which lantern is suspended, and two tanks at base; on iron skeleton structure; all black.	23	
65	Red wooden post, with iron bracket from which lantern is suspended	18	
66	Black post with shelf near top, white above shelf		
67	Red post with shelf at top, red oilhouse at base, and red ladder attached		
68	White, stone tower, with brown horizontal stripe on SW'ly side and brown band about midway of its height, granite dwelling attached on W'ly side; white and black horizontal band on SE'ly fence, and a similar band on W'ly fence; red fog-signal building on NE'ly side of tower.	47	1st-class compressed-air siren; blasts 3 sec., silent intervals 17 sec.
69	White tower, with light-buff dwelling attached; black lantern	46	
70	*To be established*		
71	Black lantern on red-brick dwelling, with stone trimmings and Mansard roof, on granite pier with white horizontal band on SSW'ly face.	36	Bell struck by machinery a double blow every 20 sec.
72	Red-brick, conical tower; white doors and windows, dark-green trimmings; black lantern.	35	Bell struck by machinery a single blow every 15 sec.
73	Square, pyramidal, frame tower on piers; lower part, white; upper, wood-color.	20	Bell struck by machinery a double blow every 30 sec.
74	Red stake bolted to pile on end of dike		
75	Red, square oilhouse supported by red framework attached to dike		
76	Lantern on top of white post with red oilhouse at base		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	EAST RIVER—Continued.	° ′ ″				
77	Oak Bluff		Fixed red Fixed white	Post lantern.	25 17	
78	North Brother Island	40 47 57 73 54 00	Fixed white 5 sec., eclipse 5 sec	4	46½	12
79	South Brother Island Ledge	40 47 (34) 73 53 (57)	Fixed red	Post lantern.	17½	
80	Lawrence Point Ledge	40 47 (35) 73 54 (16)	Fixed white	Post lantern.	17½	
81	Sunken Meadow	40 47 (48) 73 54 (57)	Fixed red	Lens lantern.	20½	
82	Negro Point					
83	Hell Gate	40 46 41 73 56 06	Alternately red and white, each 3 sec	Lens lantern.	22	
84	Mill Rock Northerly	40 46 (52) 73 56 (18)	Fixed red	Post lantern.	13½	
85	Mill Rock Southerly	40 46 (46) 73 56 (24)	Fixed red	Post lantern.	15	
86	Blackwells Island Reef	40 44 (47) 73 57 (55)	Two fixed red	Lens lantern.	43½ 37½	
87	MONTAUK POINT	41 04 16 71 51 27	Flashing white every 10 sec.; duration of flash about $\frac{1}{10}$ sec. (i. o. v.) Fixed red between 140° 50′ (SE ½ S) and 152° 20′ (SSE $\frac{7}{10}$ E).	3½ Range lens.	168¼ 161¼	19
88	SHINNECOCK BAY	40 51 03 72 30 16	Fixed white (i. o. v.)	1	160	18¼
89	*Fire Island Light-Vessel, No. 68*	40 28 (40) 73 11 (26)	Two fixed white; three lanterns encircling each masthead. If the electric-light apparatus should become inoperative, the lights will show fixed white, from lens lanterns suspended *under* the galleries, and will be *less brilliant* than the electric lights. (e. i.)	Lens lantern.	57 57	13
90	FIRE ISLAND	40 37 57 73 13 08	Flashing white every minute; duration of flash about 4 seconds. (i. o. v.)	1	167	19
91	NAVESINK (S'ly)	40 23 46 73 59 09	Flashing white every 5 sec.; duration of flash about $\frac{1}{10}$ sec. Light shown from S'ly tower. In case of the accidental extinguishment of the electric light a fixed white oil light of the first order will be shown from the N'ly tower. (e. a.)	1	246	22¼
	NEW YORK LOWER BAY:					
92	*Ambrose Channel Light-Vessel, No. 87*	40 28 (02) 73 50 (01)	Fixed white 12 sec., eclipse 3 sec.; three lanterns encircling masthead. Should the electric light machinery become entirely inoperative, oil lights will be placed in one set of lens lanterns, and the characteristic of the light will be *fixed* white. (e. i.)	Lens lantern.	52	12¾
	AMBROSE CHANNEL.					
93	Outer Range. West Bank (front)	40 32 (17) 74 02 (36)	Fixed white to E'd of 190° 30′ (S $\frac{13}{16}$ W) and 12° 50′ (N by E ½ E); fixed red to W'd of the same bearings. (i. o. v.)	4	69	13.9
94	Outer Range. Staten Island (rear)					
95	Middle Range. Swinburne Island front					
96	Middle Range. Swinburne Island rear					
97	Inner Range. North Hook Beacon (front)	40 28 (18) 74 00 (18)	Fixed white; *obscured between 356° (N ⅚ W) and 356° (N NW ⅙ W).* (i. o. v.)	4	44	12
98	Inner Range. SANDY HOOK (rear)	40 27 42 74 00 09	Fixed white (i. o. v.)	3	88	15
99	*Junction Light-Vessel*					

POINT JUDITH TO NEW YORK—Continued.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
77	Red post and oilhouse, inclosed by red picket fence		
78	White dwelling, with Mansard roof; black lantern; white wedge-shaped fog-bell tower SE'ly of light-house.	38	Bell struck by machinery a single blow every 15 sec.
79	Red, square foundation; red house with post, top of post white		
80	Black, square foundation; black house with post, top of post white		
81	Red, square, foundation crib; red post with lantern on shelf and red, square daymark above; small oilhouse on corner of crib.		
82	*To be established*		
83	Small, white, pyramidal, wooden tower, upper part natural wood		Bell struck by machinery a single blow every 5 sec.
84	Red post with white top, red oilhouse at base, on concrete block		
85	Red post with white top, red oilhouse at base, on concrete block		
86	Lanterns, one vertically above the other, on black iron spindle with ladder		
87	White tower with a brown band about midway of its height; white dwelling on hill near by; fog-signal building about 100 feet E'ly of tower.	97	1st-class compressed-air siren; blasts 3 sec., silent intervals alternately 3 and 31 sec.
88	Red-brick tower, with drab dwelling attached	150	
89	Flush-deck, schooner-rigged steam vessel, two masts, no bowsprit; black masthead; black, circular gallery under lens lanterns at each masthead; red hull, with "FIRE ISLAND" in white on each side and "68" in white on each bow and each quarter; a black smokestack and fog signal between the masts.		12-inch steam chime whistle; blasts 3 sec., silent intervals alternately 4 and 20 sec. Submarine bell strikes the number of the vessel, "68," at regular intervals. If whistle be disabled a bell will be struck by hand 7 blows every minute.
90	Black and white horizontally-banded tower, two of each color, black at the top; dark-red granite dwelling attached; on white stone pier.	152	
91	Two brownstone towers, 228 feet apart, 171° 40′ (S ¾ E) and 351° 40′ (N ¾ W), connected by brownstone dwelling; N'ly tower, octagonal; S'ly tower, square.	53	
92	Flush-deck, steam, schooner-rigged vessel, two masts, no bowsprit; straw-colored masts; black, circular, hoop-iron, cagework daymark at each masthead; straw-colored smokestack and fog signal between the masts; straw-colored hull, with "AMBROSE CHANNEL" in black on each side and "87" in black on each bow and each quarter.		12-inch steam whistle; blasts 3 sec., silent intervals 12 sec. Submarine bell strikes "22" at regular intervals. If whistle be disabled a bell will be struck by hand a single blow approximately every 30 sec.
93	Black, cylindrical pier, expanding in trumpet shape at its upper end to form a gallery, surmounted by a brown, conical tower; black lantern; conical roof around base of tower and covering gallery; white horizontal band around pier, 6 feet above low water.		Compressed-air siren; blasts 2 sec., silent intervals alternately 2 and 5 sec.
94	*To be established*		
95	*To be established*		
96			
97	Brown conical tower; black lantern; white dwelling about 600 feet W'ly of tower; red-brick fog-signal house about 200 feet E'ly from tower.	42	1st-class, automatic, compressed-air siren; blasts 3 sec., silent intervals 27 sec.
98	White stone tower, with white frame dwelling detached; black lantern	77	
99	*To be established*		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristic of light.	Order of light.	Height of light above mean high water, in feet.	Distance visible, in nautical miles.
	NEW YORK LOWER BAY—Continued.	° ′ ″				
100	Old Orchard Shoal	40 30 44 74 05 57	Fixed white 12 sec., eclipse 3 sec., from 212° (SSW ⅛ W) to 96° (E $\frac{3}{16}$ S); fixed red 12 sec., eclipse 3 sec., in remaining sector; between 109° (ESE $\frac{1}{16}$ E) and 199° (S by W $\frac{1}{16}$ W) the red light shows dimly.	4	50½	12½
	MAIN CHANNEL.					
101	Main Channel Range. Point Comfort Beacon (front)	40 26 53 74 07 18	Fixed white (i. o. v.)	Range lens.	42½	11¾
102	Main Channel Range. Waackaack (rear)	40 26 38 74 08 11	Two fixed white	Range lens.	101½ 95½	16 15½
103	North Hook Beacon	40 28 (18) 74 00 (18)	Fixed white (i. o. v.)	4	44	12
104	Sandy Hook Fog Bell					
105	SW Split Range. South Hook Beacon (front)	40 27 46 74 00 21	Fixed white (a.)	6	37	11¼
106	SW Split Range. SANDY HOOK (rear)	40 27 42 74 00 09	Fixed white (i. o. v.)	3	88	15
107	Conover and Chapel Hill Range. Conover Beacon (front)	40 25 17 74 03 22	Fixed white (i. o. v.)	Range lens.	57½	13
108	Conover and Chapel Hill Range. Chapel Hill Beacon (rear)	40 23 54 74 03 33	Fixed white (i. o. v.)	Range lens.	221½	21½
	SOUTH AND SWASH CHANNEL.					
109	*Scotland Light-Vessel, No. 11*	40 26 (39) 73 55 (10)	Two fixed red	Refl'r.	45 45	12
110	Swash Channel Range. Elm Tree Beacon (front)	40 33 50 74 05 44	Fixed white (i. o. v.)	Range lens.	59½	13¼
111	Swash Channel Range. New Dorp Beacon (rear)	40 34 51 74 07 14	Fixed white (i. o. v.)	Range lens.	189½	20
112	Romer Shoal	40 30 47 74 00 50	Flashing white every 4 sec	4	54	12.8
113	West Bank	40 32 (17) 74 02 (36)	Fixed white to E'd of 190° 30′ (S $\frac{1}{16}$ W) and 12° 50′ (N by E ⅛ E); fixed red to W'd of the same bearings. (i. o. v.)	4	69	13.9
114	Coney Island	40 34 36 74 00 44	Flashing red every 5 sec	4	75	14¼
115	Craven Shoal					
	THE NARROWS:					
116	Fort Wadsworth	40 36 (20) 74 03 (15)	Flashing alternately red and white, interval between flashes 10 sec.	4	75	14¼
117	Fort Lafayette Fog-Signal Station	40 36 (28) 74 02 (19)				
	NEW YORK UPPER BAY:					
118	Light-House Depot Fog-Signal Station	40 38 (33) 74 04 (21)				
119	Robbins Reef	40 39 27 74 03 57	Flashing white every 6 sec	4	56	13
120	Governors Island	40 41 35 74 01 13	Two fixed red	Lens lantern.	60 75	
121	Governors Island East End Fog-Signal Station	40 41 (27) 74 00 (44)				

POINT JUDITH TO NEW YORK—Continued.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
100	Black cylindrical pier, expanding in trumpet shape at its upper end to form a gallery, surmounted by a conical tower, lower half brown, upper half white; black lantern; conical roof around base of tower covering gallery.	.....	Compressed-air siren; blasts 7½ sec., silent intervals 7½ sec.
101	White, square, wooden tower, rising from the roof of a white, wooden dwelling; dark-red lantern roof.	40	.....
102	White, square, pyramidal, iron, skeleton tower, with central stair-cylinder; black lantern.	96½ / 91½	.....
103	Brown conical tower; black lantern; white dwelling 600 feet to W'd of tower; red-brick fog-signal building about 200 feet E'ly from tower.	42	1st-class, automatic, compressed-air siren; blasts 3 sec., silent intervals 27 sec.
104	White, wedge-shaped, wooden, skeleton structure.....	.....	Bell struck by machinery a triple blow every 10 sec.
105	White wooden tower; black lantern.....	24	.....
106	White stone tower, with white frame dwelling detached; black lantern.....	77	.....
107	Tower with horizontal belts of white, red, and white between two white screens, each with a diagonal black cross; red lantern roof.	55	.....
108	White tower on white dwelling between two black screens.....	40	.....
109	Two masts, schooner-rigged, no bowsprit; black, circular, cagework daymark at each masthead; lead-colored hull, with "SCOTLAND" in black on each side, and "11" in black on each quarter.	.....	Bell struck by hand a triple blow approximately every 45 sec.
110	White wooden tower, with red horizontal band and red lantern roof.....	55	.....
111	White wooden tower on white dwelling.....	40	.....
112	Black, cylindrical, iron pier, surmounted by a conical iron tower, lower part white, upper part brown; bell on SW'ly side of watchroom gallery.	45	Bell struck by machinery a single blow every 30 sec.
113	Black, cylindrical pier, expanding in trumpet shape at its upper end to form a gallery, surmounted by a brown conical tower; black lantern; white horizontal band around pier, 6 feet above low water; conical roof around base of tower covering gallery.	.....	3d-class Daboll trumpet; blasts 3 sec., silent intervals alternately 2 and 12 sec.
114	White, square, pyramidal, skeleton, iron tower; black lantern; keeper's dwelling about 15 feet to S'd and E'd; fog-bell tower, near edge of bluff, to S'd and W'd of light-tower.	61¼	Bell struck by machinery a single blow every 15 sec.
115	.....	.....	.....
116	Red-brick, semicylindrical tower, with red-brick, square building in rear, and a lead-colored, wooden frame, supporting the bell, in front; cylindrical, black lantern.	.....	Bell struck by machinery a single blow every 15 sec.
117	White square structure with shingled roof, natural color; bell hung from gallows frame on top.	.....	Bell struck by machinery a single and a double blow alternately, intervals 20 sec.
118	.....	.....	Bell struck by machinery a single blow every 30 sec.
119	Conical tower, lower half brown, upper half white, on white stone base; black lantern; black horizontal stripe on S'ly side of pier.	46	Compressed-air siren; blasts 3 sec., silent intervals 3 sec. If siren be disabled a bell will be struck by machinery a single blow every 15 sec.
120	Red post, with shelf and ladder; one lantern on shelf and other on top of post; brownstone fog-signal house.	.....	Compressed-air siren; blasts 3 sec., silent intervals 12 sec. If siren be disabled a bell will be struck by machinery a double blow every 20 sec.
121	Drab, square, pyramidal skeleton, surmounted by small white house.....	.....	Bell struck by machinery a single blow every 10 sec.

The lights of the United States in this list are arranged as nearly as practicable in their regular geographic order from East to West, commencing at the first light nearest to the northeastern boundary, and following the seacoast to the entrances to the sounds, bays, rivers, etc. The lights of each estuary are arranged in regular order from the sea to the head of navigation under separate references; after which the next seacoast light will be found in the order. In some instances seacoast lights have been repeated for convenience of reference.

The names of the lights are printed as follows, viz:

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS AND LAKE-COAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, river, and harbor lights.

The geographic positions of lights which are uncertain by some seconds, not having yet been accurately determined, and those of light-vessels which vary somewhat in position, have the seconds inclosed thus: 30° 45′ (57″). The geographic positions which are given without having the seconds so inclosed are furnished by the Coast and Geodetic Survey and have been accurately determined by triangulation.

In the column "Characteristic of light" the time interval of flashing lights is given from the beginning of one flash to the beginning of the next following flash. Illuminants other than oil burned in regular service lamps are indicated thus: "(a.)"=acetylene; "(e. a.)"=electric arc; "(e. i.)"=electric incandescent; "(g.)"=gas; "(i. o. v.)"=incandescent oil vapor.

In the column "Distance visible, in nautical miles," will be found the distances within which the lights can be seen, under ordinary conditions of the atmosphere, the height of the light being measured from mean high water and the eye of the observer taken at an elevation of fifteen feet above sea level. In the majority of cases the given distances are computed *geographic* ranges. In the cases in which the given distances are smaller than would be found by computation, *luminous* ranges have been substituted for *geographic* ranges, because the lights (principally the lower orders of *fixed red* lights) are not of sufficient power to be seen, under ordinary atmospheric conditions, to the limits of their geographic range.

Distances are given in *nautical miles.*

Bearings in degrees read, clockwise, from 0° at N, to 90° at E, 180° at S, 270° at W, and 360° (0°) at N: the equivalents in compass points follow in parentheses.

Bearings and courses given are *magnetic.*

Bearings relating to the visibility of lights are given from *seaward.*

The distance of visibility of a light may be augmented by abnormal atmospheric refraction, which usually increases with the height of the barometer and a falling temperature.

VARIATION OF THE COMPASS.

The magnetic variations for 1910, and annual increase at points mentioned, are as follows:

LOCALITY.	Compass variation.		Annual increase.
	°	′	′
Off Point Judith	12	15 W.	3
Between Watch Hill and Montauk Point	11	15 W.	3
Between Block Island and Montauk Point	11	15 W.	3
Gardiners Bay	11	00 W.	3
Stonington Harbor	11	15 W.	3
New London Harbor	11	00 W.	3
Connecticut River Entrance	11	00 W.	3
North of Horton Point lighthouse	10	45 W.	3
New Haven Harbor Entrance	10	30 W.	3
Bridgeport Harbor Entrance	10	15 W.	3
Off Greens Ledge lighthouse	10	15 W.	3
Huntington Bay	10	00 W.	3
Oyster Bay	10	00 W.	3
Off Great Captain Island lighthouse	9	45 W.	3
Throgs Neck	9	30 W.	3
Southward of Montauk Point	11	00 W.	3
Off Shinnecock lighthouse	10	15 W.	3
Off Fire Island lighthouse	9	45 W.	3
Entrance to New York Bay	9	15 W.	3
New York Upper Bay	9	30 W.	3

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations is correct to July 1, 1908. The geographical positions given are approximate and are taken from the Official Register of the Service. These stations are furnished with lifeboats, mortars, and all other appliances for affording assistance in case of shipwreck.*

Name of Station.	State.	Locality.	Approximate Position. Latitude North.			Longitude West.		
			°	′	″	°	′	″
Point Judith	R. I.	Near light	41	21	40	71	29	00
Quonocontaug	R. I.	7½ miles east of Watch Hill light	41	19	50	71	43	10
Watch Hill	R. I.	Near light	41	18	20	71	51	30
Fishers Island	N. Y.	West shore of East Harbor	41	17	00	71	56	40
Sandy Point	R. I.	Block Island, north side, near light	41	13	40	71	34	40
New Shoreham	R. I.	Block Island, east side, near landing	41	10	20	71	33	30
Block Island	R. I.	Block Island, west side, near Dickens Point	41	09	40	71	36	40
Montauk Point	N. Y.	At the light	41	04	00	71	51	30
Ditch Plain	N. Y.	3½ miles southwest of Montauk light	41	02	10	71	54	30
Hither Plain	N. Y.	½ mile southwest of Fort Pond	41	01	30	71	57	50
Napeague	N. Y.	Abreast of Napeague Harbor	40	59	45	72	02	40
Amagansett	N. Y.	Abreast of the village	40	58	00	72	08	20
Georgica	N. Y.	1 mile south of the village of East Hampton	40	56	40	72	11	40
Mecox	N. Y.	2 miles south of the village of Bridgehampton	40	54	10	72	18	00
Southampton	N. Y.	¾ mile south of the village	40	52	10	72	23	40
Shinnecock	N. Y.	2 miles east-southeast of Shinnecock light	40	50	40	72	27	50
Tiana	N. Y.	2 miles southwest of Shinnecock light	40	49	40	72	31	30
Quogue	N. Y.	½ mile south of the village	40	48	20	72	36	00
Potunk	N. Y.	1½ miles southwest of Potunk village	40	47	30	72	39	00
Moriches	N. Y.	2½ miles southwest of Speonk village	40	46	30	72	43	10
Forge River	N. Y.	3½ miles south of Moriches	40	44	30	72	49	00
Smiths Point	N. Y.	Abreast of the point	40	44	00	72	52	20
Bellport	N. Y.	4 miles south of the village	40	42	40	72	55	50
Blue Point	N. Y.	4½ miles south of Patchogue	40	40	40	73	01	20
Lone Hill	N. Y.	8 miles east of Fire Island light	40	39	40	73	04	20
Point of Woods	N. Y.	4 miles east of Fire Island light	40	38	50	73	08	10
Fire Island	N. Y.	½ mile west of Fire Island light	40	37	40	73	13	20
Oak Island	N. Y.	East end of Oak Island	40	38	10	73	17	40
Gilgo	N. Y.	West end of Oak Island	40	37	20	73	22	20
Jones Beach	N. Y.	East end of Jones Beach	40	36	40	73	26	20
Zachs Inlet	N. Y.	West end of Jones Beach	40	36	10	73	28	50
Short Beach	N. Y.	½ mile east of Jones Inlet	40	35	30	73	31	20
Point Lookout	N. Y.	2 miles west of New Inlet	40	35	10	73	35	40
Long Beach	N. Y.	Near west end of Long Beach	40	35	10	73	40	45
Far Rockaway	N. Y.	(*Not yet rebuilt*)						
Rockaway	N. Y.	Near the village of Rockaway	40	35	30	73	47	30
Rockaway Point	N. Y.	West end of Rockaway Beach	40	34	10	73	51	50
Coney Island†	N. Y.	Manhattan Beach	40	34	20	73	55	30
Sandy Hook	N. J.	On Bayside, ½ mile south of point of Hook	40	27	51	74	00	27
Spermaceti Cove	N. J.	2½ miles south of Sandy Hook light	40	25	40	73	59	00
Eatons Neck	N. Y.	East side entrance to Huntington Bay, Long Island Sound	40	57	10	73	24	00
Rocky Point	N. Y.	Near Rocky Point, Long Island Sound, about 4 miles northerly from Greenport.	41	08	20	72	21	10

*Instructions to enable mariners to avail themselves fully of the assistance thus afforded will be sent free of charge upon application to the General Superintendent of the Life-Saving Service, Washington, D. C.

†Not in operation.

TIDES.*

GENERAL TABLE.

Locality.	Lunitidal Intervals.†		Correction for standard time.	Rise and Fall (Range).			Extreme range of tide observed.
	High water.	Low water.		Mean tides.	Spring tides.	Neap tides.	
	h. m.	h. m.	m.	Feet.	Feet.	Feet.	Feet.
Point Judith	7 32	1 17	—14	3.1	3.8	2.3	4.7
Montauk Point	8 20	2 03	—13	2.0	2.4	1.6	3.1
Fishers Island Sound (eastern entrance)	8 55	2 45	—12	2.7	3.2	2.1	4.2
Stonington	8 59	2 52	—12	2.7	3.2	2.2	4.2
Little Gull Island light	9 26	3 04	—12	2.5	3.0	2.0	3.9
Plum Gut	10 00	3 41	—11	2.7	3.2	2.2	4.1
Gardiners Bay, SE. part (Acabonack Harbor)	9 25	3 21	—11	2.7	3.1	2.1	4.2
New London	9 26	3 30	—12	2.5	2.9	2.0	7.2
Connecticut River Entrance	10 29	4 11	—11	3.6	4.3	2.9	5.6
Falkner Island	10 57	4 40	— 9	5.4	6.3	4.3	8.2
Thimble Islands	10 59	4 42	— 9	5.6	6.7	4.5	8.6
New Haven Entrance	11 08	4 54	— 8	6.0	7.1	4.8	9.2
Port Jefferson	11 41	5 46	— 8	6.6	7.8	5.3	10.1
Stratford Shoal (Middle Ground) light	11 03	4 56	— 8	6.6	7.8	5.3	10.2
Bridgeport	11 09	5 04	— 7	7.2	8.5	5.8	11.0
Sheffield Island Harbor	11 06	5 00	— 6	7.2	8.5	5.8	11.0
Huntington Bay	11 06	4 59	— 6	7.6	9.0	6.1	11.7
Northport Harbor	11 07	5 00	— 7	7.3	8.6	5.8	11.2
Lloyd Harbor	11 06	4 59	— 6	7.6	9.0	6.1	11.7
Oyster Bay	11 07	5 06	— 6	7.3	8.6	5.8	11.2
Cold Spring Harbor	11 08	5 07	— 6	7.6	9.0	6.1	11.7
Captain Harbor	11 07	5 02	— 6	7.3	8.6	5.9	11.1
Hempstead Harbor	11 09	5 06	— 5	7.2	8.5	5.8	11.1
New Rochelle	11 13	5 10	— 5	7.6	8.9	6.0	11.6
Manhasset Bay	11 09	5 14	— 5	7.2	8.5	5.8	11.1
Willets Point	11 09	5 22	— 5	7.2	8.5	5.7	11.3
Hell Gate Ferry	10 10	3 46	— 4	5.1	6.1	4.0	7.9
Governors Island	8 04	2 05	— 4	4.4	5.3	3.4	11.5
The Narrows	7 43	1 40	— 4	4.6	5.6	3.6	11.9
Sandy Hook	7 35	1 27	— 4	4.7	5.6	3.7	11.9
Rockaway Inlet	7 42	1 15	— 4	4.3	5.2	3.4	6.6
Fire Island Inlet (inside)	7 19	1 20	— 7	2.0	2.3	1.5	3.0

It will be noticed that there is in Long Island Sound a gradual increase of rise and fall from east to west until the contracted part of the Sound is reached at Eatons Neck; westward of this there is but a slight increase in the range. Between Falkner Island and Willets Point the differences in the times of high and of low water are but small between the various stations.

WIRELESS-TELEGRAPH STATIONS.

Vessels fitted with wireless-telegraph apparatus can communicate with these stations by following the instructions contained in Hydrographic Office Notice to Mariners No. 47*a*, dated November 22, 1904.

The following is a list of the U. S. Naval coastwise wireless-telegraph stations covered by this volume, and their call letters, corrected to March, 1909. Changes or additions to the stations or in the regulations are published in Hydrographic Office Notices to Mariners issued weekly:

Call letters.	Stations.
P K	**Newport, R. I.**
P R	**Fire Island, N. Y.**
P T	**New York Navy Yard, N. Y.**

The following stations not operated by the Navy Department are open to public service:

Call letters.	Stations.
M S K	**Sagaponack, L. I., N. Y.**
D F	**Manhattan Beach, L. I., N. Y.**
M S E	**Sea Gate, L. I., N. Y.**
N Y	**New York City, N. Y.**
B G	**Bridgeport, Conn.**

* Tide tables for the Atlantic coast of the United States, published annually by the Coast and Geodetic Survey, predicting the times and heights of tides for every day of the year, at all the principal ports, can be obtained from the agents named in the list given on pages 7–8; price $0.15.

† The mean lunitidal interval for high water or for low water is the average time from the meridian transit of the moon to the next following high or low water, respectively; it is also called the corrected establishment.

STORM WARNING DISPLAY STATIONS.

The storm warning displays of the United States Weather Bureau are made for the benefit of mariners at the following points. The signals are described and their meaning is explained in Appendix III.

Point Judith, R. I.
Block Island, R. I.
Block Island (Southeast Light), R. I.
Stonington, Conn.
New London (Custom-House), Conn.
New Haven, Conn.
New Haven Light, Conn.
Bridgeport, Conn.
Seawanhaka Yacht Club, N. Y.
Greenwich, Conn.
New Rochelle Yacht Club, N. Y.
Fort Schuyler, N. Y.
Montauk Point, N. Y.
Bay Shore, N. Y.
Sandy Hook, N. J.
Sea Gate, N. Y.
Governors Island, N. Y.
New York City (Borough of Manhattan), N. Y.

SEACOAST TELEGRAPH AND REPORTING STATIONS.

The Western Union Telegraph Company maintains telegraph stations at the following places, from which passing vessels are reported to the Maritime Exchange in New York for the information of members, and from this exchange the reports are distributed to the newspapers:

Block Island (Southeast Light), R. I.
City Island, N. Y.
Fire Island Light, N. Y.
Highlands of Navesink, N. J.
Sandy Hook, N. J.
Quarantine, Staten Island.

BLOCK ISLAND SOUND *

is the approach to Long Island Sound, Fishers Island Sound, and Gardiners Bay, and is otherwise of no special importance. Its eastern and southern limits are defined by Point Judith, Block Island, and the eastern end of Long Island. It is comparatively free of dangers in the northern part, and easily navigated in clear weather; the aids are numerous, and the important dangers are marked by buoys.

Point Judith, the eastern limit of the northern part of Block Island Sound, is marked by a lighthouse (see page 12); about 1¼ miles southward of this lighthouse a gas and whistling buoy is moored. Westward of the lighthouse is a high wireless-telegraph mast, the most prominent landmark on this part of the coast. Northward of Point Judith, near Narragansett Pier, is a square granite tower over 100 feet high, which can be seen 20 miles on a clear day. The breakwaters of Point Judith Harbor of Refuge lie westward of the point; the harbor is described on page 33.

Point Judith Pond, on the west side of Point Judith Neck, has a length of 3 miles in a 16° true (**NNE ½ E** mag.) direction, and is very irregular, with numerous islands, but has general depths of 7 to 12 feet. The south end of the pond is shallow, and is separated from Block Island Sound by a beach ¼ to ½ mile wide, through which a channel has been cut from Block Island Sound to the 8-foot curve in the pond, and it is proposed to deepen this cut. At present (1908) the west jetty at the entrance extends to 7 feet of water, and lies 1¾ miles northwestward of Point Judith lighthouse. The channel into the pond is used by boats only.

Block Island, 9 miles 202° true (**SW** by **S** mag.) from Point Judith, is a prominent feature in approaching from eastward; it is 5 miles long, is high at both ends, and is marked by a lighthouse on its northern end and another on its southeastern end, the latter showing a primary seacoast light.

Block Island Harbor and **Great Salt Pond** are treated separately on pages 33 and 34.

Montauk Point, the eastern point of Long Island, presents high sand bluffs covered with grass when seen from eastward; Montauk Point lighthouse, on the top of one of the bluffs, shows a primary seacoast light.

Fort Pond Bay is a semicircular bay about 1 mile wide making into the northern shore of Long Island about 5½ miles westward of Montauk Point. The bay is free from dangers, but flats make out from its eastern shore for ¼ mile. In approaching, the offshore dangers must be avoided when westward of Montauk Point. Fort Pond Bay affords anchorage in 7 to 8 fathoms, soft bottom, but is exposed to northerly and northwesterly winds, and is little used except by the menhaden fishermen who frequent the waters about Gardiners Island.

Napeague Bay, a part of Block Island Sound, lies southward and southeastward of Gardiners Island, between it and the Long Island shore. The southwest part of the bay is filled with shoals, through which a buoyed channel leads to Gardiners Bay; it is rarely used except by the local fishermen. There is a considerable tidal current in this part of the bay. **Promised Land**, a village on the southeast side of the southwest end of the bay, is engaged principally in the fishing industry. Vessels anchor here occasionally, but the bottom is sand and not good holding ground.

These bays are not sheltered against northerly winds; strong northerly squalls occur frequently in summer. Of the two, Fort Pond Bay is the better anchorage.

* Shown on chart **114**, scale $\frac{1}{80,000}$, price $0.50. See also the footnote on page 9.

Napeague Harbor, in the southern part of Napeague Bay, has about 8 feet over the bar at low water; the channel is crooked and unfit for a stranger. It is used by the menhaden fishermen and by small craft.

Storm warning display and seacoast telegraph stations.—Storm warning displays of the United States Weather Bureau are made at Point Judith, Block Island, and Block Island (SE) lighthouse. There is a seacoast telegraph station at Block Island (SE) lighthouse and a telegraph station at Point Judith from which passing vessels are reported. Vessels may communicate with the station on Block Island by the use of international code signals.

For **variation of the compass**, see page 22.

For **tides**, see table, page 24.

Lists of lighthouses, life-saving stations, and other general matters, will be found on preceding pages.

TIDAL CURRENTS, BLOCK ISLAND SOUND.

Between Point Judith and Block Island the velocity of the flood or westerly current at strength is about 1.8 miles, and the velocity of the ebb or easterly current somewhat greater.

Between Block Island and Montauk Point the velocity of the flood or northwesterly current is about 1.2 miles in the middle of the passage, and nearly 2 miles off Montauk Point, while the ebb or southeasterly current has a velocity of nearly 2 miles in the passage.

About 2 miles north of Fort Pond Bay the current has a velocity of about ¾ mile in an easterly and westerly direction.

About 1 mile north of Cerberus Shoal whistling buoy the flood or westerly current has a velocity of about 1.4 miles, and the ebb current about 1.7 miles at strength.

About 2 miles southeast from Watch Hill lighthouse the velocity of the flood at strength is about 1.2 miles, and of the ebb about 1 mile.

REMARKS ON APPROACHING BLOCK ISLAND SOUND FROM SOUTHWARD AND EASTWARD.

The locality between Gay Head and Montauk Point, including Block Island Sound, is noted for frequent fogs in spring and fall; and the tidal currents have considerable velocity between Montauk Point and Block Island and in Block Island Sound. See current notes preceding.

In clear weather no special caution is necessary as the aids are numerous and land will be in sight to be recognized in time to avoid dangers. Point Judith and Block Island, at the eastern entrance, are prominent, and Montauk Point can not be mistaken when seen by vessels approaching from southward.

In thick weather the greatest caution is necessary; soundings can not be depended on for locating the vessel's position, although they will serve to indicate a near approach to dangers. Reliable allowance can not be made for the strong tidal currents between Montauk Point and Block Island and in the sound, as the force and direction of the winds have an influence on their velocity and direction.

Vessels approaching Block Island Sound from sea and not being sure of their position are advised to remain offshore until the weather clears. Vessels if approaching between Block Island and Montauk Point should sound frequently, and if a depth of 10 fathoms or less is obtained should exercise the greatest caution, the bottom being irregular inside a depth of 10 fathoms; in some cases shoals with 3½ to 5½ fathoms over them rise abruptly from depths of 9 and 10 fathoms. Coasting vessels coming from eastward aim to make the fog signal at Block Island SE lighthouse and from it shape a course to pass into the sound. Approaching the south shore of Block Island a depth of less than 10 fathoms indicates a distance of less than ¾ mile from the shore and the vessel should be headed offshore immediately.

Coasters coming from southward or southwestward stand in for the south shore of Long Island between Shinnecock lighthouse and Montauk Point, sounding frequently, and when the depth is 12 to 13 fathoms make good a 65° true (**ENE ¾ E** mag.) course, which leads parallel to the beach and about 2¼ miles from it; and when Montauk Point fog signal is made and located, they shape their course into the sound, taking care to clear the shoals off the point. In strong easterly winds the shore of Long Island should not be approached closer than in 15 fathoms by a sailing vessel, and Montauk Point fog signal can not then be heard.

SAILING DIRECTIONS, BLOCK ISLAND SOUND, ENTERING FROM EASTWARD BETWEEN POINT JUDITH AND BLOCK ISLAND.

The entrance by this passage is clear and unobstructed, except that a dangerous reef (Block Island North Reef, see dangers following) makes off ⅞ mile from the northern end of Block Island, and is marked by a black bell buoy at its northern end.

A red gas and whistling buoy, moored about 1¼ miles southward of Point Judith lighthouse, is a useful thick-weather aid. Note the information concerning tidal currents on page 26.

For convenience the directions are given under three sections, according to destination:

1. Bound to Gardiners Bay.
1 A. Bound to Long Island Sound.
1 B. Bound to Fishers Island Sound.

Under each section courses are given from several positions, and although the position of a vessel entering Block Island Sound may not agree exactly with any of the positions here given, a reference to the paragraphs which most nearly agree with the position may facilitate shaping the proper course. The directions are good for vessels of the deepest draft.

1. ***Bound to Gardiners Bay.***—Proceed as directed below, according to position, and then follow the directions under the heading "Gardiners Bay."

If the courses and distances given in the first three paragraphs below, I, II, III, be made good, the concrete structure near the northern end of the sand spit, making northward from Gardiners Island, will bear 158° true (*S* by *E* mag.) and be distant ½ mile. The gas buoy (fixed white light), in summer, or bell buoy, in winter, should be ⅓ mile distant on the port beam, and Orient Point lighthouse should bear 284° true (*NW* by *W* ¾ *W* mag.).

I. From a position 1 mile south of Point Judith lighthouse.—Make good a 249° true (**W** ⅞ **S** mag.) course for 32¼ miles.

II. From a position 2¾ miles south of Point Judith lighthouse.—Make good a 252° true (**W** ⅝ **S** mag.) course for 32¼ miles.

III. From a position 4¼ miles south of Point Judith lighthouse.—Make good a 254° true (**W** ⅜ **S** mag.) course for 32 miles, passing 1¼ miles northward of Block Island North Reef bell buoy.

IV. If farther southward than the position of paragraph III, foregoing.—Exercise caution in rounding the north end of Block Island, giving its northern shore a berth of 1½ miles, and pass 500 yards northward of Block Island North Reef bell buoy; then shape the course 256° true (**W** ¼ **S** mag.) for Gardiners Bay entrance. In rounding the north end of Block Island keep well outside of a depth of 12 fathoms to insure safety.

V. At night.—Follow any of the foregoing directions, and when Orient Point light is sighted steer for it on any course between 281° true (**WNW** mag.) and 268° true (**W** ¾ **N** mag.). Pass northward of the gas buoy off the north point of Gardiners Island, and when Little Gull Island light bears 34° true (*NE* mag.) a 214° true (**SW** mag.) course will lead into the middle of Gardiners Bay.

Remarks.—Northward of the courses, about 17¼ miles westward of Point Judith lighthouse, is Watch Hill lighthouse; extending westward from the latter are Fishers Island Sound entrance, Fishers Island (hilly, bare of trees). The Race with its two lighthouses, and then the islands defining the northern side of Gardiners Bay entrance. For description of the lighthouses, see page 12.

Southward of the courses is Block Island, about 12 miles westward of which is Montauk Point. Gardiners Island should be made well on the port bow stretching away southward; and Gardiners Point (low, concrete structure) should be made on the port bow, and the courses should lead ½ mile northward of it.

The eastern shore of Gardiners Island should not be approached nearer than ¾ mile on account of the shoals which make off from the shore for that distance.

The courses given lead northward of Cerberus Shoal and southward of Constellation Rock; a lookout should be kept for the buoys marking these dangers. The ebb sets southeastward and the flood northwestward, and allowance must be made accordingly.

Dangers.—On any of these courses, when westward of Point Judith and Block Island North Reef, and until nearly up with Gardiners Bay entrance, there are only two dangers requiring special notice, Cerberus Shoal and Constellation Rock.

Block Island North Reef extends ⅞ mile northward from the northern point of Block Island, has 5 to 8 feet over it, and is marked off its northern end by a buoy (bell, black); deep-draft vessels should pass well northward of this buoy. This rocky shoal is dangerous to approach; the water shoals rapidly when approaching it and the tidal currents set across it with considerable velocity.

Cerberus Shoal, 7 miles 106° true (**SE** by **E** ⅝ **E** mag.) from Little Gull Island lighthouse, has 14 feet over it, and is marked by a whistling buoy and a spar buoy (both red and black horizontal stripes). The whistling buoy is ¼ mile eastward of the shoal; the spar buoy is on the shoal in rocky bottom. The shoal is small, and ordinarily there are strong tide rips near it.

Constellation Rock is 1⅞ miles 184° true (**S** by **W** ¼ **W** mag.) from Little Gull Island lighthouse, and nearly on the range of Little Gull Island lighthouse and New London lighthouse. It has 17 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). About ¾ mile 265° true (**W** ½ **N** mag.) from Constellation Rock is a 16-foot rock, and northwestward of this, between Plum Island and Great Gull Island, are foul, rocky patches.

Gardiners Point is the low, bare islet near the northern end of the dangerous spit and shoal which extends about 1½ miles 323° true (**NNW** ¼ **W** mag.) from the north end of Gardiners Island. This spit shows in places at low water, but is all covered at high water except Gardiners Point. The spit is steep-to on its western side, but a shoal extends ¾ mile from its eastern side. The northern part of Gardiners Point is occupied by a concrete structure of considerable extent and about 20 feet high. A gas buoy (fixed white light) and a bell buoy are placed about 300 yards northward of the point to mark the north end of the shoal. The strong tidal currents heel the gas buoy over at times so as to obscure the light until it is close-to; this buoy is removed in the winter.

1 A. ***Bound to Long Island Sound.***—Proceed as directed below, according to position, until nearing The Race. Race Rock lighthouse and Little Gull Island lighthouse then become the guides. In approaching and passing through The Race, follow the directions under the heading "Long Island Sound."

In paragraphs I, II, III, and IV, following, the courses made good for the distances stated will lead to a point about ¾ mile northeastward of Little Gull Island lighthouse.

I. From a position 1 mile south of Point Judith lighthouse.—Make good a 254° true (**W** ⅜ **S** mag.) course for 29 miles.

II. From a position 2¾ miles south of Point Judith lighthouse.—Make good a 258° true (**W** mag.) course for 29 miles.

III. From a position 4¼ miles south of Point Judith lighthouse.—Make good a 261° true (**W** ¼ **N** mag.) course for 29 miles.

IV. If farther southward than the position of paragraph III, foregoing.—Steer so as to pass 1½ miles north of the lighthouse on the northern end of Block Island, and pass 500 yards northward of the bell buoy marking Block Island North Reef. When the bell buoy bears 169° true (*S* mag.), distant about ¼ mile, make good a 264° true (**W** ½ **N** mag.) course for 23½ miles, which will lead about ¾ mile northeastward of Little Gull Island lighthouse.

In rounding the northern end of Block Island, keep well outside a depth of 12 fathoms to insure safety.

Remarks.—The courses given above lead well clear of all dangers, until up with The Race, and pass 3¼ to 4¼ miles northward of Cerberus Shoal, and 1¾ to 3½ miles southward of the dangers in Fishers Island Sound entrance.

On the flood a vessel will probably be set northward and on the ebb southward.

About 17¼ miles westward of Point Judith is Watch Hill lighthouse; extending westward from the latter are Fishers Island Sound entrance, Fishers Island, and The Race, through which the course will lead. About ½ mile southwestward of Race Point (the southwestern end of Fishers Island) is Race Rock lighthouse (see page 12), marking the northern side of The Race. About 3½ miles 231° true (**SW** by **W** ½ **W** mag.) from Race Rock lighthouse is Little Gull Island lighthouse (see page 12), marking the southern side of The Race; beyond the latter are the islands, all to be left on the port hand, separating Long Island Sound from Gardiners Bay entrance.

Dangers.—**Valiant Rock** with 3 fathoms over it is described on page 60.

Block Island North Reef and **Cerberus Shoal**, are described above. The dangers of Fishers Island Sound entrance are described under the heading "Fishers Island Sound," and those of The Race are described in connection with the sailing directions for that passage (see heading "Long Island Sound," page 60).

1 B. ***Bound to Fishers Island Sound.***—Proceed as directed below, according to position, and then follow the directions under the heading "Fishers Island Sound" in approaching and entering.

Strangers should not attempt to enter Fishers Island Sound at night.

I. From a position 1 mile south of Point Judith lighthouse.—Make good a 261° true (**W** ¼ **N** mag.) course for 17¼ miles, to Gangway Rock buoy (spar, red, No. 2).

Remarks.—The 261° true (**W** ¼ **N** mag.) course leads clear of all dangers, and does not approach the north shore closer than ⅞ mile until nearly up to Watch Hill lighthouse, which will be made a little on the starboard bow. Fishers Island (hilly and bare of trees) will be seen 3 miles westward of the lighthouse. Drawing near Watch Hill lighthouse, several buoys and spindles will be seen, which mark some of the many rocks and ledges in the eastern entrance to Fishers Island Sound.

Dangers.—Block Island North Reef is described on page 28.

Old Reef, with 4 feet over it, lies 800 yards from the beach 3½ miles eastward of Watch Hill lighthouse. A rock (**Hercules Rock**) is reported 250 feet southward of the reef, and is marked by a buoy (spar, red, No. 2). The beach in this vicinity should be given a berth of ¾ mile.

Gangway Rock, ⅛ mile south of Watch Hill lighthouse, is marked by a buoy (spar, red, No. 2) placed ⅛ mile south of the rock on the end of a shoal making southward from Watch Hill Point.

The dangers at the entrance to Fishers Island Sound are described under the heading "Fishers Island Sound."

II. From a position 2¾ miles south of Point Judith lighthouse.—Make good a 267° true (**W** ¾ **N** mag.) course for 17½ miles, to Gangway Rock buoy (spar, red, No. 2).

Note the remarks, etc., under paragraph I foregoing.

III. From a position 4¼ miles south of Point Judith lighthouse.—Make good a 271° true (**WNW** ⅞ **W** mag.) course for 17¾ miles, to Gangway Rock buoy.

Note the remarks, etc., under paragraph I foregoing. The course passes about 2¾ miles northward of the bell buoy marking Block Island North Reef.

IV. If farther southward than the position of paragraph III foregoing.—Follow the directions of paragraph IV, section 1, page 27, in rounding the north end of Block Island, until ¼ mile northward of the bell buoy marking Block Island North Reef, and then shape the course 282° true (**NW** by **W** ⅞ **W** mag.). This course, made good for 13 miles, leads to Gangway Rock buoy at Fishers Island Sound entrance.

Note the remarks, etc., under paragraph I foregoing.

SAILING DIRECTIONS, BLOCK ISLAND SOUND, ENTERING FROM SOUTHWARD BETWEEN BLOCK ISLAND AND MONTAUK POINT.

The flood sets northwesterly and the ebb southeasterly, both with considerable velocity. (See tidal currents, page 26.)

The tidal currents off Montauk Point form tide rips, which are most marked on the ledges and shoals.

Several of the dangers (see paragraph V following) in this passage are marked by buoys. For description of the lighthouses, see page 12.

For convenience the directions are given under three sections, according to destination:

1. Bound to Gardiners Bay.

1A. Bound to Long Island Sound.

1B. Bound to Fishers Island Sound.

Under each section courses are given from several positions, and although the position of a vessel entering Block Island Sound may not agree exactly with any of the positions here given, a reference to the paragraphs which most nearly agree with the position may facilitate shaping the proper course.

1. ***Bound to Gardiners Bay.***—Proceed as directed below, according to position, and then follow the directions under heading "Gardiners Bay." (See remarks, page 26.)

I. From a position 1¼ miles 191° true (SSW mag.) of Block Island SE lighthouse.—Make good a 272° true (**WNW** ¾ **W** mag.) course for 26¾ miles to a position ¼ to ⅜ mile northward of Gardiners Island gas buoy (fixed white light); having passed northward of this buoy, continue the course until Little Gull Island lighthouse bears 34° true (*NE* mag.).

Remarks.—The course leads about 1 mile north of Southwest Ledge and midway between Shagwong Reef and Cerberus Shoal, giving them a berth of 1½ miles.

The south shore of Block Island can be approached as close as ¾ mile.

Dangers are described under paragraph V following.

II. From a position 4 miles 191° true (SSW mag.) of Block Island SE lighthouse.—Make good a 278° true (**WNW** ¼ **W** mag.) course for 26½ miles to a position ¼ to ⅜ mile northward of Gardiners Island gas buoy.

Remarks.—The course leads nearly ¾ mile north of Shagwong Reef, and south of Southwest Ledge, Cerberus Shoal, and Constellation Rock; it leads close to and over spots with depths of 5¼ to 6 fathoms over them, and in a heavy sea deep-draft vessels should follow the directions in the next paragraph, III. (See dangers under paragraph V following.)

III. From a position southwestward of that of paragrath II, foregoing.—If coming from southward, give Montauk Point a berth of 5 miles and steer 349° true (**N** mag.), passing about 5 miles eastward of Montauk Point lighthouse, or a little more than 6 miles westward of Block Island. When the south end of Block Island bears 87° true (*E* ¾ *S* mag.), steer 272° true (**WNW** ¾**W** mag.) about 17¼ miles, passing ⅓ mile northward of Gardiners Island gas buoy (fixed white light). When Little Gull Island lighthouse bears 34° true (*NE* mag.), a 214° true (**SW** mag.) course will lead into the middle of Gardiners Bay.

Remarks.—These directions avoid the detached shoals lying southeastward, eastward, and northeastward of Montauk Point. In a heavy sea deep-draft vessels should follow these directions; or, if coming from eastward, they may follow the directions in paragraph I preceding. The 272° true (**WNW** ¾ **W** mag.) course leads about midway between Shagwong Reef and Cerberus Shoal, giving them a berth of 1½ miles. Allowance should be made for the currents, which have considerable velocity. (See dangers under paragraph V following.)

IV. To round Montauk Point close inshore, for vessels of less than 16 feet draft.—Give the south shore of Long Island a berth of at least ½ mile, and pass ¾ to 1¼ miles eastward of Montauk Point lighthouse. Then steer 349° true (**N** mag.) until the lighthouse bears 214° true (*SW* mag.), distant about 1½ miles. From this position make good a 304° true (**NW** mag.) course for 4 miles, passing about ¾ mile northeastward of the bell buoy on Shagwong Reef, and when this buoy is abaft the port beam steer 277° true (**WNW** ⅜ **W** mag.) for Gardiners Bay entrance. Leave Gardiners Island gas buoy ⅓ mile on the port hand, and when Little Gull Island lighthouse bears 34° true (*NE* mag.), a 214° true (**SW** mag.) course will lead into the middle of Gardiners Bay.

Remarks.—The above directions are good in smooth weather for vessels of less than 16 feet draft. The 349° true (**N** mag.) course leads between Montauk Point and Great Eastern Rock, and passes over and near spots with as little as 3¾ fathoms over them. Strong tide rips cover the shoals eastward of the point, and in a heavy sea they are marked by breakers.

Dangers are described under paragraph V following.

V. At night.—If coming from eastward, follow the directions in paragraph I.

If coming from southward or westward, follow the directions in paragraph III, steering 349° true (**N** mag.) until Block Island N lighthouse bears 59° true (*ENE* ¼ *E* mag.), and then haul up on the 272° true (**WNW** ¾ **W** mag.) course and continue as directed in paragraph III.

If coming from westward in smooth weather and with a light-draft vessel, follow the directions in paragraph IV.

When westward of Cerberus Shoal steer for Orient Point light on a course between 268° true (**W** ¾ **N** mag.) and 281° true (**WNW** mag.), to clear Constellation Rock and Gardiners Point.

Dangers.—The dangers entering by the passage between Block Island and Montauk Point would not, in smooth weather, interfere with vessels of 16 feet or less draft.

Southwest Ledge lies 2½ to 3¾ miles 236° true (**WSW** mag.) from the southwestern point of Block Island. It has as little as 25 feet of water over it, and is marked at its southwest end by a spar buoy and a whistling buoy (both red and black horizontal stripes). The sea breaks on this ledge in heavy weather.

Phelps Ledge and **Great Eastern Rock** lie about 1¾ miles northeastward of Montauk Point, between the bearings 34° true (**NE** mag.) and 79° true (**E** mag.) from the lighthouse. The least depth on Phelps Ledge is 28 feet, and on Great Eastern Rock 21 feet; the latter rock is 1⅝ miles 79° true (**E** mag.) from Montauk Point lighthouse, and is marked by a buoy (can, black, No. 1) and spar marker.

The depths between Montauk Point and Phelps Ledge are 3¾ to 5 fathoms. The 18-foot curve lies about ¼ mile from the beach.

Endeavor Shoals are a number of spots northward and eastward of Phelps Ledge. The general depth over these spots is 5 to 6 fathoms, but northward of Phelps Ledge, and lying 2¼ miles between 17° true (**NNE** ½ **E** mag.) and 34° true (**NE** mag.) from Montauk Point lighthouse, the depths range from 19 to 24 feet. The eastern end of Endeavor Shoals, with least depths of 4½ to 5½ fathoms, lies 4 miles between 45° true (**NE** by **E** mag.) and 67° true (**E** by **N** mag.) from Montauk Point lighthouse.

Montauk Shoal lies 2 to 3 miles between the bearings 135° true (**SE** by **S** mag.) and 169° true (**S** mag.) from Montauk Point lighthouse. It has 5 to 6 fathoms over it, and the sea breaks on it in heavy southerly gales; depths of 10 to 12 fathoms are found between the shoal and Montauk Point. The shoal is generally shown by tide rips.

Shagwong Reef, 3¾ miles 314° true (**NW** ⅞ **N** mag.) from Montauk Point lighthouse, has 7 feet over it, and is marked by a black bell buoy placed at the eastern end of the reef. The reef is also covered by a red sector of an arc of one point from a range lens on the gallery railing of Montauk Point lighthouse. There are spots, with 7½ to 18 feet over them, between Shagwong Reef and Shagwong Point (the nearest land on Long Island).

Washington Shoal, about midway between Shagwong Reef and Shagwong Point, has 15½ feet over it. A spot with 18 feet over it lies 500 yards 349° true (**N** mag.) of Washington Shoal.

Shagwong Rock, about 700 yards 3° true (**N** by **E** ¼ **E** mag.) from Shagwong Point, has 7½ feet over it, and is marked by a buoy (spar, red and black horizontal stripes). A spot with 17½ feet over it lies about 500 yards 343° true (**N** ½ **W** mag.) from Shagwong Rock.

Cerberus Shoal, *Constellation Rock*, and *Gardiners Point*, are described on page 28.

1 A. ***Bound to Long Island Sound.***—Proceed as directed below, according to position, until nearing The Race. Race Rock lighthouse and Little Gull Island lighthouse then become the guides. In approaching and passing through The Race follow the directions under the heading "Long Island Sound." For description of lighthouses see page 12. The dangers are described above. See also remarks on page 26.

The tidal currents have considerable velocity and allowance should be made for them.

I. From a position 1¾ miles 191° true (SSW mag.) of Block Island SE lighthouse.—A 282° true (**WNW** mag.) course made good for 25 miles will lead about ¾ mile northeastward of Little Gull Island lighthouse.

Remarks.—Block Island should be given a berth of at least ¾ mile. The course leads north of Southwest Ledge and Cerberus Shoal (see description above and page 28).

II. From a position 4¾ miles 191° true (SSW mag.) of Block Island SE lighthouse.—A 289° true (**NW** by **W** ¼ **W** mag.) course made good for about 25 miles will lead about ¾ mile northeastward of Little Gull Island lighthouse.

Remarks.—The course leads nearly ¾ mile south of the whistling buoy on Southwest Ledge (see above) and only about ¼ mile north of Cerberus Shoal buoys (see page 28).

III. From a position southwestward of that of paragraph II foregoing.—Steer so as to pass about midway between Montauk Point and Block Island, and when fair between them steer

304° true (**NW** mag.) until Montauk Point is abaft the beam. Then steer a 292° true (**NW** by **W** mag.) course, and when nearing The Race head a little more westward, if necessary, and follow the directions for that passage.

Remarks.—On the 292° true (**NW** by **W** mag.) course, when Montauk Point lighthouse approaches a 146° true (**SSE** mag.) bearing, care must be taken to give Cerberus Shoal whistling buoy a berth of over ¼ mile.

IV. To round Montauk Point close inshore.—Follow the directions of paragraph IV, page 30, until Montauk Point lighthouse bears 214° true (*SW* mag.) distant 1½ miles. Then a 302° true (**NW** ⅛ **W** mag.) course made good for 13¾ miles will lead about ¾ mile northeastward of Little Gull Island lighthouse.

Remarks.—Strong tide rips are apt to be met in rounding Montauk Point close inshore. The course leads nearly ¾ mile northward of Shagwong Reef and clear of dangers (see the remarks under paragraph IV, page 30, and dangers under paragraph V, page 31).

V. Entering and passing through Block Island Sound to The Race at night.—Block Island SE. light and Montauk Point light are the guides entering by this passage; after passing northward of a line drawn between these two lights, Watch Hill light, Race Rock light, and Little Gull Island light will be made northward and westward, and Block Island N. light northeastward. On approaching The Race, New London light and Bartlett Reef light-vessel will be made northwestward of The Race. For description of lights, see table, page 12.

If coming from eastward, follow the directions in paragraph I preceding.

If coming from southward or westward, give Montauk Point a berth of 5 miles and steer 349° true (**N** mag.), passing about 5 miles eastward of Montauk Point light. When Block Island N. light bears 56° true (*ENE* mag.), steer 298° true (**NW** ½ **W** mag.) until Little Gull Island light or Race Rock light is made; these two lights should be made nearly at the same time.

When northward of the shoals off Montauk Point, to clear Cerberus Shoal and Shagwong Reef, Little Gull Island light can be steered for on any course between 291° true (**NW** by **W** ⅛ **W** mag.) and 298° true (**NW** ½ **W** mag.), leaving the light 1 mile on the port hand when passing, or it can be steered for on any course from 248° true (**W** by **S** mag.) through west, to 281° true (**WNW** mag.), leaving it 1 mile on the port hand when passing.

Race Rock light can be steered for on any course between 265° true (**W** ½ **N** mag.) and 304° true (**NW** mag.), leaving the light about ¼ to ½ mile on the starboard hand.

See directions under the heading "Long Island Sound," for passing through The Race.

1 B.

Bound to Fishers Island Sound.—Proceed as directed below, according to position, and then follow the directions under the heading "Fishers Island Sound."

Strangers should not attempt to enter Fishers Island Sound at night.

For description of dangers between Block Island and Montauk Point see page 31; for other dangers see heading "Fishers Island Sound."

See remarks on tidal currents, page 26.

I. From a position 1 mile southwest of the southwest point of Block Island.—A 311° true (**NW** ⅝ **N** mag.) course made good for 14½ miles will lead to Gangway Rock buoy (spar, red, No. 2) at Fishers Island Sound entrance.

Remarks.—Watch Hill lighthouse should be made right ahead. The course leads clear of all dangers until up to Fishers Island Sound entrance.

II. From a position 6 miles 79° true (E mag.) of Montauk Point.—A 335° true (**N** by **W** ¼ **W** mag.) course made good for nearly 14 miles will lead clear of all dangers, and to Gangway Rock buoy (spar, red, No. 2).

The remarks under paragraph I preceding apply to this paragraph also.

III. From close around Montauk Point.—Keep ¾ mile off the south shore of Long Island and round Montauk Point, keeping the same distance from the shore. When Montauk Point lighthouse bears 259° true (*W* mag.), distant ¾ mile, steer 358° true (**N** ¾ **E** mag.). This course made good for 13½ miles leads to Gangway Rock buoy (spar, red, No. 2).

Remarks.—These directions are good with a smooth sea, and for vessels of less than 16 feet draft. (See the remarks under paragraph IV, page 30).

POINT JUDITH HARBOR OF REFUGE.*

This harbor, on the west side of Point Judith, is formed by a broad V-shaped breakwater 6 feet high above mean high water, and another breakwater making off in a southwesterly direction from the western side of Point Judith, leaving an entrance between the western end of the latter breakwater and the eastern end of the V-shaped breakwater. The easternmost of the two breakwaters is being extended and is not finished in 1908. Three red lights are maintained on the western (V shaped) breakwater by the U. S. Engineer in charge of the improvement, and a gas buoy is placed to mark the western end of the eastern breakwater. There is an entrance just north of the western arm of the breakwater with a width of 400 yards and depth of 18 to 21 feet. Northward of this distance from the breakwater a ridge extends to the beach; the southern end of this ridge is rocky and has a least depth of 9 feet marked by a red and black horizontally striped buoy, the northern part of the ridge has depths of 15 to 17 feet over it.

The best shelter is in the elbow and about 250 to 300 yards from the breakwater. The bottom is generally hard, and rocky in spots. The depths at the anchorage range from 22 to 32 feet, care being taken to avoid the rocky spots which are marked by buoys.

The tall wireless telegraph tower, or mast, is a very conspicuous feature and a useful mark to assist in entering the harbor by either the eastern or western entrances. A bell buoy is placed outside the knuckle of the V-shaped breakwater and about 200 yards from it.

For tides, see table, page 24.

GENERAL DIRECTIONS, POINT JUDITH HARBOR OF REFUGE.

These directions are good for vessels of 18 feet or less draft; deeper draft vessels should anchor off Newport or in Dutch Island Harbor. The directions lead between Point Judith and the eastern arm of the breakwater, which is the deeper entrance.

From Eastward.—Give Point Judith a berth of ¾ mile or more in rounding it, and steer for the light on the northeast end of the eastern arm of the breakwater on any bearing between 326° true (**NNW** mag.) and 11° true (**NNE** mag.). Give the red gas buoy a berth of 75 yards on the starboard hand and the end of the breakwater on the port hand a berth of 50 to 150 yards. Anchor behind the breakwater on the port hand and not over 600 yards from it, taking care to avoid the 13-foot spot.

From Westward.—The directions in paragraph I of sections 1, 1 A, and 1 B, pages 27–29, give the courses from Point Judith through Block Island Sound. As Point Judith is approached from westward, bring the lighthouse to bear 59° true (**ENE** ¼ **E** mag.) and steer for it on this bearing, which leads ¼ mile south of the breakwater. Follow the eastern arm of the breakwater at a distance of about 400 yards, course 50° true (**NE** by **E** ½ **E** mag.) and round its northeast end at a distance of 50 to 150 yards. Anchor behind the breakwater and not over 600 yards from it, taking care to avoid the 13-foot spot.

Remarks.—The broken ground surrounding Point Judith has depths of 3½ fathoms nearly ½ mile southeastward and southward of the lighthouse, and 4¼ to 4½ fathoms for a distance of 1 mile 217° true (**SW** ¼ **W** mag.) from the lighthouse. The sea breaks on these spots in heavy southerly gales, and all vessels should then avoid them.

BLOCK ISLAND HARBOR.†

This artificial harbor is on the eastern side of Block Island about 1⅜ miles northward of Block Island SE. lighthouse. It is formed by a riprap breakwater which extends from the shore 1,900 feet in a 11° true (**NNE** mag.) direction. On the western side of the outer breakwater, at its inshore half, is the inner harbor, which is protected on the north by a detached breakwater extending to the shore, leaving an entrance about 250 feet wide.

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*See footnote on page 25.

†Shown on charts **114**, scale $\frac{1}{80,000}$; **356**, Block Island, scale $\frac{1}{10,000}$, price of each $0.50.

At the southeast end of the inner harbor is a cribwork basin 250 by 300 feet; its entrance is from the inner harbor on the north side of the basin, and is 80 feet wide. The basin has a depth of 9 feet at mean low water, but 7 feet is the deepest draft of the vessels taken in. Vessels entering run lines and haul in, and generally moor with lines to the shore and cribwork.

The inner harbor, which is about 600 feet in extent, affords fair shelter, and vessels of 9 feet draft can enter with a smooth sea, but the anchorage space is very limited, owing to shoals in its western part, and only vessels about 60 feet long can find room to swing at anchor. The anchorage is most used during the spring and summer months by small craft; the bottom in the inner harbor is sand and clay, and small vessels can ride out any but the heaviest northeasterly gales. The steamer landing is on its eastern side. Fishing vessels and local craft generally go into the basin.

Two lights (see table, page 12) form a range to clear the end of the outer breakwater and are guides to the inner harbor and basin; the outer light is a lantern hung on a stake on the western side of the entrance to the basin, and the inner one bears about 177° true (**S** ¾ **W** mag.) from it. The range of these two stakes just touches the end of the western breakwater at the entrance to the inner harbor.

A bell buoy is placed ½ mile 34° true (**NE.** mag.) from the northern end of the outer breakwater in about 9 fathoms of water, and a black spar buoy is placed 75 feet north from its northern end.

The island has some trade in fish and produce, carried in local vessels and by strangers. In the summer it has steamboat communication with Long Island and points in Connecticut and Rhode Island; in the winter a steamer runs to the island from Newport. In easterly gales, when no landing can be made on the east side of the island, a good harbor can be made in Great Salt Pond, on the west side of the island.

Pilots.—Strangers entering sometimes take a pilot, standing off and on, or anchoring outside the breakwater, until one comes on board.

Supplies.—Limited quantities of anthracite coal for steamers, and water through pipe and hose, can be obtained at the wharf in the basin. Provisions and some ship-chandler's stores can be had at Block Island, the settlement at the harbor.

Storm warning displays are made on a hill near the south end of Great Salt Pond, and are visible when eastward or westward of the island, and from Block Island Harbor and Great Salt Pond. (See Appendix III.)

Ice usually forms the whole length of the breakwater during January.

Tides.—The mean rise and fall of tides is 3 feet; high water occurs practically at the time of high water, and low water 8 m. later than low water at Point Judith (see table, page 24).

GREAT SALT POND.*

This is a large pond in the middle of Block Island, having deep water and good holding ground. It is the best harbor in Block Island Sound for vessels of 18 feet or less draft. In easterly gales, when the sea is too heavy to make a landing at Block Island Harbor, a landing can always be made at Great Salt Pond. The entrance to the harbor is 2 miles 202° true (**SW** by **S** mag.) from Block Island N. lighthouse; it is a dredged cut through the narrow strip of beach which separates the pond from Block Island Sound, and is protected on its southern side by a riprap jetty which extends 530 yards in a 323° true (**NNW** ¼ **W** mag.) direction from the beach into a depth of 24 feet in the sound. On the jetty about 450 feet from its end is a light (see page 12), and where the jetty joins the beach is a light and fog signal. These two lights form a range for approaching the harbor at night; a red bell buoy is moored about 830 yards 323° true (**NNW** ¼ **W** mag.) from the outer end of the jetty.

The dredged entrance had (1909) a depth of 15 feet or more for a width of 300 feet, and a central depth of 24 to 25 feet.

The village and post office of Block Island is distant about 1 mile, by a good road, from the head of Great Salt Pond.

For storm warning displays see Block Island Harbor.

Tides.—The mean rise and fall of tides in the pond is about 2.5 feet.

GENERAL DIRECTIONS, GREAT SALT POND.

The following directions (in 1909) are good for a draft of 18 feet; vessels of a greater draft require some local knowledge to carry the best water.

* Shown on charts **114**, scale $\frac{1}{80,000}$; **356**, Block Island, scale $\frac{1}{10,000}$; price of each $0.50.

Approaching and Entering.—Give the western shore of Block Island a berth of about ½ mile until off the entrance. Then pass close to the bell buoy and head through the middle of the entrance, course 143° true (**SSE ¼ E** mag.), following the south jetty at a distance of 100 yards, which leads in the best water. When well inside steer 141° true (**SSE ½ E** mag.) for the end of the large wharf at the head of the pond. Anchor when the wharf is about 350 yards distant, in 4 fathoms, soft bottom.

Or, when well inside the entrance, haul eastward and anchor in the middle of the pond in 4 to 5 fathoms, soft bottom.

Remarks and dangers.—There is very little tidal current and a small rise and fall of tides. The best water leads about 100 yards from the south jetty, and through the middle of the entrance.

On the 141° true (**SSE ½ E** mag.) course care should be taken not to approach closer than 220 yards to the point, on the western side, about midway between the entrance and the large wharf at the head of the pond; a shoal, with 15 feet at its end, makes out for a distance of 200 yards from this point.

The eastern shore near the head of the pond is shoal for a distance of 600 yards, and should be approached with caution; a black spar buoy marks the end of a shoal about 650 yards northward of the large wharf at the southern end of Great Salt Pond. The western shore should be given a berth of at least 200 yards.

GARDINERS BAY.*

Gardiners Bay is at the western end of Block Island Sound, from which it is separated by Gardiners Island, and makes into the northern shore of the eastern part of Long Island; the entrance is about 14 miles 292° true (**NW** by **W** mag.) from Montauk Point and 32½ miles 249° true (**W ⅞ S** mag.) from Point Judith.

The bay is irregular in form, has an average diameter of about 6 miles, and is comparatively free from dangers. It forms the approach to Shelter Island Sound and the Peconic bays, a favorite cruising ground for yachts, and is sometimes used as an anchorage by naval vessels.

Gardiners Bay is important as an anchorage for vessels bound into Long Island Sound and overtaken by unfavorable weather. It is one of the best natural harbors of refuge on the Atlantic seaboard. The depths at the anchorage for large vessels range from 5 to 6 fathoms, with good holding ground. For a description of Gardiners Point see page 28.

Entrances.—The approach to Gardiners Bay from eastward is through Block Island Sound and between Gardiners and Plum islands; this entrance, leading in north of Gardiners Point, has an unobstructed width of 1¾ miles, with a depth of 5½ to 21 fathoms.

A narrow, crooked channel, which is buoyed, leads through the shoals southward of Gardiners and Ram islands, but is not used by strangers.

A channel less than ¼ mile wide, with a depth of 3½ fathoms, leads through the shoals just eastward of Plum Island; this channel is marked by a buoy, but it should not be used by strangers unless compelled.

Plum Gut, the entrance to Gardiners Bay from Long Island Sound, is nearly ¾ mile wide and has sufficient water for vessels of the deepest draft; there are several rocks in the passage, with depths of 17 to 19 feet over them, and the tidal currents set through with great velocity, but steamers, or sailing vessels with a strong favorable wind, should have no difficulty in passing through. Plum Island lighthouse is on the eastern side of the passage, and Orient Point lighthouse is near the end of Oyster Pond Reef, on the western side of the passage.

Adjacent waters.—Shelter Island Sound, divided by Shelter Island into a northern and a southern part, is on the western side of Gardiners Bay, and connects it with Little and Great Peconic bays. Orient Harbor, Greenport Harbor, Sag Harbor, and other waters having special names, are mentioned elsewhere.

Lighthouses and other aids.—At night, in clear weather, a sufficient number of lights will be in sight to guide to an anchorage. It is not advisable for a stranger to attempt to enter Shelter Island Sound at night, although the entrances to the sound are marked by buoys and lighthouses. (See table, page 12.)

Repairs.—Greenport has facilities for making ordinary repairs to the machinery of steamers, with well-equipped shipyards for repairs to hulls of vessels, and several marine railways, the largest capable of hauling out vessels of 1,000 tons. (See also "Fishers Island Sound" and "Long Island Sound.")

For **variation of the compass** in Gardiners Bay see page 22; for **tides** see page 24.

Consult also pages 9–10.

*Shown on chart **298**, scale $\frac{1}{40,000}$, price $0.25; and in parts on charts **114, 115**, scale $\frac{1}{80,000}$, price of each $0.50.

SAILING DIRECTIONS, GARDINERS BAY.

Orient Point lighthouse is the leading mark for entering Gardiners Bay by day or night.

If bound into Shelter Island Sound, or Little or Great Peconic Bay, see heading "Shelter Island Sound," page 39 or 41.

Directions for approaching through Block Island Sound are given on pages 27 and 30.

1. ***From Eastward.***—*I.* Having left Gardiners Island gas buoy on the port hand and with Orient Point lighthouse bearing between 268° true (*W ¾ N* mag.) and 281° true (*WNW* mag.) bring Little Gull Island lighthouse to bear 34° true (*NE* mag.) and steer 214° true (**SW** mag.). Having stood on the latter course until well into the bay, stand over to an anchorage which affords the best lee in the prevailing wind. Take care to keep clear of Crow Shoal, which makes off from the west point of Gardiners Island.

II. Or, deep-draft vessels desiring to anchor in 6 fathoms of water.—Passing north of Gardiners Island gas buoy, steer for Orient Point lighthouse bearing between 268° true (**W ¾ N** mag.) and 281° true (**WNW** mag.) until Little Gull Island lighthouse bears 34° true (*NE* mag.), then steer 236° true (**WSW** mag.) until Orient Point lighthouse bears 349° true (*N* mag.). Then steer 169° true (**S** mag.), keeping Orient Point lighthouse on the bearing astern, and anchor on this bearing, keeping 1½ miles or more from the southern end of the bay.

Remarks and dangers.—**Gardiners Point**, off the north end of Gardiners Island, is marked by a concrete structure about 20 feet high, partly protected by riprap. This structure can not be seen on a dark night. Too much dependence can not be placed on sighting the gas buoy at night, as the strong tidal currents heel the buoy over so as to sometimes obscure the light until it is close-to. See also page 28.

The above directions lead clear of all dangers, and those in paragraph II lead in the best water in the bay.

The western shore for a distance of 3 miles southward of Orient Point should not be approached nearer than ¾ mile by vessels of 18 feet draft or over.

The shore in Bostwick Bay, on the western side of the spit which makes off northward from Gardiners Island, can be approached as close as 500 yards in 3¾ fathoms water; but keep clear of Crow Shoal.

Crow Shoal makes out southwestward from the point south of Bostwick Bay for a distance of 1¾ miles; it has from 3 to 17 feet over it, and is marked at its southwestern extremity by a buoy (spar, red and black horizontal stripes); there is 15 to 17 feet across the shoal midway between this buoy and the point.

For sailing directions through Gardiners Bay to Greenport and beyond see "Sailing Directions, Shelter Island Sound, Passing North of Shelter Island," page 39.

For sailing directions through Gardiners Bay to Sag Harbor see "Sailing Directions, Shelter Island Sound, Passing South of Shelter Island," page 41.

1 A. ***From Westward, through Plum Gut.***—Owing to the velocity of the tidal currents, this passage is often difficult and at times impracticable for sailing vessels. Strangers under sail should not use it unless the wind and tide are favorable. The following directions are available for vessels drawing 15 feet or less.

Steer for Plum Island lighthouse on any course from 85° true (**E ½ S** mag.), through south to 180° true (**S** by **W** mag.). Give the lighthouse a berth of at least ¼ mile and pass about midway between Plum Island and Orient Point lighthouses. Then steer 115° true (**SE ¾ E** mag.); leave the shore of Pine Point, the southernmost point of Plum Island, about 300 yards on the port hand, and the buoy marking Midway Shoal about 300 yards on the starboard hand.

When Little Gull Island lighthouse shows clear of the southern end of Plum Island, bearing about 59° true (*ENE ¼ E* mag.), *if bound to Orient, Greenport, Southold, or into Little Peconic Bay*, haul southward, giving Midway Shoal buoy a berth of over 300 yards, and steer 213° true (**SW** mag.) about 4¼ miles until up to the mid-channel buoy; then follow the sailing directions for Shelter Island Sound, in section 2, page 39.

If bound to Sag Harbor, follow the directions just given; leave Orient Point lighthouse 600 yards on the starboard hand and then haul southward, leaving Midway Shoal buoy on the port hand. Then bring Plum Island lighthouse to bear 6° true (*N* by *E ½ E* mag.) and make

good a 186° true (**S** by **W** ½ **W** mag.) course about 6 miles, until Cedar Island lighthouse bears 235° true (**SW** by **W** ⅞ **W** mag.), when head for it on this bearing and follow the sailing directions for Shelter Island Sound, section 1, page 41.

The *tidal currents* in Plum Gut have great velocity; the velocity here at strength is as great as in The Race (see page 58); but while the currents there have great velocity nearly all the time, the period of such marked velocity is perhaps somewhat shorter in Plum Gut.

On the flood the current sets westward in Plum Gut directly on Oyster Pond Reef.

Remarks.—Approaching Plum Island, Orient Point lighthouse, near the end of Oyster Pond Reef, will be made southwestward of Plum Island lighthouse, and a concrete structure about 20 feet high, on the end of the spit making northward from Gardiners Island, will be made showing between Plum Island and Orient Point. **Orient Point** will be distinguished from westward as a low, bare point with straggling trees at a distance from its end, and several houses and a large hotel backed by trees some distance westward of the point. **Crow Head**, the high bluff on the western side of Gardiners Island, will be seen showing between Plum Island and Orient Point.

Ram Head.—To a vessel which has entered Gardiners Bay through Plum Gut, several prominent bluffs will show on the shore southwestward. Of these Ram Head is the nearest, and the smoothest in appearance and outline. When well within the bay another bare patch will be seen northward of it, somewhat similar in appearance but farther away.

Dangers.—**A reef** with 6 to 10 feet over it makes off about 150 yards southwestward from the shore at Plum Island lighthouse, and causes a dangerous rip or overfall; the shore should here be given a berth of not less than ¼ mile.

Middle Ground is the name given to a shoal with 3¼ fathoms over it lying 400 to 600 yards 194° true (**SSW** ¼ **W** mag.) from Plum Island lighthouse.

Oyster Pond Reef makes eastward from Orient Point for about 1,000 yards, and has less than 4 feet at a distance of 800 yards from shore. About 750 yards from the shore, near the eastern edge of the reef, is Orient Point lighthouse. Vessels drawing 10 feet should pass at least 125 yards eastward of Orient Point lighthouse; vessels drawing 15 feet should give it a berth of not less than 300 yards. A spot with 3¼ fathoms over it lies 500 yards 65° true (**ENE** ¾ **E** mag.) from Orient Point lighthouse.

Midway Shoal lies about ½ mile 96° true (**ESE** ½ **E** mag.) from Orient Point lighthouse, and has a least depth of 17 feet. It is marked by a buoy (spar, red and black horizontal stripes). There are a number of spots with 3¼ to 3¾ fathoms over them between Orient Point lighthouse and Midway Shoal.

SHELTER ISLAND SOUND, LITTLE AND GREAT PECONIC BAYS, AND PECONIC RIVER.*

These waters lie in the order mentioned, extending westward of Gardiners Bay in a general 236° true (**WSW** mag.) direction about 22 miles to Riverhead, which is the head of navigation on the Peconic River. At low water 20 feet can be carried through Shelter Island Sound and Little Peconic Bay as far as Robins Island, at the entrance to Great Peconic Bay. Across the bar between Little and Great Peconic bays 13 feet can be carried at low water. When across this bar, a greater depth is found in Great Peconic Bay. Up to Jamesport, at the mouth of the Peconic River, 5 feet can be carried at low water; above this only small craft and lighters go as far as Riverhead. Above Greenport and Sag Harbor these waters are mostly navigated by small vessels and by yachts. Shelter Island is a prominent summer resort. In the summer steamers ply between the different towns and villages on these waters and the ports in Long Island Sound and Block Island. Oyster stakes are scattered throughout these waters and some care is necessary to avoid them.

Shelter Island Sound is divided into a northern and a southern part by Shelter Island. On the northern arm are Orient Harbor, Greenport Harbor, Pipes Cove, Derring Harbor, and Southold Bay; on the southern arm are Sag Harbor and Noyack Bay.

The more important places are Orient Harbor with Orient and East Marion, Greenport Harbor and Greenport, Southold Bay and Southold, and Sag Harbor; these are mentioned more fully under separate headings.

Derring Harbor makes into Shelter Island opposite (southward of) Greenport; the harbor is about ⅜ mile in extent, and affords anchorage in the middle for vessels of 8 feet or less draft. Derring Point, the northeast point at the entrance, is marked on its north side by a large hotel. A shoal, with 5 to 7 feet over it, extends halfway across the entrance of the harbor from the southwest point at the entrance.

Pipes Cove, about ¾ mile in extent, lies on the north side westward of Greenport, and has its entrance between Fanning Point and Conkling Point. Extensive shoals make out from the shores of the cove, but, entering with care,

*Shown on chart **115**, scale $\frac{1}{80,000}$, price $0.50. Shelter Island Sound is shown on chart **298**, scale $\frac{1}{40,000}$; and the Peconic Bays are shown on chart **299**, scale $\frac{1}{40,000}$, price of each $0.25.

anchorage may be selected a little southwestward of the middle, about 600 yards from the head of the cove, in 4 to 5 fathoms. Passing 150 yards southward of Fanning Point Shoal buoy (spar, red, No. 8), a 253° true (**W ½ S** mag.) course for ⅝ mile leads in the best water to the anchorage.

Noyack Bay lies southward of the western end of Shelter Island, between **North Haven** on the east and **Jessup Neck** on the west. It makes in about 2¼ miles and in width is about the same; the average depth is about 21 feet. There are no dangers in the bay, if the shores be given a berth of about ⅜ mile. A shoal with 9 to 11 feet over it makes out nearly ¾ mile from the south end of Shelter Island and is marked at its southern end by a gas buoy and spar buoy, (red, No. 2), which is near the middle of the entrance to Noyack Bay.

Little Peconic Bay is about 5 miles long and 3¾ miles wide at its widest part. On the northern side of the bay is a broad bight, westward of which is a long peninsula (**Nassau Point**); westward of the latter is Cutchogue Harbor, on the western side of which is New Suffolk.

Great Peconic Bay, nearly circular in form and about 5 miles in diameter, is separated from Little Peconic Bay by Robins Island, which lies about midway between the north and the south shores, leaving a channel on its northern and southern sides; the northern passage is not practicable for strangers.

Peconic River, at the western end of Great Peconic Bay, is navigable for very small craft as far as Riverhead, 4¼ miles above its mouth.

New Suffolk, on the western side of **Cutchogue Harbor**, in the western part of Little Peconic Bay, has a little trade in building material and produce carried by small vessels. The entrance to this harbor is obstructed by flats, and strangers should not enter without a pilot.

Jamesport Harbor and the village of **Jamesport** are at the western part of Great Peconic Bay, on the north shore opposite Southport. Vessels of 8 to 9 feet draft go up as far as Jamesport. The least depth in the channel at mean low water is 5 feet, which depth is said to be increasing. The depth alongside the wharves at low water is 5 feet.

Southport is a small village on the south side of the entrance to the Peconic River. It is 1¼ miles south of Jamesport, and the same draft can be carried there as to Jamesport.

Flanders is 2½ miles westward of Southport and at the head of Reeves Bay (a shallow bight).

Riverhead, on the Peconic River 4½ miles above Jamesport, is at the head of navigation and has railroad communication; the deepest draft of vessels going there is 4½ feet at high tides. Vessels having cargoes for Riverhead unload at Jamesport and the cargoes are sent up in lighters.

Channels.—Shelter Island Sound forms two channels leading from Gardiners Bay into Little Peconic Bay. *The channel north of Shelter Island* has the better water and is the easier to navigate, there being no shoals and flats except at the entrance and in the bights and coves. *The channel south of Shelter Island* has numerous shoals, but is well buoyed and easily followed.

Southwestward of Shelter Island these two channels unite and lead into Little Peconic Bay, through a passage about ½ mile wide between Cedar Beach Point and Jessup Neck. There is a good unobstructed channel through Little Peconic Bay, but it narrows when approaching the 13-foot bar south of Robins Island, where, at its narrowest part, it is a little over ¼ mile wide between the 12-foot curves. North of Robins Island are numerous shoals and shoal spots, making this channel into Great Peconic Bay unfit for a stranger. There is deep water through Great Peconic Bay; shoals make out from the shores, but the middle of the bay is unobstructed. The channel into Peconic River narrows, and is only 200 yards wide, with a depth of 5 feet at low water; at Jamesport it widens again southwestward, and forms a good anchorage for vessels that are able to come so far. Above Jamesport the channel is crooked and unfit for anything but vessels of very light draft.

Lights and other aids.—There are two lighthouses, one at each entrance to Shelter Island Sound (see table, page 12). For a stranger bound in at night they are good guides to an anchorage in Gardiners Bay, but it is not advisable to proceed farther unless the buoys can be seen. The most dangerous shoals are buoyed (see System of Buoyage, pages 5–6).

Pilots can sometimes be found in Gardiners Bay, or at Orient, Greenport, or Sag Harbor; they are generally fishermen or masters of small vessels trading in these waters. Pilotage is not compulsory.

Vessels bound in by the northern arm of Shelter Island Sound and desiring a pilot can set signal and either stand off and on outside the mid-channel buoy, or anchor well southeastward of Long Beach Bar lighthouse.

If bound to Sag Harbor, see "Pilots" under that heading.

Towboats are seldom used in these waters; the nearest point at which they can be found is New London, Conn.

Ice obstructs navigation above Greenport in winter, but to that place the channel is nearly always open.

The **tidal currents** have considerable velocity wherever the channel is narrowed; at some such places there are sand spits making out shoal, with a strong tidal current setting across. The currents turn from 1 to 1½ hours after high and low water.

Tides.—At Cutchogue Harbor the mean rise and fall of tides is 2.3 feet; high water occurs 2h. 01m. later, and low water 1h. 48m. later than at New London. At Jamesport the mean rise and fall of tides is 2.4 feet; high water

occurs 2h. 47m. later, and low water 2h. 42m. later, than at New London. For tidal data at other places in Shelter Island Sound see headings.

Additional information of a general nature will be found on pages 9–10.

Sailing directions are given first for the northern arm of Shelter Island Sound, the more important branch, and the one generally used by vessels bound through. Directions for the southern arm follow those for the northern arm.

SAILING DIRECTIONS, SHELTER ISLAND SOUND AND PECONIC BAYS, PASSING NORTH OF SHELTER ISLAND.

Directions for entering Gardiners Bay are given in sections 1 and 1 A, pages 36–37. The following directions are available into Little Peconic Bay for vessels drawing 16 feet or less; vessels of deeper draft should employ a pilot. There is a depth of 13 feet on the bar between Little and Great Peconic bays. The tidal currents have considerable velocity in the narrow parts of the sound, and require some attention; they set in the general direction of the channel.

1. ***Up to Mid-channel buoy.***—Having entered Gardiners Bay as directed in section 1, page 36, bring Orient Point lighthouse to bear 281° true (*WNW* mag.) and Little Gull lighthouse to bear 34° true (*NE* mag.). From this position a 236° true (**WSW** mag.) course made good for 5¾ miles will lead up to Mid-channel buoy.

Or, follow the directions in section 1 A, page 36, until up to Mid-channel buoy.

Remarks.—The 236° true (**WSW** mag.) course across Gardiners Bay is free from dangers. On this course Shelter Island and Mid-channel buoy will be directly ahead, and Ram Head, a prominent bluff on the island (see page 37), should be made on the port bow; well southward, Cedar Island lighthouse may be picked up. Long Beach Bar lighthouse will be made well on the starboard bow.

Mid-channel buoy (nun, black and white perpendicular stripes) marks the entrance to the northern arm of Shelter Island Sound. From this buoy, Long Beach Bar lighthouse bears 284° true (**NW by W ¾ W** mag.), distant 2⅛ miles.

Dangers.—**A shoal** with 17 feet over it lies about ¼ mile northward of Mid-channel buoy; and the spit of a shoal with 14 to 17 feet over it, making northward from Ram Head, extends to within ¼ mile of the buoy, the end of the spit bearing 236° true (**WSW** mag.) from the buoy.

2. ***Mid-channel buoy to Long Beach Bar lighthouse.***—Pass Mid-channel buoy close-to on either hand, and steer 273° true (**WNW ¾ W** mag.), with the buoy astern. On this course a red spar buoy (No. 2) should be made on the starboard bow, and a black spar buoy (No. 1) nearly ahead. When Long Beach Bar lighthouse bears 337° true (*N* by *W* mag.) steer 305° true (**NW ⅛ N** mag.), pass about 150 yards southward of the red buoy, about 250 yards northeastward of black spar buoy No. 1, and about 500 yards southwestward of the lighthouse. From the red buoy to the lighthouse, the tidal currents at strength have considerable velocity. When the lighthouse is abeam, proceed as directed in section 3; or, if bound to Orient Harbor, proceed as directed under that heading.

Remarks.—On the 273° true (**WNW ¾ W** mag.) course **Hay Beach Point**, the north end of Shelter Island, will be on the starboard bow; this point is a low flat at the end backed by wooded high land. Northwestward of the lighthouse, on the more distant northern shore, is the village of East Marion. On getting well in, Orient will open westward of Long Beach Point.

The **channel** narrows as the 273° true (**WNW ¾ W** mag.) course is followed, and near the turning point and on the 305° true (**NW ⅛ N** mag.) course the shoaling is abrupt to 12 feet on either side; two buoys mark the channel here, a red spar, No. 2, at its northern edge, and a black spar, No. 1, at its southern edge.

Dangers.—**Long Beach Shoal**, left on the starboard hand, is an extensive shoal, irregular in shape, making out from Long Beach. Near its western end stands Long Beach Bar lighthouse, and a buoy (spar, red, No. 2) marks its southern edge, about ⅜ mile southward from the lighthouse. From the buoy the shoal makes in a general easterly direction for a distance of 1¾ miles. At its eastern end the shoaling is gradual, but on the southern and western sides the shoal rises abruptly from a depth of 10 and 12 fathoms to 15 feet.

Extensive flats, left on the port hand, make off from Ram Head, and from the shore between it and Hay Beach Point. The northern part of this shoal is known as **Hay Beach Point Flats**. A buoy (spar, black, No. 1) marks the edge of the shoal nearly ½ mile 183° true (**S** by **W** ¼ **W** mag.) from Long Beach Bar lighthouse, and a bell buoy (black, No. 3) marks the shoal near its northern point. It has 5 to 15 feet over it, and spots with 5 and 6 feet over them are found nearly ¾ mile offshore southward of buoy No. 1. From buoy No. 1 to buoy No. 3 and thence to Hay Beach Point, the shoal rises abruptly from the deep water of the channel.

3. ***Long Beach Bar Lighthouse to Greenport.***—Continue on the 305° true (**NW** ⅛ **N** mag.) course, and when up to Hay Beach Point Flats bell buoy (black, No. 3), leave the buoy about 250 yards on the port hand. From a position 250 yards northward of Hay Beach Point Flats bell buoy, steer 262° true (**W** ¼ **N** mag.), passing about 350 yards northward of Hay Beach Point, which has good water on its northern side. When this point is abeam, steer about 222° true (**SW** ¾ **W** mag.) past the end of Greenport breakwater, and proceed as directed in section 4.

To anchor off Greenport, come-to in 4 to 10 fathoms of water, between the Railroad wharf and the breakwater; the water shoals abruptly inside the depth of 24 feet.

Remarks.—When past Long Beach Bar lighthouse, Greenport breakwater, with Greenport just beyond, will open gradually northward of Hay Beach Point; and when changing course to 262° true (**W** ¼ **N** mag.) the light on the end of the breakwater will be well open from the point. Care should be taken not to be set off the courses by the tidal current.

Dangers.—A shoal with 6 to 10 feet over it, left on the starboard hand, extends over 1 mile eastward from Cleaves Point, on the western side of the entrance to Orient Harbor. The southeastern point of the shoal is marked by a buoy (spar, red, No. 4) and is nearly ⅝ mile 301° true (**NW** ¼ **W** mag.) from Long Beach Bar lighthouse.

Sheephead Rocks, marked by a buoy (spar, red, No. 6), have 2½ feet over them, and lie off Cleaves Point nearly ½ mile northward of Hay Beach Point.

Greenport Flats are southeastward of Youngs Point, at the eastern end of Greenport; the breakwater is on the flats, and extends nearly to the 18-foot curve. A light marks the end of the breakwater.

4. ***Greenport to Little Peconic Bay.***—After passing Greenport breakwater at a distance of 300 yards, shape a course about 222° true (**SW** ¾ **W** mag.) so as to pass southward of Fanning Point Shoal buoy (spar, red, No. 8). Then follow the southern shore at a distance of 350 yards, passing in mid-channel between Conkling Point and Jennings Point, and round Jennings Point at a distance of about 350 yards.

From a position 350 yards westward of Jennings Point, steer about 153° true (**S** by **E** ½ **E** mag.) so as to pass about 150 yards eastward of Hallock Point Shoal gas buoy (red, No. 10, red light with eclipses). Then steer 164° true (**S** ½ **E** mag.) for nearly ¾ mile and pass about 200 yards eastward of Hallock Point Shoal southeast buoy (spar, red, No. 10½). Then steer 211° true (**SW** ¼ **S** mag.) for 1 mile so as to pass about 200 yards northward of Jessup Neck Shoal buoy (spar, black, No. 5), and follow the directions in section 5.

Remarks and dangers.—The 222° true (**SW** ¾ **W** mag.) course leads a little southward of mid-channel between Fanning Point and the white bluff of Shelter Island opposite, and Conkling Point will be ahead. Jennings Point will show over Conkling Point, and the channel between them will open gradually when passing south of Conkling Point.

Fanning Point is on the north shore at the western end of Greenport. A shoal, with 4 to 12 feet over it, extends about 300 yards off the point, and is marked at its end by a buoy (spar, red, No. 8).

Conkling Point, on the north shore 1 mile southwestward of Fanning Point, is low and sandy at the end, and has deep water as close as 150 yards.

Jennings Point, the northwest end of Shelter Island, is nearly ½ mile westward of Conkling Point. It is high and wooded, and has several summer cottages. There are no dangers off the point if it be given a berth of over 150 yards.

The 153° true (**S** by **E** ½ **E** mag.) course should lead about 200 yards eastward of Hallock Point Shoal buoy, and about 300 yards from the western point of Shelter Island.

Paradise Point, on the west side of the sound, is low and wooded, and from the point a sloping sand spit shows nearly out to Hallock Point Shoal gas buoy (red, No. 10) which marks the end of the shoal off the point. For a distance of ¾ mile southward of Paradise Point a shoal, with 10 to 15 feet over it, makes out ⅝ mile; the southeast point of the shoal is marked by **Hallock Point Shoal southeast** buoy (spar, red, No. 10½). There are a number of oyster stakes moored off the edge of the shoal.

The west end of Shelter Island, opposite Paradise Point, is a low flat backed by woods, and should be given a berth of over 150 yards.

The 211° true (**SW** ¼ **S** mag.) course leads across the entrance to Noyack Bay, which extends about 3 miles southeastward, and passes about midway between Cedar Beach Point on the north and Jessup Neck on the south.

Jessup Neck is a long, narrow strip, partly wooded, which separates Noyack Bay from Little Peconic Bay. The north end of the neck is a sand spit, from which a shoal with 5 to 11 feet over it extends over 600 yards 319° true (**NNW** ¾ **W** mag.). The end of the shoal is marked by a buoy (spar, black, No. 5). This buoy does not show well during the strength of the current.

5. ***Through Little and Great Peconic bays.***—Pass 200 yards northwestward of Jessup Neck Shoal buoy (spar, black, No. 5), and steer 211° true (**SW** ¼ **S** mag.) for 3⅝ miles passing 300 yards southeastward of Great Hog Neck Shoal buoy (spar, red, No. 12), and 500 yards southeastward of Little Hog Neck Shoal buoy (spar, red, No. 14). When red spar buoy No. 14 is abeam distant 500 yards steer 224° true (**SW** ¾ **W** mag.) and pass 100 yards northwestward of Cow Neck Flat buoy (spar, black, No. 7), and 100 yards southeastward of Robins Island buoy (spar, red, No. 16); and the course made good for 2⅞ miles leads to a position 100 yards northward of the buoy (spar, black and white perpendicular stripes) which lies about 1 mile southwestward from the south end of Robins Island.

From this position steer 260° true (**W** mag.) for 3½ miles, and anchor at discretion about 350 yards southward of Aquebogue Flat buoy (spar, red, No. 18), which is about 1½ miles eastward of Jamesport at the mouth of Peconic River. If bound into the river, take a pilot if one has not already been taken in Gardiners Bay, Orient, or Greenport.

Remarks.—On the 211° true (**SW** ¼ **S** mag.) course the end of Cow Neck, which is high and wooded with a bare sandy face at its end, will be ahead. A good lookout should be kept for black spar buoy No. 7 when standing on the 224° true (**SW** ¾ **W** mag.) course.

SAILING DIRECTIONS, SHELTER ISLAND SOUND, PASSING SOUTH OF SHELTER ISLAND.

The following directions are available for vessels drawing 12 feet or less; vessels of deeper draft should anchor outside of the outer buoys off Cedar Island lighthouse and take a pilot. The tidal currents have considerable velocity in the narrow parts of the sound and require some attention; they set in the general direction of the channel.

1. ***Gardiners Bay to Cedar Island lighthouse.***—Having followed the directions for entering Gardiners Bay, section 1, page 36, or section 1 A, page 36, bring Little Gull lighthouse to bear 32° true (*NE* ⅛ *N* mag.) and steer 212° true (**SW** ⅛ **S** mag.), or bring Plum Island lighthouse to bear 6° true (*N* by *E* ½ *E* mag.) and steer 186° true (**S** by **W** ½ **W** mag.), until Cedar Island lighthouse bears 235° true (**SW** by **W** ⅞ **W** mag.). Then steer for Cedar Island lighthouse, keeping it bearing 235° true (**SW** by **W** ⅞ **W** mag.) until up to Outer Bar buoy (spar, red, No. 2), which pass close-to on either side.

From this buoy the course is 243° true (**WSW** ⅝ **W** mag.), crossing a 17-foot bar, and leaving a danger buoy (spar, red and black horizontal stripes) well southward of the course, and the two Cedar Point Shoal buoys (spars, black, Nos. 1 and 3), on the port hand. When black spar buoy No. 3 is about 200 yards distant on the port beam, change the course to 237° true (**WSW** mag.) and pass 350 yards northward and westward of Cedar Island lighthouse. Then follow the directions in section 2.

Remarks.—In approaching on either the 212° true (**SW** ⅛ **S** mag.) or 186° true (**S** by **W** ½ **W** mag.) courses, Long Beach Bar lighthouse will be seen well westward, and Cedar Island lighthouse will be made on the starboard bow. On the 235° true (**SW** by **W** ⅞ **W** mag.) course the Outer Bar buoy (spar, red, No. 2) should be made in line with Cedar Island lighthouse.

Dangers.—A shoal with 7 to 18 feet of water extends from Ram Head in a southeasterly direction nearly to the shore east of Cedar Point. The southern end of this shoal, across which the channel leads, is called **Sag Harbor Bar,** good for 17 feet of water; Outer Bar buoy (spar, red, No. 2) is placed as a guide for this bar.

Dangerous Rock buoy (spar, red and black horizontal stripes), well southward of the course, marks a rock over ¼ mile from shore.

Cedar Point Shoal extends about ⅜ mile northward of Cedar Point. Its northern edge is marked by two buoys (black spars, No. 1 and No. 3), both left on the port hand.

Nichol Point Shoal extends about ½ mile eastward from Nichol Point (the next prominent point southward of Ram Head). It is marked by a buoy (spar, red, No. 4) placed about ⅜ mile from shore, eastward of some sunken rocks; this buoy is about ½ mile north from Cedar Island lighthouse and is left well on the starboard hand.

Single Rock, marked by a buoy (spar, red, No. 6), lies nearly ½ mile westward from Cedar Island lighthouse, and has 4 feet over it; the water is shoal westward of this buoy.

2. ***Cedar Island lighthouse to Sag Harbor entrance.***—From a position 350 yards westward of Cedar Island lighthouse steer 183° true (**S** by **W** ¼ **W** mag.), taking care not to be set westward by the ebb current, and pass 400 yards eastward of Mashomack Point; black spar buoy No. 7 should be made a little on the port bow, nearly ahead. Pass 150 yards northwestward of this buoy and steer 236° true (**WSW** mag.), leaving red spar buoys Nos. 8 and 10 on the starboard hand and black spar buoys Nos. 9 and 11 on the port hand. From a position 125 yards northward of buoy No. 11 steer 270° true (**W** by **N** mag.) and pass about 150 yards southward of Sandspit beacon (pile of rocks with red spindle and cage). Then follow the directions in section 3.

To anchor off Sag Harbor.—Continue the 270° true (**W** by **N** mag.) course and pass northward of black spar buoy No. 13. Pass midway between the latter buoy and red spar buoy No. 12 (with cage), and steer about 222° true (**SW** ¾ **W** mag.) for red spar buoy No. 14. Anchor about midway between buoys Nos. 12 and 14, in 16 feet of water.

Remarks.—The channel for a distance of about ¾ mile southward of Cedar Island lighthouse is locally known as **Northeast Harbor.** Vessels desiring a pilot for Sag Harbor or through Shelter Island Sound can anchor here with the pilot signal flying until a pilot comes on board.

Dangers.—**West Harbor Flats** extend from the eastern shore to the line of Cedar Island lighthouse and the black buoys southward of it. The ruling depths over these flats are about 7 to 8 feet, with 4 to 9 feet at their western edge. The channel through Shelter Island Sound and to Sag Harbor is narrow westward of buoy No. 7.

Barcelona Bank, with 4 to 5 feet over it, lies on the south side of the channel, about 1 mile eastward from the end of the breakwater at Sag Harbor. The northern edge of the bank is marked by two buoys (spars, black, Nos. 9 and 11).

Gull Rocks, showing bare at half tide, and lying about ⅜ mile northeastward from the wharf at Sag Harbor, are marked by a buoy (spar, black, No. 13) off their northern end.

Sandspit is the extensive shoal, partly bare at low water, lying between Mashomack Point and Sag Harbor. The southeastern and southern sides of the shoal are marked by red spar buoys Nos. 8 and 10 and a beacon (pile of rocks with red spindle and cage). The shoal extends 1⅜ miles northwestward of the beacon, with 5 to 9 feet over it, and its western edge is marked by two buoys (spars, red, Nos. 2 and 4).

3. ***Sag Harbor entrance to Little Peconic Bay and Paradise Point.***—From a position 150 yards southward of Sandspit beacon, steer 270° true (**W** by **N** mag.) so as to pass about 100 yards northward of black spar buoy No. 13. Then steer 311° true (**NW** ⅝ **N** mag.), passing about 200 yards eastward of red spar buoy No. 12 (with cage) to a position 150 yards westward of red spar buoy No. 2. Then steer 338° true (**N** by **W** mag.), giving the eastern shore of North Haven a berth of 400 yards, and pass about 150 yards westward of red spar buoy No. 4, at the northern end of the shoal, extending northwestward from the Sandspit. Continue the course so as to pass about 400 yards eastward of the black gas buoy off the northeastern point of North Haven.

As the black gas buoy is approached haul westward and pass close northward of it, and steer 253° true (**W** ½ **S** mag.) through the passage northward of North Haven; on this course keep the northern shore aboard, distant about 200 yards when about ⅜ mile westward of the

buoy, and pass about ¼ mile northward of the northwest point of North Haven. From a position 600 yards northwestward of the northwest point of North Haven steer 231° true (**SW** by **W** ½ **W** mag.) so as to pass about 200 yards southward of the red spar buoy and gas buoy (No. 2, red light) lying near the middle of the entrance to Noyack Bay. Then:

Bound to Little Peconic Bay.—Steer 267° true (**W** ¾ **N** mag.) for 1¼ miles to a position about 200 yards northward of Jessup Neck Shoal buoy (spar, black, No. 5), and follow the directions in section 5, page 41.

Bound northward in Shelter Island Sound.—Pass 200 yards southwestward of red spar buoy No. 2 and gas buoy (No. 2, red light), in the entrance to Noyack Bay, and steer 310° true (**NW** ½ **N** mag.) for 1⅛ miles to a position about 150 yards eastward of Hallock Point Shoal southeast buoy (spar, red, No. 10½). Then steer 341° true (**N** ¾ **W** mag.) for the end of Jennings Point and pass 150 yards eastward of Hallock Point Shoal gas buoy (No. 10, red light with eclipses). Then reverse a part of the directions in section 4, page 40.

Remarks and dangers.—**Sandspit**, and the shoal extending northwestward from it, are described on page 42.

A **shoal**, with 5 to 10 feet over it, extends nearly 400 yards from the eastern side of North Haven, about midway between buoys Nos. 2 and 4. The northern end of North Haven should be given a berth of over 200 yards. A shoal, with 6 to 12 feet over it, extends nearly 350 yards northwestward from the northwest point of North Haven.

West Neck Shoal, with 9 to 11 feet over it, makes out nearly ¾ mile from the south end of Shelter Island, about ⅞ mile westward of the northwest point of North Haven, and is marked at its southern end by a spar buoy and gas buoy (No. 2, red light), which lie near the middle of the entrance to Noyack Bay.

ORIENT HARBOR.*

This is a well-sheltered harbor north of Shelter Island and just inside of Shelter Island Sound, affording excellent anchorage for vessels up to 15 feet draft. It is seldom used except by vessels trading to Orient. The entrance is contracted by flats to a width of ⅜ mile, but these are easily avoided.

Long Beach Bay, making eastward from Orient Harbor on the north side of Long Beach Point, is shallow. A channel, 6½ feet deep and with a least width of 35 feet, was dredged from the entrance through the bay to Hallocks dock, about ½ mile northward of Browns Point; this channel has shoaled.

Orient, a village of little commercial importance, is at the northeastern end of the harbor, and has 8 feet of water at the end of the wharf at low water. **Provisions** can be obtained in Orient.

East Marion is a small village on the western shore of the harbor. Pilots for Shelter Island Sound and the Peconic bays are sometimes found here.

Tides.—The mean rise and fall of tides is 2.5 feet; high water occurs 55m. later and low water 33m. later than at New London.

GENERAL DIRECTIONS, ORIENT HARBOR.

Directions for approaching are given in sections 1 and 2, page 39.

Pass ¼ mile westward of Long Beach Bar lighthouse and steer 349° true (**N** mag.), passing about 300 yards eastward of red spar buoy No. 4. Continue on the course until the end of the wharf at Orient bears about 34° true (**NE** mag.), and then steer for the end of the wharf. Anchor in about 16 feet, soft bottom, about 700 yards from the northeast side at the head of the harbor, and south of the line of the wharf.

Remarks.—On the 349° true (**N** mag.) course the water shoals from 25 to 18 feet, and on the 34° true (**NE** mag.) course the depths are 17 to 16 feet. Northward of the line of the wharf and about 300 yards from its end the water shoals suddenly to 9 feet.

The eastern part of Orient Harbor, eastward of a line from Long Beach Bar lighthouse to the end of the wharf at Orient, has depths of 7 to 9 feet, with the exception of a channel ¼ mile wide about midway between the lighthouse and wharf, which leads to the entrance of Long Beach Bay and has depths of 14 to 19 feet.

Dangers.—Long Beach Shoal is described on page 39.

A **shoal** makes eastward from the western shore over halfway across the entrance to Orient Harbor, and is marked at its eastern extremity by a buoy (spar, red, No. 4). The shoal has an average depth of 7 to 9 feet, but a 6-foot spot lies about 300 yards northwestward from the buoy.

* See footnote on page 37.

GREENPORT HARBOR.*

Greenport Harbor, in Shelter Island Sound, is just westward of Orient Harbor. At the northeastern part of the harbor is a breakwater which extends ¼ mile in a southeasterly direction from Youngs Point, nearly to the 18-foot curve, and is marked at its outer end by a light (see table, page 14).

During heavy easterly gales, with spring tides, the breakwater is submerged, and vessels lying alongside the eastern side of the wharves are moved to the western side to prevent chafing.

Greenport, a town on the northern side of the harbor, has some vessels engaged in the coasting trade; it is also engaged in shipbuilding. The carrying trade employs a number of vessels, some transient and some owned in the vicinity. Greenport is the terminus of a branch of the Long Island Railroad. During the summer steamboats run to places on Long Island Sound and to Block Island.

The **least water** in the channel at mean low water is 21 feet. The deepest draft of vessels entering Greenport Harbor is 15 feet, and the usual draft not more than 12 feet. The depth of water alongside the wharves at mean low water is from 7 to 19 feet, according to location.

Pilots.—There are no regular pilots. The piloting is generally done by fishermen or by masters of small vessels trading in these waters, and strangers usually take one. Vessels desiring a pilot, and not having found one in Gardiners Bay, can anchor outside of Long Beach Bar lighthouse, near Mid-channel entrance buoy, with signal flying, when one will come on board.

Towboats are rarely used, but they can be obtained from New London, Conn.

Anchorage, etc.—The usual and best anchorage is between the end of the breakwater and railroad wharf. There are no harbor regulations or harbor dues. The custom-house landing and public landing are at Main Street Wharf.

Supplies.—Anthracite coal in limited quantity for steamers and water can be obtained alongside the wharves. In the summer water can also be obtained from a water boat. Provisions and some ship-chandler's stores can be obtained in Greenport.

Repairs.—There are several marine railways; the largest is 230 feet long, has a depth of 22 feet on the cradle at the outer end and 13 feet at the inner end, and a capacity of about 1,000 tons. Ordinary repairs to machinery can be made.

Yacht basins.—There are two inclosed basins at Greenport which afford excellent facilities for laying up and fitting out yachts. The depth in the basins is about 9 feet.

The **tidal currents** follow the general direction of the channel (see also page 38).

Ice.—During the winter months there is some drift ice at Greenport, but not sufficient to interfere with navigation.

Tides.—The mean rise and fall of tides is 2.4 feet; high water occurs 59m. later and low water 43m. later than at New London.

Sailing directions are given on pages 39–40.

SOUTHOLD BAY.*

Southold Bay and the village of Southold are in a bight at the northwestern part of Shelter Island Sound, opposite Jennings Point, the northwestern end of Shelter Island. Great Hog Neck separates Southold Bay from Little Peconic Bay, and narrows this end of Shelter Island Sound to a width of ⅜ mile. The deepest draft of vessels entering Southold Bay is 10 to 14 feet. There is 8 feet of water alongside the wharf at mean low water.

Southold is on the line of the Long Island Railroad.

Pilots are usually taken by strangers (see page 38). **Towboats** are not much used.

The **best anchorage** is ⅜ to ½ mile eastward of the wharf.

Ice obstructs navigation during the winter.

Tides.—The mean rise and fall of tides is 2.5 feet; high water occurs 1h. 48m. later, and low water 1h. 32m. later, than at New London.

DIRECTIONS FOR ANCHORING IN SOUTHOLD BAY.

Directions for approaching are given on pages 39–40.

Rounding Jennings Point, giving it a berth of 350 yards, steer 208° true (**SW ½ S** mag.) until the wharf in Southold bears about 270° true (**W by N** mag.); then haul over for the wharf and anchor when it is about ⅜ mile distant.

* See footnote on page 37.

Remarks.—The shore for over 1 mile northeastward of the wharf at Southold should not be approached nearer than ⅜ mile, as shoal water extends out that distance and deepens abruptly. The western part of the bay is also shoal, and strangers seeking anchorage should use the lead, and anchor when the water shoals to 18 feet, the wharf bearing northward of 259° true (**W** mag.).

SAG HARBOR.*

Sag Harbor is south of Shelter Island, in the south arm of Shelter Island Sound, and about 3 miles southwest from Cedar Island lighthouse. It lies on the southwestern side of the bight included between Cedar Point on the east and North Haven on the west; this bight is full of shoals, but it has a buoyed channel, narrow in places, leading from Gardiners Bay to the Peconic bays.

Sag Harbor is on a division of the Long Island Railroad; in summer it has steamboat communication with places in Long Island Sound and New York. A breakwater starts from the shore ¼ mile eastward of the wharves at Sag Harbor, and extends out to a point about ¼ mile northward of the wharves. A light is shown on its outer end; see table, page 14.

The deepest draft of vessels entering Sag Harbor is 13 feet, the usual draft is 9 to 10 feet; 8 to 12 feet can be taken alongside the wharf. The depths in the channel are 10½ to 13 feet, and the width is 300 feet; there is a depth of 10 feet or more off the end of the breakwater.

Pilots.—A pilot can be taken at Cedar Island lighthouse; or come to anchor in Northeast Harbor and one will come from Sag Harbor in answer to signal.

Towboats are rarely used; the nearest place at which they can be found is New London. Fishing steamers sometimes do towing.

Anchorage.—The usual anchorage for vessels bound to Sag Harbor is in Northeast Harbor, southward and westward of Cedar Island lighthouse, between it and Mashomack Point; the depth is 15 feet to 6½ fathoms, hard bottom. Small craft can find shelter here in northerly gales with Cedar Island lighthouse bearing 358° true (**N** ¾ **E** mag.). With strong northerly winds it is not advisable for any vessel to anchor out in mid-channel between the lighthouse and Mashomack Point, as there will then be a rough sea on the ebb; under such conditions the best anchorage is on the western side of the channel out of the strength of the current. In the eastern part of this harbor flats rise rather abruptly; the eastern side of the channel is defined by the lighthouse and the black buoys southward of it.

Supplies.—Anthracite coal in limited quantity for steamers, and fresh water through pipe and hose, can be had alongside the wharf. Provisions and some ship-chandler's stores can be obtained at Sag Harbor.

Harbor regulations are not in force, but vessels are docked by the wharf master.

Hospitals.—At Sag Harbor emergency relief is furnished as for stations of Class IV of the United States Public Health and Marine-Hospital Service. (See Appendix IV.)

Tides.—The mean rise and fall of tides is 2.5 feet; high water occurs 1h. 05m. later, and low water 51m. later, than at New London.

The **tidal currents** have considerable velocity at full and change; they follow the general direction of the channel.

Ice obstructs navigation in the winter.

Sailing directions are given in sections 1 and 2, pages 41–42.

FISHERS ISLAND SOUND †

is at the northeastern end of Long Island Sound, and lies between the mainland of Connecticut and Fishers Island. It is a little over 7 miles long and forms one of the passages into Long Island Sound.

The **prominent landmarks** in approaching from eastward are Watch Hill, a high, bare bluff, with a number of large hotels and summer houses back a little from its edge, and Watch Hill lighthouse, standing on the low point southward of the bluff. Fishers Island is a hilly island 6 miles long, bare of trees, lying 3 miles westward of Watch Hill. Chocomount, 136 feet high, on Fishers Island, 2 miles from its eastern end, is the highest land in this vicinity.

The **channels** to enter Fishers Island Sound from eastward lead between the ledges and rocks which extend 3 miles in a broken line from Watch Hill Point to East Point, the eastern point of Fishers Island.

Watch Hill Passage is between Watch Hill lighthouse and Watch Hill Reef. This is the best passage for vessels coming from eastward and is the one generally used; it is good for 17 feet at mean low water and is better marked than the others; near the middle of the passage is a 12-foot rock, but this is marked by a buoy and is easily avoided.

Next, westward, is *Sugar Reef Passage*, between Watch Hill Reef and Sugar Reef. This passage is ¼ mile wide and the channel with depths of about 5½ fathoms is marked by several buoys. The tidal currents set with considerable velocity directly on the reefs near this passage.

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*See footnote on page 37.

†Shown on charts **358**, scale $\frac{1}{20,000}$, price $0.40; **114**, scale $\frac{1}{80,000}$, price $0.50.

Catumb Passage between Sugar Reef and the Catumb Rocks is 250 yards wide, with a least depth of 22 feet. The tidal currents make this channel dangerous.

Lords Passage lies between East Spindle and Wicopesset Rock; it is ¼ mile wide and has a least depth of 20 feet.

Wicopesset Passage lies between Wicopesset Island and East Point. This channel is narrow and is obstructed by a rock in the middle which is marked by a buoy; strangers should not attempt this passage. The tidal currents set in the direction of the channel.

Lights and other aids.—There are several lights to serve as guides through the sound at night (see table, page 12), but strangers are advised not to run through unless the buoys can be seen readily. All the important dangers are marked by buoys or spindles.

Little Narragansett Bay, a shallow bay at the eastern end of Fishers Island Sound, is about 1¾ miles long and nearly 1 mile wide at the narrowest part. A dredged channel, with a least width of 50 feet and depth of 7 feet, leads from Fishers Island Sound through Little Narragansett Bay, and up the Pawcatuck River to Westerly. Work is in progress to obtain a channel 10 feet deep from Stonington to Westerly, with a width of 200 feet from Stonington to Avondale, and 100 feet from Avondale to Westerly. **Westerly** is a town 4½ miles above the mouth of the Pawcatuck River; vessels of 8 feet draft can go up to the town on a high tide.

Avondale is a village on the east bank of the river, about 2½ miles below Westerly. Strangers should take a pilot, and if bound to Westerly a towboat is required. A pilot or a tug may be had at Stonington. Navigation in Little Narragansett Bay is closed by ice during the winter.

Stonington Harbor and **Mystic River** northward of the sound are treated under special headings.

East Harbor and **Chocomount Cove** are the names of two indentations, given in order from eastward, in the north shore of Fishers Island. They are sometimes used as anchorages for small craft owned in the vicinity, but as the holding ground is not good and the approach to the latter leads over foul ground, it is not advisable for strangers to use them.

West Harbor, on the north side of the western part of Fishers Island, is described under a separate heading on page 54.

Hay Harbor, in the northwestern side of Fishers Island, is used only by small craft. It is a summer resort, and near its head are several hotels.

Silver Eel Pond, in the western side of Fishers Island and a little over ½ mile northward of Race Point, is entered through a dredged channel between two jetties. The channel is narrow with a depth of about 13 feet, and leads to a wharf in the pond. The approach outside the jetties is marked by buoys.

Storm warning displays of the United States Weather Bureau are made from a flagstaff close to the lighthouse on Stonington Point. (See Appendix III.)

Consult also pages 9–25 for information concerning lighthouses, life-saving stations, variation of the compass, tides, fogs, etc.

TIDAL CURRENTS IN FISHERS ISLAND SOUND.

In the Watch Hill Passage the current of flood sets nearly in the direction of the channel, with a tendency northward, while the ebb shows a tendency southward. The northerly and southerly set is very marked between Napatree Point and Latimer Reef Lighthouse.

In the Catumb and Sugar Reef passages the tidal current sets obliquely across the axes of the channels; and as the former is not marked by buoys, it should not be attempted by strangers.

In the main channel, northward of Wicopesset, the flood sets about **NW ¾ W** and the ebb nearly **SE ¾ E**, with a velocity of 2 miles at strength.

South of Eel Grass Ground the current of flood has a tendency southward of **W**, while the ebb sets nearly due **E**, the average velocity being but little over 1 mile at strength.

Off Groton Long Point the flood sets nearly **W**, while the ebb has a tendency southward of **E**, the latter having a velocity of nearly 1½ miles at strength.

The currents turn in the Watch Hill Passage and in Fishers Island Sound about 1½ hours earlier than in the middle of The Race.

SAILING DIRECTIONS, FISHERS ISLAND SOUND.

The following directions are available for vessels of 15 feet or less draft in the daytime when the buoys can be seen.

In heavy southeast gales the passages and reefs between Watch Hill and Fishers Island are covered with breakers. See the descriptions of the channels preceding for the depths.

1. ***Approaching from Eastward and Southward.—I. To enter by Watch Hill Passage.—*** Directions for approaching through Block Island Sound are given on pages 29 and 32. Bring Watch Hill lighthouse, just northward of the entrance, on any bearing between 261° true (**W ¼ N** mag.) and 343° true (**N ½ W** mag.) and steer for it. When about ¾ mile from the lighthouse Gangway Rock buoy (marking the north side of the entrance) should be made; steer for the buoy, pass about 75 yards southward of it, and proceed as directed in section 2 following.

Remarks.—Gangway Rock buoy lies ¼ mile south of Watch Hill lighthouse, near the extremity of a rocky ledge making out from Watch Hill Point. Nearing the entrance, the black bell buoy (marking the south side of the entrance), the red and black horizontally striped nun buoy (marking a 12-foot spot in the passage), and the beacon and spindles marking some of the reefs lying between Watch Hill and Fishers Island should be seen.

See dangers under section 2 following.

II. To enter by Sugar Reef Passage.—Passing 1 mile or more southward of Watch Hill lighthouse bring the western end of Napatree Point to bear 315° true (**NW** by **N** mag.) and steer for the end of the point on this bearing. Two black can buoys and a red nun buoy will be made nearly ahead. Leave the red nun buoy (S. R. E. 2) about 60 yards on the starboard hand, and then haul northward so as to leave black can buoy (S. R. W. 3) about 60 yards on the port hand. When the latter buoy is passed, steer for the end of Napatree Point and when Latimer Reef lighthouse bears 279° true (**WNW ¼ W** mag.) head for it and pass 75 to 100 yards south of Napatree Point Ledge buoy (nun, red, No. 4). Then proceed as directed in section 2 following.

Remarks.—When standing on the 315° true (**NW** by **N** mag.) course the spindle on Watch Hill Reef will be on the starboard bow and the spindle on the northwestern end of Sugar Reef will be on the port bow. The three buoys in the Sugar Reef Passage mark the channel with a depth of 5½ fathoms. (See tidal currents, page 46.)

The 279° true (**WNW ¼ W** mag.) course for Latimer Reef lighthouse leads 250 yards northward of Sugar Reef, and care must be taken not to be set southward by the ebb current which has a southerly set until up to Latimer Reef lighthouse.

See dangers under section 2 following.

III. To enter by Lords Passage.—Passing south of the dangers between Watch Hill and Fishers Island, bring Stonington Outer Breakwater light, on the western end of Stonington East Breakwater, to bear 349° true (**N** mag.), and stand in, keeping it on that bearing, and passing midway between and about 250 yards from East spindle and Wicopesset Rock spindle.

To aid in keeping the bearing pick up a range over the end of the breakwater while yet outside of the reefs.

When inside, with Latimer Reef lighthouse bearing about 282° true (*WNW* mag.), steer 273° true (**WNW ¾ W** mag.) for Ram Island Reef light-vessel and follow such directions of section 2 following as apply; see also the remarks and dangers under that section.

Other directions for Lords Passage are as follows: Bring Stonington Breakwater lighthouse to bear 346° true (**N ¼ W** mag.) when it is about 3 miles distant, and steer for it, keeping on that bearing, passing about midway between East spindle and Wicopesset Rock spindle.

When Latimer Reef lighthouse bears about 282° true (*WNW* mag.), steer 273° true (**WNW ¾ W** mag.) for Ram Island Reef light-vessel, keeping it on that bearing.

Remarks.—As strong tidal currents set diagonally across the course care must be taken to avoid being set on the shoals on either side (see tidal currents, page 46).

Standing through Lords Passage, East spindle should be given a berth of 250 yards on the starboard hand and Wicopesset Rock spindle 250 yards on the port hand.

2. ***From Gangway Rock buoy to Ram Island Reef light-vessel.***—Passing 75 yards southward of Gangway Rock buoy, steer 273° true (**WNW ¾ W** mag.) for Ram Island Reef light-vessel (5¼ miles distant) and pass about 200 yards north of the buoy (nun, red and black horizontal stripes) marking the 12-foot spot in Watch Hill Passage.

Napatree Point Ledge buoy (nun, red, No. 4) should be ahead, distant 1⅜ miles; pass 75 yards south of this buoy.

From Napatree Point Ledge buoy continue the 273° true (**WNW ¾ W** mag.) course for Ram Island Reef light-vessel, making allowance for the current; the course leads well south of the buoy (spar, red and black horizontal stripes) on the east end of Latimer Reef, and 200 yards north of the buoy (spar, red and black horizontal stripes) on the 13-foot spot about ½ mile north of the eastern end of Fishers Island; this buoy should be left 50 to 200 yards on the port hand.

Pass about 300 to 500 yards southward of Latimer Reef lighthouse.

When up to Ram Island Reef light-vessel pass southward of it and proceed as directed in section 3 following.

See tidal currents, page 46.

Remarks.—When passing Gangway Rock buoy, Ram Island Reef light-vessel and Latimer Reef lighthouse should be made a little on the starboard bow; and open northward of the latter are the large house on the southern end of Ram Island and the houses of Noank. Directly ahead, off Napatree Point, is Napatree Point Ledge buoy. Broad off the starboard bow, across Napatree Point, is Stonington. On the port bow are the spindles marking the broken line of reefs and rocks lying between Watch Hill and the eastern end of Fishers Island (the latter hilly in appearance).

Approaching Latimer Reef, North Dumpling lighthouse will be seen on the port bow. Vessels becalmed just westward of Latimer Reef and finding that they are drifting down on the reef, should not attempt to tow southward, but should go northward of the lighthouse, as the ebb current sets northward and eastward on the western side of the reef.

Dangers.—**Gangway Rock** is about ⅛ mile south of Watch Hill Point, has 3 feet over it, and is marked by a buoy (spar, red, No. 2) placed in 15 feet ⅛ mile southward of the rock. A **17-foot spot** lies about 120 yards southwestward from the buoy; it is not dangerous for the draft of vessels using this passage; to avoid it, pass 50 to 100 yards southward of the red buoy.

Watch Hill Reef, marked by a black iron spindle with square cage, placed on a rock bare at low water, lies about ⅝ mile 205° true (**SW ¾ S** mag.) from Watch Hill lighthouse. The reef extends 210 yards eastward from the spindle, and is marked at its eastern end by a black bell buoy. Northeastward of the spindle, a little southward of a mid-channel line, are detached spots with 12 to 16 feet over them, which are marked by a buoy (nun, red and black horizontal stripes). Between the nun buoy and the bell buoy is a deep but narrow channel; never attempt to pass southward of the bell buoy.

The line of reefs and rocks which, with narrow passages between them, extends from Watch Hill to Fishers Island, includes Gangway rock and Watch Hill Reef, just described. Westward of the latter are the following: **Sugar Reef**, 2 to 11½ feet of water, black iron spindle, cone cage. **Catumb Rocks**, marked by a stone beacon with black spindle and cage placed on a rock bare at low water; rocks with ½ foot to 18 feet over them extend ¾ mile westward in a broken line to East spindle, a red iron spindle with cask, this spindle marking the eastern side of Lords Passage. **Wicopesset Rock**, 4 to 12 feet over it, black iron spindle with cask, lies ⅜ mile east from Wicopesset Island.

Napatree Point Ledge is a cluster of shoal spots extending southward and southwestward from Napatree Point. Off the end of the ledge is a 15-foot spot lying ⅜ mile southwestward of the point; it is marked by a buoy (nun, red, No. 4).

Middle Ground, well northward of the course, marked off its western side by two buoys (spar, red, No. 4½, and nun, red, No. 6), has 9 feet of water over it and lies 1⅛ miles 292° true (**NW** by **W** mag.) from Napatree Point. The western end of *East Breakwater* of Stonington Harbor extends to the northern part of the Middle Ground.

Wicopesset Island, southward of the course, is small, low and surrounded by foul ground.

Latimer Reef lighthouse marks the western end of Latimer Reef, which is 2 miles 267° true (**W ¾ N** mag.) from Napatree Point, and ¾ mile north of the eastern part of Fishers Island. The eastern end of the reef has depths of 6½ to 16 feet and is marked by a buoy (spar, red and black horizontal stripes). A **spot** with 15 feet over it lies nearly 300 yards 202° true (**SW** by **S** mag.) from this buoy. **North Latimer Reef**, marked by a buoy (spar, red and black horizontal stripes), has 11 feet of water, and is ⅜ mile 36° true (**NE ¼ E** mag.) from the lighthouse. The sailing line leads southward of these dangers.

A **spot** with 13 feet of water, marked by a buoy (spar, red and black horizontal stripes), lies about ⅜ mile 180° true (**S** by **W** mag.) from the buoy on the eastern end of Latimer Reef, and 400 yards 45° true (**NE** by **E** mag.) from Seal Rocks buoy.

Seal Rocks, marked off their northern side by a buoy (spar, black, No. 3), lie about ⅜ mile northwestward from the eastern point of Fishers Island.

Youngs Rock, 1½ to 13 feet of water, marked by a buoy (spar, black, No. 5), lies about ⅜ mile westward from Seal Rocks buoy.

An unmarked **13-foot spot** lies 600 yards 321° true (**NNW ½ W** mag.) from Youngs Rock buoy, and is a little southward of the course.

Eel Grass Ground is well northward of the course, being ½ to 1 mile 295° true (**NW ¾ W** mag.) from Latimer Reef lighthouse; it has 6 to 15 feet of water, and is marked by two buoys, one at its northwestern end and the other at its southeastern (spars, red, No. 12 and No. 10).

East Clump is a cluster of rocks bare at low water well southward of the course, and lying ¾ mile 118° true (**SE ½ E** mag.) from Ram Island Reef light-vessel.

Ram Island Reef light-vessel, described on page 12, is southward of Ram Island Reef; the latter is described on page 51.

Middle Clump is a cluster of bare rocks, about ⅝ mile 189° true (**S by W ¾ W** mag.) from Ram Island Reef light-vessel. A buoy (spar, black, No. 5½) is placed nearly ¼ mile 0° true (**N by E** mag.) from the rocks, and marks the northernmost of two 17-foot spots; this buoy is a little over ⅜ mile 191° true (**SSW** mag.) from Ram Island Reef light-vessel.

3. ***From Ram Island Reef light-vessel to Long Island Sound.***—Having passed southward of Ram Island Reef light-vessel, bring it to bear 74° true (*E ½ N* mag.) and steer 254° true (**W ½ S** mag.) for Bartlett Reef light-vessel, passing about midway between Seaflower Reef beacon and North Dumpling lighthouse.

The 254° true (**W ½ S** mag.) course continued for 4½ miles after Seaflower Reef beacon bears abeam will lead to Bartlett Reef light-vessel.

Remarks.—After passing Ram Island Reef light-vessel, Seaflower Reef beacon should be seen northwestward of North Dumpling lighthouse, and New London and Southwest Ledge lighthouses will be made well on the starboard bow. Northward is the western approach to Noank and Mystic River. Southward and a little farther west is West Harbor; dangers lie in a broken line between Middle Clump and South Dumpling.

Dangers.—**West Clump** is a small cluster of bare rocks lying on a line between Middle Clump and South Dumpling Island. A long shoal with 5 to 11 feet over it extends a little over ½ mile eastward and nearly ⅜ mile westward of West Clump.

Pulpit Rock, marked by a black iron spindle (barrel on top), has 5 feet over it, and lies near the western end of the shoal making westward from West Clump.

Flat Hammock is a low bare islet about ½ mile southeast of North Dumpling lighthouse. A shoal with 1½ feet over it extends ¼ mile northeastward from the northern end of this islet, and is marked at its northern end by a buoy (spar, red, No. 2).

A spot with 18 feet over it lies northward of the sailing line when one-third the way from Ram Island Reef light-vessel to Seaflower Reef beacon. This spot is about ½ mile 121° true (**SE ¼ E** mag.) from Groton Long Point spindle.

Intrepid Rock with 13 feet over it lies about halfway between Ram Island Reef light-vessel and Seaflower Reef beacon, and ⅜ mile 168° true (**S ⅛ E** mag.) from Groton Long Point spindle. It is marked by a buoy (spar, red and black horizontal stripes).

North Dumpling, marked by North Dumpling lighthouse, is an island at the western end of Fishers Island Sound, and is about 1¼ miles 208° true (**SW ½ S** mag.) from Groton Long Point. A shoal with 9½ to 16 feet over it makes out ¼ mile eastward from the lighthouse.

South Dumpling is a small island lying about ¼ mile west of Flat Hammock and a little over ¼ mile 157° true (**S by E** mag.) from North Dumpling lighthouse. A channel about 350 yards wide and with a depth of over 30 feet leads between South Dumpling and North Dumpling islands.

Seaflower Reef, marked by a large granite beacon, lies a little over ¾ mile 306° true (**NW ¼ N** mag.) from North Dumpling lighthouse. This reef is nearly ¼ mile long in a general northeasterly direction.

STONINGTON HARBOR.*

Stonington Harbor is on the northeastern side of Fishers Island Sound. There are three breakwaters:

East Breakwater begins near the southwestern end of Bartlett Reef and extends about 800 yards in a 244° true (**WSW ¾ W** mag.) direction to the north end of the Middle Ground; the western end of the breakwater is marked by Stonington Outer Breakwater light. Several large fish weirs are located inside this breakwater.

West Breakwater, 2,000 feet long, extends in a southeasterly direction from off Wamphassuck Point, and affords protection to vessels in the upper harbor, which is small. Stonington Breakwater lighthouse (see table, page 12) marks the eastern end of this breakwater.

*See footnote on page 45.

Inner Breakwater is about 200 yards northward of Stonington Point, on the east side at the entrance. It extends westward about 250 yards, and is marked at its western end by a small, gray, stone pyramid, which with Stonington Breakwater lighthouse forms a range for crossing Noyes Shoal through the dredged cut.

The deepest draft of vessels entering the harbor at mean low water is 13 feet; the depth alongside the wharves at mean low water is 7 to 13 feet, according to locality.

Approaches.—The harbor is approached from southward, southwestward, and westward; the southern approach is the best, having fewer dangers, and the lights serve as guides to avoid them.

Approaching from westward and southwestward several changes of course are necessary. The principal guides are buoys placed to mark the dangers. In the daytime, with clear weather, no difficulty should be experienced in entering by any of the approaches.

Pilots can be obtained from fishing boats, or from the shore by signaling. Fishermen will bring vessels into the harbor. Pilotage is not compulsory.

Towboats are not much used; they may he had by telegraphing or telephoning to New London.

Anchorage is found anywhere inside the breakwaters. In the upper harbor a channel 300 feet wide must be left clear from the end of the inner breakwater to the head of the steamboat wharf.

Quarantine regulations are given in the State laws in Appendix II. Vessels which have sickness on board should anchor inside the East Breakwater and set signal.

Hospitals.—New London is the nearest place where seamen can apply for medical treatment. The nearest marine hospital is at Stapleton, Staten Island. (See Appendix IV.)

Storm warning displays of the United States Weather Bureau are made on Stonington Point. For explanation of the displays, see Appendix III.

Supplies.—Anthracite coal can be obtained for steamers in limited quantity. It is put on board alongside the wharf. Water can be obtained alongside the railroad wharf from hydrant through hose. Provisions and some ship-chandler's stores can be had in Stonington.

Repairs.—Noank is the nearest place for repairs to hulls, New London for repairs to machinery.

For **variation of the compass** in Stonington Harbor, see page 22.

For **tidal** data, see page 24.

Ice seldom forms except in very cold weather; steamers running daily keep the channel open.

Consult also pages 9 and 10.

SAILING DIRECTIONS, STONINGTON HARBOR.

The following directions are safe for vessels of 15 feet draft until abreast of Stonington Point, when, after entering the inner harbor, the sailing line is not good for a draft of more than 11 feet at low water. Vessels drawing 13 feet or over must exercise care in passing the Middle Ground, and Noyes Shoal lying opposite it on the west side of the channel; the channel between these two shoals is only about 300 yards wide.

1. ***Approaching from Eastward.—I. Having come through Watch Hill Passage.***—Having followed the directions on pages 47 and 48, for Fishers Island Sound until abreast of Napatree Point Ledge buoy (nun, red, No. 4), pass southward of this buoy and steer 298° true (**NW ½ W** mag.) a little over 1 mile, passing at least 150 yards southward of Middle Ground south buoy (spar, red, No. 4½). When this buoy is well on the quarter and Stonington Breakwater lighthouse bears 353° true (**N ⅜ E** mag.), steer for the lighthouse on this bearing; pass about 150 yards westward of Middle Ground west buoy (nun, red, No. 6) and proceed as directed in section 2 following.

II. Having come through Sugar Reef Passage.—Having followed the directions in paragraph II, page 47, until about 150 yards south of Napatree Point Ledge buoy (nun, red, No. 4), steer 298° true (**NW ½ W** mag.) and proceed as directed in the preceding paragraph.

III. Having come through Lords Passage.—Having followed the directions in paragraph III, page 47, until Latimer Reef lighthouse bears about 282° true (*WNW* mag.), haul westward and bring Stonington Breakwater lighthouse to bear 353° true (**N ⅜ E** mag.) and steer for it. Pass 100 to 200 yards westward of Middle Ground west buoy (nun, red, No. 6) and proceed as directed in section 2 following.

Remarks.—On the 293° true (**NW** ½ **W** mag.) course the town of Stonington will be broad off the starboard bow behind East Breakwater; farther westward the lighthouse on the eastern end of Stonington West Breakwater will be seen.

Dangers.—**Napatree Point Ledge** and the **Middle Ground** are described on page 48.

Noyes Shoal, with 10 to 16 feet over it, commences about 300 yards west from Middle Ground west buoy (nun, red, No. 6) and extends nearly 1½ miles in a general 287° true (**NW** by **W** ½ **W** mag.) direction. The sailing line passes between this shoal and Middle Ground buoy.

1 A. ***Approaching from Southwestward.***—When about 1 mile eastward of Ram Island Reef light-vessel, bring it to bear 259° true (*W* mag.) and steer 79° true (**E** mag.) keeping it on the bearing; pass southward of Eel Grass Ground southeast buoy (spar, red, No. 10) and take care to pass northward of the red and black horizontally striped spar buoy marking North Latimer Reef. When Stonington Breakwater lighthouse bears 27° true (**NE** ⅝ **N** mag.) and is in range with the small gray stone beacon on the end of Inner Breakwater at Stonington, steer for the lighthouse, keeping close on the range. When Stonington Breakwater lighthouse is less than ½ mile distant ahead, and Noyes Shoal has been crossed, haul eastward a little and proceed as directed in section 2 following.

Remarks.—The 79° true (**E** mag.) course leads almost directly for the buoys marking the southeast end of Eel Grass Ground and North Latimer Reef. A channel about 160 feet wide and 17 feet deep has been dredged across Noyes Shoal on the range of Stonington Breakwater lighthouse and the west end of Inner Breakwater at Stonington. This channel has shoaled somewhat since it was dredged.

When crossing Noyes Shoal the depth of water should not be less than 15 feet in the dredged channel.

Dangers.—**Eel Grass Ground** and **North Latimer Reef** are described on pages 48–49.

Noyes Shoal is described above.

1 B. ***Approaching from Westward.***—Leave Ram Island Reef light-vessel 150 yards on the port beam and steer 52° true (**NE** by **E** ⅝ **E** mag.) heading for White Rock and passing about midway between the spindle on Ellis Reef and the red buoy (spar, No. 12) on the western end of Eel Grass Ground.

When nearly up to White Rock and Stonington Breakwater lighthouse bears 79° true (**E** mag.), steer for the lighthouse on this course: leave White Rock 200 yards on the port hand and pass about 300 or 400 yards north of the buoy (spar, red, No. 8) on Noyes Rock. When past the buoy on Noyes Rock haul a little southward and give Stonington Breakwater lighthouse a berth of at least 200 yards; then head 0° true (**N** by **E** mag.), and proceed as directed in section 2 following.

Or, to follow the main channel through Fishers Island Sound.—When well past Latimer Reef lighthouse, and about 200 yards north of Seal Rocks northeast buoy (spar, red and black horizontal stripes), marking a 13-foot spot, steer for the eastern end of East Breakwater on a 45° true (**NE** by **E** mag.) course, and when nearly up with the Middle Ground west buoy haul northward. Pass about 150 or 200 yards west of the buoy on a 0° true (**N** by **E** mag.) course, and proceed as directed in section 2 following.

Remarks.—As Ram Island Reef light-vessel is approached, Ram Island with the building near its southern end will show conspicuously. The spindle on Ram Island Reef and the red buoy southward of the reef will be seen northward and eastward of the light-vessel.

Stonington West Breakwater and the town of Stonington will be plainly seen as White Rock is approached.

Dangers.—**Ram Island Reef** lies about 400 yards northward of Ram Island Reef light-vessel, has 5 to 7 feet over it, and is marked by a red iron spindle with round cage. A buoy (nun, red, No. 14) in 18 feet of water lies 300 yards south of the spindle and just southward of a 6½-foot spot.

Ellis Reef, left on the port hand, marked near its eastern end by a black iron spindle, with round cage, shows a dry spot at low water. It lies 1 mile 72° true (**E** ⅝ **N** mag.) from the southern end of Ram Island. About 350 yards northeastward of the spindle, on the northeastern edge of the shoal which surrounds the reef, is a buoy (spar, black, No. 1) marking the entrance to Noank from eastward.

Eel Grass Ground, left on the starboard hand, is described on page 49.

White Rock is a small rocky islet, conspicuous on account of its solitary position. It lies 2⅛ miles 55° true (**NE** by **E** ⅞ **E** mag.) from Ram Island Reef light-vessel, and 1⅛ miles 349° true (**N** mag.) from Latimer Reef lighthouse.

Noyes Rock, left on the starboard hand, is described below.

Latimer Reef is described on page 48.

2. ***From abreast Middle Ground buoy to the Inner Harbor.***—When 150 to 200 yards west of Middle Ground west buoy (nun, red, No. 6) steer 0° true (**N** by **E** mag.) for Stonington entrance. Give the western end of East Breakwater a berth of 250 to 350 yards and Stonington Breakwater lighthouse (on the eastern end of Stonington West Breakwater) a berth of not less than 200 yards. Then if of less than 11 feet draft:

Pass between black buoy No. 1 and the western end of Inner Breakwater, and come to anchor, leaving a channel 300 feet wide from the end of the breakwater to the steamboat dock.

To anchor inside East Breakwater, haul eastward and anchor northward of the breakwater in 14 to 16 feet with Stonington Point bearing northward of 338° true (*N* by *W* mag.).

To anchor northward of Stonington West Breakwater, haul westward after passing Stonington Breakwater lighthouse and anchor southward of a 270° true (*W* by *N* mag.) bearing on the south end of Wamphassuck Point.

Remarks.—On the 0° true (**N** by **E** mag.) course Stonington Breakwater lighthouse will be on the port bow and Stonington Point will be on the starboard bow.

A large part of the area behind the East Breakwater is taken up by fish weirs in the summer.

Dangers.—**Noyes Rock**, marked by a buoy (spar, red, No. 8), has 9 feet over it, and lies ½ mile 236° true (**WSW** mag.) from Stonington Breakwater lighthouse. Pass eastward of the buoy in entering from southward.

The **shoal** making southward from Stonington Point is marked by a buoy (spar, red and black horizontal stripes). This buoy will be left on the starboard hand in entering the inner harbor.

Penguin Shoal buoy (spar, black, No. 1), inside of the harbor, is about 600 yards 12° true (**NNE** mag.) from Stonington Breakwater lighthouse, and marks **Penguin Shoal**, which has 4 to 9 feet over it. The shoal extends about 400 yards westward, and 200 yards southward from the buoy.

MYSTIC RIVER.*

This river flows into Fishers Island Sound about 3¾ miles westward of Stonington Harbor. It has a crooked channel with a least width of 100 feet and a depth of 15 feet to the town bridge at Mystic, and is navigable for vessels of 8 feet draft to the head of navigation about 1 mile above the town. The river at Mystic is crossed by two bridges—town bridge (width of draw, 58 feet) and railroad bridge (width of draw, 62 feet).

Noank, a village on the western bank, at the entrance, is on the N. Y., N. H. & H. Railroad. The chief industries are shipbuilding and fishing. The deepest draft of vessels going to Noank is 18 feet; depth alongside wharves at low water, 10 feet.

Mystic, a town on both banks of the river, about 1½ miles above Noank, is on the line of the N. Y., N. H. & H. Railroad. There are several manufactories and shipyards at Mystic. The deepest draft of the vessels going up as far as this town at high water is 12 to 14 feet. The depth in the channel at low water is 15 feet, and the depth alongside the wharves at low water is 10 feet.

Prominent features.—Morgan Point lighthouse is on the southern end of Morgan Point (see table, page 12), south of the village of Noank; it is one of the guides leading up to the entrance of the river. Ram Island Reef light-vessel is about ½ mile southward of Ram Island (see table, page 12). Ram Island, about ½ mile eastward from Morgan Point lighthouse, is readily distinguished by the building near its southern end.

Channels.—The entrance of the river is approached through two narrow and crooked channels, one from eastward, passing north of Ram Island, and one from westward and southward, passing south of Groton Long Point. These channels are marked by spindles, beacons, and buoys, but strangers should not attempt them without a pilot. The eastern channel is generally used; vessels of 18 feet draft can enter by this channel. The deepest draft coming through the southern channel at low water is 12 feet.

* See footnote on page 45.

Pilots are generally taken by strangers entering the river. Vessels from westward desiring a pilot will get one by making signal off Groton Long Point. When coming from eastward, if not boarded by a pilot, vessels sometimes anchor ¼ mile southwest of Baker Island, and wait, with signal flying, until one comes from Noank. Pilotage is not compulsory.

Towboats.—Sailing vessels bound to Noank or Mystic generally take a tug, which can be had at Noank by telephoning to New London for one.

Anchorage.—The anchorage for vessels bound into Mystic River from eastward is about ¼ mile southwest from Baker Island—between it and the northern end of Ram Island—in 20 feet of water, soft bottom.

Small vessels of 50 to 100 tons sometimes anchor in the channel abreast of Noank. Good holding ground will be found anywhere in the channel of the river above Crooks beacon.

Repairs.—There are several well-equipped shipyards and marine railways at Noank; the largest railway is 300 feet long, can take out vessels of 14 feet draft, has a capacity of 1,600 tons, and is able to haul out any vessel entering the river. Ordinary repairs to the machinery of steamers can also be made here.

Supplies.—Anthracite and bituminous coal, in limited quantities, for steamers, and fresh water through hose, can be obtained alongside the wharves at Noank and Mystic. Provisions and some ship-chandler's stores can be obtained at these places.

Tides.—The mean rise and fall of tides at Noank is 2.5 feet; high water occurs 8m. earlier, and low water 14m. earlier, than at New London.

SAILING DIRECTIONS, APPROACHING MYSTIC RIVER.

1. ***From Eastward.***—The directions in this section, if closely followed, are good for a draft of 17 feet, but there are unmarked shoal spots near the sailing line, and vessels are liable to be set on these by the tidal currents. With vessels drawing more than 10 feet great care is necessary, and it is advisable to take a pilot.

Follow the directions on pages 47 and 48, for entering Fishers Island Sound, until up with Napatree Point Ledge buoy (nun, red, No. 4). Pass 150 yards southward of this buoy and make good a 293° true (**NW** by **W** mag.) course for 3¼ miles, passing well southward of the buoy (spar, red, No. 4½) off the southwest side of the Middle Ground and about 250 yards northward of North Latimer Reef buoy (spar, red and black horizontal stripes).

Pass about 150 yards northward of black buoy No. 1, north of the spindle on Ellis Reef, and continue on the 293° true (**NW** by **W** mag.) course until Morgan Point lighthouse shows just north of the northern one of the two small islets north of Ram Island; then steer 255° true (**W** ⅜ **S** mag.) for the northern end of Ram Island. When Mason Point, the southern point of Mason Island, bears 349° true (*N* mag.), distant about 300 yards, come to anchor in 20 feet of water and wait for a pilot, or take a towboat.

Remarks.—On the 293° true (**NW** by **W** mag.) course, when off Napatree Point, Latimer Reef lighthouse will be on the port bow, showing open just southward of Noank. Stonington and the East Breakwater will be broad on the starboard bow. When up with the buoy (spar, red and black horizontal stripes) on North Latimer Reef the spindle on Ellis Reef will be made on the port bow and Baker Island will be ahead. Ram Island will be distinguished by the building near its southern end.

On the 255° true (**W** ⅜ **S** mag.) course, heading for the northern end of Ram Island, the first islet north of Ram Island will show just clear of Ram Island.

Dangers.—**Noyes Shoal,** with 10 and 16 feet over it, extends 1½ miles in a general 287° true (**NW** by **W** ½ **W** mag.) direction, and is not marked; it is left 150 to 500 yards on the starboard hand, on the 293° true (**NW** by **W** mag.) course.

North Latimer Reef, left on the port hand, lies ⅜ mile 36° true (**NE** ¼ **E** mag.) from Latimer Reef lighthouse, has 11 feet of water, is of small extent, and is marked by a buoy (spar, red and black, horizontal stripes).

Eel Grass Ground, left well on the port hand, is described on page 49.

White Rock and **Ellis Reef** are described on pages 51–52.

A **spot** with 10 feet over it, not marked, lies about 400 yards south from the southern end of Baker Island and ¼ mile 51° true (**NE** by **E** ½ **E** mag.) from Gates Island, the small island ⅜ mile southward of Mason Point. The sailing line passes about midway between this shoal spot and Baker Island.

1 A. ***From Westward.***—The directions in this section are for vessels of 12 feet or less draft.

Pass midway between North Dumpling lighthouse and Seaflower Reef beacon, steering about 73° true (**E** ½ **N** mag.) for Ram Island Reef light-vessel and making signal for a pilot. Do not pass northward of the line of Groton Long Point spindle and Ram Island Reef light-vessel, standing off and on until a pilot comes off. Keep well northward of the Clumps (see page 49.)

Remarks and dangers.—The entrance to Mystic River from southward is buoyed, but it is advisable for a stranger, unless of very light draft, to remain outside, as directed above, until a pilot is obtained.

Intrepid Rock is described on page 49.

WEST HARBOR.*

This harbor is on the north side of Fishers Island southeastward of North Dumpling lighthouse, and affords shelter from southerly winds for vessels of 12 feet or less draft. The southern end of the harbor has depths of 9 to 11 feet in a space about 400 yards in diameter, and affords shelter for vessels of 8 feet or less draft from northwesterly winds also. The harbor is a summer resort; the post office is Fishers Island. The principal dangers in the entrances and harbor are buoyed.

SAILING DIRECTIONS, WEST HARBOR.

The following directions are good in the daytime, when the buoys can be seen, for a draft of 12 feet, and for a draft of 8 feet to an anchorage above Hawks Nest Point.

1. ***Approaching and Entering from Northward and Eastward.***—Follow the directions in section 2, page 47, to Ram Island Reef light-vessel. Pass southward of the light-vessel and steer for North Dumpling lighthouse, course 248° true (**W** by **S** mag.). When about 1 mile from the lighthouse, and Pulpit Rock spindle bears on the port beam, steer 193° true (**SSW** ⅛ **W** mag.), heading for the east tangent of Hawks Nest Point (west side of West Harbor); pass 300 yards eastward of the buoy (spar, red, No. 2), lying nearly ¼ mile northeastward of Flat Hammock, and pass ¼ mile eastward of Flat Hammock. When southward of Flat Hammock, haul southward and anchor in 15 to 18 feet of water about ¼ mile northward of the buoys eastward of Hawks Nest Point, taking care to give the southeast shore a berth of 400 yards.

Vessels of 8 feet or less draft to anchor inside Hawks Nest Point.—Pass 100 yards eastward of the buoy (spar, red, No. 6) lying 150 yards eastward of Hawks Nest Point, and steer for Goose Islet (in the southern part of the harbor) on a 202° true (**SW** by **S** mag.) course. Anchor about 200 yards from Goose Islet and the shore eastward of it, in 10 to 11 feet, soft bottom.

Remarks and dangers.—The 193° true (**SSW** ⅛ **W** mag.) course leads in a least depth of 14 feet over the shoal which extends from Flat Hammock to Pulpit Rock. Flat Hammock and Pulpit Rock are described on page 49.

The portion of West Harbor northward of the buoys lying eastward of Hawks Nest Point has depths of 13½ to 18 feet, but rocks make out 350 yards from the southeast shore for a distance of ¼ mile northeastward of black spar buoy No. 3.

The western shore south of Hawks Nest Point should be given a berth of 150 yards. **Shoals** extend from the southeast shore over halfway across the entrance to the harbor inside Hawks Nest Point; the northern point of the shoals, where there are rocks with a depth of 4 feet, is marked by a buoy (spar, red and black horizontal stripes), and the southwest edge of the shoals is defined by the range of Hawks Nest Point and the southwest point of South Dumpling.

1 A. ***Approaching and Entering, from Westward.***—Pass close to the bell buoy (black and white perpendicular stripes) lying nearly ⅜ mile 202° true (*SW* by *S* mag.) from North Dumpling lighthouse, and steer 141° true (**SSE** ½ **E** mag.) so as to pass midway between red spar buoy No. 4 and black spar buoy No. 1. From a position 100 yards

*Shown on charts **358, 359**, scale $\frac{1}{20,000}$, price of each $0.40; **114**, scale $\frac{1}{80,000}$, price $0.50.

southwestward of buoy No. 1, steer 113° true (**SE** by **E** mag.), passing about 400 yards northward of Hawks Nest Point. Anchor as directed in section 1.

Remarks and dangers.—The directions should lead in a least depth of 14½ feet when passing buoy No. 1.

Rocks with 6 feet and less over them extend 450 yards 326° true (**NNW** mag.) from the northern point at the western end of Fishers Island. The northern edge of the shoal is marked by two buoys (spars, red, Nos. 2 and 4). From this point to Hawks Nest Point, the shore should be given a berth of over 200 yards.

A shoal with 13 to 14½ feet over it extends 600 yards 180° true (**S** by **W** mag.) from South Dumpling, and is marked near its southern end by a buoy (spar, black, No. 1) placed in a depth of 13½ feet.

LONG ISLAND SOUND.*

Long Island Sound lies between the shores of Connecticut and New York on the north and Long Island on the south. Eastward is Block Island Sound; at the western end Long Island Sound joins East River between Throgs Neck and Willets Point. The distance from Little Gull Island lighthouse to Execution Rocks lighthouse is about 76 miles; the greatest width, nearly abreast New Haven entrance, is a little more than 16 miles, decreasing gradually eastward and westward.

This large body of water is important as an approach to New York from eastward; nearly all of the coasting vessels and steamers between New York and the Eastern States pass through, bound both ways; it has several important harbors on its shores.

Vessels drawing 26 feet have been taken through Long Island Sound and East River, but this was exceptional. Ordinarily, the greatest draft passing through does not exceed 23 to 23½ feet; vessels of as deep draft as this, trading to New York, sometimes go to sea by way of the Sound, but generally come in by way of Sandy Hook.

Channels leading into the Sound.—The principal approach to Long Island Sound from eastward is through Block Island Sound and The Race. Besides The Race there are two other passages leading into Long Island Sound, one through Fishers Island Sound (see page 45), and one from Gardiners Bay through Plum Gut (see page 35). Vessels of deep draft pass in through The Race. Vessels of 14 feet draft or less, with a strong, favorable breeze, sometimes pass through Fishers Island Sound with an adverse tide, the tidal current here being weaker than in The Race. Plum Gut has water for vessels of deep draft, but is not generally used by vessels of over 15 feet draft on account of strong tidal currents and dangers.

There is also a passage between Great Gull Island and Plum Island; this passage is marked by a buoy, but it should not be attempted by a stranger.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced in entering through The Race and passing through the Sound, as the lights are numerous and readily distinguished; they are described on pages 12–17. In most places in the Sound several lights will be in sight at the same time, making navigation comparatively easy. The buoyage accords with the system adopted in United States waters (see page 5).

Pilots.—A number of the Hell Gate pilots have their headquarters at City Island; the eastern station of these pilots extends 3 miles eastward of Execution Rocks. In 1908 the Hell Gate pilot boat (schooner) cruised off Eatons Neck, and boarded vessels desiring a pilot.

Pilotage is compulsory for foreign vessels and vessels from a foreign port, and vessels sailing under register, going to the port of New York. Extracts from the laws of Connecticut and New York, relating to Pilots and Pilotage, are given in Appendix II.

Towboats are generally to be found in the vicinity of City Island, in the western part of the Sound, and in East River. In case of necessity they can be obtained from New York by telegraphing at City Island or at Whitestone. Vessels bound to New York and intending to take a towboat should do so before going westward of Rikers Island (see heading "East River"). At New London and some of the principal ports in the Sound towboats can be obtained, as stated under the several headings.

Harbors and Anchorages.—A number of the shallow harbors which were formerly used by the comparatively small vessels then engaged in the coasting trade are now of little importance. Much of the carrying trade of these places is now done by the railroads and by canal boats and barges, and such harbors are seldom entered for shelter only. Under present conditions, coasters bound westward sometimes almost reach New Haven, and then being driven back return all the way to Niantic Bay or to New London Harbor for shelter, if they can not make the

*Long Island Sound is shown on chart 52, deg. of lat=21.6 in., price $0.50, and in three sheets on charts as follows, **114, 115, 116**, scale $\frac{1}{80,000}$, price of each $0.50. **114**, Eastern sheet, Newport to Plum Island, including Block Island Sound; **115**, Middle sheet, Plum Island to Stratford Shoal; **116**, Western sheet, Stratford Shoal to New York. See also the footnote on page 9.

anchorage behind Duck Island breakwater. Westward of Norwalk Islands seagoing vessels frequently anchor on shoaling their water sufficiently toward the north shore, and with good ground tackle hold on in northerly winds and sea without attempting to make any particular harbor.

New London Harbor is the most important of the anchorages sought for shelter in the eastern part of Long Island Sound. *Niantic Bay* is used considerably, and serves as a general anchorage for vessels bound foreign and having unfavorable winds on reaching the eastern part of the Sound. The anchorage used by such vessels lies within the limits of Bartlett Reef, Hatchett Reef, and the north shore. The holding ground is good and it is easy to get in and out. This is frequently spoken of as the *anchorage off Black Point*. Smaller vessels stand farther inside, going well up into Niantic Bay. The small harbors along the north shore between Niantic Bay and New Haven, excepting Duck Island Roads, are not often entered for shelter only. Seagoing vessels sometimes anchor offshore in northerly winds. *Off Madison* there is good anchorage sheltered from northerly winds. With westerly winds vessels sometimes anchor under the lee of *Falkner Island* (see the detailed directions for Long Island Sound). *New Haven Harbor* is an important harbor of refuge. On the south shore there is an anchorage westward of *Crane Neck*, but it is dangerous in winter, and should always be left upon the first indication of a northerly or northwesterly wind. Large vessels frequently anchor in the *bight outside Bridgeport Harbor lighthouse*, and *Black Rock Harbor* is frequently sought by light-draft vessels. *Huntington Bay*, on the south shore, is much used, and the large Sound steamers sometimes seek shelter in it. *Oyster Bay*, on the south shore, is also used. *Cockenoe Island Harbor*, on the north shore, is sometimes entered for shelter; vessels in this vicinity prefer to make *Sheffield Island Harbor* (Norwalk Harbor), which is also often used by tows. *Captain Harbor* affords good shelter, but it is not very much used. *Westward of the Norwalk Islands* it is usual for vessels to anchor along the north shore of the Sound, as already noted. *Hempstead Harbor* is used a great deal, and vessels of suitable draft often use *Manhasset Bay*. *City Island Harbor* (Hart Island Roads) is a great resort for coasters; small vessels anchor between Hart and City islands, large vessels anchor southward of City Island. All of these harbors and others in Long Island Sound are treated under special headings.

Quarantine.—The quarantine laws of Connecticut govern the ports in that State; local boards of health have the power to make sanitary regulations for the ports under their control. The laws of the State of New York govern the ports of that State, including those on the shore of Long Island; the quarantine laws for the city of New York control vessels westward of Execution Rocks lighthouse. (See Appendix II.)

Ordinarily there is no special boarding station for vessels coming through the Sound bound to New York. During periods when the necessity for such course has been felt, health officers have been detailed and temporary boarding stations established at or near the Sound entrance of the East River. The health officer of the port of New York has his headquarters just above Fort Wadsworth, Staten Island, as stated in Appendix II.

For **Marine Hospitals** see page 9.

Storm warning displays.—A list of display stations of the United States Weather Bureau is given on page 25. For an explanation of the displays see Appendix III.

Repairs.—Machine shops for repairs to the machinery of steamers will be found at the following places eastward of New York: New London, New Haven, Bridgeport, and City Island. Vessels requiring heavy work generally go to New York.

Marine railways and shipyards for the repair of vessels will be found at the following places: New London, capacity of railways up to 2,500 tons and 310 feet length of cradle; Port Jefferson, capacity of railways from 50 to 2,000 tons; Bridgeport, a marine railway, capacity 500 tons; Northport has several marine railways, the largest with a capacity of 300 tons; City Island has several railways, capacity up to 1,000 tons.

Supplies.—Coal, fresh water, provisions and some ship-chandler's stores can be obtained at New London, Bridgeport, New Haven, and Port Jefferson. Supplies other than coal can be obtained at City Island. As mentioned under their separate headings, there are other places in the Sound where coal and other supplies can be obtained, but the quantity to be had is apt to be limited and the facilities are not always good. New London is available as a coaling port for large vessels.

Reporting stations.—There is a station at City Island from which vessels are reported. (See heading "City Island Harbor.")

Oyster grounds, marked off by stakes or poles, occupy a considerable part of some of the bays and harbors of the Sound, and also extend well offshore into the Sound from the north shore between Branford Reef and Stamford Harbor, where they are in 5 to 8 fathoms of water.

Steamboat courses.—Each line or steamer follows its own track, which differs somewhat from others. A route sometimes followed by the steamers of one line is given as an example: Bound west, passing through The Race, the course is shaped to pass about ¼ mile southward of Cornfield Point light-vessel; the course is then changed so as to pass about 1 mile southward of Stratford Shoal (Middle Ground) lighthouse; here the course is changed again so as to lead about 1 or 1½ miles south of Sheffield Island, thence heading for Execution Rocks lighthouse.

Bound east, the reverse courses are followed.

In clear weather, bound west, after passing into the Sound through The Race, the course is sometimes shaped to pass 1½ miles northward of Horton Point lighthouse (south shore), and thence to pass 1 mile southward of Stratford Shoal lighthouse, as before, and continuing the route already given.

Eatons Neck is generally given a wide berth on account of the number of small vessels frequently found in its vicinity, and deep-draft vessels avoid it on account of the shoal spots lying northward of Eatons Point. Apart from this, the foregoing route is based mainly upon convenience in using the thick weather aids when they are needed.

A direct route, frequently used under favorable circumstances, is as follows: Having entered through The Race, when passing northward of Little Gull Island lighthouse the course is shaped 256° true (**W ⅜ S** mag.) with Race Rock lighthouse directly astern. This leads about 2 miles south of Cornfield Point light-vessel and about 5 miles southward of Falkner Island lighthouse. When Stratford Shoal (Middle Ground) lighthouse is made, the course is shaped to pass about 1 mile southward of it. Vessels drawing less than 15 feet often continue the 256° true (**W ⅜ S** mag.) course from Stratford Shoal lighthouse, passing northward of the buoys off Eatons Neck and Lloyd Neck and until past Great Captain Island lighthouse (north shore), or until Execution Rocks lighthouse bears 238° true (**WSW** mag.), then heading for the latter on this bearing.

The **prevailing winds** in Long Island Sound are referred to on page 10. For remarks concerning **fogs** in the Sound and adjacent waters see page 10.

Variation of the compass.—The variation of the compass at different points for 1910 is given on page 22.

Tides.—The table on page 24 gives tidal data for Long Island Sound and the adjacent waters.

TIDAL CURRENTS IN LONG ISLAND SOUND.

Along the axis of the Sound from The Race to Eatons Point ebb begins about 2½ hours after high water, and flood begins about 2½ hours after low water at New London, Conn. Farther west these intervals gradually increase, the change being rapid between Execution Rocks and Throgs Neck.

In the eastern portion of the Sound the currents turn about 1 hour earlier along the shores than along a line midway between the shores.

In The Race at strength the velocity of the ebb is 3.5 miles, and the flood 3.2 miles. Going westward along the axis of the Sound these velocities gradually diminish until south of New Haven, where they are 1.1 and 1.0 miles, respectively. Going farther west they increase slightly until north of Eatons Point, where they are 1.3 and 1.4 miles, respectively. Still continuing westward, the velocities again diminish until between Rye Neck and Matinicock Point, the velocity of the flood or ebb is 0.5 mile. Westward the velocities increase slightly, and off Pelham Bay are 0.9 mile for ebb and 0.7 mile for flood.

In the main channel from Hewlett Point westward, the east-going current should be regarded as the flood and the west-going as the ebb; because between this point and the Hudson River the greatest velocity of the east-going current occurs upon a rising tide. Eastward from Hewlett Point, the greatest velocity of the east-going current occurs upon a falling tide, and this should be regarded as the ebb.

In the following table the direction of the current is given in the upper line, and the velocity, in miles and tenths, in the lower line. The bearings and directions are true (not magnetic), and distances are in nautical miles.

HIGH WATER.							LOW WATER.						
Hours before.			Hours after.				Hours before.			Hours after.			
3	2	1	0	1	2	3	3	2	1	0	1	2	3
Current stations in Long Island Sound, referred to time of tide at New London, Conn.													
Station (1) Long Island Sound, 4 miles S. from the mouth of the Connecticut River.													
287°	265°	245°	240°	255°	. . .	55°	51°	46°	48°	53°	60°	67°	285°
0.4	1.0	1.5	1.6	1.2	0.0	1.1	1.6	2.1	2.4	2.4	1.6	0.5	0.2
Station (2) Long Island Sound, 8 miles S. from the Thimbles.													
270°	265°	258°	250°	242°	234°	50°	51°	53°	55°	57°	59°	61°	272°
0.1	0.7	1.2	1.5	1.0	0.2	0.1	0.4	0.9	1.2	1.0	0.7	0.3	0.1

ICE IN LONG ISLAND SOUND AND ADJACENT HARBORS.

In ordinary winters the floating and pack ice in this Sound, while impeding navigation, does not render it absolutely unsafe. But in exceptionally severe winters the reverse is the case, none but powerful steamers being able to make their way.

Drift ice (formed originally along the northern shore of the Sound), under the influence of the prevailing northerly winds, drifts across to the southern side and accumulates there, massing into large fields, and remains until removed by southerly winds, when it drifts back to the northerly shore.

The whole Sound has been known to be completely covered with heavy ice extending through The Race and as far eastward as Point Judith and Block Island, and outside of Montauk Point to a distance varying from 5 to 15 miles from land.

Such conditions are of very rare occurrence.

New London Harbor.—The lower part of the Thames River is rarely much obstructed by ice. In extremely severe winters, however, the pack has been known to extend about 1¾ miles above the lighthouse. Between New London and the mouth of the river sailing vessels may navigate with comparative safety in ordinary winters; and even in severe weather there is rarely a stoppage of navigation of more than a week's duration. Steamers can nearly always enter and leave with safety. Drift ice sometimes forms a decidedly dangerous obstruction in the approaches through Long Island Sound during severe winters, especially during February and March; and sailing vessels are much hindered in their movements during the months of January, February, and March.

New Haven Harbor.—During severe winters the accumulation of ice is local, and begins to obstruct the movements of sailing vessels in December. From that month until the latter part of March it frequently bars the ingress or egress of sailing vessels without the assistance of tugboats. Except in extraordinarily severe weather, however, steamers can always enter and leave the harbor without much difficulty.

Bridgeport Harbor.—In exceptionally severe winters this harbor is liable to be completely closed to all navigation unless a channel is cut through "the pack" by ice boats. Ordinarily the regular steamers keep the channel open.

Effect of tides, winds, etc., on the ice in the Sound and the above harbors.—In Long Island Sound northerly winds drive the ice to the southern shore of the Sound and southerly winds carry it back to the northern shore. Northeasterly winds force the ice westward and cause formations heavy enough to prevent the passage of vessels of every description until the ice is removed by westerly winds. These winds carry the ice eastward, and if of long enough duration drive it through The Race into Block Island Sound, whence it goes to sea and disappears.

The Race may be said to be the only locality where tidal currents have any decided influence on the movements of the ice. Large quantities of "floe" ice usually pass through The Race during the ebb, especially if the wind be westerly; and in severe winters this ice causes serious obstructions in Block Island Sound and around Montauk Point. These obstructions are the most extensive about the middle of February.

Navigators must not depend too implicitly upon the light-vessels and buoys. In severe winters these are liable to be carried away; and in fact during every winter it is better to depend on the lights and other permanent objects than on the buoys. In New London Harbor winds from east through north to west remove all drift ice from the approaches to the Thames River; while those from southeastward, southward, and southwestward bring the ice in. The buoys in the river are not usually disturbed; but Bartlett Reef light-vessel is sometimes drifted from her position and may in extreme cases remain so for several days.

In New Haven Harbor the influence of the northerly winds is to clear the harbor and its approaches unless the local formation is too heavy to be moved. Southerly winds force the drift ice in from the Sound and prevent the local formations from leaving the harbor. Tides have little effect upon the ice.

In Bridgeport Harbor winds from north to northwest clear the harbor of drift ice, and those from southeast through south to southwest force the ice into the harbor from the Sound. The outer buoys are apt to be carried out of position by heavy ice during severe winters.

THE RACE.

The Race is the main channel leading into the eastern end of Long Island Sound. From Race Point, the southwestern end of Fishers Island, to Little Gull Island, the width is about 4 miles.

Race Rock lighthouse marks the northern side of the passage, and Little Gull Island lighthouse the southern side. Between these lighthouses the only dangers are Valiant Rock and Little Gull Island Reef (see page 60).

There is also a narrow passage northward of Race Rock lighthouse.

The **tidal currents** through The Race have an ordinary velocity at strength of 3.5 knots. The ebb current sets southeasterly and the flood sets northwesterly and westerly. There is always a strong tide rip in The Race except for about half an hour at slack water, during which period only is there any marked decrease in the velocity of the current. The rips are exceptionally heavy when a strong wind opposes the current at strength.

Vessels approaching The Race with an adverse current often find it to their advantage to pass through near Race Rock, as the current turns here about ½ hour before it does in the middle of The Race. On the last of the ebb or the flood in the middle of The Race the current on either side will be running in the opposite direction.

During the ebb eddies are formed southeastward of Race Rock lighthouse; these cover several acres. While the flood is running similar eddies are formed to the northwestward of the lighthouse.

Vessels attempting to beat through The Race with the current against them are often unable to get through until the tide turns.

See also Tidal Currents in Long Island Sound, page 57.

SAILING DIRECTIONS, LONG ISLAND SOUND.

General outline of arrangements.—The following are the general headings under which the sailing directions for Long Island Sound are arranged:

Approaching and entering Long Island Sound.
Through courses, The Race to Execution Rocks.
Sailing directions in detail for the Sound.
Sailing directions along the north shore of the Sound.
Sailing directions along the south shore of the Sound.

APPROACHING AND ENTERING LONG ISLAND SOUND.

Courses through Block Island Sound to The Race are given in section 1A, pages 28 and 31. When approaching and going through The Race the guides are Race Rock lighthouse, on the northern side of The Race, and Little Gull Island lighthouse, on the southern side (see page 12).

The directions for entering Long Island Sound are divided into sections, as follows:

1. From eastward, through The Race.
1 A. From southeastward, through The Race.
1 B. From Gardiners Bay, through Plum Gut.

1. ***From Eastward, through the Race.***—Any of the following directions may be used:

I. Keep Race Rock lighthouse on any bearing between 265° true (**W** ½ **N** mag.) and 304° true (**NW** mag.) when approaching, and pass 150 yards to ½ mile south of this lighthouse in going through The Race. *Or*, approaching as just directed, pass northward of this lighthouse, giving it a berth of 200 yards or more, and leaving Race Point buoy (spar, red, No. 2) on the starboard hand. This passage is narrow, but has depths of 4¼ to 5¼ fathoms.

NOTE.—The ***tidal current*** turns about an hour earlier north of Race Rock than it does in the middle of The Race. Vessels approaching The Race with the current against them often take advantage of this, keeping Race Rock lighthouse the best aboard, or passing northward of it.

II. Steer for Little Gull Island lighthouse on any course between 248° true (**W** by **S** mag.) and 281° true (**WNW** mag.), and pass ½ mile to 1 mile northward of this lighthouse in going through The Race.

III. In beating, keep Race Rock lighthouse bearing northward of 265° true (**W** ½ **N** mag.) and keep Little Gull Island lighthouse bearing westward of 281° true (**WNW** mag.). Passing through The Race, avoid Valiant Rock and give the lighthouses a berth as directed in paragraphs I and II.

IV. At night, Race Rock light and Little Gull Island light should be made about the same time, and any of the foregoing directions may be followed. In passing through The Race, when on, or westward of, a line drawn from Race Rock light to Little Gull Island light, or when New London light bears eastward of 353° true (*N* ⅜ *E* mag.) the vessel will be clear of Valiant Rock.

The ***tidal currents*** have considerable velocity in The Race. (See "The Race" and the remarks on currents preceding these directions.)

Dangers.—*In the passage northward of Race Rock lighthouse* the only danger is **Race Point Ledge**, on the northern side of the passage. Race Rock lighthouse, on the southern side of the passage, should be given a berth of 200 yards or more.

In the main passage, between the two lighthouses, the only dangers are **Valiant Rock**, in the middle of The Race, and **Little Gull Island Reef**, on the southern side of the passage. **Cerberus Shoal**, lying a little over 7 miles 106° true (**SE** by **E** ⅝ **E** mag.) from Little Gull Island lighthouse, is the chief danger in approaching, and is described on page 28.

Race Point Ledge makes out southwesterly for nearly ¼ mile from the southwestern end of Fishers Island. It has bowlders with 3 to 9 feet over them at lowest tides; outside these is a buoy (spar, red, No. 2) in 18 feet water.

Race Rock, on the northern side of The Race, and about 120 yards in diameter with a less depth than 18 feet, is marked by Race Rock lighthouse (see page 12).

Valiant Rock, nearly in the middle of The Race, has 18 feet over it at mean low water. From the rock Race Rock lighthouse bears 40° true (**NE** ½ **E** mag.) distant 1½ miles, and Little Gull Island lighthouse bears 236° true (**WSW** mag.) distant 2⅛ miles.

Little Gull Island Reef extends nearly ¼ mile in a northeasterly direction from Little Gull Island lighthouse, and is marked at its eastern end by a buoy (can, black, No. 1).

Little Gull Island lighthouse is described in the table on page 12. For bearings and distances from it see page 10.

1 A. ***From Southeastward, through The Race.***—Courses through Block Island Sound are given in section 1A, page 31. *Having passed northward of Cerberus Shoal*, in approaching and passing through The Race follow any of the directions given under section 1 foregoing, for vessels coming from eastward.

Having passed northward of Shagwong Reef and *southward of Cerberus Shoal*, in approaching The Race, steer for Race Rock lighthouse on any course between 321° true (**NNW** ½ **W** mag.) through north to 26° true (**NE** ¾ **N** mag.) or steer for Little Gull Island lighthouse on any course between 291° true (**NW** by **W** ⅛ **W** mag.) to 338° true (**N** by **W** mag.) In passing through The Race follow the directions of section 1 preceding.

Dangers to be avoided when past Montauk Point and before coming up with The Race are Shagwong Reef and Cerberus Shoal (see pages 28 and 31). Dangers in The Race are described under section 1 preceding.

1 B. ***From Gardiners Bay through Plum Gut.***—Vessels bound into the Sound, if they have anchored in Gardiners Bay, find it a great saving in distance to pass through Plum Gut. With a favorable strong breeze and flood current, vessels drawing 15 feet or less may pass through without danger by observing the following directions:

Pass about 400 yards south of the southern end of Pine Point, the southernmost point of Plum Island, and steer 295° true (**NW** ¾ **W** mag.) so as to pass about midway between Orient Point lighthouse and Plum Island lighthouse.

Or, bring Plum Island lighthouse to bear 14° true (**NNE** ¼ **E** mag.) and keep it on that bearing, taking care not to be set nearer than 500 yards to Orient Point lighthouse.

When Plum Island lighthouse is ⅜ to ½ mile distant ahead, bearing 14° true (*NNE* ¼ *E* mag.) and Orient Point lighthouse bears southward of 259° true (*W* mag.) steer more westerly so as to pass midway between Plum Island and Orient Point lighthouses.

Or, bring Plum Island lighthouse to bear 337° true (**N** by **W** mag.) and steer for it on that bearing, taking care to leave Midway Shoal buoy on the port hand. When Orient Point lighthouse bears 270° true (*W* by *N* mag.), steer 295° true (**NW** ¾ **W** mag.), passing about midway between the lighthouses.

The ***tidal currents*** through Plum Gut have great velocity. (See section 1 A, page 37.)

On the flood, the current sets westward directly on Oyster Pond Reef.

On the ebb, small vessels bound westward through Plum Gut, and acquainted with the locality, are often able to slip through by hugging Orient Point lighthouse as closely as is safe and keeping in with the Long Island shore, when otherwise the passage would be impracticable for them.

Dangers in Plum Gut are described under section 1A, page 37.

THROUGH COURSES FROM THE RACE TO EXECUTION ROCKS LIGHTHOUSE.

An outline is given on page 59 of the general headings under which the directions for Long Island Sound are arranged. The through courses from The Race to Execution Rocks are given in sections as follows:

1. Direct route for vessels of less than 20 feet draft.

1 A. Direct route to carry not less than 5 fathoms of water.

1 B. Having come through The Race, to take a departure from Cornfield Point light-vessel.

1. ***Direct route for vessels of less than 20 feet draft.***—The following route is available for vessels of less than 20 feet draft in clear weather. In thick weather it would not be used, owing to the distance at which it passes some of the important fog signals.

With Little Gull Island lighthouse bearing south, distant 1 mile, steer 256° true (**W** ⅜ **S** mag.). This course made good for 60 miles leads a little northward of the buoy (can, black, No. 13) off Eatons Neck lighthouse, and when nearing this lighthouse the course should be shaped so as to pass about ¼ mile northward of black buoy No. 13. Farther northward, off Eatons Neck, there are rocky, shoal spots with 16 to 21 feet over them. The former of these spots is marked by a buoy (spar, red and black horizontal stripes).

When Eatons Neck lighthouse is abeam, haul a little more northward, course 261° true (**W** ⅛ **N** mag.), so as to pass a little over ⅜ mile northward of the black bell buoy off Lloyd Point, and when abreast this buoy continue the 256° true (**W** ⅜ **S** mag.) course until Great Captain Island lighthouse is abeam, distant 2¾ miles; Execution Rocks lighthouse should then bear about 238° true (*WSW* mag.), distant 6¾ miles.

In approaching Execution Rocks lighthouse, steer for it on any course from 219° true (**SW** ¼ **W** mag.) to 244° true (**WSW** ½ **W** mag.). It is usual to pass southward of this lighthouse. The ledge surrounding the lighthouse is marked by buoys at its eastern and western ends, but there are unmarked rocks 400 feet south of the lighthouse. Directions from Execution Rocks lighthouse to Throgs Neck will be found under section 6 of the "Sailing Directions in detail for passing through Long Island Sound," page 66.

The ***tidal currents*** have considerable velocity in the eastern part of the Sound, and allowance should be made for them (see page 57).

Prominent objects.—The following are some of the most prominent features passed, their distances from the sailing line when abeam on the 256° true (**W** ⅜ **S** mag.) course being given in some cases. The distances along the sailing line from Little Gull Island lighthouse are given in the middle column.

Left on the Port hand.	Distance in miles.	Left on the Starboard hand.
1. Little Gull Island lighthouse	0	Bartlett Reef light-vessel, about 2¾ miles distant.
2. Great Gull Island	½	Niantic Bay will be opened out.
3. Plum Island and Orient Point lighthouses, the former about 1¾ miles distant.	5	The Connecticut River entrance will be opened out forward of the beam.
4. The shore of Long Island will be about 2 miles distant until about 7 miles westward of Plum Island lighthouse.	.....	
	9¼	5. Saybrook Breakwater lighthouse and Saybrook (Lynde Point) lighthouse, distant about 5 and 5½ miles.
	11½	6. Cornfield Point light-vessel, distant about 2½ miles (marks the dangerous Long Sand Shoal). After passing this light-vessel Falkner Island lighthouse may be made off the starboard bow.
7. Horton Point lighthouse, distant about 4¼ miles.	16½	
	23¾	8. Falkner Island lighthouse, distant about 5¾ miles.
	35	9. Southwest Ledge Light at New Haven entrance (at night), distance about 10 miles.

Left on the Port hand.	Distance in miles.	Left on the Starboard hand.
10. Tesla's, Tower on high land on Long Island, distant about 7 miles.	38¾	
	44½	11. Stratford Point light (at night), distant about 7¼ miles.
	45¾	12. Stratford Shoal (Middle Ground) lighthouse, distant 1¾ miles.
13. Old Field Point lighthouse, distant 2¾ miles. About 2 miles westward of this lighthouse is Crane Neck; between the latter and Eatons Neck is Smithtown Bay.	47½	
	50	14. Penfield Reef and Black Rock lights (at night), the former distant about 6½ miles.
15. Eatons Neck lighthouse, nearly 1¼ miles distant. Pass ¼ mile northward of the black buoy No. 13. Shoal patches (16 to 21 feet) northward of the course.	60¼	
	61	16. Greens Ledge light (at night), about 4½ miles distant.
17. Lloyd Point, distant about ⅞ mile (see directions).	64	
Westward of Lloyd Point, Oyster Bay will be opened out.	66	18. Stamford Harbor light (at night), distant about 3⅝ miles.
19. Center Island Reef buoy (spar, black, No. 15) should be left 1¼ miles distant on the port hand.	66¾	
	70	20. Great Captain Island lighthouse, distant about 2¾ miles. Greenwich church spire may show above the outline of the hills.

When steering for Execution Rocks lighthouse, Sands Point lighthouse should be in sight a little on the port bow. The high red tower on Davids Island may be seen. Pass ½ mile or more northward of black spar buoy No. 17 off Matinicock Point, and pass northward of the black bell buoy ¾ mile 94° true (**ESE** ¾ **E** mag.) from Execution Rocks lighthouse.

1 A. ***Direct route to carry not less than 5 fathoms of water.***—Having come through The Race as directed in section 1, page 59, bring Race Rock lighthouse astern on a 256° true (**W** ¼ **S** mag.) course, which made good for 49 miles leads to a position ¾ mile southward of Stratford Shoal (Middle Ground) lighthouse.

Then, to avoid the shoals northward of Eatons Neck, from a position ¾ mile southward of Stratford Shoal (Middle Ground) lighthouse, make good a 264° true (**W** ⅜ **N** mag.) course for 15 miles to a position with Greens Ledge lighthouse bearing 327° true (*NNW* mag.), distant 1⅜ miles. The course should lead 1½ miles southward of the old light-tower on Sheffield Island, and Stamford Harbor lighthouse should be made directly ahead; and leads to a position midway between Budd Reef (4½ fathoms) and a 4¾-fathom patch, lying, respectively, ⅞ mile and 1⅞ miles 147° true (*SSE* mag.) from Greens Ledge lighthouse. To insure clearing these spots, keep Stamford Harbor lighthouse ahead on the 264° true (**W** ⅜ **N** mag.) course when passing between them.

With Greens Ledge lighthouse bearing 327° true (*NNW* mag.), distant 1⅜ miles, steer 239° true (**WSW** ⅛ **W** mag.) and proceed as directed under section 5 of the "Sailing Directions in detail for passing through Long Island Sound," page 66.

The tidal currents have considerable velocity in the eastern part of the Sound, and allowance should be made for them (see page 57).

Remarks.—The 256° true (**W** ¼ **S** mag.) course leads from ½ mile at Little Gull Island to 1 mile at Stratford Shoal northward of the 256° true (**W** ⅜ **S** mag.) course given in section 1. The principal danger on this course is the 19-foot spot on **Six Mile Reef**, which is described on page 63; the course leads 1⅝ miles southward of it. The course leads southward of the following aids at the distances stated: Bartlett Reef light-vessel, 2⅜ miles; Cornfield Point light vessel, 1⅞ miles; Falkner Island lighthouse, 4¾ miles; Stratford Shoal (Middle Ground) lighthouse, ¾ mile; and northward of the following aids at the distances stated: Little Gull Island lighthouse, 1½ miles; Plum Island and Orient Point lighthouses, the former 2¼ miles; Horton Point lighthouse, 4⅞ miles. For the distances along the sailing line of these aids from Little Gull Island lighthouse see the middle column of the table preceding.

1 B. ***Having come through The Race, to take a departure from Cornfield Point light-vessel.***—Follow the directions for the north shore given under section 1 of the "Sailing Directions in detail for passing through Long Island Sound," below, until close southward of Cornfield Point light-vessel.

Then to pass northward of Stratford Shoal (Middle Ground) lighthouse, make good a 262° true (**W** ¼ **N** mag.) course for 12½ miles, or until Falkner Island lighthouse bears 350° true (*N* mag.) distant 1¾ miles, when follow the directions of section 3 of the detailed directions, page 65.

From Cornfield Point light-vessel, to pass southward of Stratford Shoal (Middle Ground) lighthouse, shape the course 253° true (**W** ½ **S** mag.); this course made good for a little over 34 miles leads about ¾ mile southward of Stratford Shoal (Middle Ground) lighthouse, but requires great care with deep-draft vessels on account of Six Mile Reef (19 feet). Large vessels should steer more southward until past this reef.

In approaching Stratford Shoal lighthouse, shape the course so as to pass about ¾ mile southward of it and then follow the directions in section 1 A foregoing.

Six Mile Reef is directly in the track on the 253° true (**W** ½ **S** mag.) course. This reef has general depths of 5 to 7 fathoms. Near its western part, 6 miles 253° true (*W* ½ *S* mag.) from Cornfield Point light-vessel, is a small ledge about ¼ mile in diameter, over which the least depth is 19 feet.

Tidal currents have considerable velocity in this part of the Sound, and some allowance should be made for them.

SAILING DIRECTIONS IN DETAIL FOR PASSING THROUGH LONG ISLAND SOUND.

An outline is given on page 59 of the general headings under which the directions for Long Island Sound are arranged. The detailed directions for passing through the Sound are given in sections, as follows:

1. Along the North Shore to Cornfield Point light-vessel.
2. From Cornfield Point light-vessel to Falkner Island lighthouse.
3. From a position South of Falkner Island lighthouse to Stratford Shoal (Middle Ground) lighthouse.

3 A. From a position North of Falkner Island lighthouse to Stratford Shoal (Middle Ground) lighthouse.

4. From a position North of Stratford Shoal (Middle Ground) lighthouse to Greens Ledge lighthouse.
5. From abreast Greens Ledge lighthouse to Execution Rocks lighthouse.
6. From Execution Rocks lighthouse to Throgs Neck lighthouse.

1. ***Along the North Shore to Cornfield Point light-vessel.—1. Having come through The Race.***—Directions for approaching and passing through The Race are given in sections 1 and 1 A, pages 59–60. The course is about 265° true (**W** ½ **N** mag.) until Cornfield Point light-vessel is made. If in coming through The Race, Race Rock lighthouse (on the north side of the Race) has been favored, shape the course a little more westerly; if Little Gull Island lighthouse (on the south side of The Race) has been favored, shape the course a little more northerly.

When Cornfield Point light-vessel (about 14 miles westward of The Race) is made, keep it ahead in approaching, and pass close southward of it. Then proceed as directed in paragraph I or II under section 2, following.

The ***tidal currents*** have considerable velocity, setting westward on the flood and eastward on the ebb (see page 57).

Remarks.—New London entrance and lighthouse (mouth of Thames River) lie about 5 miles northward of The Race. On the 265° true (**W** ½ **N** mag.) course Bartlett Reef light-vessel (nearly 4 miles northwestward of The Race) will be left well on the starboard hand; foul ground lies inshore from this light-vessel. Niantic Bay (high white tower at its head) will be opened westward of the light-vessel. Great Gull Island and Plum Island (lighthouse on its western

end) will be seen southward; and when farther westward, Orient Point lighthouse and Plum Gut, leading into Gardiners Bay, will be opened out.

Cornfield Point light-vessel (described on page 14) will be made ahead. This light-vessel, a most important guide, is moored about 1 mile southward of the dangerous Long Sand Shoal, about midway of the length of the shoal.

Dangers.—**Long Sand Shoal** extends east and west about 5½ miles with a greatest width of nearly ⅜ mile. The depths over it are 8 to 17 feet, bottom hard and lumpy; but as the lumps are shifting in position and size, spots with but 4 feet over them may sometimes be found at extreme low tides. The shoal is marked by a buoy (spar, red and black horizontal stripes) on its eastern end, and by a gas buoy (red and black horizontal stripes, white light with eclipses) at its western end. Cornfield Point light-vessel is 1 mile south of it and nearly midway between the buoys. From Long Sand Shoal (west end) gas buoy, Saybrook Breakwater lighthouse bears 66° true (**ENE** ⅞ **E** mag.) distant 5⅜ miles, and Six Mile Reef bears 222° true (**SW** ¾ **W** mag.) distant 3¼ miles.

The **tidal currents** have considerable velocity over Long Sand Shoal, setting about 281° true (**WNW** mag.) on the flood and 101° true (**ESE** mag.) on the ebb.

II. Having come through Fishers Island Sound.—Passing midway between Seaflower Reef beacon and North Dumpling lighthouse, shape the course 254° true (**W** ½ **S** mag.) for Bartlett Reef light-vessel, and pass southward of it. When past this light-vessel bring it astern on a 254° true (**W** ½ **S** mag.) course; on the flood it will be necessary to steer more southerly. The 254° true (**W** ½ **S** mag.) course made good about 11¾ miles from Bartlett Reef light-vessel leads close southward of Cornfield Point light-vessel; when up with this light-vessel follow the directions under section 2, paragraph I or II, following.

2. ***From Cornfield Point light-vessel to Falkner Island lighthouse.—I. To pass Southward of the lighthouse.***—From a position 200 yards southward of Cornfield Point light-vessel, make good a 262° true (**W** ¼ **N** mag.) course for about 12½ miles, or until Falkner Island lighthouse bears 349° true (*N* mag.), distant 1¾ miles; then proceed as directed in section 3 following.

The ***tidal currents*** have considerable velocity; the average at strength is 1 to 2 miles. On the flood the set is northwestward, on the ebb eastward and southeastward.

See **Remarks** and **Dangers** under paragraph II following.

II. To pass northward of Falkner Island lighthouse.—Strangers should not attempt this passage at night, nor in thick weather. From Cornfield Point light-vessel make good a 274° true (**WNW** ⅝ **W** mag.) course for 12¾ miles. Pass nearly ¾ mile southward of the gas buoy (red and black horizontal stripes), marking the western end of Long Sand Shoal, and northward of Kimberley Reef buoy (spar, red and black horizontal stripes) and Falkner Island Reef buoy (spar, black, No. 1), giving Falkner Island lighthouse a berth of 1 mile. When Falkner Island lighthouse bears 169° true (*S* mag.), distant 1 mile, proceed as directed under section 3 A following; or, to follow the north shore, proceed as directed in section 3, page 70.

Remarks.—**On the south shore** Horton Point lighthouse is passed; probably will not be distinguished. (For description see page 14.) The light shows well at night.

On the north shore Westbrook Harbor, Duck Island Roads, and Clinton Harbor are passed; none of them, except Duck Island Roads, are of importance to strangers. Next is Hammonasset Point (the one projecting farthest, has bowlders, rocky hillocks, and a number of summer cottages), and westward of it is the large bight off Madison; this bight is sometimes used for anchorage. See the separate headings for these harbors.

Falkner Island lighthouse, when on the 274° true (**WNW** ⅝ **W** mag.) course, will be a little on the port bow, and can be made out, on a clear day, when past Cornfield Point light-vessel. Falkner Island has good water on its southern side, but a dangerous reef extends ⅜ mile northward from the island. **Goose Island**, ⅞ mile westward of Falkner Island, has bad, rocky patches extending ⅜ to ⅝ mile northward, northeastward, and eastward from it, and also for ¼ mile southward, where it is marked by a red bell buoy. The **tidal currents** set across these rocks and shoals with considerable velocity and should be allowed for in approaching them; northward of Falkner Island the flood sets about 248° true (**W** by **S** mag.) at strength, southward of the island about 236° true (**WSW** mag.). The current turns about an hour earlier northward of Falkner Island than it does southward; hence vessels having the current against them may often gain by going northward, although most vessels bound through pass well southward of the island.

Anchorage in the vicinity of Falkner Island.—*With westerly winds*, protection from wind and sea can be found by anchoring under the eastern shore of Falkner Island, in 12 to 20 feet, ⅛ to ¼ mile from the shore; vessels seeking

this shelter often anchor too far from the island to make a good lee, and thus, the island being small, they get the counter swell from both sides, when by keeping closer inshore they would have smoother water. *With easterly winds*, seagoing vessels sometimes anchor westward of Goose Island; small craft sometimes anchor under the western side of Falkner Island, finding there good anchorage, soft bottom, but in doing so they must be careful to avoid the reefs making out eastward from Goose Island, and should give the western side of the southern end of Falkner Island a berth of 500 yards, thus keeping in depths of 10 to 18 feet.

Several buoys along the north shore are left on the starboard hand, and are mentioned under section 2, page 70.

Dangers.—**Long Sand Shoal**, northward of the course, is described under section 1, page 64. On the flood guard against being set too far toward the shoal. The gas buoy (red and black horizontal stripes) marking the western end of the shoal is sometimes difficult to pick up. From this buoy Cornfield Point light-vessel bears 103° true (**SE** by **E** ⅞ **E** mag.), distant 3½ miles.

Six Mile Reef, southward of the course, dangerous for deep-draft vessels only, lies in the fairway of the Sound. It has a least depth of 19 feet over it, from which Cornfield Point light-vessel bears 73° true (**E** ½ **N** mag.), distant about 6 miles; Horton Point lighthouse bears 157° true (**S** by **E** ⅛ **E** mag.), distant 6½ miles, and Falkner Island lighthouse bears 283° true (**NW** by **W** ⅞ **W** mag.), distant 7 miles.

Kimberley Reef, 1⅜ miles 76° true (**E** ¼ **N** mag.) from Falkner Island lighthouse, has 12 feet over it, with 5 and 6 fathoms around it, and is marked by a buoy (spar, red and black horizontal stripes).

Falkner Island Reef shows some bare spots at low water, and extends ⅜ mile northward from Falkner Island. Its northern end is marked by a buoy (spar, black, No. 1). The tidal currents set across this dangerous shoal with considerable velocity.

3. ***From a position south of Falkner Island lighthouse to Stratford Shoal (Middle Ground) lighthouse.***—With Falkner Island lighthouse bearing 349° true (*N* mag.), distant 1¾ miles, make good a 254° true (**W** ½ **S** mag.) course for about 21½ miles. This course will lead about 1½ miles north of Stratford Shoal lighthouse; then proceed as directed under section 4 following.

The ***tidal currents*** have a moderate velocity, setting westward on the flood and eastward on the ebb.

Remarks.—Stratford Shoal (Middle Ground) lighthouse should be given a berth of at least 1 mile, and deep-draft vessels should give Stratford Point lighthouse a berth of not less than 3 miles, but vessels of 15 feet draft can approach the point as close as 2 miles.

When off New Haven entrance, or a little farther westward, Stratford Point lighthouse (on the north shore) and Stratford Shoal lighthouse (in mid-sound) will be made. The distance across from one to the other is 5½ miles.

Mention of prominent features will also be found under section 3 A following.

Dangers.—**Stratford Point** makes out shoal for 2 miles; a buoy (spar, red, No. 16½), in 14 feet of water, marks a 12-foot spot on the shoal nearly 1 mile offshore. There are several outlying shoal spots, with 15 to 18 feet over them, from 1 to 2 miles offshore and from ⅝ mile to 1⅛ miles southeastward, southward, and southwestward of the red buoy just mentioned. There are also spots with 19 to 21 feet over them lying about 2½ miles offshore and northward from Stratford Shoal (Middle Ground) lighthouse. The numerous oyster stakes off Stratford Point make it difficult to recognize spar buoy No. 16½ until it is close to.

Stratford Shoal Middle Ground extends about ⅜ mile northward and southward of the lighthouse marking it, with depths of 8 to 16 feet; there are outlying shoal spots of 14 to 18 feet reaching out ¾ mile northeastward and northward of the lighthouse. A buoy (spar, black, No. 1) is placed about 1 mile northward of the lighthouse to guide clear.

3 A. ***From a position north of Falkner Island lighthouse to Stratford Shoal (Middle Ground) lighthouse.***—Having followed the directions under section 2, paragraph II, preceding, or section 2, paragraph I, page 69, when Falkner Island lighthouse bears 169° true (*S* mag.), distant about 1 mile, shape the course 247° true (**WSW** ⅞ **W** mag.). This course made good for 22 miles leads about 1½ miles north of Stratford Shoal lighthouse, whence proceed as directed in section 4 following.

Remarks.—The course leads clear of all dangers until in the vicinity of Stratford Point Shoal and Stratford Shoal Middle Ground (see section 3, preceding).

On this course Sachem Head will be left on the starboard hand. The Thimble Islands, about 2½ miles westward of Sachem Head, will be made. **Branford Reef beacon** and gas buoy will be made broad off the starboard bow. On a clear day the monument on **East Rock**, at the head of New Haven Harbor, will be seen above the outline of the hills. The old New Haven light-tower, and the lighthouses on the ends of the breakwaters (Southwest Ledge and Outer Breakwater lighthouses) at entrance to New Haven Harbor will be made broad off the starboard bow, and will be distant about 5 miles when abeam.

After passing New Haven entrance, Stratford Point lighthouse will be made on the starboard bow and Stratford Shoal lighthouse on the port bow. As Stratford Point is approached, on a clear day, the entrances to Bridgeport and Black Rock harbors may be made westward of the point, and Penfield Reef lighthouse, Black Rock lighthouse, and Bridgeport Harbor lighthouse will be on the starboard bow, the latter nearest to Stratford Point.

4. ***From a position north of Stratford Shoal (Middle Ground) lighthouse to Greens Ledge lighthouse.***—Having followed the directions in section 3 or 3 A until about 1½ miles northward of Stratford Shoal lighthouse, shape the course 256° true (**W** ⅜ **S** mag.). This course made good for 15 miles will lead 1⅜ miles south of the old light-tower on Sheffield Island, and to a position with Greens Ledge lighthouse bearing 327° true (*NNW* mag.), distant 1⅜ miles. Then proceed as directed under section 5 following.

Dangers.—Stratford Point Shoal and Stratford Shoal Middle Ground are described under section 3, preceding. After passing these shoals the only dangers are those near Norwalk Islands, which are described under section 5, page 73.

Budd Reef, small, with 27 feet over it, lies ⅞ mile 147° true (**SSE** mag.) from Greens Ledge lighthouse. It is not marked, and has deeper water all around it.

A shoal, with 4¾ fathoms over it, lies 1⅞ miles 147° true (**SSE** mag.) from Greens Ledge lighthouse. It is not marked and has deeper water all around it.

5. ***From abreast Greens Ledge lighthouse to Execution Rocks lighthouse.***—The distance to Execution Rocks lighthouse is about 16 miles. With Greens Ledge lighthouse bearing 327° true (*NNW* mag.), distant 1⅜ miles, steer 239° true (**WSW** ⅛ **W** mag.); Execution Rocks lighthouse should be made ahead. When Execution Rocks lighthouse is made, steer for it on any course between 219° true (**SW** ¼ **W** mag.) and 244° true (**WSW** ½ **W** mag.). When nearing Execution Rocks lighthouse change the course so as to pass southward of the lighthouse, about midway between it and Sands Point Reef buoy (spar, black, No. 21) off Sands Point lighthouse. Stamford Harbor lighthouse and Great Captain Island lighthouse are left well on the starboard hand. When past the latter the course favors the southern shore. In thick weather use the lead in passing Matinicock Point and Prospect Point.

Having passed southward of Execution Rocks lighthouse, proceed as directed under section 6 following.

Remarks and dangers.—For prominent features and dangers along the north shore, see section 6, page 73; and along the south shore, see section 4, page 76. In approaching Execution Rocks, pass northward of Prospect Point Shoal buoy (bell, black), and pass well southward of the buoys marking Execution Rocks, and give the lighthouse a berth of over 175 yards, when southward of it.

Execution Rocks are marked by Execution Rocks lighthouse. The limits of the shoal are also marked by several buoys. On the *northern end* of the shoal is a buoy (spar, red and black horizontal stripes); vessels entering the southern channel should give this buoy a berth of one-half mile. On the *eastern side* of the shoal is a buoy (spar, red, No. 30), and on the *southwest end* of the shoal is a buoy (spar, red and black horizontal stripes). Rocks with 8 to 9 feet over them extend about 400 feet southward from the lighthouse. The directions given lead southward of the lighthouse, but there is also a good channel northward.

6. ***From Execution Rocks lighthouse to Throgs Neck lighthouse.***—Passing midway between Execution Rocks lighthouse and the buoy (spar, black, No. 21) off Sands Point lighthouse, steer about 214° true (**SW** ⅛ **S** mag.) with Stepping Stones and Throgs Neck lighthouses on the port bow. Leave Gangway Rock buoy (spar, black, No. 23) about 250 yards on the port hand, and the south end of Hart Island about 400 yards on the starboard

hand. Pass 400 yards northwestward of Stepping Stones lighthouse and steer about 195° true (**SSW ⅛ W** mag.) with Throgs Neck on the starboard bow.

Round Throgs Neck, giving it a berth of about 350 yards when passing southward of it. Then follow the directions for the East River. If a pilot or a towboat is required, one should be taken before reaching Rikers Island. (See "Pilots," page 55, also heading "East River.")

If desiring to anchor after reaching the western end of Long Island Sound, Hempstead Harbor and City Island Harbor are available and convenient (see page 56, see also these headings). Farther westward (see heading "East River" vessels frequently anchor on the north shore, westward of Throgs Neck, and also off Whitestone (south shore).

For currents, see page 57.

Remarks.—After passing Execution Rocks lighthouse a group of islands will be seen northward; the high red tower is on Davids Island. Southward of the sailing line are Gangway Rock buoy (spar, black, No. 23) and Stepping Stones lighthouse. Hart Island will be recognized by its barrack-like buildings and over Hart Island will generally be seen the masts of vessels lying in City Island Harbor (Hart Island Roads).

As Hart Island is approached, Manhasset Bay will be opened on the south shore, and when past this, City Island Harbor will open westward of Hart Island and the wharves and shipyards on the eastern shore of City Island will be seen. When abreast of City Island Harbor, Little Neck Bay will be opened southward and the fort at Willets Point (the western point at entrance to Little Neck Bay and directly opposite Throgs Neck) will be distinguished.

Opposite Stepping Stones lighthouse and west of City Island is East Chester Bay, shallow, forming the approach to East Chester Creek. Throgs Neck lighthouse will appear on Fort Schuyler, the granite fort on Throgs Neck.

Caution.—On the walls of the granite fort on Willets Point is the following notice: *Torpedoes! Don't anchor.* Keeping northward of a line from Stepping Stones lighthouse to the end of the long wharf at Willets Point avoids the torpedo ground.

Dangers and aids.—*Gangway Rock buoy* (spar, black, No. 23) and *Success Rock spindle* (red, southeastward of the buoy) should be left on the port hand; these aids mark the outer part of a rocky ledge making out over ⅝ mile northwestward from Barker Point, the eastern point at the entrance to Manhasset Bay. See also page 129.

A **shoal** extends 320 yards northward of Hewlett Point, the western point at the entrance to Manhasset Bay, and is marked at its northern end by a buoy (spar, black, No. 25).

City Island Shoal buoy (spar, red, No. 32) marks a cluster of rocks southwestward of the southern end of City Island; **Big Tom**, one of this cluster, is awash at low water. The directions lead well southwestward of this buoy.

Stepping Stones lighthouse marks the outer part of a dangerous reef, with depths of 2 feet in places, which extends southeastward from the lighthouse to the shore. The shoal extends nearly 400 yards northward and northeastward of the lighthouse, with depths of 2 to 13 feet.

Extensive flats occupy East Chester Bay, westward of the course. Their eastern edge, rising abruptly, with depths of 10 to 13 feet, follows nearly a line from the end of Throgs Neck to the southeastern end of City Island.

Throgs Neck Shoal buoy (spar, red, No. 34) marks a shoal making out 200 yards southward from Throgs Neck. Pass southward of this buoy, giving it a berth of not less than 50 yards.

The entrance to Little Neck Bay, southward of the course, is shoal, the edge of the shoal extending northeastward from Willets Point, with depths of 10 and 12 feet.

SAILING DIRECTIONS ALONG THE NORTH SHORE OF LONG ISLAND SOUND.

This track is frequently used in the daytime, especially with northerly winds and during the fall and winter. The directions are good in the daytime with clear weather for vessels of 15 feet or less draft. Except at a few places, vessels of 18 feet draft can follow the track safely.

An outline is given on page 59 of the general headings under which the directions for Long Island Sound are arranged. The directions along the north shore of the sound are given in sections, as follows:

1. From The Race, Plum Gut, or Fishers Island Sound to the Eastern End of Long Sand Shoal.
2. Passing North of Long Sand Shoal to Falkner Island lighthouse.
3. Along the North Shore, from Falkner Island lighthouse to New Haven entrance.
4. Along the North Shore, from New Haven entrance to Penfield Reef lighthouse.
5. Along the North Shore, from Penfield Reef lighthouse to Stamford Harbor lighthouse.
6. Along the North Shore, from Stamford Harbor lighthouse to Execution Rocks lighthouse.

1. ***From The Race, Plum Gut, or Fishers Island Sound, to the Eastern End of Long Sand Shoal.***—The entrance to the channel leading north of Long Sand Shoal is 8½ miles west from Bartlett Reef light-vessel. It is about ½ mile wide and is marked by two buoys—on the north side a buoy (nun, red, No. 8), marking the southern point of a shoal making out from Saybrook Bar, mouth of Connecticut River; on the south side a buoy (spar, red and black horizontal stripes), marking the eastern end of Long Sand Shoal. The courses under the following paragraphs lead to a position about 200 yards southward of red nun buoy No. 8.

I. Having come through The Race from a position ¼ mile south of Race Rock lighthouse, make good a 273° true (**WNW ¾ W** mag.) course for 12 miles, until up with the buoy (nun, red, No. 8) off Saybrook entrance. Pass southward of this buoy, giving it a berth of about 200 yards. Then proceed as directed in section 2, paragraph I or II, following.

Or, if near Little Gull Island lighthouse, bring this lighthouse to bear 105° true (*SE* by *E* ¾ *E* mag.) and make good a 285° true (**NW** by **W ¾ W** mag.) course for about 9½ miles from Little Gull Island lighthouse, keeping Saybrook (Lynde Point) lighthouse and Saybrook Breakwater lighthouse well on the starboard bow until abreast of the buoy (nun, red, No. 8). Then proceed as directed in section 2, paragraph I or II, following.

Or, being well southeastward of Saybrook entrance, or having come through Plum Gut, bring Plum Island lighthouse to bear 132° true (*SE* ¾ *S* mag.), and Saybrook Breakwater lighthouse to bear 312° true (**NW ¾ N** mag.), and steer for the latter on this bearing. When up with the buoy (nun, red, No. 8) proceed as directed in section 2, paragraph I or II, following.

Remarks.—The tidal currents have considerable velocity, setting westward on the flood, and eastward on the ebb. When Saybrook Breakwater lighthouse bears 303° true (**NW ⅛ W** mag.) the buoy (nun, red, No. 8) marking the entrance to the channel leading north of Long Sand Shoal is in line with this lighthouse, and the lighthouse on a bearing of 310° true (**NW ½ N** mag.) will lead 350 yards westward of buoy No. 8 and will leave the red and black horizontally striped buoy near the eastern end of Long Sand Shoal well on the port hand.

II. Having come through Fishers Island Sound, passing midway between North Dumpling lighthouse and Seaflower Reef beacon, make good a 254° true (**W ½ S** mag.) course for Bartlett Reef light-vessel, and pass southward of it; when past the light-vessel, bring it to bear 82° true (*E* ¼ *S* mag.) and make good a 262° true (**W ¼ N** mag.) course, keeping the bearing. Continue the 262° true (**W ¼ N** mag.) course until up with the buoy (nun, red, No. 8) marking the entrance and placed on the southern shoal making out from Saybrook Bar, having on this course passed about 1½ miles southward of Black Point, and about ¾ mile southward of the buoy (spar, red, No. 6) marking Hatchett Reef, near the eastern end of Saybrook Bar. In approaching the buoy (nun, red, No. 8) keep it bearing a little on the starboard bow. Pass southward of it, giving it a berth of about 250 yards, and proceed as directed in section 2, paragraph I or II, following.

Remarks.—The remarks under section 1, on page 63, apply to this paragraph until abreast of Bartlett Reef light-vessel; see also remarks under paragraph I immediately preceding. On the 262° true (**W ¼ N** mag.) course, Cornfield Point light-vessel will be made on the port bow.

Dangers.—**Bartlett Reef** is described under section 1, Sailing Directions, Niantic Bay, page 82.

Hatchett Reef, about 3⅝ miles 88° true (**E ¾ S** mag.) from Saybrook Breakwater lighthouse, has 5 to 8 feet over it; it is marked by two buoys. The sailing line passes about 1 mile southward of it.

Saybrook Bar, obstructing the mouth of the Connecticut River, is a shifting bar with depths of 2 to 16 feet. The shoal extends eastward as far as Hatchett Reef, and in a southeasterly direction from Saybrook Breakwater lighthouse for 1⅝ miles to the buoy (nun, red, No. 8). From this buoy Race Rock lighthouse bears 93° true (**ESE ¾ E** mag.), distant 12 miles; Bartlett Reef light-vessel bears 82° true (**E ¼ S** mag.), distant 8½ miles; Long Sand Shoal (east end) buoy (spar, red and black horizontal stripes), 247° true (**W by S** mag.), distant about ⅞ mile.

2. ***Passing North of Long Sand Shoal to Falkner Island lighthouse.—I. To pass North of Falkner Island lighthouse.***—Pass southward and westward of the entrance buoy (nun, red, No. 8), giving it a berth of about 250 yards, as already directed, and steer 282° true (**WNW** mag.) for ½ mile. Then make good a 265° true (**W ½ N** mag.) course a little over 15 miles.

Leave the buoy (spar, red and black horizontal stripes) on the eastern end of Long Sand Shoal, about 500 yards on the port beam. The course leads about 1⅞ miles north of Cornfield Point light-vessel, ½ mile south of the red buoy (spar, No. 10) off Cornfield Point, ⅝ mile south of the spindle on Hen and Chickens, and about ⅜ mile south of the red buoy (spar, No. 12) marking Crane Reef.

Continuing the 265° true (**W ½ N** mag.) course, pass ½ mile south of the buoy (spar, red, No. 14) on Stone Island Reef and take care to pass southward of the spot with 16 feet, which lies nearly ⅜ mile southwestward from the buoy; pass ¾ mile south of Hammonasset Point, and 1 mile north of Falkner Island lighthouse. Then proceed as directed under section 3, following. Or, if bound direct, to pass north of Stratford Shoal (Middle Ground) lighthouse, proceed as directed in section 3 A, page 65.

At night, keep well southward of the red rays of Saybrook Breakwater light until past Crane Reef. The gas buoy on the western end of Long Sand Shoal should be left about ¾ mile on the port hand.

The ***tidal currents*** have considerable velocity, and on the 265° true (**W ½ N** mag.) course care must be taken not to be set too far toward Long Sand Shoal on the ebb, or toward the dangers along the north shore on the flood, making allowance as necessary.

Remarks.—On the 265° true (**W. ½ N.** mag.) course, after passing the buoy (spar, red and black horizontal stripes) on the eastern end of Long Sand Shoal, Cornfield Point will be on the starboard bow and just westward the houses of Westbrook (see heading "Westbrook Harbor").

Westward of Cornfield Point the land recedes northward, forming Westbrook Harbor and Duck Island Roads, the latter lying between Westbrook and Clinton (see heading "Duck Island Roads"). Clinton is a little eastward and northward from Hammonasset Point.

Fish weirs.—The bights along the northern shore are obstructed by fish weirs in summer, and, except in Duck Island Roads, there are many sunken rocks in the bights and off the projecting points; there are also outlying dangers northward of the course, of which special mention is made.

Southward of the course is Long Sand Shoal. (See description on page 64.)

When off Westbrook the gas buoy (red and black horizontal stripes) marking the western end of Long Sand Shoal is seen southward of the course. **Hammonasset Point** (bowlders, rocky hillocks, a number of summer cottages back from the point) will be seen on the starboard bow, and Clinton Harbor will open just eastward of it. On a clear day Falkner Island and lighthouse will be seen on the port bow.

When abreast Hammonasset Point, Sachem Head (high, with summer houses and hotels) will be made about 7½ miles westward, a little on the starboard bow. Between Hammonasset Point and Sachem Head is a long bight, near the eastern end of which is the town of Madison (see heading).

Dangers.—**Long Sand Shoal,** described on page 64, is the only danger southward of the course, until up with Kimberley Reef; special care should be taken to avoid it.

Cornfield Point Shoal, with a least depth of 3 feet, lies nearly ½ mile south of Cornfield Point, and is marked off its southeastern side by a buoy (spar, red, No. 10). There is a channel for small craft inside the buoy; strangers should never try it.

Hen and Chickens, bare in places at low water, marked by a spindle near the southern side of the rocks, lies about ⅞ mile westward of Cornfield Point Shoal, and is about ⅝ mile long in an easterly and westerly direction with depths of less than 18 feet.

Crane Reef, having a least depth of 3 feet, is ⅞ mile westward of the spindle marking Hen and Chickens. A buoy (spar, red, No. 12) marks the southern side of Crane Reef.

Duck Island (small, grassy, about 10 to 15 feet high) will be seen on the starboard bow, and is surrounded by bowlders. A shoal with 18 feet and less extends nearly ½ mile southward and southwestward from the island. The breakwater (with light at its western end) shows conspicuously.

Stone Island Reef, about midway between Duck Island and Hammonasset Point, lies southward of Stone Island, and has depths of 10 to 12 feet over its southern part, which is marked by a buoy (spar, red, No. 14). A small spot, with 16 feet over it, lies nearly ⅜ mile southwestward from this buoy.

Hammonasset Point makes out shoal and should be given a berth of over ¾ mile. Shoal spots with 11 to 17 feet over them extend ½ mile southward and southeastward from the point. About ⅜ mile southwestward of the point is a buoy (spar, red, No. 2).

Charles Reef and **Madison Reef**, marked by buoys, are in the bight off Madison and well northward of the sailing line.

Kimberley Reef, and Falkner Island with the reefs surrounding it, are described on page 65.

Guilford Harbor (see heading) is northward of Falkner Island. The entrance has dangers, some of which are marked by buoys. *Indian Reef southwest buoy* (spar, red, No. 6), the outermost one, should be given a berth of at least ½ mile. A rock with 6 feet over it lies nearly ½ mile westward from this buoy.

II. To pass South of Falkner Island lighthouse.—Follow the 265° true (**W ½ N** mag.) course as directed in paragraph I, foregoing, until Saybrook Breakwater lighthouse bears 71° true (*E ¾ N* mag.). Then make good a 251° true (**W ¾ S** mag.) course, keeping the bearing, and pass nearly ½ mile northward of the gas buoy (red and black horizontal stripes) on the western end of Long Sand Shoal; the distance from this buoy to Falkner Island lighthouse is about 9 miles. Approaching Falkner Island lighthouse, keep it well on the starboard bow. The 251° true (**W ¾ S** mag.) course leads 1¾ miles southward of the lighthouse. Then proceed as directed under section 3, page 65.

The ***tidal currents*** have considerable velocity; note what is said of them under paragraph I preceding. On the 251° true (**W ¾ S** mag.) course the tidal currents set across the sailing line; on the flood steer more southerly, on the ebb a little more westerly. Care must be taken not to be set southward on Long Sand Shoal.

Remarks.—The dangers, prominent objects, etc., are those described under paragraph I foregoing, but the course leads farther offshore.

3. ***Along the North Shore, from Falkner Island lighthouse to New Haven entrance.***—***To pass close to The Thimbles.***—Having followed the directions in section 2, paragraph I, preceding, or section 2, paragraph II, page 64, when Falkner Island lighthouse bears 169° true (*S* mag.), distant 1 mile, steer 279° true (**WNW ¼ W** mag.), heading for the southern end of Two Tree Island, the southernmost of the Thimble Islands, and pass a little over ½ mile southward of Sachem Head and about 400 yards southward of Goose Rocks Shoal bell buoy. Pass southward of Outer Thimble (which is a large, bare rock just southeastward of Two Tree Island) and Two Tree Island, giving them a berth of at least 100 yards.

Then bring the southern end of Two Tree Island astern on a 251° true (**W ¾ S** mag.) course, and pass midway between Inner Reef buoy (spar, red, No. 2) and Wheaton Reef buoy (spar, black, No. 1). Leave Northwest Reef buoy (spar, red and black horizontal stripes) 200 yards on the port hand, and pass 500 yards southward of Negro Heads buoy (spar, red, No. 4). Pass nearly ½ mile northward of Branford Reef beacon, and leave Townshend Ledge buoy (spar, red and black horizontal stripes) 500 yards on the port hand. Continue the course 3½ miles after Townshend Ledge buoy bears abeam to a position 1⅝ miles 170° true (**S** mag.) from New Haven Outer Breakwater lighthouse, on the eastern end of the western breakwater. Then proceed as directed in section 4 following.

Remarks.—The 279° true (**WNW ¼ W** mag.) course leads ⅝ mile south of the outer buoy (spar, red, No. 6) off the entrance to Guilford Harbor (see the dangers of section 2, paragraph I, preceding), and southward of a spot with 18 feet over it lying 600 yards southward of the buoy. **Sachem Head** (high, with summer houses and hotels) is the nearest point passed, and care should be taken to pass the point and Goose Rocks Shoal bell buoy at the distances stated. The course leads about midway between Goose Rocks Shoal bell buoy and a spot with 15 feet over it lying ⅝ mile southwestward of it. **Two Tree Island**, the southernmost of the Thimble Islands, will be easily distinguished when abreast Sachem Head.

The 251° true (**W** ¾ **S** mag.) course leads northward of East Reef, Wheaton Reef, Browns Reef, and Northwest Reef, and southward of Inner Reef, Hooker Rock, Gangway Rock, and Negro Heads. Care must be taken to keep close on the course to clear Northwest Reef, Branford Reef, and Townshend Ledge; these dangers are south of the sailing line. New Haven Outer Breakwater lighthouse will be seen from Negro Heads, and Middle and East breakwaters, the latter marked at its western end by Southwest Ledge lighthouse, will be seen northeastward of Outer Breakwater lighthouse. Westward of Branford Reef beacon a large number of oyster stake buoys will be encountered, some of them 4 to 5 inches in diameter.

Dangers.—Chimney Corner Reef is about ⅜ mile southward of Sachem Head, and has a least depth of 9 feet over it. The reef is not marked; to insure clearing the reef, in passing southward of it, keep the south end of Two Tree Island bearing northward of 276° true (**WNW** ⅝ **W** mag.).

Goose Rocks, several bare rocks, lie ½ mile westward of Sachem Head; **Goose Rocks Shoal** extends ¼ mile southwestward of Goose Rocks, and has a spot with 2 feet over it. A buoy (bell, red) marks the southern edge of the shoal.

A **spot** with 15 feet over it lies ⅝ mile 231° true (**SW** by **W** ½ **W** mag.) from Goose Rocks Shoal buoy.

East Reef, Wheaton Reef, Browns Reef, and **Northwest Reef** lie in a detached cluster about ½ mile southwestward of Two Tree Island; the course leads between them and Two Tree Island. **East Reef**, with a rock awash at low water, is marked at its southeastern end by a buoy (nun, red, No. 10). **Wheaton Reef**, with a least depth of 1 foot, is marked at its northwestern end by a buoy (spar, black, No. 1). **Browns Reef**, awash at low water, is not marked; it lies about 500 yards southward of Wheaton Reef buoy and is about 600 yards westward of East Reef buoy. **Northwest Reef** is a small, detached spot, with 7 feet over it and marked by a buoy (spar, red and black horizontal stripes), lying about 600 yards 248° true (**W** by **S** mag.) from Wheaton Reef buoy; the 251° true (**W** ¾ **S** mag.) course leads 200 yards northward of it.

Inner Reef, marked by a buoy (spar, red, No. 2) off its southern end, is a small cluster of rocks, showing bare in places at low water, lying 700 yards westward of Two Tree Island.

A **spot** with 8 feet over it, not marked, lies nearly ⅜ mile 285° true (**NW** by **W** ¾ **W** mag.) from Inner Reef, on a line from the buoy on this reef to the buoy marking Hooker Rock. There is a channel 500 yards wide, with a depth of 12 to 15 feet, between this spot and Inner Reef.

Hooker Rock, bare at low water, lies ⅝ mile 285° true (**NW** by **W** ¾ **W** mag.) from Inner Reef, and is marked by a buoy (spar, red, No. 2½). There is a clear passage ¼ mile wide, with 16 feet of water, between this rock and the spot with 8 feet just described.

Gangway Rock, a small, detached rock with 5 feet over it, lies nearly ⅝ mile 62° true (**ENE** ½ **E** mag.) from Negro Heads buoy. This rock is not marked, but it lies a little southward of a line from Negro Heads buoy to Hooker Rock buoy.

Negro Heads is a dangerous, rocky ledge, partly bare at low water; its southern end is about ⅞ mile northward of Branford Reef beacon, and is marked by a buoy (spar, red, No. 4). The ledge extends northward to the islands lying off Indian Neck.

Branford Reef lies 4⅞ miles 99° true (**ESE** ¼ **E** mag.) from Southwest Ledge lighthouse, and is marked at its shoalest point by a granite beacon, with iron shaft and ball. A gas buoy (red, No. 10, "B. R.," white light with eclipses) is placed about 400 yards southward of the beacon. The reef extends ¼ mile northward and ⅛ mile southward of the beacon, with depths less than 16 feet. The red rays of Southwest Ledge lighthouse cover the reef, and vessels passing southward of the reef can avoid it by keeping in the white rays of the light.

Five Foot Rock, marked on its south side by a buoy (spar, red, No. 6), lies ½ mile southward from Johnson Point, the western point at the entrance to Branford Harbor.

Cow and Calf is the name of two rocks lying ⅝ mile 205° true (**SW** ⅞ **S** mag.) from Johnson Point; they are close to each other, and Cow, the larger, always shows out of water. Spots with 11 and 12 feet over them extend 450 yards in a northwesterly direction from these rocks. A buoy (spar, red, No. 10½) is placed just southward of Cow and Calf.

Round Rock, a little over 1¼ miles 88° true (**E** ¾ **S** mag.) from Southwest Ledge lighthouse and ½ mile from the shore, is a bare rock, surrounded by sunken ledges and marked by a buoy (nun, red, No. 12), which is placed ¼ mile southward of the rock; 17 feet of water will be found ⅛ mile southward of this buoy.

Townshend Ledge, with 18 feet over it and marked by a buoy (spar, red and black horizontal stripes), lies about 2½ miles 256° true (**W** ⅜ **S** mag.) from Branford Reef beacon and 2¾ miles 122° true (**SE** ¼ **E** mag.) from Southwest Ledge lighthouse.

II. To pass southward of Branford Reef.—From a position 1 mile northward of Falkner Island lighthouse, steer 261° true (**W** ⅛ **N** mag.) and pass ⅜ mile southward of the gas buoy, at the south end of Branford Reef, and Townshend Ledge buoy. This course made good for 12¾ miles should lead to a position 1⅝ mile southward of New Haven Outer Breakwater lighthouse. Then proceed as directed in section 4 following.

The nearest dangers to the sailing line are Branford Reef and Townshend Ledge, which are described under paragraph I preceding.

4. ***Along the North Shore, from New Haven entrance to Penfield Reef lighthouse.—Vessels of less than 13 feet draft.***—Passing 1⅝ miles southward of New Haven Outer Breakwater lighthouse, steer 244° true (**WSW** ⅝ **W** mag.); Stratford Point lighthouse should be on the starboard bow and is left 1 mile on the starboard hand when abeam. Stand on this course for 9½ miles from New Haven Outer Breakwater lighthouse until Stratford Point Shoal buoy is ½ mile distant on the starboard beam. Then steer 258° true (**W** ⅛ **S** mag.) for 4½ miles to a position ½ mile southward of Penfield Reef lighthouse, and proceed as directed in section 5, following.

Vessels of 13 to 18 feet draft.—Passing 1⅝ miles southward of New Haven Outer Breakwater lighthouse, steer 240° true (**WSW** ¼ **W** mag.) for 9¾ miles, taking care to pass Stratford Point lighthouse at a distance of 1½ miles when abeam to insure giving the shoal southward of the point a safe berth. Stand on this course for nearly 2¼ miles past the lighthouse to a position about 1¼ miles southward of Stratford Point Shoal buoy (spar, red, No. 16½), or until Stratford Point lighthouse bears 23° true (**NE** by **N** mag.). Then steer 266° true (**W** ½ **N** mag.) so as to pass ½ mile southward of Penfield Reef lighthouse, and proceed as directed in section 5, following.

Remarks and dangers.—Charles Island is small and low, and lies ½ mile from shore; it is the western point at the entrance to Milford Harbor. A rocky shoal extends ⅜ mile southward from the island, and is marked at its end by a buoy (bell, black). Two red spar buoys lie 1 mile and 1¾ miles, respectively, eastward of Charles Island, and mark the end of reefs which extend about ⅜ mile from points on the shore.

The 244° true (**WSW** ⅝ **W** mag.) course leads near spots with 15 feet over them lying about ¾ mile eastward of Stratford Point Shoal buoy. The 240° true (**WSW** ¼ **W** mag.) course leads about ⅜ mile southward of spots on Stratford Point Shoal having 16 and 17 feet over them.

Stratford Point is described under section 3, page 65. The entrance of Housatonic River is between Stratford Point and the jetty ⅝ mile northeastward of it (see heading).

The 258° true (**W** ⅛ **S** mag.) and 266° true (**W** ½ **N** mag.) courses lead across the entrance to the broad bight which extends northward between Stratford Point and Penfield Reef lighthouse to the entrances of Bridgeport and Black Rock harbors (marked by lighthouses).

Fairfield Bar is a long sand spit, bare at low water, which extends out from Shoal Point in a southeasterly direction 1⅛ miles. The eastern end of Fairfield Bar is marked by a beacon.

Penfield Reef, which is a part of the shoal making southeastward from Shoal Point, is southward of the eastern extremity of Fairfield Bar and is marked by Penfield Reef lighthouse.

5. ***Along the North Shore, from Penfield Reef lighthouse to Stamford Harbor lighthouse.***—From a position ½ mile southward of Penfield Reef lighthouse steer 244° true (**WSW** ⅝ **W** mag.); pass ½ mile south of Cockenoe Island Shoal bell buoy, 1¼ miles southward of Peck Ledge lighthouse, ⅝ mile south of the southernmost of the Norwalk Islands, ½ mile south of Great Reef spindle, and ⅞ mile south of Greens Ledge lighthouse. This course made good for 15 miles should lead to a position nearly ½ mile south of The Cows gas buoy, and Stamford Harbor lighthouse should bear 313° true (*NW* ¾ *N* mag.), distant 1⅜ miles. Then proceed as directed in section 6, following.

Remarks.—The 244° true (**WSW** ⅝ **W** mag.) course leads over spots with 3¾ to 4½ fathoms lying south of Norwalk Islands.

Nearly 2 miles westward of Penfield Reef lighthouse is Pine Creek Point. Northwestward of Pine Creek Point is a bight in which is the entrance to Mill River (Southport Harbor; see heading). About 6½ miles westward from Penfield Reef lighthouse is **Cockenoe Island**, the easternmost of Norwalk Islands; this island can be distinguished by the two hillocks on its southern and eastern sides. The entrance to Saugatuck River (Westport Harbor; see heading) lies north of Cockenoe Island. Just westward of Cockenoe Island is Peck Ledge lighthouse and Cockenoe Island Harbor, which is the eastern passage into Norwalk River.

There is an old lighthouse on the western end of Sheffield Island, the westernmost of the Norwalk islands, and Greens Ledge lighthouse, 1⅛ miles westward from it, is the guide into Sheffield Island Harbor (also known as Norwalk Harbor), the western entrance to Norwalk River.

About 1½ miles westward of Greens Ledge lighthouse is Long Neck Point with a large building near the end, the easterly point at the entrance to Darien River. About 4 miles westward of Greens Ledge lighthouse and ¾ mile eastward of Stamford Harbor lighthouse is Shippan Point. Nearly 5 miles westward of Greens Ledge lighthouse is Stamford Harbor lighthouse, at the entrance to Stamford Harbor and Mill River (see heading).

Dangers.—Pine Creek Point Shoal, extends in a southerly direction ⅝ mile from Pine Creek Point; it is marked on its southern end by a buoy (spar, red, No. 18).

Cockenoe Island Shoal extends 1⅜ miles easterly from Cockenoe Island. **Georges Rock**, at the eastern end of the shoal, is awash at low water. Nearly ⅜ mile southward of Georges Rock the shoal is marked by a buoy (bell, red, No. 20); this buoy should be left ½ mile on the starboard hand and the islands should not be approached nearer than in 4 fathoms water.

Great Reef lies ½ mile southwestward of the old light-tower on Sheffield Island and is marked by a red spindle on its eastern side. Pass at least ¼ mile southward of the spindle.

Greens Ledge extends westward for 1 mile from the western end of Sheffield Island. It is marked on the northern side ¼ mile from its western end by Greens Ledge lighthouse, and at its southwest end by a buoy (spar, red, No. 20¼).

Smith Rock is a cluster of rocks ⅜ mile long in a north and south direction and 200 yards wide, showing bare in places at low water. This danger lies ⅞ mile 227° true (**SW** by **W** mag.) from Long Neck Point. A buoy (spar, red, No. 22) is placed on the southern end of the rocks.

The Cows are a cluster of detached rocks, bare at low water, lying about 1 mile 117° true (**SE** ¾ **E** mag.) from Stamford Harbor lighthouse; off their southern end is a gas buoy (No. 24, white light with eclipses).

6. ***Along the North Shore, from Stamford Harbor lighthouse to Execution Rocks lighthouse.***—From a position ½ mile south of The Cows buoy, with Stamford Harbor lighthouse bearing 313° true (*NW* ¾ *N* mag.), distant 1⅜ miles, steer 253° true (**W** ⅝ **S** mag.) for 4¾ miles to a position ½ mile southward of Great Captain Island lighthouse. Then steer 223° true (**SW** ¾ **W** mag.), heading for Execution Rocks lighthouse, the distance being 7¾ miles. After passing Great Captain Island lighthouse, Execution Rocks lighthouse, when made, may be steered for on any course between 219° true (**SW** ¼ **W** mag.) and 244° true (**WSW** ½ **W** mag.). When nearing Execution Rocks lighthouse change the course so as to pass southward of the lighthouse, about midway between it and Sands Point Reef buoy (spar, black, No. 21) off Sands Point lighthouse. Then proceed as directed in section 6, page 66.

Remarks.—Midway between Stamford Harbor and Great Captain Island lighthouses is Greenwich Point, westward of which is the entrance to Captain Harbor, Greenwich Cove, and Coscob Harbor. A large white residence with red roof and a white clock tower show up very prominently westward of Coscob Harbor and northward from Great Captain Island lighthouse. Between Greenwich Point and Great Captain Island lighthouse is **Little Captain Island**, the western point at the entrance to Captain Harbor (see heading).

Westward of Great Captain Island lighthouse is the entrance to Port Chester. When abreast Great Captain Island lighthouse, on a clear day, the red tower on Davids Island, Execution Rocks lighthouse, and Sands Point lighthouse will be made southwestward. About 4¼ miles westward of Great Captain Island lighthouse is **Rye Neck**, the eastern point at the entrance to Mill Creek and Mamaroneck Harbor (see heading). Two miles westward of Rye Neck is Long Beach Point, the eastern point at the entrance to Larchmont Harbor, described under a separate heading.

In approaching Execution Rocks, pass northward of Prospect Point Shoal buoy (bell, black), and well southward of the buoys marking Execution Rocks, giving the lighthouse a berth of over 175 yards when southward of it.

Dangers.—A shoal extends ½ mile eastward and southward from Greenwich Point. A buoy (spar, red, No. B 24½) marks the southern side of this shoal from May to November.

Little Captain Island East Reef extends about ½ mile eastward from Little Captain Island; it has rocks and bowlders bare at low water, and is marked at its eastern end by a gas buoy (black, No. 1, white light with eclipses).

A **shoal** with 17 feet near its end extends ¼ mile southward from the west end of Great Captain Island, and is marked on its west side by a buoy (spar, red, No. 2).

Bluefish Shoal, **Glovers Reef**, and **Porgy Shoal** are some of the numerous rocks and shoals which lie ¼ to ⅝ mile from shore between Great Captain Island and Parsonage Point. The 223° true (**SW** ¾ **W** mag.) course leads ⅝ mile or more southward of the buoys marking them. For a more detailed description of these dangers see section 1 B, Sailing Directions, Captain Harbor.

Scotch Caps, two rocky islets lying ¼ mile in a southwesterly direction from Rye Neck, are part of a reef which extends ¾ mile in a southwesterly direction from Rye Neck. A gas buoy (red, No. 28, white light with eclipses) is placed southwestward of the islets and ¼ mile southward of a spot with 12 feet over it. The 223° true (**SW** ¾ **W** mag.) course leads ¾ mile southeastward of this buoy.

Execution Rocks are described on page 66.

SAILING DIRECTIONS ALONG THE SOUTH SHORE OF LONG ISLAND SOUND.

An outline is given on page 59 of the general headings under which the directions for Long Island Sound are arranged. The directions along the south shore of the Sound are given in sections, as follows:

1. From The Race to Roanoke Point Shoal.
2. From Roanoke Point Shoal to Old Field Point.
3. From Old Field Point to Eatons Point.
4. From Eatons Point to Execution Rocks lighthouse.

In clear weather, having come through The Race and desiring to stand along the south shore, the following directions are available. In thick weather the south shore should be given a much wider berth.

1. ***From The Race to Roanoke Point Shoal.***—From a position about 1 mile northward of Little Gull Island lighthouse make good a 250° true (**W** ¾ **S** mag.) course for 12 miles, with Race Rock lighthouse astern, to a position 1 mile northward of Rocky Point. Then make good a 243° true (**WSW** ½ **W** mag.) course for 17½ miles, passing 2 miles off Horton Point lighthouse, to a position 1 mile northward of Roanoke Shoal buoy. Then proceed as directed under section 2, following.

The ***tidal currents*** have considerable velocity, setting westward on the flood and eastward on the ebb. When passing the opening westward of Great Gull Island and that westward of Plum Island (Plum Gut) care must be taken not to be drawn inshore on the ebb (see page 37).

Caution.—Note that the 243° true (**WSW** ½ **W** mag.) course, if held too long, would lead directly for Herod Point Shoal (5½ miles westward of Roanoke Point Shoal); on the flood a vessel would overrun her reckoning, and if Roanoke Point Shoal buoy were not picked up she might stand on too far before changing the course. (See "Tidal Currents," page 57.)

Remarks and dangers.—The 250° true (**W** ¾ **S** mag.) course leads about 1 mile northward of Plum Island and then follows the south shore at a distance of about 1 mile to Rocky Point. There is foul ground between Great Gull Island and Plum Island. Plum Island lighthouse, on the western end of the island, should be passed at a distance of 1⅜ miles. The opening of Plum Gut and Orient Point lighthouse are just westward of it.

Rocky Point, 6¾ miles westward of Plum Island lighthouse, will be known by the life-saving station on it. Terry Point, 2 miles eastward of Rocky Point, is a high, round, smooth hill with a large house on top. **Orient Shoal**, between Terry Point and Rocky Point, is marked on its northern side by a buoy (spar, black, No. 3), which lies 1¼ miles northeastward from Rocky Point; the shoal has 7 to 16 feet over it.

After passing Horton Point lighthouse there are no marked features for a long distance on the south shore by which a stranger could locate himself. Beginning about 5 miles westward of Horton Point lighthouse, the shore shows a succession of yellow bluffs varying in height and crowned with trees; in places the shore slopes to the water gradually, or there is a level space between the bluffs where a small stream flows into the sound. Such features continue as far as Old Field Point lighthouse (not reached, however, under the directions of this section).

Friar Head, 14¼ miles westward of Horton Point lighthouse and near Roanoke Point Shoal, is 244 feet high and quite prominent. Its upper part has stronger markings and a sharper point than the other bluffs near it.

The **shore** between Rocky Point and Horton Point lighthouse can be approached as close as ⅜ mile. For a distance of 6 miles westward of Horton Point the shore should be given a berth of at least 1 mile, shoals with 5 to 17 feet extending out ⅞ mile from the shore westward of Horton Point.

Roanoke Point Shoal, 12½ miles westward of Horton Point lighthouse, makes out from the shore about 1½ miles; the shoal has 12 to 18 feet on it to within ⅝ mile of the beach, where it shoals to 8 feet. The northern end of this shoal is marked by a buoy (spar, black, No. 5). There is 11 to 18 fathoms northward of this shoal, which is very abrupt on its northern side.

2. ***From Roanoke Point Shoal to Old Field Point.***—From a position 1 mile northward of the buoy (spar, black, No. 5) off Roanoke Point Shoal, steer 265° true (**W ½ N** mag.) for 19 miles, keeping 2 to 3 miles offshore until nearly abreast Old Field Point lighthouse, and pass 1 mile northward of the lighthouse. Then proceed as directed under section 3 following.

Remarks.—The south shore between Roanoke Point and **Mount Misery**, about 2 miles eastward of Old Field Point, is a line of yellowish sand bluffs covered with trees, broken at intervals by low land where small streams flow into the Sound, and with scattered bowlders along the beach.

The entrance to Port Jefferson is just westward of Mount Misery; between Gardiners Bay and Huntington Bay this is the only harbor on the south shore which can be entered at low water by vessels of over 5 feet draft. (See heading "Port Jefferson Harbor.")

Old Field Point when seen from eastward appears quite low, as the land eastward of Port Jefferson is comparatively high. In the daytime the lighthouse and keeper's dwelling do not show plainly until within 3½ miles of the point; they are backed by the high land of Crane Neck. A tabular description of lighthouses is given on page 14.

Dangers.—**Roanoke Point Shoal** is described on page 74.

Herod Point Shoal lies about 5½ miles westward of Roanoke Point Shoal, and makes out from the land for a distance of 1½ miles; it has 10 to 16 feet over it. A 10-foot spot lies 1½ miles from the shore, and just northward of this shoal spot is placed a black buoy (spar, No. 7). The course leads about 1 mile north of the shoal.

A **shoal**, with 12 to 16 feet over it, lies 6 miles westward of the buoy on Herod Point Shoal; it extends 1¼ miles offshore, and off its northern edge is Rocky Point buoy (spar, black, No. 9). A **2-foot spot**, ½ mile offshore, lies northeastward from Miller Landing, and ¼ mile northwestward from **Miller Rock**; the latter is a rock bare at low water nearly ⅜ mile from the shore.

Mount Misery Shoal has 7 to 9 feet over it, and lies northward of Mount Misery Point, distant about ¾ mile from the shore. This is a small patch about ⅜ mile long and ¼ mile broad, marked at its northeastern end by a black buoy (spar, No. 11). There is a channel with 13 to 17 feet between this shoal and the point, but it is not used except by small vessels bound in or out from Port Jefferson.

There is a **17-foot spot** about ⅜ mile northeastward of Old Field Point lighthouse, and a shoal extends ¼ mile northward from the point.

3. ***From Old Field Point to Eatons Point.***—Passing about 1 mile northward of Old Field Point lighthouse, steer 264° true (**W ⅜ N** mag.) for about 12½ miles; this should lead a little over 1 mile northward of Eatons Neck lighthouse and not over ¼ mile northward of the buoy (can, black, No. 13) marking the shoal which makes off from Eatons Point, and about ⅜ mile southward of the buoy (spar, red and black horizontal stripes) marking the 16-foot spot off the point. Passing about ¼ mile northward of black buoy No. 13, the depth should not be less than 22 feet. Farther northward there are shoal patches (16 to 21 feet).

Then proceed as directed under section 4 following.

Remarks.—Between the buoy on Mount Misery Shoal and Old Field Point is the entrance to Port Jefferson (see heading). About 2 miles westward of Old Field Point lighthouse is **Crane Neck Point**, the eastern point of Smithtown Bay (see heading). Eatons Neck lighthouse bears 263° true (**W ¼ N** mag.) from Old Field Point lighthouse, distant 12½ miles.

Dangers.—**Mount Misery Shoal** is described under section 2 preceding.

Off **Old Field Point**, about ⅜ mile northeastward from the lighthouse, is a 17-foot spot which is not marked. Shoal water extends ¼ mile in a northerly direction from Old Field Point and ¼ mile in a northwesterly direction from Crane Neck Point.

Stratford Shoal, in the middle of the Sound, and marked by Stratford Shoal lighthouse, is described on page 65. Vessels passing southward of the lighthouse should give it a berth of at least ⅜ mile.

The shore of Smithtown Bay should not be approached nearer than 1 mile, as shoals extend out over ⅞ mile in places, except along the west shore of Crane Neck and along the east shore of Eatons Neck.

Northward of Eatons Point are several rocky patches with 16 to 21 feet over them; to avoid them vessels should either pass not more than about ⅜ mile northward of the buoy (can, black, No. 13) off the point, or they should pass at least 3 miles northward of the lighthouse, keeping closer to Greens Ledge lighthouse than to Eatons Neck lighthouse. The spot with 16 feet over it is marked by a buoy (spar, red and black horizontal stripes) placed nearly 1⅝ miles 337° true (**N by W ⅛ W** mag.) from Eatons Neck lighthouse.

4. ***From Eatons Point to Execution Rocks lighthouse.***—The distance to Execution Rocks lighthouse is about 17 miles. The directions of this section should carry a depth of not less than 23 feet. Passing about ¼ mile northward of Eatons Point Shoal buoy (can, black, No. 13) make good a 262° true (**W ⅛ N** mag.) course for about 4 miles, leaving Lloyd Point Shoal buoy (bell, black) about ½ mile on the port hand; Stamford Harbor lighthouse on the north shore will then bear about 320° true (*NNW ¾ W* mag.).

Then steer 246° true (**WSW ¾ W** mag.) for Execution Rocks lighthouse, passing at least ¼ mile northward of Matinicock Point Shoal buoy (spar, black, No. 17), placed about ¼ mile north of Matinicock Point. When about 1 mile distant from Execution Rocks lighthouse, head so as to pass southward of the lighthouse about midway between it and Sands Point Reef buoy (spar, black, No. 21) off Sands Point lighthouse, and proceed as directed under section 6, page 66.

Remarks.—Eatons Neck lighthouse stands on a high bluff. Westward of the point is Huntington Bay. About 4¼ miles westward of Eatons Neck lighthouse is **Lloyd Point**, the eastern point at the entrance to Oyster Bay; when Oyster Bay is well opened, Cooper Bluff, 180 feet high, seen southward within the bay, will show as a high, yellow sand bluff with trees covering the top. Cold Spring Harbor lighthouse will be seen over toward the eastern shore of the bay.

About 7¼ miles westward of Lloyd Point is **Matinicock Point**, the eastern point at the entrance to Hempstead Harbor. This harbor when opened will be distinguished by four yellow sand bluffs joining each other and covered with trees on top; these bluffs are on the western shore, about midway between Mott Point and Prospect Point. When approaching Matinicock Point the red tower on Davids Island, Execution Rocks lighthouse, and Sands Point lighthouse will be made westward, and the houses on Hart Island, westward of Execution Rocks lighthouse, will be made after passing the point.

In approaching Execution Rocks, pass northward of Prospect Point Shoal buoy (bell, black), and well southward of the buoys marking Execution Rocks, giving the lighthouse a berth of over 175 yards when abeam.

Dangers and aids.—*Several buoys* are passed on the south shore between Eatons Neck lighthouse and Execution Rocks lighthouse.

Eatons Point Shoal buoy (can, black, No. 13) marks the shoal which makes northward and northeastward from Eatons Point. The shoal is rocky, and patches with 3 to 5 feet over them will be found about ¼ mile offshore.

About ⅞ mile northwestward from Eatons Point Shoal buoy is a **rocky patch** with 16 feet over it, marked by a buoy (spar, red and black horizontal stripes); and 1 to 1¾ miles northward from Eatons Point Shoal buoy are **several rocky patches** with a least depth of 21 feet.

Lloyd Point Shoal, marked at the northeastern edge by a bell buoy (black, No. 13½), is the shoal making out nearly ¾ mile in a northerly direction from Lloyd Point. About ½ mile eastward of the point is **Morris Rock** with 2 feet over it.

Center Island Reef, marked on its northwestern edge by a buoy (spar, black, No. 15), is the reef making northward from the western point at the entrance to Oyster Bay. **Rocks awash** at low water are found ⅜ mile offshore.

Matinicock Point Shoal, making out about ¼ mile northward of the point, is marked by a buoy (spar, black, No. 17).

Prospect Point, about ¾ mile eastward of Sands Point, has a rocky shoal making out nearly ½ mile northward from it. The shoal rises abruptly from a depth of 10 fathoms to 17 feet, and has bowlders; the outer and most important one, the **Old Hen** (about ¼ mile offshore) is awash at low water. The northern extremity of this shoal is marked by a bell buoy (black, No. 19).

Sands Point Reef, marked by a buoy (spar, black, No. 21), ¼ mile offshore, is the shoal making out from Sands Point.

Execution Rocks are described on page 66.

THAMES RIVER AND NEW LONDON HARBOR.*

The Thames River flows into the eastern end of Long Island Sound, northwestward of the western end of Fishers Island Sound. The entrance forms New London Harbor, the most important harbor of refuge in this part of Long Island Sound. Vessels of deep draft find anchorage here in any weather. The river channel is marked by buoys and lights to Norwich, 13 miles above its mouth.

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* Shown on charts **293**, scale $\frac{1}{10,000}$; **114**, scale $\frac{1}{80,000}$, price of each $0.50; **359**, Thames River, Harbor of New London and approaches, scale $\frac{1}{20,000}$, price $0.40.

A large railroad **drawbridge** crosses the river at New London. Its western end is at **Winthrops Point** (upper part of New London). The central span of this bridge is 502 feet, the draw pier is about 75 feet, thus leaving a clear passage over 200 feet wide on each side of the pier.

New London, a city on the west bank of the river, 2 miles above the mouth, has considerable trade by water. The average draft of the vessels trading to New London is about 14 feet, and the deepest draft taken to the coal wharf in Winthrops Cove is about 22 feet; 7 to 21 feet can be taken alongside the wharves at low water. A dredged channel 23 feet deep leads from the deep water of the harbor along the wharves of New London and into Winthrops Cove nearly to the Central Vermont Railroad bridge.

Groton, a town on the east bank, opposite New London, has a coal wharf and several granite quarries.

The **United States Naval Station** is situated on the east bank, about 2 miles above New London.

Norwich, a city at the head of navigation on the Thames River, at its junction with the Shetucket and Yantic rivers, is about 11 miles above New London. The deepest draft going to Norwich is about 13 feet, the usual draft is not more than 10 feet; depths of 8 to 15 feet are found alongside the wharves. There is a daily line of steamers running between New York and Norwich when the river is not closed by ice. Sailing vessels bound up the river generally take a towboat at New London. Strangers always take a pilot or a towboat.

The entrance to the Thames River, or to New London Harbor, is between **Avery Point** on the east and **Lighthouse Point** on the west; just inside these points the river is ½ mile wide.

Prominent objects seen from southward are New London Harbor lighthouse, the lighthouse which, in 1909, is being erected on Southwest Ledge, the monument at Fort Griswold on the east bank, and Fort Trumbull on the west bank. Above Fort Trumbull the spires and houses of New London appear. The railroad bridge which crosses the river at New London is a prominent feature.

The channel as far up as the Naval Station is straight, with a least depth of 22 to 24 feet on several spots, and follows the eastern bank; it is a little over ⅜ mile wide at the entrance, and contracts gradually to 200 yards abreast the Naval Station; with local knowledge a draft of 26 feet, at high water, can be taken up to the Naval Station. There is a depth of 26½ feet in a very narrow channel about ⅞ mile above New London lighthouse, but it requires local knowledge to carry this depth. Above the Naval Station the channel is narrow and crooked, with several bars, and, although buoyed, is unfit for strangers. For a distance of 4½ miles above New London the channel has a depth of 20 feet and over, and from thence to Norwich its depth is 14 feet. The latter depth was obtained by dredging, and training walls have been constructed to maintain it.

Pine Island Channel, at the entrance, leading in from eastward close along shore, is often used by those who are well acquainted with its dangers, if they have come through Fishers Island Sound in small vessels. Strangers should not use it. *An inshore channel* also leads into the entrance from westward; it is dangerous, is only available for very small vessels, and strangers do not attempt it.

Anchorage.—Vessels anchoring in New London Harbor come to at will anywhere in the channel from the mouth of the river up to New London. Large vessels keep eastward of a line drawn from the wharf ⅜ mile northward of New London lighthouse, to Winthrops Point (west bank, upper part of New London), and give the eastern shore a berth of over 200 yards.

Vessels of light draft, 7 feet or less, can anchor in Greens Harbor by following the western bank at a distance of 250 yards when ½ mile above the lighthouse. Anchor at this distance from the bank southward or southwestward of Hogs Back Shoal buoy (spar, black, No. 5½).

Vessels of 12 feet draft or less will find good anchorage in 14 to 23 feet, soft bottom, between Fort Trumbull and the city of New London, favoring the latter. Many vessels anchor off New London.

Above New London anchorage is found anywhere in the channel.

Pilots are not generally employed by strangers, but if one is desired he may be had by making signal and coming to anchor outside of the entrance until boarded. Strangers bound to Norwich take a pilot at New London, where one can be obtained by inquiry.

Pilotage is compulsory for all vessels in the foreign trade drawing 9 feet and over, if spoken. There are no regular fees for pilotage.

Extracts from the laws of Connecticut relating to pilots and pilotage will be found in Appendix II.

Towboats will be found at New London, and when likely to be needed will be found near the entrance. Strangers entering do not require a towboat unless with a head wind and contrary tide. Sailing vessels bound up the river above New London generally take a towboat at New London.

Quarantine regulations for New London are prescribed as necessary by the local board of health (see Appendix II).

Hospital.—At New London is a relief station (Class III) of the U. S. Public Health and Marine Hospital Service. The nearest marine hospital is at Staten Island, N. Y. (See Appendix IV.)

Harbor regulations.—No special harbor regulations are in force for New London Harbor, except that a clear passage across the river must be left for the ferry between New London and Groton; this is above the usual anchorage. The harbor master has authority to berth vessels, shifting them if necessary, but occasion for doing so seldom arises. (See Appendix II.)

Supplies.—Coal for steamers can be had alongside the wharves at New London, Groton and Norwich, or in lighters in the stream at New London. Water can be obtained at the anchorage from water boats, or alongside the wharves at New London and Norwich; provisions and some ship-chandler's stores at New London and Norwich.

New London is available as a coaling port for large vessels; eastward the nearest one for such vessels is Newport, R. I., westward, New York.

Repairs to vessels and to machinery of steamers can be made in New London, where there are several marine railways; the largest has a capacity of about 2,500 tons and a cradle 310 feet long; it can haul out a vessel drawing 17 feet aft.

Storm warning displays of the United States Weather Bureau are made from a staff on the custom-house, and can be seen by vessels at anchor in the harbor.

Buoy depot.—One of the depots of the Third Lighthouse District (see page 12) is at the custom-house wharf, New London.

Ice does not endanger navigation; it seldom forms below the Naval Station. Above the Naval Station ice obstructs navigation about two months each year (see also page 58).

Freshets usually occur in the river during February and March.

Currents.—The tidal currents follow the general direction of the channel and are not usually strong. During freshets, and when the river is high, the resulting current sometimes has considerable velocity, and vessels are often embarassed in light winds, after getting in past the lighthouse, by a strong surface current setting out even on the flood.

Tides.—The mean rise and fall of tides at New London is 2.5 feet (see also page 24). Daily predictions for New London are given in the tide tables published annually by the Coast and Geodetic Survey.

For **variation of the compass** see page 22.

SAILING DIRECTIONS, NEW LONDON HARBOR.

The following directions, except where otherwise stated, are good either in the daytime or at night for vessels of 20 feet draft. Strangers of deeper draft should take a pilot.

1. ***Approaching from Eastward.—I. Having come through The Race.***—Directions for approaching The Race are given on pages 28 and 31. Vessels may pass either northward or southward of Race Rock lighthouse, giving it a berth of at least 150 yards and being careful not to be swept closer by the tidal current.

When through The Race haul northward and steer for New London lighthouse on any course from 355° true (**N** ½ **E** mag.) to 327° true (**NNW** mag.), keeping between these limits. This leads eastward of Sarah Ledge buoy and westward of Southwest Ledge lighthouse; several other buoys farther eastward and westward are also passed.

Or, with Race Rock lighthouse bearing 157° true (*S* by *E* ⅛ *E* mag.), directly astern, steer 337° true (**N** by **W** ⅛ **W** mag.) for New London lighthouse, directly ahead, keeping on this line. Then proceed as directed in section 2.

The ***tidal currents*** have considerable velocity, and allowance must be made for them.

Remarks.—Standing for the entrance, with New London lighthouse ahead as directed, there will be seen on the starboard bow the lighthouse (under construction) on Southwest Ledge, the high granite monument at Groton, opposite New London, and Black Ledge beacon; farther eastward are Seaflower Reef beacon and North Dumpling lighthouse, at the western end of Fishers Island Sound, showing open northward of Fishers Island. Broad off the port bow Bartlett Reef light-vessel, 4 miles 293° true (**NW** by **W** mag.) from Race Rock lighthouse, will be made.

When within 2 miles of New London lighthouse the buoys marking the dangers on both sides of the entrance will be readily picked up by day.

Dangers.—Sarah Ledge, marked by a buoy (bell, red and black horizontal stripes) has 15 feet over it, and is about 1¼ miles 181° true (**S** by **W** ⅛ **W** mag.) from New London lighthouse; the buoy is on the southern side of the ledge, which is about 80 yards long. Southwestward and northwestward of Sarah Ledge buoy are other buoys marking dangers mentioned under section 1 A following.

Black Ledge, ¼ mile eastward of Southwest Ledge lighthouse, is marked on its western side by a large granite beacon (with red spindle, having double-cone cage), and on its northern side by a buoy (spar, black, No. 1), colored and numbered as a Pine Island Channel buoy. The ledge has 2 to 17 feet over it, and is ⅜ mile long and ¼ mile wide. A dumping ground a little over ¼ mile southward of Black Ledge is marked on its southern side by two buoys (nun, red, Nos. 2 and 4).

Southwest Ledge, eastward of the course, and marked by a lighthouse, has 7 feet over it, and is about 150 yards long; it lies ⅞ mile **SSE** ⅝ **E** from New London lighthouse. In 1909 the lighthouse is being erected on this ledge. A 22-foot spot lies about 400 yards southward from Southwest Ledge.

II. Having come through Fishers Island Sound.—Directions for Fishers Island Sound are given on pages 46–49.

Pass ¼ to ⅜ mile southward of Seaflower Reef beacon, steer 282° true (**WNW** mag.) with North Dumpling lighthouse a little on the port quarter; pass over ⅜ mile southward of Black Ledge beacon and 300 to 500 yards southward of the buoys (nun, red, Nos. 2 and 4) off the dumping ground southward of Black Ledge. When the lighthouse marking Southwest Ledge bears on the starboard beam distant about ⅜ mile, steer 355° true (**N** ½ **E** mag.) and leave Southwest Ledge lighthouse about 350 yards on the starboard hand. Then follow the directions in section 2.

The tidal currents have considerable velocity.

Remarks.—On the 282° true (**WNW** mag.) course Black Ledge beacon, Southwest Ledge and New London lighthouses, and the entrance to the harbor will be on the starboard bow. Groton Monument will show as the entrance is opened out. On the port bow Bartlett Reef light-vessel should be made; this light-vessel bears 249° true (**W** ⅞ **S** mag.), distant nearly 4⅝ miles from Seaflower Reef beacon.

The dangers are described under paragraph I preceding.

1 A. ***Approaching from Westward.—I. To pass Southward of outlying dangers.***—Pass about 250 yards southward of Bartlett Reef light-vessel, and steer 50° true (**NE** by **E** ⅜ **E** mag.), keeping Black Ledge beacon a little on the port bow; this course leads about 400 yards southward of Rapid Rock buoy (spar, red and black horizontal stripes), and the same distance southward of Sarah Ledge bell buoy (red and black horizontal stripes). When the entrance is well opened out, or when New London lighthouse bears westward of 349° true (*N* mag.), steer 0° true (**N** by **E** mag.), pass 350 yards westward of Southwest Ledge lighthouse, and proceed as directed in section 2 following.

These directions are good for either day or night.

Remarks.—When 250 yards southward of Bartlett Reef light-vessel, heading 50° true (**NE** by **E** ⅜ **E** mag.), Black Ledge beacon will be a little on the port bow, and Southwest Ledge and New London lighthouses, northwestward of the beacon, will be broad off the port bow. As Black Ledge beacon is approached the harbor will open out between Southwest Ledge and New London lighthouses.

Rapid Rock and **Sarah Ledge** are on or a little eastward of a line from Bartlett Reef light-vessel to Southwest Ledge lighthouse, and by keeping over 300 yards eastward of this line these dangers will be avoided. The dangers westward of the entrance are covered by a red sector in New London lighthouse. The eastern edge of the sector is on a 0° true (**N** by **E** mag.) bearing to the lighthouse and passes close eastward of Sarah Ledge.

Dangers.—**Extensive shoals** make out from and inclose Goshen Point, about midway between Bartlett Reef light-vessel and New London lighthouse. Black spar buoys Nos. 1, 3, and 5 mark the southern edge of these shoals. **Rapid Rock** and **Sarah Ledge,** both buoyed, are outlying dangers southward and southeastward of these shoals. The course leads southward of all these dangers.

Rapid Rock, marked by a buoy (spar, red and black horizontal stripes), has 13 feet over it and lies nearly 1⅞ miles 197° true (**SSW** ½ **W** mag.) from New London lighthouse and ⅞ mile southeastward from Goshen Point.

Sarah Ledge, Southwest Ledge, and **Black Ledge** are described under section 1 preceding.

II. To pass North of Rapid Rock and Sarah Ledge.—The following directions are available by day, at any stage of the tide, for vessels drawing 15 feet or less. Pass Bartlett Reef light-vessel close-to, and when past this light-vessel bring it astern on a 42° true (**NE** ¾ **E** mag.) course. This course continued for 1¾ miles from the light-vessel leads well southward of Little Goshen Reef buoy (spar, black, No. 1), and fair between Goshen Ledge buoy (spar, black,

No. 3) and Rapid Rock buoy (spar, red and black horizontal stripes); continued for ⅝ mile farther, the 42° true (**NE ¾ E** mag.) course leads fair between the buoy (spar, black, No. 5) marking a ledge off Cormorant Rock and the buoy (bell, red and black horizontal stripes) marking Sarah Ledge.

When New London lighthouse bears 327° true (*NNW* mag.), and Southwest Ledge lighthouse is about 400 yards distant a little forward of the starboard beam, steer 355° true (**N ½ E** mag.) and proceed as directed in section 2 following.

The ***tidal currents*** have considerable velocity and allowance must be made for them. In smooth water it is probable that the bell buoy on Sarah Ledge will not ring.

Remarks and dangers.—Note the descriptions of dangers, etc., under paragraph I preceding. On the 42° true (**NE ¾ E** mag.) course Black Rock will be a very little on the port bow; Rapid Rock and Sarah Ledge are left on the starboard hand. The shoals off Goshen Point are left on the port hand; Little Goshen Reef, Goshen Ledge, Cormorant Rock, and the ledge off it are parts of these shoals.

Little Goshen Reef, marked near its southern end by a buoy (spar, black, No. 1), has a least depth of 2½ feet; the buoy is in 18 feet and is nearly 1½ miles 31° true (**NE ¼ N** mag.) from Bartlett Reef light-vessel.

Goshen Ledge, marked at its southern end by a buoy (spar, black, No. 3), has 10 feet over it, and is nearly ⅝ mile 146° true (**SSE** mag.) from Goshen Point.

Cormorant Rock, showing out of water, is ½ mile 84° true (**E ½ S** mag.) from Goshen Point. A buoy (spar, black, No. 5) is placed ¼ mile 104° true (**SE by E ¾ E** mag.) from Cormorant Rock; the buoy is in 18 feet and marks the eastern end of the ledge.

2. ***Entering and proceeding up the River.***—Passing about 350 yards westward of Southwest Ledge lighthouse steer 355° true (**N ½ E** mag.); pass about midway between New London lighthouse and the eastern shore, and continue the course up the river, favoring the eastern bank, but giving it a berth of at least 200 yards. Anchor at discretion. See "Anchorage," page 77.

If bound to the Naval Station, favor the eastern bank and be guided by the chart.

If bound to Norwich, take a pilot or towboat.

Remarks.—Frank Ledge buoy (spar, red and black horizontal stripes), northward of Black Ledge, is on the starboard hand, and nearly ⅜ mile beyond it is **Black Rock**, an islet lying off the eastern shore. When fair between New London lighthouse and Black Rock, heading about 355° true (**N ½ E** mag.) the monument at Groton, opposite New London, will be a little on the starboard bow. Fort Trumbull, with the city of New London beyond, will be a little on the port bow. The railroad drawbridge will show prominently ahead. Greens Harbor will show open southward and southwestward of Fort Trumbull; several small islands and rocks extend in a broken line southward from the fort. Abreast New London the deepest water is 200 to 300 yards from the eastern bank.

Dangers.—Frank Ledge, marked by a buoy (spar, red and black horizontal stripes), is small, has a least depth of 13½ feet over it, and is ⅜ mile 330° true (**N by W ¾ W** mag.) from Black Ledge beacon.

Black Rock is a rocky islet lying nearly ¼ mile 143° true (**SSE ¼ E** mag.) from Eastern Point. A rock with 3 feet over it lies about 100 yards northwestward from the western end of Black Rock; a depth of 26 feet is found close westward of this rock.

The western shore, for ⅜ mile southward and the same distance northward of New London lighthouse, has a number of scattered, rocky heads; all of them will be avoided by giving the shore in this vicinity a berth of 400 yards.

Farther northward, but southward of Fort Trumbull and westward of the channel, are *Hogs Back*, *White Rock*, *Goose* and *Powder islands*, and *Melton Ledge*.

Hogs Back, a small ledge with ¼ foot over it, lies in Greens Harbor nearly ¼ mile from its western shore, and is marked by a buoy (spar, black, No. 5½).

White Rock, an islet, lies nearly 200 yards northeastward from Hogs Back and about 450 yards southward from Melton Ledge.

Melton Ledge, marked by a buoy (spar, black, No. 7) near the western edge of the channel, has ½ foot over it, and is about 150 yards eastward of Powder Island.

Powder Island and **Goose Island**, both small, are southward of Fort Trumbull and close in with the northern shore of Greens Harbor.

NIANTIC BAY AND RIVER.*

Niantic Bay, lying 4½ miles westward of Thames River entrance (New London Harbor), is a good anchorage, sheltered against winds from west, through north, to east. It is important as a harbor of refuge in northerly gales, and is used by sailing vessels unable to get into New London Harbor (see also page 56). From 25 to 30 feet will be found just inside of Black Point (the western point at the entrance to the bay), but the general depth in the bay is about 19 feet, the water shoaling gradually northward; the 12-foot curve extends a little over ¼ mile from the shore at the head of the bay. The entrance is 1¼ miles wide, and the dangerous shoals are marked by buoys, or show out of water so that they can be avoided.

Prominent objects.—The chief guide in approaching from eastward is Bartlett Reef light-vessel (see page 12). The most prominent mark in entering is a high, white tower in Niantic, at the head of the bay. **Black Point**, the western point at the entrance, is flat, with a number of cottages near its end and showing a steep side southward. **Millstone Point**, the eastern point at the entrance, is rocky and irregular in shape; a stone quarry (houses and derricks near the end of the point) will be distinguished from southward.

Niantic, on the N. Y., N. H. & H. Railroad, is at the head of the bay; it is a popular place of residence in summer, but of no commercial importance. The depth alongside the wharf at Niantic is 9 feet at mean low water.

Niantic River, shallow and unimportant, flows into the head of the bay through a narrow gut crossed by two bridges, one the N. Y., N. H. & H. Railroad bridge and the other carrying the county road. Above the gut the river widens, and 1½ miles from the bridge a branch makes off in a northeasterly direction; the main river continues north to the village of **East Lyme**, about 4 miles above the entrance. Vessels of 7 feet draft go up the river as far as East Lyme, crossing the bar and passing through the bridges near the time of high-water slack. The width of the draw in the county road bridge is 27 feet; the other is wider.

Pilots and towboats.—Strangers bound into the river take a pilot at Niantic. Towboats are sometimes used by vessels bound to East Lyme; they may be had from New London.

Ice closes navigation in the river during the winter.

Tides.—The mean rise and fall of tides is 2.7 feet; high water occurs 14m. later, and low water 4m. later, than at New London.

SAILING DIRECTIONS, NIANTIC BAY.

1. ***Approaching and Entering, from Eastward.—I. From Bartlett Reef light-vessel.***—Having come through Fishers Island Sound, as directed on page 49, or through The Race, as directed on page 59, steer for Bartlett Reef light-vessel and pass 200 yards southward of it. From a position ¼ mile westward of the light-vessel steer about 304° true (**NW** mag.), leaving Bartlett Reef buoy (spar, red, No. 4) over 300 yards on the starboard hand. Anchor at discretion on the 304° true (**NW** mag.) course.

To stand farther up the bay, continue the 304° true (**NW** mag.) course for 2¾ to 3¼ miles until the high, white tower at Niantic bears between 349° true (**N** mag.) and 9° true (**N** by **E** ¾ **E** mag.); then steer for the tower, keeping it between these bearings. Anchor according to draft; 16 feet will be found ½ mile from the northern shore of the bay, which should not be approached closer. Vessels bound into the river should take a pilot.

At night, when westward of Bartlett Reef light-vessel, keep Race Rock light showing open southward of Bartlett Reef light-vessel. Continue thus until Little Gull Island light bears 147° true (*SSE* mag.) when steer 327° true (**NNW** mag.), keeping this bearing, and anchor as soon as the water shoals to 20 feet (low water).

The ***tidal currents***, until well within the bay, have considerable velocity; in the bay the currents are scarcely noticeable, vessels at anchor usually swinging to the wind.

Remarks.—On the 304° true (**NW** mag.) course the buoy (spar, red, No. 4) on the southern end of Bartlett Reef ½ mile northwestward of the light-vessel, and Two Tree Island, will be left on the starboard hand. Three Foot Rock buoy (spar, black, No. 5), on the western side of the bay, will be nearly ahead. Black Point, the western point at the entrance of Niantic Bay, will be on the port bow, and the white tower (high and prominent) and the houses in Niantic will be on the starboard bow. There are no dangers on the port hand in approaching from eastward while on the 304° true (**NW** mag.) course.

*Shown on chart 114, scale $\frac{1}{80,000}$, price $0.50.

Dangers.—**Bartlett Reef**, marked at its southern end by a buoy (spar, red, No. 4) and at its northern end by a buoy (spar, black, No. 1), is about 1⅜ miles long in a general north and south direction, and about ⅜ mile wide at its southern end. At low water it is bare in spots. Bartlett Reef light-vessel (see page 12) is placed nearly ⅜ mile southward of the southern end of the reef.

Two Tree Island is a small, bare island 1¾ miles 323° true (**NNW ¼ W** mag.) from the light-vessel and about ¾ mile 141° true (**SSE ½ E** mag.) from **Millstone Point**, the eastern point at the entrance to Niantic Bay. Shoals extend eastward and southward from the island, and also northward, where the edge is marked by a buoy (spar, black, No. 3), a guide for Two Tree Island Channel.

White Rock is an islet about ½ mile westward of the southern end of Millstone Point. A buoy (spar, red, No. 4) is placed near a small rock off the southeastern end of White Rock.

Black Rock, small and bare, is about ⅜ mile northward of White Rock. Still farther northward, in the northeastern part of the bay, is **Waterford Island**, also small and bare.

Three Foot Rock, marked off its eastern side by a buoy (spar, black, No. 5), is about ¼ mile from the western shore and nearly 1¼ miles northward of the end of Black Point; vessels should not pass inshore of this buoy. Nearly ⅝ mile northward from Three Foot Rock and about 200 yards from shore is **Wigwam Rock**, in the northwestern part of the bay; southwestward of Wigwam Rock, and about 300 yards offshore, is a small rock, bare at low water.

II. Through Two Tree Island Channel.—This channel may be used to advantage by vessels having come through Fishers Island Sound or from New London Harbor, but strangers are advised to use it with caution, and should never attempt to beat through. With either tide the current sets through this channel with much greater velocity than outside. The channel is well buoyed, and is often used to advantage by small vessels going with the tide.

When westward of North Dumpling lighthouse, bring this lighthouse to bear 88° true (*E ¾ S* mag.) and steer 268° true (**W ¾ N** mag.). On this course Sarah Ledge buoy (bell, red and black horizontal stripes) and Rapid Rock buoy (spar, red and black horizontal stripes) will be left on the starboard hand, as will other buoys near these but farther inshore.

Pass 200 yards southward of Rapid Rock buoy (spar, red and black horizontal stripes), and continue on the course until New London lighthouse bears 27° true (*NE ⅝ N* mag.) and is in line with the end of the first point south of the lighthouse. Then steer 299° true (**NW ½ W** mag.), passing Little Goshen Reef buoy, which is left about 400 yards on the starboard hand.

Keep the buoy (spar, black, No. 1) marking the northern end of Bartlett Reef on the port bow when on the 299° true (**NW ½ W** mag.) course. Leave this last-mentioned buoy about 300 yards on the port hand, passing about midway between it and the northern shore, and haul gradually westward, so as to leave Two Tree Island Shoal buoy (spar, black, No. 3) about 350 yards on the port hand.

Pass southward of the two red spar buoys (Nos. 2 and 4), which will be on the starboard bow, and pass southward of White Rock. Then haul northward, keeping the high, white tower near Niantic bearing between 349° true (**N** mag.) and 9° true (**N** by **E ¾ E** mag.), and anchor in about 16 feet (low water).

Dangers.—**Sarah Ledge, Rapid Rock,** and **Little Goshen Reef**, left on the starboard hand in following the foregoing directions, are described on pages 79–80.

Bartlett Reef, Two Tree Island Shoal, and **White Rock** are described under paragraph I foregoing.

Whitestone Creek entrance is passed and left on the starboard hand. **Flat Rock**, bare at low water, lies in the eastern side of the entrance. **High Rock**, bare at low water, with ledges and sunken rocks about it, is about 600 yards westward of Flat Rock.

Millstone Point Reef, marked by a buoy (spar, red, No. 2), makes off about ⅛ mile southward of **Millstone Point.**

1 A. ***Approaching and Entering, from Westward.***—Pass close to Cornfield Point light-vessel and steer 64° true (**ENE ⅝ E** mag.) for about 8½ miles, and pass about ½ mile southward of Black Point. When the high, white tower at Niantic bears between 9° true (**N** by **E ¾ E** mag.) and 349° true (**N** mag.), steer for the tower, keeping it between these bearings, and anchor as directed under section 1 of the foregoing.

The ***tidal currents,*** until well within the bay, have considerable velocity. The flood has a tendency to set a vessel northward, and the ebb southward.

Remarks.—The 64° true (**ENE** ⅝ **E** mag.) course leads southward of Long Sand Shoal, Saybrook Bar, Hatchett Reef, and Black Boy Rock, of which all but the last are described on pages 64 and 68. The lighthouses at Saybrook entrance are left well on the port beam. Black Point will be made a little on the port bow and Bartlett Reef light-vessel on the starboard bow.

Dangers and aids.—The following buoys are passed, all left on the port hand and nearly ¾ mile distant: *Long Sand Shoal east end buoy* (spar, red and black horizontal stripes); *Saybrook Bar buoy* (nun, red, No. 8), marking eastern side of entrance to passage leading north of Long Sand Shoal; *Hatchett Reef* buoys, one on the northeastern end of the reef (spar, black, No. 1) and the other on the southeastern end (spar, red, No. 6), the latter left about ½ mile distant.

Black Boy Rock, marked by a buoy (spar, red, No. 2) off its southern end, is about ¾ mile 273° true (**WNW** ¾ **W** mag.) from Black Point. It is a small ledge, bare in places at low water, with shoal spots of 3 and 6 feet southward and eastward of it. The sailing line passes nearly ¾ mile southward of it.

Two Tree Island, White Rock, etc., are described under section 1 preceding.

CONNECTICUT RIVER.*

This river, one of the largest and most important in the New England States, empties into Long Island Sound about 11½ miles westward of Thames River entrance. It is navigable as far as the city of Hartford, and considerable tonnage, mostly steamers and barges, is employed in the commerce of the cities, towns, and villages on its banks.

The entrance to the Connecticut River is obstructed by a bar of shifting sand and gravel, known as Saybrook Bar. At the western side of the entrance jetties have been built and a channel 200 feet wide and 12 feet deep at low water has been dredged between the jetties.

East and West jetties.—The inner end of the **East Jetty** is at a stone beacon ¼ mile southeastward from Saybrook lighthouse; this jetty extends southwestward and then southward. The inner end of the **West Jetty** is on the beach westward of Saybrook lighthouse; it first extends southeastward and then nearly south to the Breakwater lighthouse.

The **channel** in the river up to Harftord has been dredged in places, and dikes built to prevent, as mush as possible, the formation of bars. The project for the improvement of the river contemplates the maintenance of a channel 10 feet deep at mean low water up to Hartford.

The only channel to enter the river for strangers of over 5 feet draft is the one dredged between the jetties. The bar eastward of the jetties has several channels with 6 feet, but they shift and are not reliable, lumps with 4 to 5 feet over them sometimes forming in the middle of the channels.

Between **Saybrook** and **Middletown** the river banks are hard and in some places rocky, but between Middletown and **Hartford** the river flows through alluvial bottom land, and the channel changes in places after each freshet and ice jam.

The river is crossed by **several drawbridges** below Hartford, and at Hartford a bridge crosses the river, connecting with East Hartford.

Saybrook is a village on the western bank of the river westward of Saybrook Point and just inside the entrance. **Saybrook Point**, a village eastward of Saybrook, is about 1 mile northward of Lynde Point (the western point at the entrance to the river, marked by Saybrook lighthouse), and is the first landing in the river. Vessels of 13 feet draft go to Saybrook Point at high water; there is 9 feet alongside the wharves at low water.

Essex, a village with several manufactories, is on the western bank about 5 miles above the entrance.

Middletown is a city on the western bank of the river, 35 miles above the entrance; 13 feet is the deepest draft taken up to the city, and 9 to 10 feet the usual draft.

Portland, a town on the east bank of the river, opposite Middletown, is noted for its stone quarries; it has communication with Middletown over a railroad bridge and a town bridge.

Hartford, 50 miles above the entrance, is an important manufacturing city and a port of entry. The greatest draft usually taken up the river to Hartford is 9 to 11 feet, but during freshets vessels drawing 12 feet have sometimes gone up to the city; the depth alongside the wharves is 11 feet.

Prominent objects.—Saybrook (Lynde Point) lighthouse and Saybrook Breakwater lighthouse are described on page 14.

Griswold Point, the eastern point at the entrance to the river, is low and level and has no prominent distinguishing features.

Anchorage is found inside the jetties, about 200 to 300 yards from the west bank, in 20 to 30 feet, soft bottom, Saybrook lighthouse bearing west or southward of west.

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*Connecticut River is shown in parts on charts **253, 254, 255, 256**, scale $\frac{1}{20,000}$, price of each $0.25. The entrance is shown on charts **115**, scale $\frac{1}{80,000}$, price $0.50; **253**, scale $\frac{1}{20,000}$, price $0.25.

Farther up, the best anchorage for vessels of less than 10 feet draft, with plenty of room, is found opposite and northward of North Cove, about 300 yards above the coal docks at the cove entrance.

Strangers seldom enter the river for shelter.

Pilots and towboats.—Strangers entering the river and bound above Saybrook should take a pilot or a towboat either outside the bar or off Saybrook Point. Each towboat carries two licensed pilots, and one may be had with or without the tug. The headquarters for pilots and tugs is at the steamboat wharf at Saybrook Point, where the steamboat wharf agent will attend to any orders given.

Towboats will be found at various points along the river. Sailing vessels bound in usually take a towboat outside the bar, and sometimes remain outside Long Sand Shoal, lying off and on or at anchor, until a tug comes out in response to signal.

Supplies.—Coal for steamers can be had in limited quantities alongside the wharves at Saybrook Point, and in unlimited quantity at Hartford. Water can be obtained alongside wharves at Saybrook Point, Middletown, and Hartford through pipe and hose. Provisions and some ship-chandler's stores can be obtained at the towns and villages along the river.

Hospitals.—At Hartford there is a relief station (Class IV) of the United States Public Health and Marine-Hospital Service. (See Appendix IV.)

Ice closes navigation in the river above Saybrook during the winter. From December 1 to April 1 navigation is entirely closed or unsafe.

Freshets occur in April and May, and sometimes in November and December. The spring freshets are the highest; at Hartford their usual height is about 20 feet and the greatest recorded height 29 feet.

The **currents** at the entrance have great velocity at times, and always require careful attention, but they are so irregular that no definite rule can be given regarding them. The action of the currents is much affected by variations in the height of the water level in the river. Off the southern end of the jetties and close to them the tidal current of the Sound often sets directly across, at right angles, to the current setting out or in between the jetties. In the river the velocity varies from 2 to 5 miles per hour, according to the state of the river, whether low or high.

For **tides** see page 24.

Below Hartford, at low stages of water, the Connecticut River is influenced by tides; at Hartford the mean rise and fall is about 0.8 foot, but when the water level is raised above 5 feet by freshets the influence of the tide is not felt.

For **variation of the compass** see page 22.

SAILING DIRECTIONS, CONNECTICUT RIVER AND SAYBROOK HARBOR.

Directions for the eastern part of Long Island Sound are given on pages 63–64, 68.

The following directions, sections 1 and 1 A, are available for any vessels that can enter the Connecticut River.

1. ***Approaching from Eastward.***—Steer for Cornfield Point light-vessel bearing between 264° true (**W ½ N** mag.) and 242° true (**WSW ½ W** mag.) When Saybrook Breakwater lighthouse (the outer one of the two Saybrook lighthouses) bears 316° true (**NW by N** mag.), steer for it on the bearing. Pass ¼ to ⅜ mile westward of the buoy (nun, red, No. 8) on the southern side of the shoals making out from Saybrook Bar, and give Long Sand Shoal (east end) buoy a good berth on the port hand. When past these buoys haul a little more westward, with signal up for pilot or tug if intending to take one. Keep Saybrook Breakwater lighthouse a little on the starboard bow in approaching; the depth should not be less than 20 feet. To enter, follow the directions in section 2.

If necessary to wait for pilot or towboat, anchor southwestward of the Breakwater lighthouse, distant ⅓ to ¾ mile. A vessel anchored southwestward of this lighthouse has better holding ground than is found directly southward, and is out of the variable currents due to the flow of the river.

Remarks.—When steering for Cornfield Point light-vessel between a 264° true (**W ½ N** mag.) and 242° true (**WSW ½ W** mag.) bearing all dangers are avoided. On the 316° true (**NW by N** mag.) course, Saybrook lighthouse, the beacon at the inner end of the east jetty, and the houses at Saybrook Point will be on the starboard bow; Saybrook Breakwater lighthouse will be directly ahead, with the largest building on Lynde Point (the hotel) open a very little to the right of it; the course leads westward of Saybrook Bar and the shoals making out from it.

Dangers.—**Hatchett Reef**, marked at its southeastern end by a buoy (spar, red, No. 6) and at its northeastern end by a buoy (spar, black, No. 1), is described on page 68.

Saybrook Bar is described on page 68.

Long Sand Shoal is marked at its eastern end by a buoy (spar, red and black horizontal stripes). This buoy is left about ½ mile on the port hand on the 316° true (**NW** by **N** mag.) course. The shoal is described on page 64.

1 A. ***Approaching from Westward.***—Pass 1 mile south of Hammonasset Point (see page 69) and steer 83° true (**E** ⅜ **S** mag.). When Saybrook Breakwater lighthouse (at outer end of the west jetty) bears 63° true (**ENE** ½ **E** mag.), steer for this lighthouse, keeping the bearing. When the Breakwater lighthouse is about ½ mile distant, haul a little southward, so as to pass about 300 yards south of the outer end of the west jetty.

If intending to take a towboat or a pilot outside.—With signal up, anchor, if necessary, as directed in section 1 preceding.

Intending to stand in.—Proceed as directed in section 2 following.

Remarks.—On the 83° true (**E** ⅜ **S** mag.) course, Stone Island Reef buoy (spar, red, No. 14), at the eastern side of the entrance to Clinton Harbor, and Crane Reef buoy (spar, red, No. 12) will be left ½ mile on the port hand, and Long Sand Shoal is left ¾ mile on the starboard hand.

On the 63° true (**ENE** ½ **E** mag.) course the spindle on Hen and Chickens and Cornfield Point Shoal buoy (spar, red, No. 10) will be left on the port hand, the latter distant about 500 yards.

Dangers.—**Crane Reef**, **Hen and Chickens**, and **Cornfield Point Shoal** are covered by the red sector of Saybrook Breakwater lighthouse. These shoals are described on page 69.

2. ***Entering the River.***—The directions given in this section are available for vessels drawing less than 10 feet. If closely followed they will carry about 12 feet through the dredged channel, but this is narrow, and a stranger drawing more than 10 feet is advised to take a pilot or a towboat outside.

In approaching and entering avoid the outer end of the east jetty, as lumps tend to form about it. When the entrance between the two jetties is opened fully, stand in, favoring the outer end of the west jetty, and steer about 6° true (**N** by **E** ½ **E** mag.) so as to leave red spar buoys Nos. 2 and 4 about 30 yards on the starboard hand, and Lynde Point buoy (spar, black, No. 1) 75 yards on the port hand. When this buoy is passed the water will deepen; when the depth is 24 feet, steer 332° true (**N** by **W** ½ **W** mag.) for the eastern end of Saybrook Point. Continue this course until up to Saybrook Point, and anchor in the channel just above the railroad wharf about 300 yards from the west bank.

Remarks.—Above Saybrook lighthouse there are sunken piers and rocks on both sides of the channel, and off the northeastern end of Lynde Point the channel is very narrow for vessels of over 8 feet draft.

Note the remarks on currents, page 84, see also description of entrance to the river, page 83.

WESTBROOK HARBOR.*

Westbrook Harbor is an open bight on the northern side of Long Island Sound, about 5 miles westward of Saybrook Breakwater lighthouse, and just eastward of Menunketesuck Point, a point formed by several low, narrow islands, connected at low water and surrounded by bowlders.

The town of **Westbrook**, on the north side of the harbor, is of no commercial importance. A tall, gray church spire is the most conspicuous object, and can be seen from a long distance. **Salt Island** is a small island, connected with the main land at low water, and has on its southwestern side a wharf with 4 feet at the end; the island is abreast of the town and about 1¼ miles east of Menunketesuck Point.

Vessels of 30 to 200 tons sometimes anchor in Westbrook Harbor, but strangers seldom do so; the anchorage westward of Menunketesuck Point, behind Duck Island Breakwater, is better. During the spring and summer Westbrook Harbor is obstructed by fish weirs, which are removed in the fall. There are also sunken rocks which are not marked.

Tides.—See heading "Duck Island Roads."

*Shown on charts 257, scale $\frac{1}{10,000}$ 115, scale $\frac{1}{80,000}$, price of each $0.50.

GENERAL DIRECTIONS, WESTBROOK HARBOR.

From Eastward, being Northward of Long Sand Shoal.—In approaching, follow the directions in section 2, page 69. Pass ¼ mile westward of Crane Reef buoy (spar, red, No. 12) and steer 337° true (**N** by **W** mag.), heading for Salt Island, a low, rocky islet close to the northern shore. Anchor in 13 to 15 feet (low water) over ¼ mile southward of this island.

From Westward.—Pass at least ½ mile south of Duck Island and steer 68° true (**E** by **N** mag.). When about 1½ miles eastward of the island, steer 3° true (**N** by **E** ¼ **E** mag.) for Salt Island. Do not approach Salt Island on any bearing eastward of 23° true (*NE* by *N* mag.).

The shore and Menunketesuck Point should be given a wide berth, as there are sunken rocks, not marked.

DUCK ISLAND ROADS *

is 6½ miles westward of Saybrook Breakwater lighthouse and just westward of Westbrook Harbor. It has been made a fair harbor of refuge, for vessels of 15 feet or less draft, by the construction of a breakwater, which extends about 900 yards westward from **Duck Island**, and affords shelter from all except southwest winds; even in southwest gales a few vessels may find shelter when anchored close behind the breakwater near Duck Island. The depth of water behind the breakwater ranges from 15 to 17 feet, shoaling gradually toward the shore northward. There is a light on the west end of the breakwater (see table, page 14).

In the spring and summer a part of this harbor is taken up by fish weirs, which are removed in the fall. The entrance westward of Duck Island is free from dangers.

A channel, about 250 yards wide between the 12-foot curves, leads between Menunketesuck Point and Duck Island, but strangers should not attempt it, as the anchorage is more easily made from westward.

Tides.—The mean rise and fall of tides is 4.5 feet; high water occurs 1h. 20m. later, and low water 1h. 01m. later, than at New London.

SAILING DIRECTIONS, DUCK ISLAND ROADS.

These directions are good for vessels of 15 feet draft at low water.

1. ***From Eastward.—Passing Northward of Long Sand Shoal.***—Follow the directions in section 2, page 69, until Crane Reef buoy (spar, red, No. 12) is sighted, and pass about ¼ mile southward of it. Then steer 271° true (**W** by **N** mag.) so as to pass over ½ mile south of Duck Island. When the light on the western end of the breakwater is abeam, steer 1° true (**N** by **E** mag.) so as to give it a berth of at least 50 yards. Anchor inside the breakwater in 15 to 17 feet (low water).

Passing Southward of Long Sand Shoal.—From Cornfield Point light-vessel steer 277° true (**WNW** ½ **W** mag.) so as to pass over ¼ mile southwestward of the gas buoy (red and black horizontal stripes), which marks the western end of Long Sand Shoal and lies 3½ miles 283° true (*NW* by *W* ⅞ *W* mag.) from Cornfield Point light-vessel. Leave this buoy ¼ mile on the starboard hand and steer 315° true (**NW** by **N** mag.) about 2 miles. When the western end of the breakwater bears eastward of 1° true (**N** by **E** mag.) steer for it. Give the end of the breakwater a berth of at least 50 yards, and anchor behind it in 15 to 17 feet (low water).

Remarks and dangers.—A shoal with 5 to 9 feet over it extends ¼ mile southward from Duck Island; this shoal with 15 to 18 feet over it extends nearly ½ mile southward of the island. A shoal with 11 to 14 feet over it lies ⅜ mile southward of the breakwater, its western end lying 170° true (**S** mag.) from the light on the western end of the breakwater.

When standing for the west end of the breakwater, care should be taken, especially in a rough sea, to avoid two 16-foot spots lying respectively 375 yards southwestward and 600 yards 203° true (**SW** by **S** mag.) from the west end of the breakwater.

A shoal with 2 to 14 feet over it extends 400 yards 6° true (**N** by **E** ½ **E** mag.) from the northern end of Duck Island. There are no known dangers northward of the breakwater, the water shoals gradually toward the shore.

* Shown on charts 257, scale $\frac{1}{10,000}$; 115, scale $\frac{1}{80,000}$, price of each $0.50.

1 A. ***From Westward.***—Passing at least ⅜ mile south of Stone Island Reef buoy (spar, red, No. 14), steer 35° true (**NE** mag.) for the west end of the breakwater. Give the end of the breakwater a berth of at least 50 yards and anchor inside.

See the remarks and dangers preceding.

CLINTON HARBOR AND HAMMONASSET RIVER.*

Clinton Harbor is on the north shore of Long Island Sound, 9 miles westward of Saybrook, and on the eastern side of Hammonasset Point. It is the entrance to Hammonasset River, a stream of no commercial importance. The harbor affords protection against northerly and northwesterly winds for light-draft vessels, but is not available for strangers.

Clinton, a town on the Shore Line Division of the N. Y., N. H. & H. Railroad, is at the head of the harbor and at the mouth of Hammonasset River. The greatest draft carried up to Clinton does not exceed 8 feet at high water; the depth alongside the wharves is 6 feet at mean low water; the depth of water over the bar at mean low water is about 5 feet.

Hammonasset Point, the western point at the entrance, is described on page 69. There is a buoy marking the channel below the bar, but strangers should not attempt to go to Clinton without a pilot.

Pilots can be obtained by making signal outside the harbor, and vessels desiring a pilot either lie off the entrance or anchor until they are boarded by one. Towboats are not much used; they can be obtained at Saybrook.

Ice extends to Sandy Point Island in the winter. There is not much drift ice.

Tides.—See heading "Duck Island Roads."

GENERAL DIRECTIONS, CLINTON HARBOR.

These directions are good for vessels of 12 feet draft to the anchorage off Wheeler Rock buoy, but 8 feet is the deepest draft that can be taken to Clinton at high water.

From Eastward.—Directions for this part of the sound are given on pages 64 and 69. Pass ⅜ mile southward and westward of Stone Island Reef buoy (spar, red, No. 14), and stand in, course about 327° true (**NNW** mag.) for Wheeler Rock buoy (spar, red, No. 4). Anchor southward of the buoy in about 14 feet. Here take a pilot.

Dangers.—Stone Island Reef is described on page 70.

Wheeler Rock, with 1 foot over it and marked by a buoy (spar, red, No. 4), lies near the head of the outer harbor. The bottom outside of the bar is generally hard and poor holding ground.

From Westward.—Pass ¾ mile southward of Hammonasset Point, round the point at this distance and stand in, course 12° true (**NNE** mag.) for Wheeler Rock buoy (spar, red, No. 4). Anchor southward of the buoy in about 14 feet.

ANCHORAGE OFF MADISON, CONN.†

A broad bight, sometimes used as an anchorage, makes into the north shore westward of Hammonasset Point. This bight is about 10 miles westward of Saybrook (Connecticut River) and about 15 miles eastward of New Haven entrance. It affords shelter in northerly and northeasterly winds, in 16 to 23 feet, excellent holding ground (mud and shells). Southwesterly winds, when across the flood, often cause considerable sea. The anchorage is not recommended, as Duck Island Harbor, eastward, and Thimble Islands Harbor, westward, afford better shelter.

Madison, a town of no commercial importance, is on the north shore of the bight, on the Shore Line Division of the N. Y., N. H. & H. Railroad; it has two landings, from each of which a road leads into the town; the wharves have 3 feet alongside at low water.

Tuxis Island, a small island close inshore, abreast the village of Madison, is a conspicuous mark in entering.

Fish weirs.—During the spring and summer many fish weirs are put down in the bight; they are removed in the autumn.

Tides.—The tides are practically the same as at Falkner Island (see table, page 24).

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* Shown on charts **258**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

† Shown on charts **259**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

SAILING DIRECTIONS FOR THE ANCHORAGE OFF MADISON.

These directions are good for vessels of 15 feet or less draft. The directions in section 1A lead between dangers with 7 to 13 feet over them, and care must be taken to make the course good.

1. ***Approaching and Entering, from Eastward.***—Give Hammonassett Point a berth of ¾ mile or more, and round this point, passing ¼ to ¾ mile westward of Hammonasset Point Reef buoy (spar, red, No. 2) off the western side of the point.

Then steer for Tuxis Island on any course from 304° true (**NW** mag.) to 316 °true (**NW** by **N** mag.). Be careful to keep within these limits, the best course being about 310° true (**NW** ½ **N** mag.), with Tuxis Island directly ahead.

Continue thus until Madison East Reef buoy (spar, black, No. 1), which is left well on the port hand, is abeam. Then stand more westward, and anchor about ¼ mile southward of Tuxis Island and the same distance northward of Madison Reef, in 19 to 24 feet (low water).

Remarks.—When rounding Hammonasset Point, Tuxis Island will be readily recognized, lying 300 yards from shore, and being the only island in this vicinity; the southern face of the island shows white, and the top of the island, which has a round appearance, is covered with trees. The houses of Madison will be seen behind Tuxis Island and open eastward of it.

Dangers.—When well past Hammonasset Point there are two dangers to be kept especially in mind, a rocky patch (10 feet) and a rock (2 feet), whose descriptions follow below after that of Madison Reef. The directions given clear these two dangers, the sailing line passing between them.

Madison Reef lies about ⅝ mile southward of Tuxis Island and extends a little over 1 mile east and west. This reef has 4 to 10 feet over it, and consists of several rocky patches with deeper water between them. Nearly ⅜ mile from the eastern end of the reef is a buoy (spar, black, No. 1); the western end of the reef is marked by a buoy (spar, red, No. 2), lying nearly ⅞ mile 223° true (**SW** ¾ **W** mag.) from Tuxis Island.

The least depth (4 feet) is found over a rock known locally as Tuxis Island Reef, about midway between the buoys.

A **rocky patch**, with 10 feet over it, lies 600 yards 88° true (**E** ¾ **S** mag.) from the buoy (spar, black, No. 1) marking the eastern part of the main reef. Vessels passing eastward of this buoy should either give it a berth of only about 200 yards, or should pass at least ⅜ mile eastward of it (as on the sailing line of the directions) to clear the 10-foot spot.

A **rock**, with 2 feet over it, lies ½ mile 106° true (**SE** by **E** ⅝ **E** mag.) from Tuxis Island, and ⅜ mile 181° true **S** by **W** mag.) from Madison east wharf.

1 A. ***Approaching and Entering, from Westward.***—Pass about 1 mile southward of Sachem Head and steer 80° true (**E** mag.) heading for the extremity of Hammonasset Point.

When Falkner Island lighthouse bears 150° true (*S* by *E* ¾ *E* mag.) and Indian Reef buoy (spar, red, No. 6) is abaft the port beam, distant a little over ½ mile, steer 57° true (**ENE** mag.), heading for Tuxis Island on this bearing. Keep the bearing, leaving Charles Reef buoy (spar, red, No. 4) about ⅜ mile on the starboard hand and Madison Mid-reef buoy (spar, red, No. 2) nearly ¼ mile on the starboard hand. When Tuxis Island is distant about ¾ mile, haul eastward and anchor in accordance with the directions already given for approaching from eastward.

On the flood be careful not to be set northward, and *on the ebb* be careful not to be set southward of the sailing line, especially while passing Charles Reef. Note that Charles Reef buoy is on the south side of the reef.

Remarks.—When off Sachem Head, on the 80° true (**E** mag.) course, Hammonassett Point will be directly ahead, Tuxis Island on the port bow and close in to the mainland, and **Lobster Rock** (locally, White Top), distinguished by a small hut upon it, will be broad off the port bow. As Sachem Head is passed, Guilford Harbor will be opened out and the houses of Guilford will appear. The buoys of Guilford Harbor entrance will be left well on the port hand.

Dangers.—Chimney Corner Reef, Indian Reef, and **Charles Reef** are described under heading "Guilford Harbor."

Several shoal spots, with 8 to 14 feet over them, lie a little over ½ mile northwestward from Charles Reef. The sailing line passes southward of these spots.

GUILFORD HARBOR.*

Guilford Harbor, a bight on the north shore of Long Island Sound, about midway between Saybrook and New Haven, lies due north from Falkner Island. Only small light-draft vessels, of 20 to 200 tons, enter the harbor, the greatest draft being 9 feet.

The entrance is much obstructed by rocks and shoals, also during spring and summer by fish weirs, and strangers going up to Guilford should always take a pilot.

Guilford, a small town on the Shore Line Division of the N. Y., N. H. & H. Railroad, is at the head of the harbor, on a stream called **West River**; 5 feet is the greatest draft carried up to Guilford at high water. Another stream, the **East River**, flows into Guilford Harbor and has the best water, the depth over the bar at its mouth being 3½ feet; at high water 9 feet can be carried into East River for 1½ miles above its mouth.

Channels.—There are two channels leading in, both buoyed, but they are unfit for strangers.

Anchorage.—There is no anchorage that can be described so as to be of use to a stranger. The anchorage off Madison is better than any offered by Guilford Harbor.

Pilots.—Vessels from westward, bound to Guilford, sometimes stop at New Haven and take a pilot, but pilots can be had by making signal and lying-off the harbor until one comes out. The piloting is generally done by fishermen.

Towboats are not much used; they can be obtained at New Haven or at Saybrook.

Tides.—See heading "Madison."

SAILING DIRECTIONS, APPROACHING GUILFORD HARBOR.

These directions are good for vessels of 15 feet or less draft, and lead to a position outside of the buoys off the entrance; but 9 feet is the deepest draft taken into Guilford Harbor at high water.

1. ***From Eastward.***—Pass 1 mile south of Hammonasset Point, and steer 279° true (**WNW ¼ W** mag.), passing well southward of the buoys marking Madison and Charles reefs. Continue the course for 5½ miles until Falkner Island lighthouse bears 175° true (*S ½ W* mag.) and Northwest Indian Reef buoy (spar, red, No. 2) is nearly ahead, distant ½ mile, then take a pilot, coming-to if necessary.

Remarks.—Approaching Guilford Harbor on the 279° true (**WNW ¼ W** mag.) course, **Lobster Rock** (known locally as **White Top**, and distinguished by a small hut) will be made a little on the starboard bow, and the houses of Guilford will be seen northward of Lobster Rock.

Dangers.—**Hammonasset Point Shoal** is described on page 70.

Madison Reef, marked by two buoys, is described on page 88.

Charles Reef, southwestward of Madison Reef, has 7 feet over it, and is marked at its southern end by a buoy (spar, red, No. 4).

Half Acre Rock is a mass of bare rocks off the eastern point at the entrance to Guilford Harbor. Bare rocks and sunken ledges extend to the north shore, and ledges with 7 to 10 feet over them extend ¾ mile in a general easterly direction from Half Acre Rock.

Guilford Shoals is the name applied to the numerous rocks and ledges, many of them bare at low water, which lie in the entrance of the harbor; **Indian Reef**, marked by two buoys, one (spar, red, No. 6) at its southern extremity and another (spar, red, No. 2) at its northeastern end, and **Lobster Rock** form parts of the shoals.

A **spot** with 6 feet over it lies nearly ½ mile westward from Indian Reef buoy (spar, red, No. 6).

1 A. ***From Westward.***—Pass ¼ mile south of East Reef buoy (nun, red, No. 10), south of Thimble Islands, and steer 82° true (**E ¼ S** mag.). This course should lead ⅝ mile south of Sachem Head, ⅜ mile south of Chimney Corner Reef, and ⅜ mile south of Indian Reef southwest buoy (spar, red, No. 6). When Falkner Island lighthouse bears 175° true (*S ½ W* mag.) steer 355° true (**N ½ E** mag.) until nearly up with the outermost buoys at the entrance, when take a pilot, coming-to if necessary.

*Shown on charts **259**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

Remarks.—On the 82° true (**E** ¼ **S** mag.) course, Sachem Head will be made a little on the port bow, and after passing Sachem Head the houses of Guilford will be seen northward as the harbor opens out.

Northward of Sachem head are two bights, **Joshua Cove (Great Harbor)** and **Sachem Head Harbor;** the latter is the headquarters of a yacht club, but the former is shallow and of no importance.

Dangers.—**Goose Rocks Shoal**, marked by a buoy (bell, red), and **Goose Rocks** lie southwestward of Sachem Head and are described on page 71.

Chimney Corner Reef not marked, is nearly ⅜ mile south of Sachem Head, and has a least depth of 9 feet over it. A rule to insure clearing the reef, in passing southward of it, is to keep the large lone tree on Thimble Island (Two Tree Island) bearing northward of 276° true (**WNW** ⅝ **W** mag.). Eastward of Sachem Head a narrow channel leads up to Guilford Harbor, but this is not available for strangers on account of the many rocks and ledges which obstruct it.

When approaching Indian Reef southwest buoy (spar, red, No. 6), the 6-foot spot lying nearly ½ mile westward from the buoy should be avoided.

SACHEM HEAD HARBOR.*

This is a very small harbor, about ¼ mile long and ⅛ mile wide, on the western side of Sachem Head; it affords shelter for small vessels against all but southwesterly winds, which sometimes throw a heavy sea into the harbor. The depth is 6 to 12 feet at low water, soft bottom. The harbor is the headquarters of a yacht club.

Tides.—The tides are practically the same as at Thimble Islands (see table, page 24).

SAILING DIRECTIONS, SACHEM HEAD HARBOR.

These directions are good for vessels of 7 feet or less draft.

1. ***From Eastward.***—Steer so as to pass about ½ mile south of Sachem Head, and when the northern and largest of the Goose Rocks bears 310° true (**NW** ½ **N** mag.), steer for it on that bearing. When Joshua Point bears 350° true (**N** mag.), steer for it on that bearing until the harbor is opened out, when steer about 63° true (**ENE** ½ **E** mag.), heading midway between Joshua Point, the western point of Sachem Head, and the small island at the southern point at the entrance; anchor according to draft when inside the points.

See Dangers under section 1 A, Guilford Harbor.

1 A. ***From Westward.***—Pass about 300 yards south of East Reef buoy (nun, red, No. 10), south of the Thimble Islands, and steer 73° true (**E** ⅝ **N** mag.); this should lead about 200 yards south of Goose Rocks Shoal buoy (bell, red). Continue this course about 600 yards eastward of the bell buoy, and then steer 34° true (**NE** mag.) for the entrance to the harbor, giving Goose Rocks a berth of 400 yards. When the harbor is opened out follow the directions given above for entering.

THE THIMBLES.*

A group of islands called **The Thimbles** lies about midway between Sachem Head Harbor and Branford Harbor. The most important of these islands, mentioned in order from southward, are:

Two Tree Island is the southernmost of the islands and has a prominent tree, which is seen when past Sachem Head.

Horse Island is just north of Two Tree Island and has small islands and rocks eastward of it, but is bold-to on its western side.

Pot Island north of Horse Island, is wooded and has a tall framework observatory near its middle.

Money Island, northeastward of Pot Island, has numerous summer houses and a hotel. Northeastward of Money Island other islands extend almost to the mainland, with narrow passages between them; these passages are unfit for strangers, as they wind among numerous unmarked rocks and shoals, but they are used by yachts and small craft owned in the vicinity.

*Shown on charts **260**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

High Island, also known as **Kidd Island**, northwestward of Pot Island, is long and narrow, covered with trees. These islands all show a rocky water line.

Numerous **rocky islets** and **shoal spots** lie between The Thimbles and the shore northwestward and westward. The quarry on Hoadley Point, known as Leetes Island Quarry, ships considerable stone to places along the Sound. The stone docks at the quarry have sufficient water for the vessels loading at them.

THIMBLE ISLAND HARBOR*

is a small and well-sheltered anchorage lying between Pot and Money Islands on the east, and High Island on the west, and is about 7 miles eastward of New Haven entrance. It is much frequented by yachts in summer, and fishing steamers anchor here for the night when fishing in the vicinity. Vessels up to 12 feet draft can find shelter here, but, as the entrance is narrow and there is no room for working when inside, it is necessary for sailing vessels to have a favorable wind entering and leaving by the only channel available for strangers. Although the harbor is open southwest, the sea from that direction loses much of its force before reaching the anchorage.

Stony Creek, a village on the Shore Line Division of the N. Y., N. H. & H. Railroad, is 1 mile north of Thimble Islands Harbor. It has several hotels and is a summer resort.

For **tides** see table, page 24.

SAILING DIRECTIONS, THIMBLE ISLANDS HARBOR.

In following these directions the depth of the water is not less than 13 feet.

1. ***Approaching and Entering, from Eastward.***—Directions for approaching from eastward, having passed northward of Falkner Island, are given in section 3, page 70.

Having passed southward of Falkner Island, steer so as to pass about ¼ mile southwestward of Goose Island bell buoy and then steer 301° true (**NW ¼ W** mag.), heading for the southern end of Two Tree Island, the southernmost of the Thimble Islands. Pass southward of Outer Thimble (which is a large, bare rock just southeastward of Two Tree Island) and southward and westward of Two Tree Island, giving them a berth of at least 100 yards.

When 150 yards westward of the northern end of Two Tree Island steer 42° true (**NE ⅝ E** mag.), heading so as to have the high frame observatory on Pot Island a little on the starboard bow, thus favoring the Pot Island shore, and leave a small, black, spar buoy about 50 feet on the port hand. When nearly up to the observatory steer a little more northward, so as to pass about midway between the islands.

Anchor between the black spar buoy and the northern end of Pot Island in 13 to 18 feet, soft bottom.

Remarks.—Two Tree Island (see above) will be easily distinguished when abreast Sachem Head.

After rounding Two Tree Island, High Island, sometimes called Kidd Island, will be opened out to the northward. The channel leads well eastward of the small cluster of rocks which will be seen about 250 yards southwestward of High Island.

Dangers.—There are many rocks eastward and northward of The Thimbles, some of them showing bare at low water.

East Reef, Wheaton Reef, Browns Reef, and **Northwest Reef** lie in a detached cluster about ½ mile southwestward of Two Tree Island; they are marked by two buoys, one (nun, red, No. 10) at the southeastern end, and the other (spar, black, No. 1) at the northern end. **Northwest Reef**, marked by a buoy (spar, red and black horizontal stripes), is a small, detached spot, with 7 feet over it, lying about 600 yards 248° true (**W** by **S** mag.) from Wheaton Reef buoy (spar, black, No. 1). These reefs are more particularly described on page 71.

Inner Reef, marked by a buoy (spar, red, No. 2) off its southern end, is a small cluster of rocks, showing bare in places at low water, lying 700 yards westward of Two Tree Island.

A **rock**, with 3 feet over it and marked by a small black spar buoy, lies east from the southern end of High Island, about 80 yards from the shore of the island. The entire distance across from High Island to Pot Island is here about 200 yards. The rock is just abreast a noticeable vertical crevice in the cliffs of High Island, and is avoided by keeping well over to the shore of Pot Island in passing; the northwestern side of Pot Island is steep-to.

*Shown on charts **260**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

1 A. ***Approaching and Entering, from Westward.***—Pass about ⅝ mile north of Branford Reef beacon, and 300 yards south of Negro Heads buoy. When this buoy bears abeam, distant 300 yards, steer 73° true (**E** ⅝ **N** mag.), heading for the southern end of Two Tree Island. Pass 150 yards southward of Inner Reef buoy and steer 42° true (**NE** ⅝ **E** mag.), favoring the islands on the starboard hand; anchor as directed in coming from eastward.

Remarks.—For appearance of the islands when approaching, see description of The Thimbles. The 73° true (**E** ⅝ **N** mag.) course leads midway between black buoy No. 1, on Wheaton Reef, and red spar buoy No. 2, on Inner Reef.

Dangers.—**Branford Reef** is described on page 71.

Negro Heads, a dangerous, rocky ledge, partly out at low water, is about 1 mile 6° true (**N** by **E** ⅜ **E** mag.) from Branford Reef beacon, and is marked off its southern end by a buoy (spar, red, No. 4). The ledge extends northward to the islands lying off Indian Neck.

Gangway Rock, a small, detached rock with 5 feet over it, lies nearly ⅝ mile 62° true (**ENE** ⅜ **E** mag.) from Negro Heads buoy. This rock is not marked, but it lies a little southward of a line from Negro Heads buoy to Hooker Rock buoy.

Northwest, Wheaton, Browns, East, and Inner reefs are described on page 91.

A **spot** with 8 feet over it, not marked, lies nearly ⅜ mile northwestward from Inner Reef, on a line from this reef to Hooker rock. There is a channel 500 yards wide, with a least depth of 12 feet, between this spot and Inner Reef.

Hooker Rock, bare at low water, lies ⅝ mile 285° true (**NW** by **W** ¾ **W** mag.) from Inner Reef, and is marked by a buoy (spar, red, No. 2½). There is a clear passage ¼ mile wide with 16 feet between this rock and the spot with 8 feet just described.

A **rock** with 3 feet over it lies in the channel off High Island; it is described under section 1 foregoing.

BRANFORD HARBOR.*

Branford Harbor, on the north shore of Long Island Sound, about 4 miles eastward of New Haven entrance, is a shallow cove between Jeffrey Point and Johnson Point, affording an anchorage for vessels up to 10 feet draft. The entrance is somewhat obstructed by ledges and rocks, but all these are either buoyed or show plainly. **Branford River**, a narrow and crooked stream, enters at the head of the harbor. **Branford**, a town on the Shore Line Division of the N. Y., N. H. & H. Railroad, is 1½ miles above the mouth of the river. The deepest draft of vessels entering the harbor and going up to Branford is 8 feet; vessels of 6 feet draft can go up at mean low water; the depth alongside the wharves is 9 feet.

Anchorages.—A small, well-sheltered anchorage, in 6½ to 7 feet, is found northward of the Mermaids, but it should not be attempted by strangers without a pilot.

An anchorage in 10 to 14 feet, protected against all but southerly winds, will be found about 400 yards north of Taunton Rock, and about midway between Bird Rock buoy and Jeffrey Point (eastern shore).

Pilots and towboats.—Strangers frequently take a pilot, making signal and anchoring outside Taunton Rock until they are boarded by one. Towboats are sometimes used by strangers who go to Branford; they can be obtained at New Haven.

Tides.—The mean rise and fall of tides is 5.6 feet; high water occurs 9m. earlier, and low water 31m. earlier, than at Willets Point.

SAILING DIRECTIONS, BRANFORD HARBOR.

The following directions are good for vessels of less than 9 feet draft.

1. ***Approaching and Entering, from Eastward.***—Pass about 250 yards south of Negro Heads buoy and steer 306° true (**NW** ⅛ **N** mag.), heading for Taunton Rock. Pass 200 yards eastward of Taunton Rock, and steer 350° true (**N** mag.), with Bird Rock buoy broad off the port bow. Anchor according to draft southward of the Mermaid rocks in 10 to 15 feet.

*Shown on charts 261, scale $\frac{1}{10,000}$; 115, scale $\frac{1}{80,000}$, price of each $0.50.

Give the shores a berth of ⅛ mile and keep at least this distance southward of the Big Mermaid (the islet seen northward in entering, about midway between the shores where the harbor narrows somewhat).

Or, passing between Negro Heads and Branford Reef, bring Branford Reef beacon astern on a 333° true (**N** by **W** ½ **W** mag.) course, and pass about 200 yards eastward of Taunton Rock. Then steer 350° true (**N** mag.) and anchor as directed in the preceding paragraph.

Remarks.—When abreast of Negro Heads buoy (spar, red, No. 4), Branford Harbor will open westward of **Jeffrey Point** (low, rocky, several small, rocky islands off its southern end, the southernmost known as **Jeffrey Rock**). Eastward of Jeffrey Point and north of Negro Heads, several small islands will be seen, the most prominent of which are, named in their order from eastward, **Spectacle Island**, **Sumac Island**, and **Clam Island**.

On the 306° true (**NW** ⅛ **N** mag.) course, with **Taunton Rock** (see dangers) ahead, **Johnson Point** (low, covered with trees) will show open a little southward of Taunton Rock. On approaching Taunton Rock the harbor will fully open out, and the houses and hotel on the western shore will be seen.

Dangers.—**East**, **Wheaton**, **Browns**, and **Northwest reefs**, and **Branford Reef** are described on page 71.

Negro Heads are described on page 71. Shoals and islands lie between Negro Heads and Jeffrey Point, and vessels should keep southward of a line drawn from Negro Heads buoy (red, No. 4) to Jeffrey Rock.

Five Foot Rock, marked by a buoy (spar, red, No. 6) off its southern side, lies nearly ⅜ mile 221° true (**SW** ½ **W** mag.) from Taunton Rock. The 306° true (**NW** ⅛ **N** mag.) course for Taunton Rock leads well eastward of this buoy, which can be passed on either hand giving it a berth of 150 yards, thus clearing the rock and shoal water surrounding it.

Jeffrey Rock is the southernmost of the rocks making out about 300 yards from Jeffrey Point. It is quite bold-to on its southern and western sides, and can be approached as close as 75 yards from these directions.

Taunton Rock, a large, bare rock at the entrance of the harbor, shows conspicuously when approaching from any direction. Coming from eastward this rock is left on the port hand in entering. It lies a little over ¼ mile west from Jeffrey Rock. Blyn Rock is nearly ¼ mile northwestward of Taunton Rock.

Bird Rock, marked by a buoy (spar, red, No. 2) near its southwestern end, has a least depth of 5 feet. It is a small, detached reef about 600 yards eastward of the southern end of Johnson Point. A spot with 12 feet over it lies about 100 yards east of the buoy.

1 A. ***Approaching and Entering, from Westward.***—From a position 1 mile southward of Southwest Ledge lighthouse steer 71° true (**E** ¾ **N** mag.), passing about 150 yards south of the Cow and Calf buoy (spar, red, No. 10½). When the Cow and Calf buoy bears abaft the port beam, distant about 300 yards, steer 43° true (**NE** ¾ **E** mag.), leaving Five Foot Rock buoy (spar, red, No. 6) about 350 yards on the starboard hand, and passing about midway between Taunton Rock and Blyn Rock. Continue the 43° true (**NE** ¾ **E** mag.) course and anchor, according to draft, as directed in coming from eastward.

Or, when the Cow and Calf buoy bears 304° true (*NW* mag.), distant 250 yards, steer 25° true (**NE** ⅞ **N** mag.), heading about midway between Blyn Rock and Johnson Point, and when on a line between them make good a 74° true (**E** ½ **N** mag.) course; leave Blyn Rock about 100 yards on the starboard hand and Bird Rock buoy (spar, red, No. 2) the same distance on the port hand, and anchor when northward or northeastward of Taunton Rock.

Remarks.—On the 71° true (**E** ¾ **N** mag.) course Round Rock buoy (nun, red, No. 12) will be left about ½ mile on the port hand. Branford Reef beacon will be made well on the starboard bow. The Cow and Calf will be made a little on the port bow. When nearly up to the Cow and Calf, Branford Harbor will be opened out. When off the entrance Taunton Rock will show conspicuously.

Dangers.—**Cow and Calf** is the name of two rocks lying nearly ¾ mile 208° true (**SW** ⅝ **S** mag.) from Johnson Point; they are close to each other, and Cow, the larger, always shows out of water. Shoal spots with 11 and 12 feet over them extend 450 yards in a northwesterly direction from these rocks. A buoy (spar, red, No. 10½) is placed just southward of Cow and Calf.

Five Foot Rock is described under section 1 foregoing.

Blyn Rock is a small rock showing plainly about midway between Taunton Rock and Johnson Point; it can be approached as close as 60 yards in 16 feet. At high water of unusually high tides Blyn Rock is just awash.

Taunton Rock and **Bird Rock** are described under section 1 foregoing.

Johnson Point is comparatively bold-to on its eastern side; the 12-foot curve makes out 100 yards from the shore about 200 yards north of the southern end of the point. A **spot** with 9 feet over it lies about 100 yards southwestward from the southern end of the point.

NEW HAVEN HARBOR.*

New Haven Harbor, the approach by water to the city of **New Haven**, is commercially one of the most important harbors in Long Island Sound. At its head is the junction of the **Mill** and **Quinnipiac** rivers. The port has a very large carrying trade, its chief item being coal. Many vessels enter the harbor for shelter, particularly during the spring and autumn. The deepest draft of vessels entering or going up to the city is 23 feet, and a draft of 19 feet can be taken in at low water.

Breakwaters.—To improve this harbor, and increase its usefulness as a harbor of refuge, a *dyke* and *three breakwaters* have been built. The *dyke* makes out eastward from Sandy Point (opposite Fort Hale) for about ⅜ mile, and thence extends southward parallel with the channel for a distance of about ⅜ mile. The *East Breakwater* is 3,450 feet in length; it extends from Southwest Ledge lighthouse northeasterly to and across **Quixes Ledge** and terminates in a depth of 16 feet at the northeastern point of Quixes Ledge. The *Luddington Rock, or Middle, Breakwater* crosses Luddington Rock (which lies about 1,200 yards 250° true (**W** ⅞ **S** mag.) from Southwest Ledge lighthouse) in a northeasterly and southwesterly direction, commencing at a point 250 yards northeasterly from Luddington Rock and extending in a southwesterly direction. This breakwater is ¾ mile long and marked at its eastern end by two white lights, and at its western end by a red light. The *West, or Outer, Breakwater* extends 600 yards in a general northwesterly direction, leaving an opening about 600 yards wide between it and the western end of the Luddington Rock Breakwater. New Haven Outer Breakwater lighthouse is just inside the eastern end of the West Breakwater.

The natural **channel** to the city wharves, which was narrow and shallow in places, has been improved, under the supervision of the United States Engineers, by dredging a cut 20 feet deep and 400 feet wide from the deep water of the Sound to the Canal dock and thence 20 feet deep and 300 feet wide to Tomlinson bridge.

Above Tomlinson bridge a channel 12 feet deep and 200 feet wide has been dredged in the Quinnipiac River about ½ mile to Ferry Street bridge, and thence there is a channel 6 feet deep and 50 feet or more in width about ½ mile farther to Grand Avenue bridge. A channel 12 feet deep and 200 feet wide has been dredged up the Mill River to above Chapel Street bridge, and thence 12 feet deep and 75 feet wide to Grand Avenue.

An 18-foot channel has been dredged through the flats south of Long wharf to the dock, and a 9-foot channel to the wharves at Oyster Point and West Haven.

The depth to be found at some of the more important wharves are as follows: Steamboat wharf, 18 feet; Belle dock, 14 feet; City dock, 12 feet; Canal wharf, 14 feet—all at mean low water.

Oyster grounds, marked off by stakes, occupy the flats on either side of the channel below Fort Hale, and also reach a considerable distance outside of the entrance; stake buoys mark the outer grounds.

Prominent objects.—With a favorable light the old lighthouse tower on the eastern point at the entrance is the best-defined object seen when approaching in the daytime. Outside of this are Southwest Ledge and Outer Breakwater lighthouses (see page 14) and the breakwaters (see description). When well in toward the entrance the Soldiers' and Sailors' Monument on the summit of East Rock is well defined in clear weather, showing above the outline of the hills northward of the harbor.

Range.—The coal elevator just to the left of the bridge at the head of the harbor, kept directly under the Soldiers' and Sailors' Monument on East Rock, forms the range for standing up the harbor through the dredged channel until abreast Fort Hale. The direction of this range is 5° true (**N** by **E** ⅜ **E** mag.).

The coal elevator can not be readily recognized by a stranger.

Pilots are not needed and are not generally taken except by vessels subject to compulsory pilotage (foreign vessels and vessels sailing under register). There are licensed pilots, and one can be obtained, if desired, by making signal when off the entrance. Extracts from laws relating to pilots and pilotage are given in Appendix II.

Towboats are used by sailing vessels, and can always be had by making signal; only a small proportion of the vessels entering for anchorage take a towboat.

Anchorage.—Vessels seeking shelter anchor anywhere on either side of the channel from just inside the breakwaters up to Fort Hale. **Morris Cove** affords good anchorage, and is used by yachts.

There is an anchorage 600 feet wide with a depth of 20 feet on the east side of the dredged channel for a distance of over ½ mile above Fort Hale.

Many vessels, especially those bound to the city, anchor in 16 feet on the west side of the dredged channel above Shag Bank buoy (spar, black, No. 5), between the buoy and Long wharf.

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*Shown on charts **362**, scale $\frac{1}{20,000}$, price $0.20; **115**, scale $\frac{1}{80,000}$, price $0.50.

Above the Canal wharf (the next large wharf above Long wharf) is an anchorage in 12 feet used by small craft. Large yachts often anchor at the 16-foot anchorage below Long wharf.

There are no special regulations prescribing the limits within which vessels must anchor, except that the dredged channel must be left clear. The extreme upper part of the harbor off the wharves is under the immediate supervision of the harbor master, who gives his attention to the berthing of vessels when necessary, in order to keep a clear channel for the steamers. **Harbor regulations** are not strictly defined except as just indicated (see Appendix II). The harbor master's headquarters are at the Belle dock just below Tomlinson bridge.

Quarantine regulations are adopted when any special necessity arises. Ordinarily vessels are not boarded; but those having sickness on board, or coming from an infected port, must not go above the innermost black buoy (Shag Bank buoy, spar, No. 5) until boarded by the health officer, to whom such vessels can be reported through any tug which may pass. (See also Appendix II.)

Supplies.—Coal, water, provisions, and some ship-chandler's stores can be obtained. Water is taken from tugs and steam water boats.

Hospitals.—The nearest United States Marine Hospital is at Staten Island, New York. There is a relief station (Class III) of the Public Health and Marine-Hospital Service at New Haven. (See Appendix IV.)

Bridges.—At the head of the harbor proper is Tomlinson bridge, width of draw 84 feet; about ¼ mile above this, and crossing Mill River, is Chapel Street bridge, width of draw 60 feet; about ⅓ mile farther up is Grand Avenue bridge, the head of navigation on Mill River.

Quinnipiac River is crossed by two bridges; the first, about ½ mile above Tomlinson bridge, has a draw 76 feet wide; the second, about ½ mile farther up, is the head of navigation on the Quinnipiac River.

Storm warning displays of the United States Weather Bureau are made at the old light-tower at the entrance to the harbor and at the city of New Haven.

Steamboat and railroad communication.—Steamboats run daily between New York and New Haven, and the N. Y., N. H. & H. R. R. enters and passes through the city.

Ice generally obstructs navigation to a considerable extent from December to March, frequently extending to the mouth of the harbor. During this period it is very often necessary for sailing vessels, bound in or out, to employ towboats. Steamers can generally enter and depart, unless the ice is exceptionally thick. (See also page 58.)

In New Haven Harbor northerly winds have a tendency to clear the harbor of ice if the formation is sufficiently light; southerly winds are apt to force in drift ice from the Sound.

For **variation of the compass,** see page 22.

Lists of lighthouses and storm warning display stations, with other general matters, will be found on pages 9–25.

Tides, see page 24.

The **tidal currents** have a velocity of about 1 mile at strength and should be considered in approaching and entering. Coming from westward, when well up with the entrance, the current sets across the course, and must be allowed for. Farther in, the ebb is somewhat affected by the dike on the western side of the channel, and has a tendency to set a vessel over on the eastern side of the channel.

SAILING DIRECTIONS, NEW HAVEN HARBOR.

The following directions are available at low water for vessels of 17 feet draft bound up to the city. They are therefore frequently available, according to the stage of the tide, for vessels of greater draft. Vessels of less than 23 feet draft can find shelter behind the breakwaters; if of over 18 feet draft, they should anchor behind the western end of the Luddington Rock Breakwater or behind the West Breakwater.

Vessels of less than 16 feet draft can anchor behind any of the breakwaters by following the directions.

1. ***Approaching from Eastward, to enter between the East and Luddington Rock breakwaters.—I. From a position Southward of Falkner Island.***—With Falkner Island lighthouse bearing 350° true (*N* mag.), distant 1 to 2 miles, steer 270° true (**W** by **N** mag.) for about 9 miles. Southwest Ledge lighthouse should then be on some bearing between 307° true (*NW* ¼ *N* mag.) and 327° true (*NNW* mag.), distant 3 to 4 miles.

Then steer for Southwest Ledge lighthouse on a bearing northward of 307° true (*NW* ¼ *N* mag.). Pass 150 to 300 yards westward of the lighthouse and proceed as directed in section 2. The depth until past the lighthouse should not be less than 21 feet.

Remarks.—The courses given lead well clear of all dangers. Falkner Island lighthouse, Goose Island, Branford Reef beacon, and Townshend Ledge buoy (spar, red and black horizontal stripes) are well off on the starboard hand. The breakwaters (see Breakwaters, page 94) will be plainly visible as Southwest Ledge lighthouse is approached. On a clear day the **monument** on **East Rock**, the latter a high hill inshore of the head of New Haven Harbor, will be seen.

II. Approaching closer along shore.—Pass about ½ mile southward of Branford Reef beacon and about 400 yards southward of the gas buoy, and steer 276° true (**WNW** ½ **W** mag.) until Southwest Ledge lighthouse bears northward of 307° true (*NW* ¼ *N* mag.). Then steer so as to pass 150 to 300 yards westward of the lighthouse, and proceed as directed in section 2.

Remarks.—On the 276° true (**WNW** ½ **W** mag.) course Southwest Ledge lighthouse should be on the starboard bow and the west end of Luddington Rock Breakwater ahead; the course leads about ½ mile northward of Townshend Ledge buoy (spar, red and black horizontal stripes) and about ⅝ mile southward of Round Rock buoy (nun, red, No. 12).

The course, when heading up so as to pass a little westward of Southwest Ledge lighthouse, leads between the lighthouse and Luddington Rock Breakwater. The monument on East Rock should be opened out a little westward of Southwest Ledge lighthouse. As the entrance is approached a great number of oyster stakes will be passed.

Dangers.—**Branford Reef**, **Townshend Ledge**, and **Round Rock** are described on page 71.

1 A. ***Approaching from Westward, to enter between the East and Luddington Rock breakwaters.***—Pass 1 to 2½ miles northward of Stratford Shoal (Middle Ground) lighthouse and steer 51° true (**NE** by **E** ½ **E** mag.). Vessels drawing 16 feet or more should give Stratford Point lighthouse a berth of 3 miles while it bears between 40° true (*NE* ½ *E* mag.) and 12° true (*NNE* mag.). On the flood, guard against a northerly set when eastward of Stratford Point.

When Southwest Ledge lighthouse bears 12° true (**NNE** mag.) steer for it. This course leads eastward of some 18-foot spots lying on the western side of the entrance between the breakwaters. When Southwest Ledge lighthouse is about 500 to 600 yards distant, haul northward, passing 150 to 300 yards westward of it, and proceed as directed in section 2.

Vessels of 14 feet or less draft may pass northwestward of West and Luddington Rock breakwaters, by following the line of Luddington Rock Breakwater at a distance of less than ¼ mile when inside of it and until clear of its eastern end.

Remarks.—The 51° true (**NE** by **E** ½ **E** mag.) course leads well southward of Charles Island (Milford Harbor), Cedar Point, and Pond Point, and the buoys placed off them. Coming from westward by day, the old lighthouse tower (white) on Five Mile Point will be the first conspicuous mark at New Haven entrance, and should be made on the port bow. Southwest Ledge lighthouse (see page 14) will be made southward of the old tower, and Outer Breakwater lighthouse will be seen westward of the former.

The eastern end of Luddington Rock Breakwater should be given a berth of over 500 yards to avoid some 17 and 18 foot spots which lie off the breakwater.

1 B. ***Approaching from Southward or Westward, to anchor behind the breakwaters.***—Being eastward of Stratford Point lighthouse, stand for Outer Breakwater lighthouse on any bearing northward of 60° true (*ENE* ¼ *E* mag.), and pass eastward of it.

Give the ends of the breakwaters a berth of over 60 yards, and come to anchor behind the breakwater that affords the best lee.

Remarks.—These directions are good either in the daytime or at night and lead clear of all dangers.

2. ***Entering and Standing up the Harbor.***—With Southwest Ledge lighthouse bearing 80° true (*E* mag.), distant about 300 yards, steer 5° true (**N** by **E** ⅜ **E** mag.); the monument on East Rock should be ahead and in range with the coal elevator, which will be seen under the monument and a little to the left of Tomlinson Bridge (a chimney just to the left of the elevator may be used as the front object of the range). This should lead fair up the channel, leaving the three red spar buoys, marking the eastern edge of the dredged

channel, on the starboard hand. Party Bar buoys (can, black, No. 3), and gas buoy (white light with eclipses) in summer, are left about 300 yards on the port hand.

When Fort Hale buoy (spar, red, No. 6) is on the starboard beam, distant 50 yards, steer about 354° true (**N** ⅜ **E** mag.), heading for the red, skeleton tower on the end of Long wharf, and leave two red spar buoys (Nos. 8 and 10) about 60 yards on the starboard hand if going to the wharves. Anchor in 20 feet of water on the east side of the channel about ¼ mile above red spar buoy No. 6, or on the west side of the channel between Shag Bank buoy (spar, black, No. 5) and the end of Long wharf, in 16 feet (low water), soft bottom.

To anchor behind the breakwaters.—Vessels of less than 16 feet draft round the ends of the breakwaters, giving them a berth of at least 60 yards, and anchor behind the one that affords the best lee, but do not enter around the east end of the East Breakwater. After rounding the western end of the East Breakwater do not stand over ¼ mile eastward of Southwest Ledge lighthouse; this is to avoid Old Head Reef.

To anchor in Morris Cove.—On the 5° true (**N** by **E** ⅜ **E** mag.) course, when Adams Fall buoy (nun, red and black horizontal stripes) is off the starboard beam, haul eastward, course about 28° true (**NE** ⅝ **N** mag.), heading for Forbes Bluff, which lies eastward of Fort Hale, giving the shore of Five Mile Point a berth of 300 yards or more. Anchor in 10 to 14 feet of water anywhere in the cove between Five Mile Point and Fort Hale, keeping clear of the fish weirs.

Remarks.—Below Fort Hale oyster stakes and oyster buoys are found in places near the channel and on the flats. The eastern edge of the channel above Fort Hale shoals abruptly to 3 and 4 feet and is marked by two buoys (spars, red, Nos. 8 and 10).

Dangers.—**Quixes Ledge** is crossed by the East Breakwater, but extends about 200 yards in a southeasterly direction from the northeastern end of the breakwater; it is a danger only for the vessels entering the harbor around the eastern end of the East Breakwater. There are numerous dangers in the passage east of the East Breakwater, and it should not be attempted by a stranger.

Old Head Reef, lying about 500 yards northwestward from the eastern end of the East Breakwater, has 7 to 9 feet over it and is not marked.

West Haven Flats, with 6 to 8 feet over them, extend out 1 mile from the shore on the western side of the entrance. A buoy (spar, black, No. 1) is placed near the southeastern edge of the 12-foot curve, ⅞ mile 299° true (**NW** ½ **W** mag.) from Southwest Ledge lighthouse.

Adams Fall, about ½ mile 8° true (**N** by **E** ⅝ **E** mag.) from Southwest Ledge lighthouse, is a rocky ledge about 120 yards in diameter, and has a least depth of 5 feet, with 17 feet or more all around it; a buoy (nun, red and black horizontal stripes) is placed off the western side of the ledge.

Party Bar is the name given to the part of West Haven Flats which extend eastward from Sandy Point. A buoy (can, black, No. 3) and in summer a gas buoy (white light with eclipses) mark the eastern edge of the bar, and are about 225 yards from the western edge of the dredged channel.

Black Rock lies about ⅛ mile from the northern shore of Morris Cove; it is bare at low water. Off the eastern edge of the dredged channel, abreast of Fort Hale, and at the south end of the 20-foot anchorage, is placed a spar buoy (red, No. 6).

Shag Bank is the long spit, bare at low water, making northeastward from Sandy Point; off its northeastern end, on the west side of the 16-foot anchorage, is placed a spar buoy (black, No. 5).

GENERAL REMARKS ON APPROACHING NEW HAVEN HARBOR AT NIGHT.

A stranger should not attempt to go up to the city at night, nor should a stranger of over 18 feet draft enter between Southwest Ledge lighthouse and Luddington Rock Breakwater.

When Southwest Ledge lighthouse is made it may be safely approached on any course from 23° true (**NE** by **N** mag.) through north to 316° true (**NW** by **N** mag.) until nearly up with it. If beating, vessels, when eastward of the entrance, should go about before entering the red rays of Southwest Ledge lighthouse, and if of over 15 feet draft keep a lookout for Townshend Ledge buoy. The red rays of the lighthouse cover Branford Reef and other dangers eastward of the entrance.

Pass 200 to 400 yards westward of Southwest Ledge lighthouse, and steer about 350° true (**N** mag.), keeping a good lookout for Adams Fall buoy on the starboard bow, and anchor in 21 feet about ⅜ mile northwestward of the lighthouse. If Adams Fall buoy can be seen, vessels drawing 12 feet or less, after passing westward of it, can steer 18° true (**NNE ½ E** mag.) about ¾ mile, coming to at the mouth of Morris Cove in 13 to 16 feet. Or, if desiring to anchor behind the breakwaters, see the directions under section 2 preceding.

MILFORD HARBOR.*

This is a bight on the north side of Long Island Sound, about 6½ miles westward of Southwest Ledge lighthouse (New Haven entrance) and about 3½ miles northeastward of Stratford Point lighthouse. The harbor affords anchorage in 6 to 14 feet, sheltered from all but southerly and southeasterly winds. Welchs Point is the eastern point at the entrance. **Charles Island**, at the western side of the entrance, is low, irregular in shape, and covered with scrubby trees near its northern end.

Milford River, or Wepowage River, a narrow, shallow stream, empties into the head of the harbor. On the eastern side of the mouth of the river a jetty, with a light at its end, has been constructed. A channel 10 feet deep and 100 feet wide has been dredged across the bar to Merwins wharf, and this is marked off its entrance by a buoy (black and white perpendicular stripes).

The depth of water in the channel above Merwins wharf to the town dock is about 6 feet for a width of about 40 feet. The deepest draft vessels entering the river at high water is 12 feet, and the usual draft not more than 8 feet. There is 10 feet at low water alongside the wharf, where water, through hose, can be obtained, and some coal for small steamers can also be procured.

Milford, a town on the Milford River, is about ¾ mile above the mouth. It is of little commercial importance. The principal trade is in coal and oysters. Vessels of 10 feet draft can go as far as Milford at high water; there is 6 feet at the town dock at low water.

Towboats.—Strangers and vessels bringing cargoes usually take a towboat. Tugs can be had at New Haven or Bridgeport. Vessels desiring a pilot anchor in the harbor and signal, when a pilot will come out from Merwins wharf.

Tides.—The mean rise and fall of tides is 6.6 feet; high water occurs 10m. earlier, and low water 31m. earlier, than at Willets Point.

SAILING DIRECTIONS, MILFORD HARBOR.

These directions are available to the anchorage for vessels drawing 12 feet or less. Vessels drawing 13 feet or more should give Stratford Point more of a berth than is here indicated by the directions for approaching from westward. Strangers should not enter the river without a pilot.

1. ***From Eastward.***—With Southwest Ledge lighthouse bearing 350° true (*N* mag.), distant about 1 mile, steer 254° true (**W ½ S** mag.) for about 6 miles; Charles Island should then be between ½ and ¾ mile distant on the starboard bow. Then steer 327° true (**NNW** mag.), and when inside Welchs Point anchor, according to draft, about midway between Charles Island and the eastern shore.

Or, passing 1¾ miles southward of Falkner Island lighthouse, make good a 271° true (**W** by **N** mag.) course for 17½ miles; when Welchs Point bears about 1° true (**N** by **E** mag.), stand in, course about 327° true (**NNW** mag.), and anchor as directed in the preceding paragraph.

Remarks.—Charles Island will be made a little on the starboard bow. As Welchs Point is approached, the buoy off Pond Point and the buoy off Welchs Point will be left on the starboard hand.

On the 327° true (**NNW** mag.) course the jetty, with a light at its end, at the head of the harbor will be on the starboard bow, and the course leads about midway between the buoy (spar, red, No. 16) off Welchs Point and the buoy (spar, black, No. 1) east of Charles Island. There are a number of oyster stake buoys off the entrance and in the harbor.

* Shown on charts **263**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each $0.50.

Dangers.—**Pond Point Shoal** extends about ⅜ mile southward from Pond Point, and is marked at its southern end by a buoy (spar, red, No. 14).

Welchs (Cedar) Point Reef extends ⅜ mile southward from Welchs Point, and is marked at its southern end by a buoy (spar, red, No. 16).

Charles Island Rocks is the name given to the rocky shoal extending southward for ⅜ mile and eastward about 200 yards from Charles Island; the southern side of these rocks is marked by a bell buoy (black, No. 1 C. I.).

About 250 yards northeastward of Charles Island a buoy (spar, black, No. 1) is placed on the eastern end of the shoal which makes out eastward from Charles Island.

1 A. ***From Westward.***—Pass about 1½ miles south of Stratford Point. When Stratford Point lighthouse bears 350° true (*N* mag.), distant 1½ miles, steer 35° true (**NE** mag.), pass ½ mile southeastward of Charles Island, giving the bell buoy a berth of over 200 yards, and then haul northward. Pass midway between the buoy (spar, black, No. 1) off the eastern end of Charles Island and the buoy (spar, red, No. 16) off Welchs Point and steer about 327° true (**NNW** mag.); anchor, according to draft, as directed in section 1.

Remarks.—On the 35° true (**NE** mag.) course Charles Island will be made on the port bow, and Welchs Point will be seen open southward of the island and on the port bow. As Charles Island is approached, the harbor will be opened out and the jetty at the head of the harbor will show distinctly. There is a post on the west end of the jetty, from which a light is shown (see table, page 14).

Dangers.—**Stratford Point Shoal** is described on page 65.

Other dangers to be considered are mentioned under section 1 foregoing.

HOUSATONIC RIVER.*

The mouth of this river is about 4 miles eastward of Bridgeport entrance and on the eastern side of Stratford Point.

There are a number of bars in the river and one at the entrance. Under Government appropriations a breakwater has been built extending from Milford Point about 5,750 feet in a southerly direction; a light marks the end of this breakwater. Dredging has also been done to increase the depth across the bar and in the river. In 1908 the depth on the bar at the entrance was 8 feet in a channel 200 feet wide, and from the entrance to Derby the depth was 6 feet in a channel having a width less than 100 feet in places.

The river is navigable for a distance of 13 miles above the entrance, to the towns of Derby and Shelton, but the channel is narrow and crooked and the currents strong and irregular; sailing vessels are obliged to take a towboat to pass above Stratford.

About 2½ miles above its entrance the river is crossed by a footbridge (width of draw 50 feet); ¼ mile above the footbridge a railroad bridge crosses the river (width of draw 70 feet).

Stratford, a town of little commercial importance, is on the western bank, a little over 1 mile above the entrance.

Derby, a town on the eastern bank of the river, 13 miles above the entrance, is of little importance.

Shelton, a town on the western bank of the river, and connected with Derby by two bridges, has many important manufactories. Coal and lumber are brought here in sailing vessels and barges; a steamer runs to New York in the summer. Vessels of 9 feet draft can go up as far as Derby and Shelton at high water, and there is 6 feet alongside the wharves at low water.

Prominent objects.—Stratford Point lighthouse (see table, page 14), is a guide to the entrance. A large granite day beacon, with shaft and ball, is located about ⅝ mile northward from the lighthouse, and westward of the dredged channel into Housatonic River.

The **anchorage** outside the bar affords no protection against storms; vessels only anchor here to wait for a pilot or for a favorable tide to cross the bar.

Pilots and towboats.—All strangers, if bound to Stratford, take either a pilot or a towboat. If bound to Derby or to Shelton they take a towboat, generally anchoring outside of Bridgeport, as it is the nearest place from which one can be obtained. Vessels desiring a pilot anchor outside the bar and signal, when one will come out from Stratford.

The **currents** in the river and at the entrance have considerable velocity, making local knowledge necessary to keep in the channel. **Freshets** occur in the river in March and April. **Ice** obstructs navigation during the winter, usually above Stratford, but sometimes to the entrance.

Tides.—See heading "Milford Harbor."

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*The lower part of Housatonic River falls within the limits of charts **264**, scale $\frac{1}{10,000}$; **115**, scale $\frac{1}{80,000}$, price of each, $0.50.

GENERAL DIRECTIONS, APPROACHING HOUSATONIC RIVER.

From Eastward.—Steer for Stratford Point lighthouse on any bearing from 237° true (**WSW** mag.) to 339° true (**N** by **W** mag.). Keep at least ½ mile distant from the lighthouse, and anchor in 20 to 25 feet outside the buoys, with the lighthouse bearing about 260° true (*W* mag.), distant ¾ mile.

From Westward.—Pass at least 1½ miles south of Stratford Point, and when eastward of the line of Stratford Point lighthouse and Stratford Shoal (Middle Ground) lighthouse haul northward. Give Stratford Point lighthouse a berth of at least ½ mile, and anchor as directed in coming from eastward.

Vessels drawing 13 feet or more should give Stratford Point a much wider berth than is here indicated.

The entrance to the channel across the bar is marked by a buoy (can, black and white perpendicular stripes), and a number of red buoys mark the channel, but strangers should not attempt to enter without a pilot.

PORT JEFFERSON HARBOR.*

This harbor, on the south shore of Long Island Sound, opposite Bridgeport, Conn., and just eastward of Old Field Point, is one of the best protected in the Sound, but is seldom used by vessels seeking shelter only, as the narrow entrance between the jetties requires a favorable wind or current for sailing vessels; the tidal current has great velocity at the entrance, and no sailing vessel can beat through the entrance against it.

Inside the entrance the harbor is 1½ miles long and about ¾ mile wide at its widest part, and is surrounded by high hills on three sides, the northern side being protected by two low points of land, between which is the narrow opening affording a passage from the Sound into the harbor.

The deepest draft of vessels entering the harbor is about 16 feet; at ordinary low water a draft of 10 feet can be carried through the channel between the jetties; 13 feet can be taken to the end of Darling Dock, Port Jefferson, at low water.

Port Jefferson, at the southern end of the harbor, is on a branch of the Long Island Railroad, and has direct communication with New York City. The principal industry is ship building and repairing, for which there are excellent facilities. Many vessels come here for repairs, and yacht owners find it a desirable place to lay up their vessels in the winter and to refit in the spring. Port Jefferson has some trade in coal, wood, lumber, and general merchandise, carried both by strangers and by vessels owned in the vicinity, the size of vessels ranging from 50 to 600 tons. A steamer carrying freight and passengers runs daily during the summer to Bridgeport, Conn., and makes occasional trips in winter.

Adjacent waters.—Conscience Bay, a shallow tidal basin off the northwestern part of Port Jefferson Harbor, is of no importance, and can only be entered by small boats. **Setauket Harbor** is a shallow inlet making into the western part of Port Jefferson Harbor; a narrow, crooked channel, with about 2 feet at low water in its shoalest part, leads from Port Jefferson Harbor to the village of **Setauket**, on the south shore of Setauket Harbor, about 1 mile above the entrance.

Prominent objects.—Old Field Point lighthouse marks the western approach to the harbor, and **Mount Misery** the eastern; the latter is a hill 180 feet high, sloping gradually toward the Sound and breaking off abruptly at the waters edge, leaving a bare bluff about 60 feet high with a very large bowlder near high-water mark.

Two jetties of riprap, the eastern about 300 yards long, the western 250 yards long, extend in a northerly direction from the entrance. Two lights form a range to lead up to the entrance between the jetties, but not through the channel. The East Breakwater light is on the north end of the east jetty, and the West light is on the low gravelly point on the west side of the entrance inside the jetties (see table, page 14).

The **channel** into Port Jefferson Harbor, between the two jetties, is narrow; it was dredged to a width of 200 feet and depth of 12 feet, but there are small spots with 11 feet over them, and the channel has narrowed slightly. A channel buoy (spar, black and white perpendicular stripes) is placed outside the jetties, and the eastern edge of the channel inside the entrance is marked by a buoy (spar, black, No. 1).

Anchorage in 9 to 10 feet, soft bottom, will be found close to the town; 21 to 27 feet, soft bottom, will be found ¾ mile from the head of the harbor.

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* Shown on charts **361**, Port Jefferson, scale $\frac{1}{10,000}$, price $0.30; **115**, **116**, scale $\frac{1}{80,000}$, price of each $0.50.

Pilots.—Strangers in a sailing vessel are advised to take a pilot or a towboat. Vessels desiring a pilot, if the weather is fair, anchor outside and northward of the jetties and make the usual signal, when a pilot will come out to them; one can always be had in the daytime. There are no regular pilots.

Towboats.—There are no regular towboats, but the steamer running to Bridgeport sometimes tows vessels in and out, and towboats may be obtained from Bridgeport.

Supplies.—Coal in limited quantities, some ship-chandler's stores, water through pipe and hose or from water boat, and provisions can be obtained at Port Jefferson.

Repairs.—There are several marine railways, the largest capable of hauling out a vessel of 2,000 tons; some of the others are available for vessels up to 300 to 400 tons. There is a machine shop where ordinary repairs can be made; there are no facilities for large repairs to machinery of steamers nearer than New Haven or Bridgeport.

Yacht basin.—An inclosed basin, on the west shore of the harbor near its head, affords excellent facilities for laying up and fitting out yachts.

Ice.—In very cold weather the entire harbor is frozen over, but the ice does not endanger shipping in the harbor.

For **tides** see page 24.

The **tidal currents** have great velocity through the entrance between the jetties, keeping the general direction of the channel; they have an estimated velocity at strength of about 4 miles. At the anchorage in the harbor vessels swing with the wind.

GENERAL DIRECTIONS, PORT JEFFERSON HARBOR.

The following directions are good for a vessel of 9 feet or less draft at ordinary low water; strangers in a sailing vessel are advised to select slack water when entering. Strangers of over 9 feet draft are advised to take a pilot.

Give the shore of Long Island a berth of at least 1 mile and steer so as to be about 1 mile offshore when the vessel is 1 mile eastward of Old Field Point lighthouse. When the light on the end of the east jetty is sighted, steer for it on any course between 125° true (**SE** mag.) and 181° true (**S** by **W** mag.), and when Offshore buoy (spar, black and white perpendicular stripes) is sighted, steer so as to pass about 25 yards westward of it.

Or, bring Stratford Shoal lighthouse astern on a 176° true (**S ½ W mag.**) course until up to Offshore buoy.

From Offshore buoy steer about 155° true (**S** by **E ⅜ E** mag.) between the jetties, and pass about 50 yards eastward of the high-water mark of the low point on the west side of the entrance, which is marked by a light.

Continue on the course, taking care not to be set off it by the currents, and pass 50 yards westward of black spar buoy No. 1, and when 200 yards south of the buoy haul more eastward, and stand up the middle of the harbor heading for the wharves at its head. Anchor according to draft; good anchorage in 12 feet, soft bottom, is found 250 to 300 yards from the head of the harbor.

Remarks.—If the velocity of the current is great, which is the case except during a limited period of slack, special attention must be paid to the steering so as to keep in the channel, and vessels should not then attempt to pass each other while in the entrance. Near the time of low water the shoals can be seen on the starboard hand when entering and when inside the western point.

For the dangers off the entrance see the sailing directions along the south shore of Long Island Sound, section 2, page 75.

Shoals lie on both sides of the channel inside the points at the entrance, and at low water a large area of them is bare. A buoy (spar, black, No. 1) is placed to mark the southwestern end of the shoals lying on the east side inside the entrance.

BRIDGEPORT HARBOR.*

Bridgeport Harbor, on the north shore of Long Island Sound, at the mouth of the **Pequonnock River**, is nearly 15 miles westward of New Haven. It is the approach to the manufacturing city of **Bridgeport**, and during the fall and winter affords shelter to many vessels. The carrying trade by water is large; the principal cargoes are coal, lumber, and iron; most of the coal is brought in canal boats and coal boxes.

* Shown on charts **265**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

The deepest draft, loaded, of the vessels entering is 21 feet; average draft about 12 feet. At low water, vessels drawing 8 feet go as far up as the head of navigation, 1 mile above Bridgeport proper, on the Pequonnock River. At mean low water the depth alongside the railroad wharf is 12½ to 18 feet; alongside the City dock 18 feet, and alongside the wharves above the first bridge 10 and 12 feet.

Prominent objects.—The chief guides in approaching are Stratford Point lighthouse eastward and Penfield Reef lighthouse westward of the entrance; the guide to the immediate entrance is Bridgeport Harbor lighthouse (see page 14). The latter, the Outer beacon, and the Breakwater lighthouse are left on the port hand on entering. Outer beacon is a black, wooden pyramid with pole and cask on top and lies ⅜ mile northward from Bridgeport Harbor lighthouse. On the eastern side of the entrance a stone breakwater extends in a southwesterly direction from Long Beach Point, and is marked on its end by a light. On the western side a breakwater makes out in a southeasterly direction from Seaside Park. Inside these breakwaters are large flats through which a channel and anchorage have been dredged. A breakwater extends from Tongue Point to the edge of the channel and is marked at its eastern end by Bridgeport Breakwater lighthouse.

Channels.—The channel across the outer bar (marked by the lighthouse) has a depth of 18 feet and a width of 300 feet from the bar to a point about 300 yards below the railroad (Naugatuck) wharf. From this point to the lower bridge the width of the 18-foot channel is 200 feet. There is one bend in the channel, at the end of the breakwater. A mid-channel course leads midway between the ends of the two outer breakwaters and gives Bridgeport Harbor lighthouse a berth of about 100 yards, the Outer beacon a berth of about 175 yards, and leads 60 yards eastward of the lighthouse on the Tongue Point breakwater; this course leads directly for Bridgeport beacon (red pile dolphin). The eastern edge of the dredged channel is marked by two red spar buoys. The entrance channel is to be deepened to 22 feet as far as Bridgeport breakwater.

The dredged channel in the Pequonnock River for a distance of ¾ mile above the lower bridge has a depth of 12 feet and width of 100 feet. A channel 12 feet deep and 100 feet wide has been dredged from the main channel to a distance of ½ mile above Yellow Mill bridge. The dredged channel into Johnsons Creek as far as the shipyard has a depth of 9 feet and width of 100 feet.

Pilots.—Sailing vessels of more than 15 feet draft should take a pilot, unless a towboat be taken. Vessels desiring a pilot should make signal and anchor southward of the lighthouse, outside the bar, until one comes on board. Pilotage is compulsory only for foreign vessels and vessels sailing under register. See the pilot laws and rates of pilotage in Appendix II.

Towboats are always taken by large sailing vessels, and will come out if signal be made. They can be found alongside the wharves.

Anchorage.—The usual anchorage is on the western side of the channel, between Bridgeport Breakwater lighthouse and the railroad (Naugatuck) wharf; this anchorage is about 700 feet wide westward of the channel and has a depth of 18 feet. Small vessels can anchor in 12 feet for a distance of 300 yards south of Naugatuck wharf, and between the steel works and the lower bridge taking a berth on the eastern side of the channel opposite the city.

Vessels sometimes come-to outside the outer bar (marked by the lighthouse) for shelter in strong northerly winds; good holding ground will be found in 14 to 20 feet, with the lighthouse bearing about north distant ½ to ¾ mile.

It is proposed to dredge anchorages on both sides of the channel between the outer breakwaters and the breakwater extending from Tongue Point.

Harbor regulations prescribe the anchorage limits as follows: Vessels of any kind anchoring southward of the railroad (Naugatuck) wharf must anchor on the western side of the channel, leaving sufficient room for vessels to pass in and out of the harbor. Any and all vessels anchoring above the railroad wharf must anchor close to the east bank, leaving room to get under way when the wind is westward.

Quarantine regulations are issued, when necessary, by the board of health. (See Appendix II.)

Supplies, provisions, and some ship-chandler's stores can be procured at Bridgeport. Coal can be obtained in unlimited quantities for steamers; if of 15 feet draft they can take it directly from the coal yards above the first (lower) bridge by going to the wharf when the water is at or above half tide. Water can be taken through hose at the elevator dock or from a water boat.

Repairs to machinery can be made in Bridgeport. For repairs to hulls there is a shipyard and marine railway in Johnsons Creek; the railway is about 140 feet long and has a capacity of about 500 tons. (See also "Repairs" under heading "Port Jefferson Harbor.")

Hospitals.—The nearest United States Marine Hospital is at Staten Island, New York. At Bridgeport there is a relief station (Class IV) of the United States Public Health and Marine-Hospital Service. (See Appendix IV.)

Storm warning displays of the United States Weather Bureau are made at the entrance of Bridgeport Harbor.

Bridges.—Four drawbridges cross the Pequonnock River at Bridgeport. The first (lower) one is a city bridge, the second is a railroad bridge; the others are city bridges. The width of draw, in the clear, is for the first (lower) bridge about 60 feet, for the second (railroad) bridge about 70 feet, for each of the others about 50 feet.

Steamboat and railroad communication.—Steamers with passengers and freight run to New York. One steamer, passengers and freight, makes trips from Port Jefferson, Long Island, during the summer, and runs occasionally during the winter. Bridgeport is on the line of the N. Y., N. H. & H. Railroad.

Ice does not, as a rule, interfere seriously with navigation; the steamers keep the channel open.

Variation of the compass, see page 22.

Tides, see page 24.

Information concerning lighthouses, storm warning displays, tides, fogs, etc., will be found on pages 9–25.

SAILING DIRECTIONS, BRIDGEPORT HARBOR.

The following directions are available for vessels of 15 feet or less draft; it is advisable for vessels drawing more than 15 feet to have a towboat or a pilot. Vessels of over 15 feet draft should go alongside the wharves.

These directions lead through the middle of the dredged channel, and if followed closely are good for a depth of 18 feet at mean low water as far as the lower bridge. A stranger of over 12 feet draft should not attempt to enter at night without a pilot or towboat.

1. ***Approaching and Entering from Eastward.***—Pass about 2½ miles southward of Stratford Point lighthouse steering 260° true (**W** mag.), and when Black Rock lighthouse bears 305° true (**NW** mag.), steer for it on that bearing until Bridgeport Harbor lighthouse bears 350° true (*N* mag.). Then steer 339° true (**N** by **W** mag.) until it is about ¾ mile distant, and when West Flats buoy (can, black, No. 1) is made and is about ½ mile distant bring it to bear 13° true (**NNE** mag.), and steer for it on this bearing. Leave West Flats buoy about 50 yards on the port hand and continue on the 13° true (**NNE** mag.) course, heading for the red pile dolphin which will show just to the right of the lighthouse on the end of the inner breakwater.

Leave two red spar buoys about 40 yards on the starboard hand, and pass 50 to 75 yards eastward of the lighthouse on the inner breakwater. Leave the red pile dolphin 75 to 100 yards on the starboard hand, and then steer 316° true (**NW** by **N** mag.), heading for the end of the railroad (Naugatuck) wharf. Anchor on the west side of the channel a little westward of a line from the lighthouse on the breakwater to the railroad wharf. Mud flats rise abruptly on both sides of the channel.

In approaching and rounding Bridgeport Breakwater lighthouse the railroad (Naugatuck) wharf is readily distinguished; it lies about 326° true (*NNW* ⅛ *W* mag.) from the lighthouse, and has a freight shed extending to its end.

Remarks.—Standing westward and passing south of Stratford Point lighthouse, as directed, Penfield Reef lighthouse should be made on the starboard bow, and northward of it will appear Black Rock lighthouse. Bridgeport Harbor lighthouse and the spires and tall chimneys in Bridgeport will be seen farther northward and eastward.

When standing for the entrance to the dredged channel across the bar, the Outer beacon if kept on the east end of Bridgeport Harbor lighthouse and so steered for will lead to the entrance of the dredged cut and nearly up to black can buoy No. 1.

On the 316° true (**NW** by **N** mag.) course the end of the railroad (Naugatuck) wharf should be a very little on the port bow, and if passing the wharf it should be given a berth of about 30 yards.

Dangers.—**Stratford Point Shoal,** marked by a buoy (spar, red, No. 16½), is described on page 65.

Other dangers and their marks have been sufficiently indicated, and need not be described further. The entrance and harbor are occupied by flats and shoals, with the exception of the channel already described.

1 A. ***Approaching from Westward.***—Keep Penfield Reef lighthouse open a little on the port bow and pass about ½ mile or more southeastward of it, steering 40° true (**NE** ½ **E** mag.), with Bridgeport Harbor lighthouse on the port bow. When Bridgeport Harbor lighthouse bears 7° true (**N** by **E** ½ **E** mag.) and is in range with Outer beacon, steer for it on the bearing; and when West Flats buoy (can, black, No. 1) is made, bring it to bear 13° true (**NNE** mag.) and proceed as directed in section 1 preceding.

Remarks.—Approaching Penfield Reef lighthouse, Black Rock lighthouse will be made well northward of it. About ⅜ mile northeastward of Penfield Reef lighthouse is Black Rock beacon, the lighthouse and beacon marking dangers near the outer end of Fairfield Bar, which extends westward from them to the shore. These dangers are described under the heading "Black Rock Harbor." In the broad bight northeastward of Black Rock lighthouse is Bridgeport Harbor lighthouse.

BLACK ROCK HARBOR *

is a small anchorage lying between **Fayerweather Island** on the east and the mainland on the west; the entrance is marked by Black Rock lighthouse and is about 2¼ miles southwestward from Bridgeport Harbor lighthouse. Westward of Fayerweather Island the depths range from 8 to 12 feet, and the anchorage is sheltered from all but south winds. Between Fayerweather Island and Fairfield Bar is an anchorage which affords a lee in northerly and westerly winds, and is used some in the fall by coasting vessels.

Black Rock Harbor and the creeks at its head are the approach by water to West Bridgeport and its large manufactories. A breakwater connects the northern end of Fayerweather Island with the mainland eastward, and a channel 9 feet deep and 100 feet wide is dredged from the head of the harbor into Cedar Creek and into Burr Creek. The deepest draft, laden, of vessels entering the harbor for shelter is about 9 feet, average draft 7 or 8 feet. Vessels drawing 15 feet may, at high water, go to the head of navigation in Cedar Creek, and 13 feet draft in Burr Creek, but they will lie aground at low water.

Prominent objects.—On Fayerweather Island, on the eastern side of the entrance, is Black Rock lighthouse. South of the entrance is Penfield Reef lighthouse, a little southward of the eastern end of Fairfield Bar; there is no passage between this lighthouse and the western shore.

Pilots and towboats.—Pilots are not needed for the anchorage. Sailing vessels bound into Cedar or Burr creeks require a towboat, and always take one; the usual custom in such cases is to anchor in Black Rock Harbor and telephone to Bridgeport for a towboat, or one may be obtained before entering by standing well in toward Bridgeport entrance and making signal (see page 102).

Good anchorage for small vessels is found in mid-harbor, with the south end of Fayerweather Island bearing southward of 125° true (**SE** mag.); the depth here is about 9 to 11 feet, muddy bottom. Larger vessels anchor about ½ mile 215° true (**SW** mag.) from Black Rock lighthouse.

Supplies can be obtained from Bridgeport. Coal can be obtained in Black Rock Harbor, at the upper wharf, if it be clear. Vessels in need of coal or water should go to Bridgeport.

Tides.—The mean rise and fall of tides is 7.1 feet; high water occurs 6m. earlier, and low water 24m. earlier, than at Willets Point.

Ice does not form to any great extent; ordinarily there is none in the outer part of the harbor in winter.

SAILING DIRECTIONS, BLACK ROCK HARBOR.

The following directions are good for a draft of 18 feet or less to the anchorage behind Fairfield Bar, and for a draft of 9 feet to the anchorage in the harbor.

1. ***Approaching and Entering, from Eastward.***—Pass from 1½ to 2½ miles south of Stratford Point lighthouse, according to draft, and steer for Penfield Reef lighthouse. When Black Rock lighthouse bears 299° true (*NW ½ W* mag.), steer about 288° true (**NW** by **W ½ W** mag.) so as to leave the lighthouse ½ mile on the starboard hand. Leave red spar buoy No. 2 about 300 yards on the starboard hand and anchor in 18 to 20 feet of water, soft bottom, when Penfield Reef lighthouse bears about 175° true (*S ½ W* mag.).

These directions will answer for both day and night.

Vessels of 9 feet draft or less, when on the 288° true (**NW** by **W ½ W** mag.) course, can stand in until Penfield Reef lighthouse bears 181° true (*S* by *W* mag.) and then steer 1° true (**N** by **E** mag.), keeping Penfield Reef lighthouse astern. Anchor in 9 to 11 feet, soft bottom, abreast the ruins of the long wharf on the western shore of the harbor.

Remarks.—Heading for Penfield Reef lighthouse, Black Rock lighthouse (white tower; see table, page 16) will be on the starboard bow, and vessels should pass ½ mile southward of it in entering the harbor; the hotels and cottages on the western shore of the harbor will be seen back of this lighthouse.

* Shown on charts 365, scale $\frac{1}{10,000}$; 116, scale $\frac{1}{20,000}$, price of each $0.50.

With Penfield Reef lighthouse over the stern, heading 1° true (**N** by **E** mag.), Black Rock will be ahead and the harbor will be fully opened out; this course leads about 350 yards west of Point Rock Shoal buoy (spar, red, No. 2) and the same distance west of Black Rock lighthouse.

Dangers.—Point Rock Shoal extends 800 yards 187° true (**S** by **W** ½ **W** mag.) from Black Rock lighthouse, and has 15 feet on its southern end, where it is marked by a buoy (spar, red, No. 2).

Fairfield Bar is bare at low water; it extends about 1 mile in a southeasterly direction from the west shore, forming a natural breakwater against southwesterly winds.

Penfield Reef extends about 700 yards south of the eastern end of the bare part (at low water) of Fairfield Bar; it is marked by a lighthouse (see table, page 16).

Black Rock lies 600 yards 46° true (**NE** by **E** mag.) from Penfield Reef lighthouse, and is marked by a beacon (iron piles with large cage, red).

The Cows are a cluster of rocks lying off the end of Fairfield Bar.

The Little Cows are a cluster of rocks, some bare at low water, lying about 300 yards north of Black Rock beacon. The shoal extends from these rocks to Fairfield Bar.

A rock with 6 feet over it lies about 250 yards southward from the end of the ruins of the long wharf in Black Rock Harbor, and 250 yards from the western shore.

1 A. ***Approaching and Entering, from Westward.***—Keep Penfield Reef lighthouse a little on the port bow, steering about 57° true (**ENE** mag.). Pass about ½ mile south of this lighthouse, and continue eastward until Black Rock lighthouse bears 344° true (**N** ½ **W** mag.); then steer for Black Rock lighthouse on this bearing until Penfield Reef lighthouse bears 215° true (*SW* mag.); then steer 299° true (**NW** ½ **W** mag.) and anchor in 18 to 20 feet, soft bottom, when Penfield Reef lighthouse bears 175° true (**S** ½ **W** mag.). These directions will answer for both day and night.

Vessels of 9 feet draft or less can follow the above directions until Penfield Reef lighthouse bears 181° true (*S* by *W* mag.). Then steer 1° true (**N** by **E** mag.) and anchor in 9 to 11 feet, soft bottom, abreast the ruins of the long wharf on the western shore of the harbor.

Remarks and dangers.—Approaching Penfield Reef lighthouse, Black Rock Harbor and lighthouse will be seen over Fairfield Bar. Black Rock beacon (iron piles with large cage on top, red) will be seen northeastward of Penfield Reef lighthouse. The 344° true (**N** ½ **W** mag.) course for Black Rock lighthouse leads 700 yards eastward of Black Rock beacon.

Shoal water makes off ¾ mile southwestward along Fairfield Bar.

Other dangers are described under section 1 foregoing.

SMITHTOWN BAY.*

This broad, open bight, on the south side of Long Island Sound, makes into the Long Island shore westward of Crane Neck Point. The bay is about 7 miles long in an east and west direction, and indents the shore 1½ to 2 miles; the shore has shoals making out to a distance of 1 mile in several places, the water shoaling abruptly from 7 fathoms to 18 feet.

A good summer anchorage in 5 to 8 fathoms, sheltered from easterly winds, is found about 1 mile southward of Crane Neck Point; in strong westerly or northwesterly winds it is unsafe, and vessels anchored here get under way on the first indications of such winds.

Stony Brook Harbor is a shallow bay in the southeastern part of Smithtown Bay. The entrance is narrow and obstructed by a shifting sand bar, having 2½ feet at low water. The channel inside the bar is narrow and crooked, and the tidal currents tend to set a vessel on the shoals. Strangers bound into the harbor take a pilot, anchoring, with the pilot signal flying, 1 mile from the shore in 6½ to 8 fathoms, with Stony Brook Church spire bearing 147° true (**SSE** mag.). A short distance inshore from this position the water shoals abruptly from 6½ fathoms to 6 feet. A pilot will come out from Stony Brook to a vessel making signal.

The village of **Stony Brook**, ½ mile above the entrance, is of little importance; it has some trade in firewood. The deepest draft that can be taken in at high water does not exceed 9 feet; the usual draft entering is not more than 7 feet; there is from 2 to 6 feet alongside the wharves.

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*Shown on chart **116**, scale $\frac{1}{80,000}$, price $0.50.

Nissequague River is a shallow, crooked stream, the mouth of which is about 4 miles westward of Stony Brook. This river can be entered only at high water, on account of the shoals which extend 1 mile northward from the entrance, with 1 to 4 feet over them at low water. About 1 mile northward of the entrance the water shoals abruptly from 6 fathoms to 6 feet. **Nissequague**, a village about ½ mile above the entrance, is of little importance; only small craft trade there. Strangers bound in must take a pilot.

Tides.—The mean rise and fall of tides at Nissequague is 6.7 feet; high water occurs 5m. earlier, and low water 20m. earlier, than at Willets Point.

Information concerning lighthouses, tides, fog, variation of the compass, etc., will be found on pages 9–25.

SOUTHPORT HARBOR.*

This is a shallow bight on the north side of Long Island Sound, about 3 miles westward of Penfield Reef lighthouse between Kensie Point on the east and Frost Point on the west. It is at the entrance of Mill River, a narrow, shallow stream which empties into its northern part. A breakwater has been built, from the eastern shore at the entrance of the river, extending in a southwesterly direction to the inner beacon. Improvements are in progress to dredge a channel 100 feet wide and 6 feet deep to the upper wharves. In 1908 the channel had a width of 75 to 100 feet and a depth of 6 feet from the 6-foot depth outside the outer beacon to the turn above White Rock, and 40 to 60 feet wide up the east branch to the dock front. This channel leads 190 feet eastward of the outer beacon and 65 feet westward of the inner beacon.

Southport, a village inside the entrance to the river, has some trade in coal and produce; provisions can be obtained here. The deepest draft of vessels going to Southport is about 11 feet.

Beacons.—The entrance is marked by two large granite beacons, the outer one with iron shaft and ball, the inner one with wooden spindle and red cask.

The **anchorage** outside the breakwater for vessels bound to Southport is southward of the outer beacon. This anchorage is sheltered only from northerly winds and is not much frequented; Black Rock Harbor and Bridgeport Harbor afford better shelter.

Pilots and towboats.—Strangers entering the river bound to Southport generally take a pilot or a towboat. Pilots can be obtained off the entrance, vessels anchoring outside the beacons with signal set until boarded by one. Towboats can be obtained at Bridgeport.

Ice closes the river to the entrance, during the winter, in very cold weather.

Tides.—See heading "Westport Harbor."

SAILING DIRECTIONS, SOUTHPORT HARBOR.

The directions are good to the entrance for any draft that can be taken to Southport. A stranger should employ a pilot if bound to Southport.

1. ***From Eastward.***—Steering 262° true (**W ¼ N** mag.), pass about ½ mile south of Penfield Reef lighthouse and about ¼ mile south of Pine Creek Point buoy; this buoy is about 2 miles westward of Penfield Reef lighthouse. When the buoy is cleared, steer 293° true (**NW by W** mag.) until the two beacons, which will be seen on the starboard bow, are in range. Then stand for the beacons and anchor southward of the outer beacon, in 12 to 18 feet, and if bound in take a pilot. The water shoals abruptly inside of 10 feet.

Pine Creek Point Shoal extends about ⅝ mile southward of Pine Creek Point, and is marked at its southern end by a buoy (spar, red, No. 18); this rocky shoal is bare in places at low water. The water shoals rapidly from 12 to 6 feet off the western side of Pine Creek Point.

1 A. ***From Westward.***—Passing ¾ mile or more southward of Greens Ledge lighthouse, make good a 66° true (**ENE ¾ E** mag.) course for 5¾ miles; Cockenoe Island Shoal buoy (bell, red, No. 20) should then be on the port beam, distant ⅝ mile or more.

From abreast this buoy, head for the outer beacon at Southport entrance, course about 26° true (**NE ¾ N** mag.); this course leads nearly ¾ mile southeastward of Frost Point, off

* Shown on charts **266**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$; price of each $0.50.

which rocky heads, bare at low water, extend for ¼ mile. Anchor in 12 to 18 feet southward of the outer beacon.

The shoals and dangers extending eastward and southward from Norwalk Islands are described on page 73.

WESTPORT HARBOR.*

This harbor, at the entrance to the Saugatuck River, on the north shore of Long Island Sound, is about 6 miles westward of Penfield Reef lighthouse and 5¾ miles eastward of Greens Ledge lighthouse. The harbor is exposed to southeasterly winds. The entrance to the Saugatuck River is between two low and marshy points, fringed with a sand beach, the eastern one (Cedar Point) being rocky off its extreme southern end.

Saugatuck is a village about 2 miles above the mouth of the river, on the line of the N. Y., N. H. & H. Railroad.

Westport, a town at the head of navigation, about 2 miles above Saugatuck, has several manufactories and has some trade by water. The depth on the bar at the entrance to the river, at mean low water, is 6 feet. The deepest draft of vessels entering the harbor is 10 feet; in 1908 a draft of 10 feet could be taken up to Westport at high water through a dredged channel 40 to 60 feet wide.

Pilots, etc.—Strangers generally take a pilot outside of the harbor; oystermen, who usually pilot vessels in, can almost always be found outside. If a pilot is not found outside, an anchorage is made southeastward of Cedar Point. Pilotage is not compulsory. The harbor and river are not buoyed, and there are no artificial aids to assist strangers in entering. The channel in the river is narrow and crooked.

Towboats can be had at Bridgeport and sometimes at Norwalk, but are seldom used except by canal boats.

Supplies.—Provisions, etc., can be obtained at Saugatuck and Westport.

Freshets sometimes occur in February, when the mill ponds break up. **Ice** forms in winter the whole length of the river to its mouth.

Tides.—The mean rise and fall of tides is 7.1 feet; high water occurs 8m. later and low water 10m. earlier than at Willets Point.

SAILING DIRECTIONS, WESTPORT HARBOR.

These directions are available for vessels drawing 9 feet or less.

1. ***From Eastward.***—Passing ½ mile south of Penfield Reef lighthouse, steer 263° true (**W ¼ N** mag.) and pass south of Pine Creek Point Shoal buoy. Continue the 263° true (**W ¼ N** mag.) course for about 3¾ miles farther, until Cedar Point bears 305° true (*N W* mag.); then, being about ⅜ mile distant from the rocks off Cedar Point, anchor in 15 to 24 feet.

Remarks.—On the 263° true (**W ¼ N** mag.) course, when past Penfield Reef lighthouse, Pine Creek Point Shoal buoy (spar, red, No. 18) will be made on the starboard bow. As this buoy is approached the beacons in the head of Southport Harbor will be opened out northward. Passing Southport Harbor, the entrance to the Saugatuck River will be made ahead, and Cedar Point (low and marshy, with a large pile of rocks off its southern end) will be a little on the starboard bow. Cockenoe Island (one of the largest of the Norwalk Islands) will be on the port bow. Penfield Reef and Pine Creek Point Shoal are described on pages 72, 73.

The points along the north shore westward of Southport should receive a berth of over ⅜ mile, as shoals and rocks extend out to that distance. A spot with 12 feet over it lies about ¾ mile 159° true (**S** by **E** mag.) from Sherwood Point (the first prominent point about 1¼ miles eastward of Cedar Point). To avoid this spot keep about ½ mile southward of Sherwood Point, and pass between the point and the 12-foot spot.

1 A. ***From Westward.***—When Greens Ledge lighthouse bears 350° true (*N* mag.), distant about ¾ mile, steer 66° true (**ENE ¾ E** mag.) for 5¾ miles; Cockenoe Island Shoal buoy (bell, red, No. 20) should be on the port beam, distant about ½ mile. When abreast this buoy, steer 12° true (**NNE** mag.) for about 1¼ miles, giving the buoy and Georges Rock (about ⅜ mile northward of the buoy) a berth of at least ¼ mile on the port hand. When the rocks on Cedar Point bear 294° true (**NW** by **W** mag.), steer for the rocks on this course, and anchor as directed under section 1 foregoing.

* Shown on charts **267**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

Remarks.—The Norwalk Islands lie well northward of the sailing line. Cockenoe Island Shoal buoy (bell, red, No. 20) will be made on the port bow, and Penfield Reef lighthouse should be made a little on the port bow. On the 12° true (**NNE** mag.) course Frost Point will be ahead, and the entrance of the Saugatuck River will be open westward of Cedar Point.

Dangers.—**Cockenoe Island Shoal.**—This is an extensive and dangerous shoal lying eastward and southward of Cockenoe Island. It has numerous rocks scattered over it, some of them showing at low water. **Georges Rock,** awash at low water, lies about 1¼ miles 100° true (**ESE** ¼ **E** mag.) from the northeastern end of Cockenoe Island, near the eastern end of the shoal. A red bell buoy (No. 20) is placed ⅜ mile southward of Georges Rock and marks the southeastern end of the shoal. The northeastern end of this shoal bears 80° true (**E** mag.), distant 1¼ miles from the northeastern end of Cockenoe Island, and has from 8 to 18 feet over it. The shoal extends for a distance of nearly ¾ mile south of Cockenoe Island.

Westward of Cockenoe Island is Cockenoe Island Harbor.

COCKENOE ISLAND HARBOR.*

This is a small harbor lying westward of Cockenoe Island and is marked by Peck Ledge lighthouse. It has anchorage for vessels of less than 9 feet draft, and is sometimes used by strangers seeking shelter. It is also an *eastern passage* to Norwalk River, but this passage requires some local knowledge, as the channel is narrow and crooked and has but few aids at present. With an easterly wind, vessels bound up the Norwalk River sometimes take a pilot at the anchorage, and are taken into the river through the eastern passage. The *western passage* into Norwalk River is through Sheffield Island Harbor. There is also a *middle passage,* which leads in eastward of Sheffield and Ram islands; it is only used by those thoroughly acquainted with the locality.

The **channel** to Cockenoe Island Harbor leads across the shoal extending southward from Cockenoe Island; at mean low water 13 feet can be taken in a short distance above Peck Ledge lighthouse, and 8 feet to an anchorage westward of the lighthouse.

The **depth of water** at the anchorage is 7 to 10 feet at low water. Vessels of 12 feet draft have been taken through the eastern passage at high water.

Pilots can be had by making signal, when at anchor near Peck Ledge lighthouse

Tides.—See heading "Westport Harbor."

SAILING DIRECTIONS, COCKENOE ISLAND HARBOR.

The following directions are available for vessels drawing 8 feet or less. Vessels of 8 to 12 feet draft, bound through this passage to Norwalk, can anchor about ¾ mile southeastward of Peck Ledge lighthouse or just north of Peck Ledge buoy and there await a favorable tide and take a pilot.

1. ***From Eastward.***—After passing Penfield Reef lighthouse, bring it astern on a 240° true (**WSW** ¼ **W** mag.) course. As soon as the red buoy on the southeastern end of the Norwalk Island reefs (Cockenoe Island Shoal buoy, bell, red, No. 20) is sighted, steer so as to pass about 400 yards southward of it, and when the buoy bears 350° true (*N* mag.) steer 249° true (**W** by **S** mag.) about ¾ mile. When Peck Ledge lighthouse bears 295° true (**NW** ⅞ **W** mag.) steer for it and leave Channel Rock buoy (spar, red, No. 2) about 100 yards on the starboard hand; when this buoy is abeam, haul a little northward and pass about 200 yards eastward of Peck Ledge lighthouse. Leave Peck Ledge buoy (spar, black, No. 1) about 120 yards on the port hand, and anchor about 125 yards northward of the buoy in 14 to 20 feet (low water).

If of 8 feet or less draft, leave Peck Ledge buoy on the port hand, steering 260° true (**W** mag.), and anchor ¼ mile westward of the buoy in 10 to 13 feet.

Remarks and dangers.—**Cockenoe Island** has two small hillocks on its southeastern side which serve to distinguish it, the rest of the island being low and level. Peck Ledge lighthouse is prominent ½ mile southwestward of Cockenoe Island. After passing red bell buoy, No. 20, the black spar buoy, No. 1, marking Peck Ledge will be seen northward of the lighthouse, and Channel Rock buoy (spar, red, No. 2) will be seen southwestward of Cockenoe Island.

* Shown on charts 267, scale $\frac{1}{10,000}$; 116, scale $\frac{1}{80,000}$; price of each $0.50.

When heading for Peck Ledge lighthouse on the 295° true (**NW** ⅞ **W** mag.) course, the western hillock of Cockenoe Island will be abeam when abreast of Channel Rock buoy. The course should then be changed northward about two points so as to leave the lighthouse 200 yards on the port hand and to clear a small 12-foot spot which lies about 250 yards southeastward from the lighthouse.

Channel Rock, with 2 feet over it, lies 500 yards 201° true (**SSW** ¾ **W** mag.) from the westernmost hillock on Cockenoe Island, and is marked by a buoy (spar, red, No. 2) placed 300 yards southwestward of the rock; the depth between this rock and the island is 2 to 8 feet.

Peck Ledge, bare at low water, lies about 400 yards 15° true (**NNE** ¼ **E** mag.) from Goose Island, and is marked off its northern side by a buoy (spar, black, No. 1), and about 200 yards northeastward of the ledge is Peck Ledge lighthouse. Just northward of the buoy there are depths of 14 to 25 feet.

1 A. ***From Westward.***—Passing ¾ mile south of Greens Ledge lighthouse, steer 66° true (**ENE** ¾ **E** mag.) a little over 4 miles until Peck Ledge lighthouse is abeam distant nearly 1½ miles. Then steer 344° true (**N** ½ **W** mag.). The red spar buoy marking Channel Rock should be sighted on the starboard bow; leave this buoy 100 yards on the starboard hand and steer about 316° true (**NW** by **N** mag.), so as to leave Peck Ledge lighthouse about 200 yards on the port hand. When the lighthouse is abaft the beam, anchor as directed in section 1 preceding.

Remarks.—After passing Greens Ledge lighthouse and Great Reef spindle, the islands should not be approached nearer than in 24 feet of water, as the shoals rise abruptly in places inside this depth. Peck Ledge lighthouse, westward of Cockenoe Island, will be prominent.

If Channel Rock buoy can not be seen, Peck Ledge lighthouse should be brought on a bearing as in section 1 preceding, and the directions in that section should be followed. (See also the remarks under directions for approaching and entering from eastward.)

SHEFFIELD ISLAND HARBOR (NORWALK HARBOR) AND NORWALK RIVER.*

Sheffield Island Harbor, now more generally known as Norwalk Harbor, is about 13½ miles westward of Bridgeport Harbor and 17¾ miles eastward of Execution Rocks lighthouse. It is formed by the mainland of the north shore and by the western Norwalk Islands; on the southern side of the western part of the harbor is Greens Ledge, which extends westward from Sheffield Island and is marked near its end by Greens Ledge lighthouse (see table, page 16). This harbor is much used in the fall and winter and affords shelter to vessels drawing less than 16 feet; tows frequently seek refuge here.

Norwalk River is generally approached from Long Island Sound through Sheffield Island Harbor; there is also an eastern passage through Cockenoe Island Harbor; and a middle passage is sometimes used by those thoroughly acquainted with the locality (see page 108). The river has a narrow and crooked channel, which has been improved by dredging to a width of 150 feet and depth of 10 feet up to South Norwalk, and 6 feet to Norwalk. Above South Norwalk the river is crossed by two bridges (least width of draws 60 feet).

Wilson Point, on the north shore of Sheffield Island Harbor, is a point for the shipment of coal, which is brought here in barges and shipped away on cars. A large wharf and wireless telegraph pole are its noticeable features.

A channel 15 feet deep at mean low water has been dredged from the western part of Sheffield Island Harbor to Wilson Point. For a distance of 750 feet south from Wilson Point the channel is about 880 feet wide, and thence to Sheffield Island Harbor about 480 feet wide. The channel close to the wharf is 12 feet deep at mean low water.

South Norwalk, a city about 1½ miles above the mouth and on the western bank of the river, has manufactories and is of some commercial importance; it is on the line of the N. Y., N. H. & H. Railroad. The deepest draft that can be taken to South Norwalk at low water is 10 feet.

East Norwalk is on the opposite side of the river from South Norwalk.

Norwalk, a city on both banks of the river, about 1¼ miles above South Norwalk, has some trade, principally coal, lumber, iron, and general merchandise. The deepest draft of vessels going up to Norwalk is about 12 feet at high water.

Prominent features.—Greens Ledge lighthouse (see table, page 16) is on the north side of the ledge near its western end, and is the principal aid for entering the harbor and Norwalk River. A granite dwelling is situated near the western end of **Sheffield Island**, the largest and westernmost of the Norwalk Islands. **Norwalk Islands** is the name of the irregular group of islands, surrounded by shoals, lying off the mouth of the Norwalk River. These islands and

*Shown on chart **116**, scale $\frac{1}{80,000}$; and in parts on charts **267**, **268**, scale $\frac{1}{10,000}$, price of each $0.50.

shoals extend about 6 miles in an easterly direction from Greens Ledge lighthouse. Oyster stakes extend southward of the islands some distance into the sound.

Tavern Island, a small island in Sheffield Island Harbor, is northward of Sheffield Island and southeastward of Wilson Point. It has several summer cottages, and there is a flagstaff near the middle of the island. Strangers should not attempt to go above Tavern Island without a pilot or a towboat.

The **channel** up to Tavern Island is good for 10 feet at low water; above the island 9 feet can be taken into the river at low water through the dredged cuts. The channel into the river is marked by a number of lighted beacons and buoys, but a stranger can not attempt it without risk on account of the numerous rocks on both sides of the channel. The dredged channel is 150 feet wide and 10 feet deep to South Norwalk, and from 60 to 100 feet wide and 6 feet deep up to Norwalk.

Anchorages.—The anchorage for vessels bound into the Norwalk River, or seeking shelter, is in Sheffield Island Harbor, northward of Sheffield Island. Vessels of 10 feet draft or less can anchor as far up the harbor as to a line drawn from Tavern Island to the wharf on Sheffield Island, giving the shore of Sheffield Island a berth of about 300 yards. Vessels of 12 to 13 feet draft should not anchor inside a line drawn from the old lighthouse on Sheffield Island to Noroton Point buoy (spar, red and black horizontal stripes, off Noroton Point). Anchorage in 17 feet water will be found 700 yards south of Noroton Point. Between Noroton Point and Wilson Point is an anchorage for vessels of light draft, much used by oyster steamers and sloops.

Pilots.—Strangers generally take a pilot, and sailing vessels take a towboat when bound up the river. Standing into the harbor with signal set, a pilot will sometimes come on board before the vessel reaches Tavern Island. If not boarded by a pilot, anchor in the channel, according to draft, until boarded by one.

Extracts from the laws of Connecticut relative to pilots and pilotage are found in Appendix II.

Towboats.—Sailing vessels frequently take a towboat. The channel is too narrow for anything but very small vessels, except with a favorable wind. Oyster steamers do the towing, but can not be depended upon to tow whenever required; in case of emergency a towboat can be obtained from Bridgeport by telegraphing. Oyster steamers will usually be found at the entrance, or off Five Mile River, or at South Norwalk.

Supplies.—Coal for steamers, either anthracite or bituminous, and fresh water through pipe and hose, can be had at the wharves of South Norwalk and Norwalk. Provisions and some ship-chandler's stores can be obtained at both places.

Repairs.—Repairs to the machinery of small steamers can be made at South Norwalk; for extensive repairs vessels generally proceed to New York.

Ice forms in the river and usually obstructs navigation for about six weeks in winter.

Variation of the compass off Greens Ledge lighthouse, see page 22.

Tides.—See page 24.

SAILING DIRECTIONS, SHEFFIELD ISLAND HARBOR.

The directions are good for a draft of 13 feet to an anchorage between Noroton Point and the western end of Sheffield Island, and for a draft of 10 feet to an anchorage south of Tavern Island.

1. ***Approaching and Entering, from Eastward.***—In approaching note the directions in section 5 on page 72.

When Greens Ledge lighthouse is made steer so as to pass ½ mile southward of the lighthouse on any course northward of 260° true (**W** mag.). When the lighthouse bears 350° true (*N* mag.), steer about 305° true (**NW** mag.), taking care to leave Greens Ledge west end buoy (spar, red) at least 100 yards on the starboard hand, and pass over ¼ mile southwestward of the lighthouse.

When Greens Ledge west end buoy is abaft the beam haul northward and then eastward so as to pass 200 yards north of the lighthouse; then steer 60° true (**ENE ¼ E** mag.) and leave the western end of Sheffield Island about 500 yards on the starboard hand.

Anchor according to draft, and if of 10 feet draft anchor about midway between Tavern Island and the north end of Sheffield Island.

Remarks.—On the 305° true (**NW** mag.) course, Greens Ledge west end buoy (red) will be made on the starboard bow, and when rounding this buoy Noroton Point will shut out Wilson Point. Five Mile River will be seen about ¾ mile westward of Noroton Point. Noroton Point has several large buildings near its southern end.

On the 60° true (**ENE** ¼ **E** mag.) course, Tavern Island will be seen eastward of Noroton Point, and between them Wilson Point will be distinguished by the large wharf and wireless telegraph pole. Noroton Point buoy (spar, red and black horizontal stripes) will be on the port bow, off Noroton Point; as it is approached, Tavern Island Flats buoy (spar, black, No. 1) will be seen.

Norwalk Islands.—About ¾ mile southwestward from *Cockenoe Island* is *Goose Island*, a low, rocky islet at high water, showing an increased area at low water; passing this island it should be given a berth of ¾ mile. *Copps Island* (small, hilly, covered with grass, loose bowlders around the shore) lies ¾ mile southwest from Goose Island and ¾ mile northeastward from the eastern end of Sheffield Island; this island should be given a berth of at least ⅜ mile when passing southward of it. *Sheffield Island* is the westernmost island of the group, its southern shore eastward of Great Reef spindle can be approached as close as ¼ mile. A number of islands lie northward of the aforementioned islands.

Dangers.—**Cockenoe Island Shoal** is described on page 108.

Great Reef, marked on its eastern side by a spindle, makes southward nearly ⅜ mile from the western end of Sheffield Island.

Greens Ledge extends nearly 1¼ miles 246° true (**WSW** ¾ **W** mag.) from the western end of Sheffield Island. It has 8 feet over it near its western end, and is marked by Greens Ledge lighthouse, near its northern side, about 1 mile from the western end of Sheffield Island; and by a buoy (spar, red, No. 20¼) placed ¼ mile 220° true (**SW** ½ **W** mag.) from the lighthouse.

Noroton Point Shoal.—Shoals make out southward from Noroton Point; a ledge with a least depth of 8 feet over it lies ⅜ mile 230° true (**SW** by **W** ⅜ **W** mag.) from the extremity of the point; about 450 yards 114° true (**SE** by **E** mag.) from Noroton Point is a spar buoy (red and black horizontal stripes), which marks the eastern edge of the dredged channel to Wilson Point.

A **ledge** makes out southwestward from Tavern Island and is marked off its southwestern end by Tavern Island Flats buoy (spar, black, No. 1).

1 A. ***Approaching from Westward.***—Passing about ¼ mile south of the red gas buoy (No. 24) off The Cows, make good a 53° true (**NE** by **E** ⅝ **E** mag.) course heading for Greens Ledge lighthouse. Pass about ½ mile southward of Smith Rock buoy (spar, red, No. 22) and close to Long Neck Point buoy (spar, red, No. 20½). Leave Greens Ledge west end buoy on the starboard hand, giving it a berth of ¼ mile, and pass 200 yards north of the lighthouse. Then steer 60° true (**ENE** ¼ **E** mag.) and anchor as directed under section 1 preceding.

Remarks.—On the 53° true (**NE** by **E** ⅝ **E** mag.) course, after passing The Cows gas buoy (red, No. 24, off Shippan Point), Smith Rock buoy (spar, red, No. 22) will be made on the port bow, and should be left about ½ mile on the port hand; Sheffield Island will be on the starboard bow. Long Neck Point buoy* should be ahead. After passing this buoy, Greens Ledge west end buoy (spar, red, No. 20¼) will be made on the starboard bow; passing this buoy, leave it ¼ mile on the starboard hand.

On the 60° true (**ENE** ¼ **E** mag.) course, Tavern Island will show conspicuously on the port bow; after passing Greens Ledge west end buoy, Wilson Point will be gradually opened out from behind Noroton Point.

Dangers.—**The Cows** are a cluster of detached rocks, bare at low water, its southern end with 6 feet of water over it lying 1 mile 118° true (**SE** ⅝ **E** mag.) from Stamford Harbor lighthouse; off the southern end is a gas buoy (red, No. 24, white light with eclipses).

Smith Rock is the southern end of a cluster of rocks, which extend in a southerly direction in a broken line from the shore about ½ mile westward of Long Neck, and show bare in places at low water. The south end of this danger lies about 2¼ miles 73° true (**E** ⅝ **N** mag.) from Stamford Harbor lighthouse, and ⅞ mile 226° true (**SW** by **W** mag.) from Long Neck Point. A buoy (spar, red, No. 22) is placed off the southern end of the rock.

Shoal water extends 500 yards southward from Long Neck Point.

Other dangers are described under section 1 foregoing.

HUNTINGTON BAY.†

This large bay, on the south shore of Long Island Sound, just westward of Eatons Neck, is an excellent anchorage, with 18 feet to 6 fathoms. The entrance to the bay is between **Eatons Point** (marked by Eatons Neck lighthouse, see table on page 16) on the east and **Lloyd Point** on the west. The bay is about 2½ miles long in a northerly and

* This buoy is in place from May 1 to November 1 only.

† Shown on charts **368**, scale $\frac{1}{30,000}$, price $0.20; **116**, scale $\frac{1}{80,000}$, price $0.50.

southerly direction, and is about 1 mile wide abreast West Beach. Vessels of the largest size anchor in Huntington Bay for shelter, the bay being protected against all but northerly winds; in bad weather it is sometimes used by the large Sound steamers, both in summer and winter.

Lloyd Harbor is a shallow body of water, full of oyster beds, on the west side of Huntington Bay; it has an arm extending westward nearly to Oyster Bay, from which it is separated by a narrow strip of beach. Lloyd Harbor lighthouse (see table, page 16) is on the northern side of the entrance to the harbor, and is one of the guides into Huntington Bay. Vessels during northwesterly gales anchor eastward of the lighthouse, as close in as their draft will allow, and those of light draft (less than 7 feet) anchor southwestward of the lighthouse. The harbor is of no commercial importance.

Huntington Harbor is a long, irregular cove, the entrance to which is ⅜ mile southeastward of Lloyd Harbor lighthouse. The entrance is buoyed, but the channel is crooked and narrow, and strangers should not attempt it. Only small vessels well acquainted with the locality enter this harbor, going up to the village of **Huntington**, at its head. A dredged channel 8 feet deep and 100 feet wide leads from the entrance to the Old Town dock, but this has shoaled, and the deepest draft that can be taken in at low water is about 7 feet.

Variation of the compass, see page 22.

Descriptions of lighthouses, tidal data, and other general matters will be found on pages 9–25.

NORTHPORT BAY AND HARBOR.*

Northport Bay is a large bay opening from the southeastern end of Huntington Bay. The western part of Northport Bay has good anchorage in 4 to 8 fathoms; the eastern end is shoal, having a depth of 8 to 11 feet. The entrance to Northport Bay from Huntington Bay is through a narrow, buoyed channel having a depth of 20 feet.

Centerport Harbor is a shoal bight in the south shore of Northport Bay, just eastward of the entrance. Little Neck (a hilly point, covered with trees) is on the eastern side of the harbor. The village of **Centerport**, near the head of the harbor, is of no commercial importance.

Duck Island Harbor is a small, shallow cove in the northern part of Northport Bay, opposite Centerport Harbor. A channel with 9 feet leads into this cove between Duck Island Bluff on the east and Winkle Point on the west, but it is only used by very small craft, as the cove itself is very shallow.

Northport Harbor is a cove in the southeastern part of Northport Bay, with numerous oyster beds, and has depths of 7 to 10 feet, shoaling gradually toward its head to 1 foot.

Northport is a village on the eastern shore near the head of Northport Harbor. It has some water-borne trade, consisting of coal, lumber, oysters, sand, gravel, fire clay, and produce, carried partly by strangers. The greatest draft that can be taken to Northport is 14 feet at high water, the usual draft 6 to 8 feet, and 6 feet can be taken alongside the wharves at low water. Northport is on a branch of the Long Island Railroad.

Vessels anchor anywhere in the harbor in 7 to 10 feet, low water; the bottom is soft mud.

Strangers sometimes take a pilot; making signal while in Huntington Bay will bring a pilot from the shore, or from one of the oyster boats in the vicinity.

Repairs to vessels can be made at Northport; there are several shipyards and marine railways; the largest railway is capable of hauling out vessels of 400 tons.

Anthracite coal in limited quantities and water through pipe and hose can be had at Northport alongside the wharves. Provisions and some ship-chandler's stores can be obtained.

Ice closes Northport Harbor about two months each winter; there is no danger from drift ice.

SAILING DIRECTIONS, HUNTINGTON BAY.

The directions are good for a draft of 16 feet into Northport Bay, and for a draft of 9 feet, at ordinary low water, into Northport Harbor.

1. ***Approaching and Entering, from Eastward.***—Pass a little over 1 mile north of Eatons Neck lighthouse, steering about 254° true (**W ½ S** mag.), and leaving Eatons Point Shoal buoy (can, black, No. 13) about ¼ mile on the port hand. When ¼ mile westward of this buoy, steer 215° true (**SW** mag.) until the bay is fully opened out and Eatons Neck lighthouse bears 102° true (*ESE* mag.), when the course should be changed to 181° true (**S** by **W** mag.), keeping the eastern shore a little the best aboard, but giving it a berth of not less than ¼ mile.

* Shown on charts **268**, scale $\frac{1}{30,000}$, price $0.20; **116**, scale $\frac{1}{80,000}$, price $0.50.

Anchor according to draft and the direction of the wind. Vessels drawing less than 18 feet can anchor with Lloyd Harbor lighthouse bearing 260° true (*W* mag.), distant from ½ to 1 mile; if of deeper draft, anchor before Lloyd Harbor lighthouse bears 260° true (*W* mag.). In southeasterly gales vessels sometimes anchor with Eatons Neck lighthouse bearing from 57° true (*ENE* mag.) to 35° true (*NE* mag.), coming to in 5 or 6 fathoms.

If bound to Northport, see section 2.

At night.—*Vessels drawing less than 14 feet* can bring Old Field Point light (see table page 14) to bear 89° true (*E* ¾ *S* mag.) over the stern, and steer 269° true (**W** ¾ **N** mag.), passing about 1¼ miles north of Eatons Neck light. When Greens Ledge light bears 350° true (*N* mag.), steer 170° true (**S** mag.), keeping Greens Ledge light on the bearing. Anchor as already directed.

Or, such vessels can bring Stratford Shoal (Middle Ground) light to bear 69° true (*E* by *N* mag.), and steer 249° true (**W** by **S** mag.), keeping the bearing. This leads nearly 1¼ miles northward of Eatons Neck light. When Greens Ledge light bears 350° true (*N* mag.), steer 170° true (**S** mag.), keeping the bearing. Anchor as already directed.

Vessels drawing 14 feet or more should keep a mid-Sound course, steering about 256° true (**W** ⅜ **S** mag.), with Stratford Shoal (Middle Ground) light bearing 76° true (*E* ⅜ *N* mag.), until Greens Ledge light bears 350° true (*N* mag.), and then steer 170° true (**S** mag.), keeping the bearing as before.

Remarks.—When passing Eatons Point in the daytime, Huntington Bay will be opened out and Lloyd Harbor lighthouse (square white tower with attached white dwelling, see page 16) will be made on the western shore near the head of the bay; several large bowlders near the western shore northward of this lighthouse will show conspicuously. Entering the bay, steering 181° true (**S** by **W** mag.), a few sand hillocks thrown up by dredges will be seen on the port hand at West Beach, and southward of the latter the entrance to Northport Bay will be opened out. A large hotel with ornamental grounds is at the head of the bay westward of the entrance to Northport Bay.

Dangers.—**Northward of Eatons Point Shoal** and north of the sailing line are outlying shoal spots with 16 to 21 feet over them. They are described on page 75, with directions to avoid them.

Eatons Point Shoal makes out ⅞ mile northward and northeastward from Eatons Neck. A depth of 5 feet is found ⅜ mile northeastward of the lighthouse. Off the northern end of the shoal is a buoy (can, black, No. 13), and close southward and also westward are spots with 13 to 15 feet over them.

The middle of Huntington Bay is free from dangers, but the 18-foot curve extends ¼ mile from the eastern shore, and about ⅜ mile from the western shore northward of Lloyd Harbor lighthouse. A long, narrow spit with 16 to 18 feet over it makes ¾ mile northward from the south shore, about midway between the eastern shore and Lloyd Harbor lighthouse.

1 A. ***Approaching and Entering, from Westward.***—Pass about 1 mile north of Lloyd Point, leaving Lloyd Point Shoal buoy (bell, black) ⅜ mile on the starboard hand, and steer 116° true (**SE** ¾ **E** mag.), giving the shore a berth of over ½ mile. When Lloyd Harbor lighthouse opens out bearing 206° (true *SW* ¾ *S* mag.), steer 170° true (**S** mag.), and anchor according to draft and direction of wind (see section 1 foregoing).

If bound to Northport, see section 2 following.

At night.—Pass Lloyd Point, keeping Eatons Neck light bearing southward of 91° true (*E* by *S* mag.). When Stamford Harbor light (see table, page 16) bears 308° true (*NW* ¼ *N* mag.), steer 128° true (**SE** ¼ **S** mag.), keeping the light on the bearing until Lloyd Harbor light bears 206° true (*SW* ¾ *S* mag.); then steer 170° true (**S** mag.), and anchor as already directed.

2. ***Bound into Lloyd Harbor or into Northport Harbor.***—Light-draft vessels bound into Lloyd Harbor can steer for the entrance of Lloyd Harbor on a 249° true (**W** by **S** mag.) course and pass about 200 yards southward of the lighthouse; anchor ¼ to ⅜ mile southwestward or westward of the lighthouse in 7 to 10 feet of water, soft bottom.

If bound to Northport Harbor, continue southward as directed under section 1 or 1A foregoing, until Lloyd Harbor lighthouse bears 285° true (*NW* by *W* ¾ *W* mag.), when shape the course about 105° true (**SE** by **E** ¾ **E** mag.), heading for the black spar buoy, and black gas buoy (white light with eclipses) close to it, at the entrance to Northport Bay.

Pass about 30 yards southward of West Beach Flats south end buoy (spar, black) and Northport Bay Entrance gas buoy (black) which is close to the former, and steer about 73° true (**E** ⅝ **N** mag.), heading for West Beach Flats east end buoy (spar, black, No. 3); leave this buoy 40 yards on the port hand and Great Neck Flats buoy (spar, red, No. 2) about 75 yards on the starboard hand. When abreast of the latter buoy, steer about 57° true (**ENE** mag.) nearly 1 mile, passing 150 to 200 yards northward of Little Neck Point buoy (spar, red, No. 4). Then steer about 136° true (**SE** by **S** mag.), and keep in mid-channel. Anchor according to draft off the wharves of Northport. The channel from Huntington Bay into Northport Bay is too narrow for a sailing vessel to beat through, and the currents here have considerable velocity.

Dangers.—West Beach Flats make southward from West Beach for over ¼ mile; this shoal has from 1 to 11 feet of water, and shoals abruptly from the channel on its southern side. The shoal is marked by a gas buoy (white light with eclipses) and black spar buoy at its southwestern end, a buoy (spar, black, No. 3) on its southern side, and a buoy (spar, black, No. 5) on its east end.

Great Neck Flats make ⅜ mile eastward from the point at the south side of the entrance, and shoal abruptly from the channel on their northern side; at the northeastern edge is placed Great Neck Flats buoy (spar, red, No. 2).

Little Neck Point Shoal makes ⅜ mile northward from Little Neck Point; it has from 5 to 16 feet over it and is marked by a buoy (spar, red, No. 4) in 12 feet of water about 450 yards northward of the point.

A **shoal** with only 4 feet over it makes out about 700 yards in an 102° true (**ESE** mag.) direction from **Winkle Point,** the point on the north side of Northport Bay ½ mile westward of Duck Island Bluff.

The eastern shore of Little Neck should not be approached nearer than 200 yards.

FIVE MILE RIVER.*

This is a narrow inlet on the north shore of Long Island Sound about 1 mile north from Greens Ledge lighthouse. It is about 1 mile long and from 100 to 300 yards wide. About ¾ mile above its mouth it runs dry at low water; at the mouth the depth is about 3 feet at mean low water.

A dredged channel 8 feet deep at mean low water, and about 100 feet wide, extends from the 8-foot curve in the sound to the wharves in the harbor. The river is used mostly by oystermen. The channel entrance is marked by a gas buoy (white light with eclipses), but local knowledge is necessary to go to the wharves.

Roaton Harbor is the name sometimes applied to the bight between Noroton Point and the Fish Islands and is the approach to Five Mile River.

Tides.—See heading "Westport Harbor."

GENERAL DIRECTIONS, APPROACHING FIVE MILE RIVER.

Follow the directions in section 1 or 1A (pages 110–111) for Sheffield Island Harbor until Greens Ledge lighthouse bears 170° true (*S* mag.), and then bring it astern and steer 350° true (**N** mag.). Use the lead and anchor in 8 to 11 feet off the mouth of the river, southward of the gas buoy.

Dangers.—A **shoal spot** with 2 feet over it lies nearly ¾ mile 331° true (**N** by **W** ¾ **W** mag.) from Greens Ledge lighthouse in a surrounding depth of 14 feet. On the 350° true (**N** mag.) course it will be left about 400 yards on the port hand.

Ballast Reef, a cluster of rocks, dry at low water, lies 400 yards westward from Pine Point and is marked by a buoy (spar, red, No. 2). These, on the course given, will be left 350 yards on the starboard hand.

* Shown on charts **268**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$; price of each $0.50.

DARIEN RIVER.*

This is a small, shallow stream, 2 miles westward of Greens Ledge lighthouse, entering Long Island Sound between Long Neck Point on the east and Noroton Neck on the west. At low water about 2¼ feet can be carried into the river, and 7 feet is the greatest draft that can enter at high water.

Darien, a town on the N. Y., N. H. & H. Railroad, is situated just above the entrance. Vessels of 6 feet draft or less, partly strangers, are engaged in the carrying trade, which consists of cargoes of coal and oysters.

A bridge about 1 mile above the mouth of the river is the head of navigation; to it 6 feet can be taken at high water.

Long Neck Point, on the eastern side at the entrance, has a conspicuous large building near its southern end and two large wharves on its eastern side.

Strangers take a pilot; if one is not found outside, they anchor between Long Neck Point and Smith Rock and get one from Darien.

Ice in winter forms to Long Neck Point.

Tides.—See heading "Sheffield Island Harbor."

SAILING DIRECTIONS, DARIEN RIVER.

1. ***From Eastward.***—Passing ½ mile south of Greens Ledge lighthouse steer 260° true (**W** mag.) nearly 2 miles, until southwestward of Long Neck Point and about ⅜ mile eastward of Smith Rock buoy (spar, red, No. 22). Anchor in 24 to 36 feet, soft bottom, with Long Neck Point bearing about 23° true (*NE* by *N* mag.), distant ½ mile.

Remarks.—In approaching from eastward, Great Reef spindle and Greens Ledge west end buoy (see page 111) will be left on the starboard hand. Long Neck Point will be made on the starboard bow; shoal water extends in a southerly direction for 500 yards from Long Neck Point. Long Neck Point buoy† (spar, red, No. 20½), which lies ⅝ mile southward of the point, is left on the port hand. Smith Rock buoy (spar, red, No. 22) and Stamford Harbor lighthouse will be on the port bow.

1 A. ***From Westward.***—Passing south of the gas buoy on The Cows, steer 52° true (**NE** by **E** ½ **E** mag.), with Greens Ledge lighthouse a little on the starboard bow. When the red buoy on Smith Rock (spar, No. 22) bears well abaft the port beam, haul northward and anchor as directed above, between Long Neck Point and Smith Rock buoy.

Remarks.—**The Cows** (see page 111), 1 mile 118° true (**SE** ⅝ **E** mag.) from Stamford Harbor lighthouse, and marked by a gas buoy (red, No. 24, white light with eclipses), should be left on the port hand. **Smith Rock**, marked off its southern end by a red buoy (spar, No. 22), lies ⅞ mile 226° true (**SW** by **W** mag.) from Long Neck Point; a cluster of rocks extends ⅜ mile in a northerly direction from the buoy.

STAMFORD HARBOR.‡

This small harbor, on the north shore of Long Island Sound, is 5½ miles westward of Sheffield Island Harbor. It is shoal and much obstructed by ledges and sunken rocks, and is of no importance as an anchorage. At the head of the harbor is the mouth of Mill River (West Branch), a shallow stream. A little eastward of Mill River entrance is the "Ship Canal" (East Branch). A dredged channel having a depth of about 9 feet and width of 70 to 100 feet leads up to the steamboat dock on the East Branch, and a channel about 6 feet deep and 130 feet wide leads up to the wharves on the West Branch.

Stamford, a city on the N. Y., N. H. & H. Railroad, is near the mouth of Mill River, and has some trade by water. The deepest draft of the vessels which go to Stamford is about 15 feet at high water. The principal cargo is coal, brought from New York in tows. The depth alongside the wharves at low water is about 7 feet.

Mill River (West Branch) has a general course about **N** from the upper part of the harbor, but the channel is crooked. About 1 mile above its mouth the river is dammed at Oliver Street bridge.

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* Shown on charts **268**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

† This buoy is in place from May 1 to November 1 only.

‡ Shown on charts **269**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

Prominent objects.—Stamford Harbor lighthouse is on the western side of the entrance. **Shippan Point,** the eastern point at the entrance, is surrounded by rocks which show at low water.

Pilots are necessary for strangers, who should make signal and anchor southward of the lighthouse.

Towboats can not be obtained ordinarily. Sometimes a small oyster steamer can be employed.

Repairs.—Minor repairs to the machinery of small steamers—light work only—can be made at Stamford. South Norwalk has better facilities for such work (see heading "Sheffield Island Harbor").

Tides.—(See "Sheffield Island Harbor," page 24.) The tidal currents have little velocity.

Ice generally obstructs navigation from January to March, frequently extending down to the lighthouse, and sometimes beyond.

SAILING DIRECTIONS, STAMFORD HARBOR.

The directions are good for any vessel that can be taken to Stamford.

1. ***From Eastward.***—Passing ¾ mile southward of Greens Ledge lighthouse steer 243° true (**WSW ½ W** mag.) for about 4¼ miles, passing about 400 yards southward of the red gas buoy (No. 24) on the southern end of The Cows. When Stamford Harbor lighthouse bears 319° true (**NNW ¾ W** mag.), steer for it, and anchor in 26 feet about 300 yards 147° true (*SSE* mag.) from Harbor Ledge buoy (can, black, No. 1). Make signal and wait for a pilot if bound to Stamford.

Remarks.—On the 243° true (**WSW ¼ W** mag.) course, Stamford Harbor lighthouse will be made well on the starboard bow, and the gas buoy on The Cows (red, No. 24) will be a little on the starboard bow.

The Cows are described on page 111.

Harbor Ledge is marked by Stamford Harbor lighthouse; black buoy No. 1 is off the southeastern end of the ledge.

1 A. ***From Westward.***—Passing ½ mile southward of Great Captain Island lighthouse, steer 63° true (**ENE ½ E** mag.), and pass not less than ½ mile southward of Greenwich Point. When Stamford Harbor lighthouse bears 12° true (*NNE* mag.), steer 35° true (**NE** mag.), so as to pass southward of Harbor Ledge buoy (can, black, No. 1). Anchor as directed above.

Remarks.—On the 63° true (**ENE ½ E** mag.) course, Captain Harbor will be passed. Greenwich Point will be on the port bow, and Stamford Harbor lighthouse will be opened out southward of Greenwich Point. The course leads south of Woolsey Reef buoy* (spar, red, No 24½) which lies south of Greenwich Point.

Shoals and rocks make out from the southeastern end of Greenwich Point for ⅜ mile, the shoals extending all along the south shore of the point to that distance. The bight between Stamford Harbor lighthouse and Greenwich Point is comparatively free from dangers while keeping the lighthouse bearing northward of 74° true (**E ½ N** mag.) and giving it a berth of over 300 yards.

OYSTER BAY.†

This bay, on the south side of Long Island Sound, about 5 miles westward of Eatons Neck lighthouse, is separated from Huntington Bay by Lloyd Neck; the entrance is between Lloyd Point on the east and Center Island Point on the west, and is about 1¼ miles wide at its narrowest part. From the middle of the entrance Stamford Harbor lighthouse bears 343° true (**N ⅝ W** mag.), distant 5 miles.

Oyster Bay and the adjacent waters afford excellent anchorage, but the channel being narrowed by Center Island Shoal, makes it difficult for sailing vessels to enter or pass out without a leading wind.

Oyster Bay Harbor is a long, crooked arm on the western side of Oyster Bay, leading westward between Center Island and Cove Neck. Good anchorage, sheltered from all winds, in 10 feet to 6 fathoms, is found in this harbor. The village of **Oyster Bay** is on the south shore of Oyster Bay Harbor. A branch of the Long Island Railroad terminates at the village.

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*This buoy is in place from May 1 to November 1 only.

†Shown on charts **367**, scale $\frac{1}{30,000}$, price $0.20; **116**, scale $\frac{1}{80,000}$, price $0.50.

Cold Spring Harbor is the southern end of Oyster Bay, and extends about 2¼ miles south of Cooper Bluff. This harbor is free from dangers, and the depth is regular, 15 to 18 feet, to near its head. **Cold Spring** is a village on the eastern shore near the head of the harbor. Vessels of 12 to 15 feet draft can go up as far as Cold Spring at low water; there is a depth of 6 to 8 feet alongside the wharves. A branch of the Long Island Railroad has a depot 2 miles above the head of the harbor.

Prominent features.—Cold Spring Harbor lighthouse (see table, page 16) is near the eastern extremity of the shoal making out over 1¼ miles eastward from **Center Island Point. Northwest Bluff** (high and covered with trees) is about 1⅛ miles southward of Lloyd Point, on the eastern shore, and about ⅞ miles northward of Cold Spring Harbor lighthouse. **Cooper Bluff** (the northeastern point of **Cove Neck**, and showing a high, bare-faced sand bluff) is a prominent feature seen when entering; it is 1¼ miles southwestward from Cold Spring Harbor lighthouse. A low, gray stone tower is on the southern end of Plum Point about 1 mile 219° true (**SW** ⅜ **W** mag.) from Cold Spring Harbor lighthouse.

Channel.—The channel is about 300 yards wide at its narrowest parts, between Cold Spring Harbor lighthouse and the eastern shore, and the same width between Plum Point and the shoals making northward from Cove Neck; it has a least depth of 24 feet to abreast the village of Oyster Bay. There is a buoyed channel with a depth of 10 feet which leads across Center Island Shoal about ⅜ mile westward of Cold Spring Harbor lighthouse.

Anchorages.—Anchorage in 18 feet to 7 fathoms, sheltered against southeasterly winds, will be found between Lloyd Point and Northwest Bluff, about ¼ to ⅜ mile off the shore. Good anchorage in 15 to 24 feet of water, sheltered against all but northerly winds, will be found anywhere in Cold Spring Harbor, south of Cold Spring Harbor lighthouse, by keeping 250 yards from the shore and giving the north shore of Cove Neck a berth of 550 yards. An excellent anchorage in 10 feet to 6 fathoms of water will be found in Oyster Bay Harbor, but sailing vessels seldom enter it for shelter on account of the difficulty in leaving, unless with a favorable wind.

Pilots and towboats.—Pilots are sometimes employed by strangers, but are not necessary. Towboats are seldom used; they may be had from New York by telegraph in case of necessity.

Storm warning displays are made at the Yacht Club on Plum Point, Center Island.

Ice.—During two months in the winter ice usually extends the whole length of the bay, and in exceptionally severe winters it extends out into the sound.

Tides.—See page 24.

The **tidal currents** have moderate velocity, and are dangerous to vessels only when near Center Island Shoal; they set across this shoal with considerable velocity during both ebb and flood.

SAILING DIRECTIONS, OYSTER BAY.

The directions in sections 1 and 1 A following are available for vessels of 20 feet draft if closely followed. Vessels of over 20 feet draft if bound to Oyster Bay Harbor are advised to take a pilot.

1. ***Approaching and Entering, from Eastward.***—Pass ¾ to 1 mile northward of Lloyd Point and ¼ to ½ mile north of Lloyd Point Shoal buoy (bell, black), and steer 237° true (**WSW** mag.) until Cold Spring Harbor lighthouse is opened out from behind Northwest Bluff. Then steer 181° true (**S** by **W** mag.) until the lighthouse bears 139° true (**SSE** ¾ **E** mag.); steer for the lighthouse on this bearing, and when it is about ⅜ mile distant ahead haul more eastward and steer so as to round the lighthouse, giving it a berth of about 300 yards. Pass about midway between it and the eastern shore, and anchor anywhere southward and within ½ mile of the lighthouse.

Or, if desiring to enter Cold Spring Harbor or Oyster Bay Harbor proceed as directed under section 2 following.

At night, when off the entrance bring Cold Spring Harbor lighthouse to bear 139° true (**SSE** ¾ **E** mag.) and steer for it. When nearly up to it haul eastward and give it a berth of at least 250 yards. The red sector of this light covers Center Island Reef and Center Island Shoal, and vessels should not approach the red sector closely while northward of the reef and shoal.

Remarks.—Rounding Lloyd Point, and when on the 237° true (**WSW** mag.) course, first Cooper Bluff and then Cold Spring Harbor lighthouse (see "Prominent features" above) will be opened out southward. When heading

for the lighthouse care must be taken not to approach it too closely; the eastern shore abreast the lighthouse can be approached as close as 125 yards.

Dangers.—Lloyd Point Shoal is described on page 76.

A shoal makes out for a distance of nearly 500 yards from the eastern shore, off Northwest Bluff; and in the summer (May to November) a black spar buoy, No. "HI," is placed off the northwest side of the shoal; ¼ mile southward of Northwest Bluff the edge of the channel gradually draws nearer the shore, the 18-foot curve being less than 125 yards from the shore eastward of the lighthouse.

Center Island Reef makes out nearly 1 mile northward from Center Island; it has from 3 to 18 feet over it, and is marked by a buoy (spar, black, No. 15) placed nearly ⅞ mile northward of Center Island Point and near the extremity of the reef.

Center Island Shoal is the name given to the shoal extending 1⅜ miles eastward from the northern part of Center Island. On this shoal, about 225 yards from its eastern end, is Cold Spring Harbor lighthouse (see table, page 16). For some distance westward of this lighthouse the shoal has from 7 to 9 feet over it, and vessels drawing 7 or 8 feet are often taken across it by those well acquainted with the locality. Two red spar buoys are placed ⅜ mile westward of the lighthouse to mark a 10-foot channel over the shoal.

1 A. ***Approaching and Entering, from Westward.***—Pass about 1¼ miles northward of Center Island Point and about ¼ mile north of Center Island Reef buoy (spar, black, No. 15) and steer 102° true (**ESE** mag.) until Cold Spring Harbor lighthouse bears 139° true (**SSE ¾ E** mag.). Steer for the lighthouse on this bearing until it is about ½ mile distant ahead, and then haul more eastward. Pass about midway between the lighthouse and the eastern shore, giving the lighthouse a berth of at least 250 yards in rounding it. Haul southward and westward as the lighthouse is rounded and anchor as directed under section 1, or follow the directions under section 2.

Remarks.—The northern end of Center Island (Center Island Point) is a 40-foot-high sand bluff, but has no distinguishing features. (See "Prominent features," page 117.)

Dangers are described under section 1 foregoing.

2. ***From Cold Spring Harbor lighthouse.—I. If bound to Cold Spring Harbor.***—Having rounded Cold Spring Harbor lighthouse as directed in section 1 or 1 A preceding, bring the lighthouse to bear 338° true (*N* by *W* ⅛ *W* mag.) and steer 158° true (**S** by **E** ⅛ **E** mag.) with it over the stern. When about ¾ mile south of the lighthouse the water will shoal to 17 and 18 feet, but 16 feet can be carried nearly to the head of the harbor.

Remark.—Good anchorage in 15 to 18 feet will be found anywhere in Cold Spring Harbor by giving the shores a berth of 400 to 500 yards.

II. If bound to Oyster Bay Harbor.—Round Cold Spring Harbor lighthouse as directed in section 1 or 1 A preceding, and when the lighthouse bears 350° true (*N* mag.), distant about 400 yards, steer 223° true (**SW ¾ W** mag.) with the gray stone tower on Plum Point a little on the starboard bow and Cove Point Shoal buoy (spar, black, No. 1) directly ahead. Pass 100 yards northward of this buoy and then steer 202° true (**SSW ⅞ W** mag.), with the long wharf at Oyster Bay village directly ahead and the red buoy off Moses Point a little on the starboard bow.

Anchor 300 to 500 yards southward of Moses Point, in 22 to 34 feet of water. If drawing 8 feet or less good anchorage in 9 to 10 feet will be found in the bight westward of Cove Neck.

At night keep out of the red rays of Cold Spring Harbor light.

Remarks.—Plum Point is bold-to on its southern side, and the shore of Center Island between Plum Point and Moses Point may be approached as close as 350 yards. A narrow channel with a least depth of 19 feet leads about 175 yards from the southern shore of Center Island, around to an anchorage in 18 to 28 feet of water northwestward of the old brickyard on **Sopers Point** (the southwestern point of Center Island).

Dangers.—Shoals extend 550 yards northward from **Cove Neck** (the neck of land separating Cold Spring Harbor and Oyster Bay Harbor) leaving a channel about 350 yards wide between the buoy (spar, black, No. 1), on the northern end of the shoal, and the shoals making off from the shore just westward of Plum Point.

CAPTAIN HARBOR.*

This harbor is on the north shore of Long Island Sound, 10 miles eastward of Execution Rocks lighthouse; it lies northward of Great and Little Captain islands and the shoals and rocks between them and affords shelter against all winds. The harbor is entered for shelter by vessels drawing 12 feet or less, and by barges being towed through the Sound. A depth of 15 to 25 feet is found northward of Little Captain Island, and from 7 to 15 feet on the flats; the bottom is soft mud.

Greenwich Cove opens into Captain Harbor from eastward, just north of Flat Neck Point; it is of no commercial importance, and is frequented only by small craft. The post village of **Sound Beach** (formerly Old Greenwich) is on Greenwich Cove.

Coscob Harbor opens into the northeastern part of Captain Harbor; 8 feet is the greatest draft of vessels entering: the general depth at the anchorage in the narrow channel inside the entrance is about 7 feet. The village of **Coscob** is about 1¼ miles above the entrance of Coscob Harbor. A railroad bridge crosses at Coscob (width of eastern draw 50 feet, western 40 feet). The village of **Mianus**, on the Mianus River, is a little over ½ mile above Coscob. The deepest draft carried to Mianus, the head of navigation, is 7 feet.

Greenwich Harbor is about 1 mile westward of Coscob Harbor, and just eastward of **Field Point**; there are coal and lumber yards near the head of the harbor; 12 feet is the deepest draft of vessels trading here. The town of **Greenwich**, on the N. Y., N. H. & H. Railroad, is about 1 mile inland from the head of the harbor. In 1908 a dredged channel, 9 feet deep and 90 feet wide, led along the western shore of the point to the steamboat dock; and 6 feet deep and 90 feet wide to the head of the harbor.

Rocky Neck Creek, small and unimportant, enters the head of Greenwich Harbor. Just eastward of the entrance to Greenwich Harbor are two shallow coves, **Chimney Corner** the eastern one and **Indian Harbor** the western.

Prominent objects seen in entering are: Great Captain Island lighthouse, the large white residence with red roof and white clock tower eastward of Greenwich Harbor, the yacht clubhouse, and a high church spire of Greenwich, which from offshore shows conspicuously above the outline of the hills in the distance. **Little Captain Island** is a small hillock with bowlders around the base; a white tripod is erected on the island.

Two channels lead into Captain Harbor. The *eastern one*, between Flat Neck Point and Little Captain Island, is buoyed and easy of access. The *western channel* leads between Great Captain Island and Manursing Island, and south of Calf Islands; this channel is well marked, but is quite narrow.

Anchorage for vessels of 8 feet draft or over is found about ½ mile northwestward, northward, and northeastward of Little Captain Island. Vessels of less than 7 feet draft anchor on the flats, either under Field Point or under the eastern shore, according to the direction of the wind.

Pilots are not needed for vessels entering Captain Harbor from eastward. A stranger bound into any of the adjacent harbors or coves should always take a pilot, setting signal off the entrance and standing off and on, or anchoring in Captain Harbor. There are no regular pilots; frequently one of the oystermen of the vicinity is employed.

Towboats are not to be had here. Vessels are sometimes towed here from other places, and engage tugs from elsewhere to take them out again.

Repairs.—There are small marine railways at Coscob, capable of hauling out small craft only. The nearest place where repairs to machinery can be made is Stamford, Conn., and the facilities there are limited.

Storm warning displays of the United States Weather Bureau are made at the Yacht Club house on the point at Greenwich. (See Appendix III.)

Freshets sometimes occur in the Mianus River in March and April.

Tides.—(See page 24.) The **tidal currents** have little velocity in the harbor and do not affect navigation, except in the channel between Jones Rocks and Cormorant Reef, where at times the currents have considerable velocity.

Ice forms in winter in all the coves and over the greater part of Captain Harbor; it sometimes extends out to the line of Little Captain and Great Captain islands.

Variation of the compass off Great Captain Island. (See page 22.)

SAILING DIRECTIONS, CAPTAIN HARBOR.

The following directions are available for vessels drawing 12 feet or less.

1. ***From Eastward.***—Passing south of the gas buoy on The Cows (red, No. 24) and south of Stamford Harbor lighthouse, bring Great Captain Island lighthouse to bear 257° true (**W ¼ S** mag.) and steer for it on this bearing.

When the large white residence with a red roof, and a white clock tower just eastward of it, bears between 305° true (*NW* mag.) and 317° true (*NW* by *N* mag.), steer for it, course

*The eastern part of the harbor is shown on chart **269**, and the western part on **270**, scale of each $\frac{1}{10,000}$; shown also on **116**, scale $\frac{1}{80,000}$, price of each $0.50.

about 311° true (**NW ½ N** mag.), and when Great Captain Island lighthouse bears 227° true (*S W* by *W* mag.), steer 255° true (**W ½ S** mag.) with Calf Islands ahead. Anchor in 15 to 30 feet of water, soft bottom, when northward of Little Captain Island.

At night.—Steer for Great Captain Island light, bearing 257° true (**W ¼ S** mag.) until the gas buoy marking Little Captain Island East Reef bears 300° true (*N W ½ W* mag.). Then steer 317° true (**NW** by **N** mag.), passing 300 yards eastward of Little Captain Island East Reef gas buoy. When Great Captain Island light bears 227° true (*S W* by *W* mag.), steer 255° true (**W ½ S** mag.) and anchor as directed above.

Remarks.—Stamford Harbor lighthouse should be left at least 1 mile on the starboard hand. As the large white residence comes on a bearing of 303° true (**NW ¼ W** mag.), Flat Neck Point Shoal buoy (spar, red, No. 2) will be about in range with it. Little Captain Island (small hillock surrounded by bowlders) will be a little on the starboard bow while heading for Great Captain Island lighthouse. The shore of Greenwich Point should be given a berth of at least ½ mile.

Standing in for the white residence on the 311° true (**NW ½ N** mag.) course, Greenwich Cove will be opened on the starboard beam, Coscob Harbor broad off the starboard bow, and Field Point, with a white flagstaff at its south end, will be on the port bow. Calf Islands will be seen southwestward of Field Point. Greenwich Harbor will be opened between the large white residence and Field Point.

Dangers.—**The Cows** are described on page 111.

Shoals make eastward and southward from Greenwich Point for a distance of nearly ⅜ mile, and a buoy* (spar, red, B24½) is placed ½ mile southward of the point; the shore should be given a berth of at least that distance while passing southward of the point.

Flat Neck Point Shoal has a number of bare and sunken rocks, and makes westward from the western extremity of Flat Neck Point; it is marked at its western end by a buoy (spar, red, No. 2).

Little Captain Island East Reef extends eastward from Little Captain Island; it has many bare rocks and bowlders bare at low water, and is marked at its eastern end by a gas buoy (black, No. 1, white light with eclipses). A group of these rocks and bowlders lying about ¼ mile northeastward from Little Captain Island is called the **Hen and Chickens**, and is marked by a small spindle. About ½ mile 38° true (**NE ¼ E** mag.) from the spindle on Hen and Chickens is a shoal spot with only 10 feet over it; the sailing line leads between the two.

Red Rock lies about ⅜ mile 128° true (**SE ¼ S** mag.) from the large white residence eastward of Greenwich Harbor, and about 500 yards from the shore of **Tweed Island**. This rock shows bare at half tide and is surrounded by shoal water; it is marked by a small spindle.

Newfoundland Reef has 3 feet over it and lies 1 mile 21° true (**NNE ¾ E** mag.) from Little Captain Island; the reef is marked by a buoy (spar, red, No. 4). Northward of Newfoundland Reef a number of rocks and islets lie in the entrance to Coscob Harbor; the channel into this harbor is narrow and leads between these dangers.

1 A. ***From Westward.***—Bring Stamford Harbor lighthouse to bear 53° true (**NE** by **E ½ E** mag.) and steer for it on this bearing. When the large white residence eastward of Greenwich Harbor bears 311° true (*N W ½ N* mag.), or the white tripod on Little Captain Island bears four points on the port quarter, steer for the large residence, course about 311° true (**NW ½ N** mag.), and follow the directions in section 1 foregoing.

Remarks.—Great Captain Island lighthouse should be left ½ mile on the port hand. The prominent features and dangers are described under section 1.

1 B. ***From Westward, through the Western Channel.***—Bring Great Captain Island lighthouse to bear 41° true (**NE ½ E** mag.) and steer for it on this bearing; as the lighthouse is approached the red spar buoys marking Glovers Reef and Bluefish Shoal should be left about ⅜ mile on the port hand. When Bluefish Shoal buoy bears abeam and Jones Rocks light bears 13° true (**NNE** mag.) steer for the light on this bearing. Leave the light 100 yards on the port hand and steer 21° true (**NNE ¾ E** mag.), heading for a white pole on the southern end of Field Point. When Great Captain Island lighthouse bears 144° true (*SSE ⅜ E* mag.), leave red spar buoy No. 2½, on Cormorant Reef, about 100 yards on the starboard hand and then steer about 70° true (**E** by **N** mag.).

* This buoy is in place from May 1 to November 1 only.

Anchor southward of Field Point; or, if of light draft, haul northward and anchor eastward of Field Point, in 8 to 10 feet of water, off the entrance to Greenwich Harbor.

Remarks.—The 41° true (**NE** ½ **E** mag.) course leads well southward of all dangers. When Great Captain Island lighthouse is about 1½ miles distant ahead, the breakwater and light at the entrance to Port Chester Harbor will be seen northward.

The 13° true (**NNE** mag.) course heading for Jones Rocks light leads midway between red spar buoy No. 2, marking Great Captain Island West Reef, and the red and black horizontally striped spar buoy on Four Foot Rocks. As the light is approached, the red spar buoy (No. 2½) on the north end of Cormorant Reef will be seen on the starboard bow; this buoy is left on the starboard hand when on the 21° true (**NNE** ¾ **E** mag.) course.

Dangers.—Numerous rocks and shoals lie northward of the sailing line between Parsonage Point and Great Captain Island.

Porgy Shoal, a small spot with 8 feet of water over it, lies nearly ½ mile 65° true (**ENE** ⅝ **E** mag.) from Parsonage Point and is marked by a buoy (spar, red, No. 28½). About ½ mile northeastward of this shoal is Forbes Rock, which shows bare at low water.

Glovers Reef, lying a little over ¼ mile southeastward of the south point of Manursing Island, has a depth of 3 feet over it and is marked by a buoy (spar, red, No. 28) placed southward of the reef.

Bluefish Shoal has a depth of 14 feet near its southern end, which lies ¾ mile 69° true (**E** by **N** mag.) from the south end of Manursing Island. A buoy (spar, red, No. 26) is placed near the 14-foot spot.

Four Foot Rocks lie nearly ⅝ mile 261° true (**W** mag.) from the western end of Great Captain Island; a buoy (spar, red and black horizontal stripes) is placed near a 6-foot spot which lies 200 yards southward of a 4-foot rock. There is a 10-foot spot about 100 yards southeastward of the rock with 4 feet over it.

Jones Rocks lie on the northern side of the channel at its narrowest part; some of these rocks show bare at all stages of the tide. The light is near the southern end of the rocks and is 333° true (**N** by **W** ⅝ **W** mag.), distant about ½ mile from the west end of Great Captain Island. A 4-foot shoal lies 325 yards westward from the light on Jones Rocks; from this point the shoal extends northward to Calf Islands.

Cormorant Reef lies northward of Great Captain Island, and part of it shows bare at all stages of the tide. A buoy (spar, red, No. 2½) is placed northward of the main part of the reef and close to a rock which shows bare at about half tide.

Bowers Island, the small, round island eastward of the Calf Islands, is surrounded by rocks and shoals which extend about 175 yards southward from the island.

PORT CHESTER HARBOR AND BYRAM RIVER.*

Port Chester Harbor, on the north shore of Long Island Sound, is the anchorage for vessels bound up the Byram River to Port Chester. The harbor lies northward of Manursing Island and about 1½ miles 272° true (**W** by **N** mag.) from Great Captain Island lighthouse; it is obstructed by sunken rocks and is not used by strangers.

Byram River is a narrow, shallow stream emptying into Port Chester Harbor.

Improvements have been made in the harbor and river, giving a channel 70 feet wide and 12 feet deep to the Town dock and 60 feet wide and 9 feet deep up to the steamboat dock, but the channel has narrowed and shoaled. A breakwater extends from Sunken Rock to high-water mark on **Byram Point** (the northeastern point at the entrance), and is marked at its southern end by a light.

Port Chester, at the head of navigation, about ¾ mile above the entrance, is on the line of the N. Y., N. H. & H. Railroad. A number of vessels, partly strangers, are employed in the carrying trade, which comprises cargoes of coal, iron, lumber, and general merchandise. There is a daily line of steamers to New York.

The deepest draft of vessels entering and bound up to Port Chester is about 12 feet.

Pilots.—Strangers should not enter the river without a pilot, and should anchor outside if not boarded by one promptly in response to signal. The piloting is done generally by oystermen. **Towboats** are not used except by barges and canal boats towed from New York.

Anchorage.—The usual anchorage for those acquainted with the locality is between the end of the breakwater on the southern end of Byram Point and the southern end of Calf Islands, but the anchorage is exposed to southerly winds. There is a small anchorage with a depth of about 7 feet inside the breakwater.

Supplies.—Coal can be supplied to small steamers and towboats in limited quantity. Water can be obtained at the propeller dock, and provisions and some ship-chandler's stores at Port Chester.

Ice forms the whole length of the river to Byram Point in winter.

Tides.—See Captain Harbor, page 24.

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*Shown on charts **270**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

SAILING DIRECTIONS, APPROACHING PORT CHESTER HARBOR.

The following directions are available for vessels drawing 9 feet or less.

1. ***From Eastward.***—Pass at least ¼ mile south of Great Captain Island lighthouse, and steer 255° true (**W ½ S** mag.) for about ½ mile until abreast the red buoy (spar, No. 2) marking Great Captain Island West Reef. Round this buoy, leaving it 200 yards on the starboard hand, and steer 317° true (**NW** by **N** mag.), leaving Four Foot Rocks buoy (spar, red and black horizontal stripes) about 400 yards on the port hand. Anchor in 14 to 16 feet about 100 yards southward of a line from the light on the end of the breakwater to the south end of Calf Island.

If bound to Port Chester, take a pilot.

Remarks.—On the 255° true (**W ½ S** mag.) course **Manursing Island** (large island, appears as a part of the main shore) will be ahead, and just northward of the island Port Chester Harbor will be opened out.

Dangers.—**Great Captain Island West Reef**, marked at its western end by a buoy (spar, red, No. 2), extend southwestward from Great Captain Island for about 300 yards.

Four Foot Rocks, marked by a buoy (spar, red and black horizontal stripes), lie nearly ⅝ mile 261° true (**W** mag.) from the west end of Great Captain Island, and cover an area of 200 yards in a north and south direction. The buoy lies southward of the rocks and can be left on either hand in entering, but when passing eastward of the buoy give it a berth of 200 yards.

Great Captain Rocks, showing bare at half tide, lie from 400 to 600 yards southeastward from the outer end of Port Chester Breakwater. These rocks are not marked.

Channel Rock, showing bare near low water, and **Boat Rock** lie 300 yards eastward from the outer end of the breakwater. There is a narrow channel with 11 feet of water between these rocks and Great Captain Rocks.

1 A. ***From Westward.***—Bring Great Captain Island lighthouse to bear 41° true (**NE ½ E** mag.) and steer for it on that bearing until the red buoy (spar, No. 26) on Bluefish Shoal bears 334° true (*N* by *W* ½ *W* mag.) and is in range with Port Chester light, on the south end of the breakwater. Then steer 353° true (**N ¼ E** mag.), pass 250 yards eastward of red buoy No. 26, and the same distance westward of the buoy marking Four Foot Rocks (spar, red and black horizontal stripes).

Continue on the course, and anchor as directed in section 1.

Remarks.—On the 41° true (**NE ½ E** mag.) course, northward of Great Captain Island lighthouse, Greenwich Church spire will show conspicuously above the outline of the trees.

The **bight** between Rye Neck and Manursing Island is full of rocks and the shore should be given a berth of at least ⅝ mile.

See the dangers under section 1 preceding, and the remarks and dangers under section 1 B, page 121.

HEMPSTEAD HARBOR.*

This harbor, on the south side of Long Island Sound, about 1½ miles eastward of Sands Point lighthouse, makes in for about 4½ miles and is 4 miles wide at its entrance, decreasing in width to its head. It is free from dangers if the shores be given a berth of ¼ mile, and is much used by vessels seeking shelter in any but strong northerly winds, affording excellent anchorage with good holding ground.

Glen Cove is a post village about 2 miles back from the eastern shore of the bay, and can be reached by small boats going up **Mosquito Cove** (a narrow, shallow creek about ⅝ mile south of the breakwater). Glen Cove steamboat wharf is about ⅝ mile south of Redspring Point, and a breakwater has been built to 4 feet above high water, extending from this wharf 1,564 feet in a 241° true (**WSW ¼ W** mag.) direction toward Mott Point. The anchorage behind the breakwater is known as **Glencove Harbor**, and it affords shelter for vessels bound up Mosquito Cove and waiting for the tide. There is only about 1 foot of water on the bar at the entrance to this cove, and about 2 feet inside, so vessels must enter during high water.

* Shown on charts **366**, scale $\frac{1}{20,000}$, price $0.20; **116**, scale $\frac{1}{80,000}$, price $0.50.

Sea Cliff is a post village on the top of a steep hill on the eastern shore, about 7/8 mile south of Glen Cove steamboat wharf, and on the south side of the entrance to Mosquito Cove. A steamboat wharf and the inclined railway from the steamboat wharf to Sea Cliff, by which, in the summer, passengers ascend the hill, are prominent features in this part of the harbor.

Roslyn, on the line of the Long Island Railroad, is a post village at the head of the harbor; it is of no commercial importance. A narrow channel leads up to a wharf on the eastern shore, about 1 mile above **Bar Beach** (a narrow sandy strip extending 600 yards eastward from the western shore of the harbor, about 2 miles southward of Mott Point). On the eastern shore opposite Bar Beach is the post village of **Glenwood Landing.** The harbor above Bar Beach can be navigated only by those perfectly acquainted with the locality.

Prominent features.—Matinicock Point is the eastern point at the entrance, and Prospect Point, about 7/8 mile eastward of Sands Point lighthouse, is the western. Mott Point is about 2 miles 113° true (**SE** by **E** 1/8 **E** mag.) from Prospect Point. Between Prospect Point and Mott Point, on the western shore, is a long line of bluffs showing bare faces; the upper outline presents four rounded sweeps and is unmistakable when seen from northward or eastward. Redspring Point, on the eastern shore, is about 2 miles southwest from Matinicock Point and 2 5/8 miles east of Prospect Point. The eastern shore south of Redspring Point is high as far as Bar Beach.

Anchorage.—Vessels can anchor in any part of the harbor according to draft and direction of the wind. A good anchorage for vessels drawing 20 feet or less is just inside of a line from Mott Point to the breakwater. Light-draft vessels, and those waiting for high water to enter Mosquito Cove, anchor southward of and behind the breakwater.

Tides.—See page 24.

GENERAL DIRECTIONS, HEMPSTEAD HARBOR.

No detailed sailing directions are needed for entering in the daytime. When within the entrance stand southward, keeping about 600 yards from the shore on either side of the harbor, and anchor at discretion.

Remarks.—Coming from eastward or from northward, the high, bare-faced bluffs between Prospect and Mott points will show conspicuously, and when up to Redspring Point the high hill and inclined railway and steamboat wharf at Sea Cliff will be made on the eastern shore; farther northward is Glen Cove steamboat wharf and the breakwater.

A buoy * (spar, black, No. E 1) is placed 400 yards from the shore nearly 3/8 mile northward of Redspring Point, and a buoy * (spar, red, No. D 2) is located 1/2 mile from the shore and 3/4 mile northward of Mott Point.

Dangers.—**Matinicock Point Shoal** makes out 1/4 mile northward from the point and is marked by a buoy (spar, black, No. 17).

Prospect Point Shoal is described on page 76. From Prospect Point to Mott Point, and a short distance south of the latter, shoals make off 500 yards from the shore; abreast Mott Point the shoal is marked by a buoy (spar, red, No. 2). **Picket Rock,** awash at low water, 1/4 mile northward of Mott Point, lies 300 yards from shore.

Shoals make out from the eastern shore of the harbor between Redspring Point and Sea Cliff, in one place for a distance of 300 yards. By giving this shore a berth of 400 yards all dangers will be cleared.

At night.—*From Eastward.*—Standing through the Sound, when Great Captain Island light bears 19° true (*NNE* 1/2 *E* mag.) steer 199° true (**SSW** 1/2 **W** mag.) until Execution Rocks light bears 269° true (*W* 3/4 *N* mag.). Then steer 168° true (**S** 1/4 **E** mag.) with the light on the end of the breakwater on the port bow; anchor according to draft, either in the middle of the harbor or southward of the breakwater.

From Westward.—Passing south of Execution Rocks, bring Execution Rocks light to bear 261° true (*W* mag.) and steer 81° true (**E** mag.) until about 1 1/2 miles eastward of this light. Then make good a 120° true (**SE** 1/2 **E** mag.) course, heading for the light on the end of the breakwater and giving the shore on the starboard hand a berth of 5/8 mile; anchor according to draft, as directed above.

Caution.—When north of Prospect Point give the point a berth of over 1/2 mile, and when inside a line from Prospect to Matinicock points do not approach the shores nearer than 600 yards.

* This buoy is in place from May 1 to November 1 only.

Glencove Breakwater light is on the end of the breakwater (see table, page 16), and care must be taken to leave it on the port hand when entering.

MILL CREEK.*

Mill Creek is a small and unimportant stream on the north shore of Long Island Sound, between Port Chester Harbor and Mamaroneck Harbor. The entrance lies about 3⅝ miles 24° true (**NE** by **N** mag.) from Execution Rocks lighthouse, and is marked by Rye Point and the Scotch Caps on the east and Hen Island on the west. The creek is very shallow and is only navigable for small vessels at high water. It is a summer anchorage for yachts and small craft. There is a depth of 8 to 10 feet in the entrance between Scotch Caps and the south end of Hen Island.

The deepest draft of vessels bound into the creek is 7 feet, the average draft is not more than 6 feet; the depth alongside the wharf at mean low water is 1 foot.

Strangers should take a pilot, anchoring off the mouth of the creek with signal up until one comes out, or proceed to City Island and obtain a pilot there.

Ice extends out to the Scotch Caps in winter.

Tides.—See heading "Mamaroneck Harbor."

GENERAL DIRECTIONS, MILL CREEK.

Approaching from Eastward.—Follow the directions for approaching Mamaroneck Harbor, leave Scotch Caps gas buoy (white light with eclipses) 100 yards on the starboard hand, and steer 311° true (**NW** ½ **N** mag.) a little over ¼ mile. Then, if of less than 7 feet draft, steer 24° true (**NE** by **N** mag.), leave Mill Creek entrance buoy (spar, red and black horizontal stripes) about 60 yards on the starboard hand and continue the course; anchor in 8 to 10 feet of water about 250 yards northwestward of the Scotch Caps.

If more than 7 feet draft anchor westward of the entrance buoy, or take a pilot.

Remarks.—Mill Creek entrance buoy (spar, red and black horizontal stripes) lies fair in the entrance to the creek and about ⅜ mile northward of Scotch Caps gas buoy; it marks a 10-foot spot, and can be left on either hand when standing into the entrance of Mill Creek.

From Westward.—Bring Execution Rocks lighthouse to bear 204° true (*SW* by *S* mag.) and steer 24° true (**NE** by **N** mag.); Mill Creek entrance buoy should be made ahead. Come to anchor as directed above.

For dangers see heading "Mamaroneck Harbor and River."

MARMARONECK HARBOR AND RIVER.*

Mamaroneck Harbor, on the north shore of Long Island Sound, about 5 miles westward of the boundary line between the States of Connecticut and New York, and 3½ miles 16° true (**NNE** ¼ **E** mag.) from Execution Rocks lighthouse, is a shallow bight between Hen Island on the east and Delancey Point on the west. It is open to southerly winds, but affords shelter against northerly winds for vessels drawing less than 10 feet; the important dangers are buoyed, enabling an anchorage to be made with safety. The depth in the outer harbor is from 7 to 12 feet at low water. **Mamaroneck River** is a shallow and unimportant stream or tidal inlet.

Mamaroneck, a village on the N. Y., N. H. & H. Railroad, is about ½ mile above the mouth of the river; it has some trade in coal and building materials. The dredged channel to the steamboat wharf has a depth of 7 feet and width of 100 feet at mean low water; from there to the other wharves the depth was 7 feet, and width 70 to 90 feet, but in 1908 the channel had shoaled. The deepest draft entering the river is about 9 feet.

Strangers can not enter the river without a pilot; one can be obtained off the entrance or at City Island.

Tides.—The mean rise and fall of tides is about 7.5 feet. For other tidal data in this vicinity, see New Rochelle in table, page. 24.

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* Shown on charts **271**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

SAILING DIRECTIONS, MAMARONECK HARBOR.

The following directions are available for vessels drawing 9 feet or less to the anchorage off the entrance:

1. ***From Eastward.***—Standing along the north shore of the sound, keep Great Captain Island lighthouse bearing northward of 43° true (*NE* ⅝ *E* mag.). Pass nearly ¾ mile south of the Scotch Caps and steer 283° true (**WNW** mag.), leaving Scotch Caps buoys (gas buoy, red, No. S. C. 28, and spar, red, No. 2) and Ship Rock buoy (spar, red and black horizontal stripes) on the starboard hand. When Ship Rock buoy bears on the starboard beam, steer 345° true (**N ½ W** mag.) and anchor according to draft before passing the line joining Outer Steamboat Rock buoy (spar, black, No. 3) and Turkey Rock buoy (spar, red and black horizontal stripes). If bound up the river take a pilot.

Remarks.—When standing westward along the north shore, Rye Neck and Scotch Caps will be made on the starboard bow. Execution Rocks lighthouse should be made on the port bow. The shore eastward of Parsonage Point should be given a berth of ¾ mile. Passing the Scotch Caps, Mamaroneck Harbor will be opened out on the starboard beam and Mill Creek entrance will show just westward of the Scotch Caps, stretching in a northeasterly direction on the west side of Rye Neck. Scotch Caps buoys should be left 100 yards on the starboard hand and Ship Rock buoy should be given a berth of 300 yards on the starboard hand.

Dangers.—**Rye Neck.**—The eastern shore of Rye Neck should receive a berth of ¾ mile on account of the numerous rocks and ledges that lie scattered along from the Scotch Caps to Manursing Island.

Scotch Caps are two rocky islets lying ¼ mile southwestward from Rye Neck; they are part of a reef which extends ¾ mile southwestward from Rye Neck. A red gas buoy (white light with eclipses) and spar buoy are placed ½ mile southwestward of the islets on the south side of the reef.

Ship Rock, ⅜ mile 197° true (**SSW ¼ W** mag.) from Hen Island, has 2 feet of water over it and is marked by a buoy (spar, red and black horizontal stripes); this buoy is nearly ½ mile 326° true (**NNW ¼ W** mag.) from Scotch Caps buoy.

Turkey Rock, marked by a buoy (spar, red and black horizontal stripes), is bare at low water and lies ¼ mile westward from the western end of Hen Island.

Outer Steamboat Rock, with 4 feet over it, lies nearly ¼ mile westward of Turkey Rock and is marked by a buoy (spar, black, No. 3).

A rock, bare at low water, lies about 230 yards northwestward from Turkey Rock and is not marked.

Delancey Point Ledge is the shoal making about 700 yards southward and eastward from Delancey Point; it is bare in places at low water, and is marked at its southern end by a buoy (spar, black, No. 1).

The western shore of the harbor is foul and should receive a berth of about 500 yards.

1A. ***From Westward.***—Bring Execution Rocks lighthouse to bear 197° true (*SS W* ⅜ *W* mag.) and steer 17° true (**NNE ⅜ E** mag.), keeping the lighthouse on the bearing. Leave Delancey Point Ledge buoy (spar, black, No. 1) about 300 yards on the port hand and continue on the course nearly ¾ mile after passing this buoy. Anchor as directed under section 1 foregoing.

Remarks.—On the 17° true (**NNE ⅜ E** mag.) course, Long Beach Point breakwater will be left ⅜ mile on the port hand when abeam and the harbor should be open ahead.

Dangers are described under section 1 foregoing.

LARCHMONT HARBOR.*

This is a cove making into the north shore of Long Island Sound, the middle of the entrance bearing 359° true (**N ¾ E** mag.) from Execution Rocks lighthouse. This bearing leads directly across Hen and Chickens, which has rocks that bare at low water and obstruct the approach, but there is a good channel on either side.

The harbor affords anchorage for light-draft vessels, and is the headquarters of the Larchmont Yacht Club.

*Shown on charts **271**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

Under Government appropriations, a breakwater was started on Umbrella Rock, of which a few rocks show at high water, near a spindle with red light which is maintained by the yacht club. A number of spindles on the rock, on the western side of the harbor are also maintained by the yacht club. A breakwater, which shows at high water, extends 1,410 feet in a 147° true (**SSE ⅛ E** mag.) direction from Long Beach Point, on the eastern side of the entrance, and is marked at its end by a light.

Umbrella Rock, on the western side of the entrance, is marked by a piece of breakwater and a spindle. The entrance eastward of Umbrella Rock is about 400 yards wide and the depth 14 to 15 feet; farther in, the water shoals to 9, 7, and 6 feet; the best water inside is toward the western shore.

The anchorage for larger vessels is westward of Long Beach Point breakwater and has soft and sandy bottom; farther in the cove are ledges and rocks, some of which are marked by spindles. The smaller yachts anchor north of a line from Long Beach Point to Umbrella Point, in 6½ to 10 feet of water. Inside of this line in summer the harbor is full of mooring buoys for small yachts.

Larchmont railroad station and the post-office are 1½ miles from the yacht clubhouse.

Tides.—See heading "Mamaroneck Harbor."

SAILING DIRECTIONS, LARCHMONT HARBOR.

These directions are good only in the daytime; strangers should not attempt to enter at night.

1. ***Approaching and Entering, from Eastward.***—With Great Captain Island lighthouse bearing 351° true (*N* mag.), distant about ¾ mile, steer 233° true (**SW** by **W** ½ **W** mag.). Pass ½ to ¾ mile south of Rye Neck, and when Scotch Caps buoys bear 351° true (*N* mag.), distant about ¼ mile, steer 256° true (**W** ½ **S** mag.) and pass about 100 yards southward of Long Beach Point breakwater. Then steer about 306° true (**NW** mag.) and anchor behind the breakwater in 4 to 5 fathoms, or, in 7 to 13 feet of water southward of a line drawn from the first wharf on the western side of Long Beach Point to the clubhouse on the west side of the harbor.

Remarks.—On the 233° true (**SW** by **W** ½ **W** mag.) course, **Rye Neck** (a rocky point with several small islands and detached rocks extending southwestward) should be made on the starboard bow. The high, square brick tower on Davids Island should be made ahead. Scotch Caps buoys (gas buoy, red, No. S. C. 28, and spar, red, No. 2) will be left about ¼ mile on the starboard hand.

On the 256° true (**W** ½ **S** mag.) course, **Long Beach Point** and the breakwater will be made on the starboard bow; the breakwater off the point will show prominently at low water Mamaroneck Harbor and the buoys marking its entrance will be left on the starboard hand; the buoys marking Hen and Chickens will be made on the port bow and left on the port hand when on the 306° true (**NW** mag.) course.

Dangers.—**Hen and Chickens**, a ledge of rocks, bare in places near the middle at low water, lies off the entrance to the harbor, 1½ to 2¼ miles 359° true (**N** ¾ **E** mag.) from Execution Rocks lighthouse. The ledge with less than 18 feet over it is about ⅝ mile long in a north and south direction, and 650 yards wide. The part having less than 12 feet over it is about 700 yards long and 550 yards wide. This ledge is marked by four buoys; at its eastern limit by a black gas buoy, at its northern end by black spar buoy No. 3, near its southwestern limit by red spar buoy No. 2, and at its western limit by red nun buoy No. 4.

Dauntless Rock, with 10 feet over it, is at the north end of the Hen and Chickens and about 600 yards 256° true (**W** ½ **S** mag.) from the end of Long Beach Point breakwater and near the black spar buoy (No. 3) which marks the northern end of the Hen and Chickens. In summer a black can buoy is placed near Dauntless Rock.

Umbrella Rock lies 250 yards eastward from Umbrella Point on the west side of the entrance, and is marked by a spindle. A few rocks of the piece of breakwater show at high water.

1A. ***Approaching and Entering, from Westward.***—Bring Execution Rocks lighthouse to bear 81° true (*E* mag.), distant about ⅜ mile, and steer 0° true (**N** ⅞ **E** mag.) heading for a large white flagstaff a little westward of the entrance to the harbor. The red buoys on the south and west limits of Hen and Chickens should be made a little on the starboard bow; pass westward of both these buoys, and when the western one (nun, red, No. 4) bears abeam, distant about 200 yards, steer 38° true (**NE** ⅛ **E** mag.) for the

south end of Long Beach Point. Umbrella Rock spindle will be made on the port bow; leave it 150 yards on the port hand, and when about midway between the spindle and the black buoy southeastward of it, haul eastward and anchor behind the breakwater. Or, leave Umbrella Rock spindle 150 yards on the port hand and steer 351° true (**N** mag.); anchor as directed under section 1 preceding.

Remarks.—On the 0° true (**N** ⅞ **E** mag.) course, Huckleberry Island will be left about 700 yards on the port hand.

The 38° true (**NE** ⅛ **E** mag.) course leads nearly 200 yards northward of black spar buoy, No. 3, on the northern end of Hen and Chickens.

See the dangers under section 1 foregoing. See also description of the harbor and improvements.

Or, bring Execution Rocks light-house to bear 261° true (*W* mag.) distant ¼ mile and steer 0° true (**N** ⅞ **E** mag.) with Larchmont Harbor light, on the end of Long Beach Point breakwater, a little on the starboard bow. Having stood on this course nearly 2¼ miles, Hen and Chickens northeast gas buoy (black, No. 1) should be on the port beam distant 230 yards. Then head up for an anchorage behind the breakwater, or, steer 331° true (**N** by **W** ¾ **W** mag.) and anchor according to draft as directed in section 1 preceding.

ECHO BAY.*

Echo Bay or Harbor, also known as Upper New Rochelle Harbor, is a small bay lying 2 miles 323° true (**NNW** ½ **W** mag.) from Execution Rocks lighthouse. This bay has anchorage in 7 to 15 feet of water, and is sheltered from all but southeasterly winds. It is the headquarters of the New Rochelle Yacht Club. The upper part of the harbor has been improved by the removal of rocks, and dredging a channel 4 feet deep and 40 feet wide from the bay to within 300 feet of the head of the harbor, but this has shoaled. There is now (1908) a channel 6 feet deep and 100 feet wide, at low water, to the wharf at Beaufort Point. A tall brick chimney near the head of the harbor is the most prominent feature for vessels passing off the entrance.

New Rochelle, a village on the N. Y., N. H. & H. Railroad, is on the northwestern and western shores of the harbor.

Pilots.—Strangers generally take a pilot when bound into Echo Bay. Pilots will be found at City Island; generally one can also be obtained from the oyster boats in the vicinity.

Tides.—See heading "Mamaroneck Harbor."

SAILING DIRECTIONS, ECHO BAY.

The following directions are, if closely followed, available for vessels drawing 12 feet or less.

1. ***Approaching and Entering, from Eastward.***—From a position about ¾ mile south of Great Captain Island lighthouse, steer 233° true (**SW** by **W** ½ **W** mag.). Pass about ⅝ mile south of Scotch Caps, and continue the course until Larchmont Harbor light, on the end of Long Beach Point breakwater, bears abeam. Then steer 250° true (**W** by **S** mag.) passing about 350 yards south of Hen and Chickens southwest buoy (spar, red, No. 2) and 200 yards south of Eight Foot Spot (Hicks Ledge) buoy (spar, red and black horizontal stripes). Then steer 293° true (**NW** by **W** ⅛ **W** mag.) directly into the bay, passing about midway between Bailey Rock buoy (spar, black, No. 1) on the west side, and the buoy (spar, red, No. 2) on the east side of the entrance. Anchor in 15 to 17 feet of water when inside a line joining the two buoys.

Remarks.—On the 233° true (**SW** by **W** ½ **W** mag.) course, a high, red brick tower on Davids Island will be ahead, and farther southward Huckleberry Island and Execution Rocks lighthouse will be seen.

On the 293° true (**NW** by **W** ⅛ **W** mag.) course, **Duck Point** will be directly ahead, and a tall brick chimney at the head of the harbor and **Gut Island** and **Echo Island** (on the northern side of the entrance) will be a little on the starboard bow.

* Shown on charts **271**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

Dangers.—Hen and Chickens are described on page 126.

Hicks Ledge, an **8-foot spot**, marked by a buoy (spar, red and black horizontal stripes), lies about 900 yards 121° true (**SE** ⅜ **E** mag.) from Premium Point, the south end of Gut Island.

Middle Shoal is about 600 yards in diameter with depths less than 12 feet, is partly bare at low water, and lies about ⅜ mile 340° true (**N** by **W** mag.) of Huckleberry Island, and 1½ miles 317° true (**NW** by **N** mag.) from Execution Rocks lighthouse. The northern extremity of this shoal is marked by a buoy (spar, black, No. 1).

Gut Island, on the northern side of the entrance, has a ledge, bare at low water, extending 130 yards westward from its western side. The ledge is marked at its western extremity by Premium Point buoy (spar, red, No. 2).

The northeastern point of **Davenport Neck**, on the southern side of the entrance to the harbor, has a **rocky shoal**, bare in places at low water, extending out 180 yards eastward; **Baileys Rock** is near the eastern end of this shoal and is marked by a buoy (spar, black, No. 1) about 50 yards eastward of the rock.

1A. ***Approaching and Entering, from Westward.***—Passing ¼ to ¾ mile northward of Execution Rocks lighthouse, bring the lighthouse to bear 153° true (*S* by *E* ½ *E* mag.) and steer 333° (**N** by **W** ½ **W** mag.), keeping Execution Rocks lighthouse in range with Sands Point lighthouse. This course will lead to a position about 200 yards westward of Eight Foot Spot (Hicks Ledge) buoy (spar, red and black horizontal stripes). Then steer 293° true (**NW** by **W** ⅛ **W** mag.) and enter as directed in section 1 preceding.

Dangers.—See under section 1 foregoing.

NEW ROCHELLE HARBOR.*

This is a small and narrow body of water between Davenport Neck, Davids Island, Glen Islands, and the mainland. It lies off the southerly part of the town of New Rochelle. A few vessels enter this harbor yearly with coal and building material. The draft of vessels trading at New Rochelle Harbor ranges from 5 to 9 feet.

The channels leading to the harbor are narrow and full of dangers, and a stranger should not attempt to enter without a pilot; one can be had at City Island, or from some of the oyster boats in this vicinity.

"No vessel shall anchor within an area ¼ mile wide extending from Davids Island to New Rochelle, the central line of which passes midway between Aunt Phebe Rocks; thence, just westward of red spar buoy No. 6, to the right of the wharf at Neptune House, New Rochelle."

Sailing directions for this harbor would not be of practical use.

MANHASSET BAY.*

Manhasset Bay, often called Cow Bay, makes into the north shore of Long Island at the western end of the Sound. The entrance is about 1¼ miles southwestward of Sands Point lighthouse, and lies between Barker Point on the east and Hewlett Point on the west. It affords excellent shelter for light-draft vessels, and is much frequented by yachts in the summer, but is of little commercial importance; oysters cultivated in the bay, and sand taken from the bluffs and towed to New York in barges, comprise the cargoes carried.

Port Washington is a village at the head of the bight in the eastern part of the bay.

Manhasset is a village at the head of the bay; vessels of less than 6 feet draft can go there at high water; at low water this part of the bay is bare for ½ mile from its head.

Anchorage in 18 to 24 feet, sheltered against easterly winds, is found just inside and westward of Barker Point; the depth in the western half of the entrance is 12 to 15 feet. Vessels will find 13 to 15 feet ½ mile southward of Barker Point, with shoaler water nearer the eastern shore. *Vessels of 8 feet draft or less* will find shelter from all winds ½ mile southeastward from Plum Point; a little farther eastward are flats over which the depth is but 6 feet. Vessels drawing less than 8 feet can also anchor in 10 to 12 feet eastward of Mott Point. The bottom is soft mud in all parts of the bay.

"No vessel shall anchor within an area ½ mile wide, the central line of which extends from the wharf at Fort Slocum to the western part of Sands Point, passing between Lower Green Flats and Pea Island."

Tides.—See table, page 24.

The tidal currents are not of sufficient velocity to affect navigation. **Ice** closes the bay about two months each winter.

*Shown on charts **272**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

SAILING DIRECTIONS, MANHASSET BAY.

The following directions are available for vessels drawing 13 feet or less, except as specially noted.

1. ***From Eastward.***—Following the directions for Long Island Sound, Execution Rocks to Throgs Neck, page 66, until past Gangway Rock buoy (spar, black, No. 23), and when about 500 yards westward of the buoy steer 148° true (**SSE** mag.) into the bay. When past Barker Point anchor at discretion, according to draft.

If drawing 8 feet or less, desiring to stand well in, continue the 148° true (**SSE** mag.) course to a mid-channel position westward of Plum Point, and then steer 117° true (**SE ¾ E** mag.), leaving black spar buoy No. 1 on the port hand. Anchor in 10 to 14 feet southward or southeastward of the black spar buoy.

Remarks.—On the 148° true (**SSE** mag.) course Mott Point (low, wooded, on the western shore of the bay) will be made ahead. **Plum Point** (low sand spit extending southward, about 1 mile south of Barker Point) should be left over 250 yards on the port hand. On the south shore of the bight, eastward of Plum Point, is the village of Port Washington.

The eastern part of the bay has the best water from Barker Point until below Plum Point.

Toward the Northern shore of the bight, east of Plum Point, the water is shoal; a buoy (spar, black, No. 1) is placed in 12 feet of water about ¼ mile southeastward of Plum Point; from 10 to 14 feet will be found 300 to 1,200 yards east of Mott Point.

Dangers.—**Gangway Rock**, marked by a buoy (spar, black, No. 23), is at the northern extremity of a broken line of rocks and shoal water extending over ⅝ mile in a 322° true (**NNW ½ W** mag.) direction from Barker Point. **Success Rock**, marked by a red spindle, is one of this broken line of rocks. These dangers are left on the port hand in entering. After passing northward and westward of Gangway Rock buoy, give Barker Point a berth of at least 250 yards in entering.

1A. ***From Westward.***—Leave Stepping Stones lighthouse 300 yards on the starboard hand and steer 41° true (**NE ½ E** mag.), passing about ⅜ mile northward of Hewlett Point. When abreast the middle of the entrance stand into the bay, keeping the eastern shore the best aboard, and anchor as directed in entering from eastward.

Remarks.—On the 41° true (**NE ½ E** mag.) course Sands Point lighthouse will be a little on the starboard bow, and the spindle on Success Rock should be nearly in range with it. Hewlett Point (steep, moderately high, and backed by woods) will be on the starboard bow.

Dangers.—A **shoal** makes out about 320 yards northward from Hewlett Point, and is marked at its northern end by a buoy (spar, black, No. 25); the point should receive a berth of not less than 400 yards, and in entering the bay leave this point about ⅜ mile on the starboard hand.

Other dangers are mentioned under section 1.

CITY ISLAND HARBOR (HART ISLAND ROADS).*

Hart Island Roads, as it is generally called, lies in the western end of Long Island Sound, about 2¾ miles southwest from Execution Rocks lighthouse. This anchorage, between Hart Island on the east and City Island on the west, is usually approached from southward. It is well sheltered against easterly and westerly gales.

This is an important anchorage, and a great resort for coasters. Besides serving as a harbor of refuge, it is often used by vessels desiring pilots or towboats, or delayed by unfavorable winds or other causes, or waiting for orders.

Hart Island, on the eastern side of the harbor, is of no commercial importance.

City Island is nearly 1½ miles long in a north and south direction, and at its northern end is connected with the mainland by a drawbridge. Its population is engaged principally in shipbuilding and dredging for oysters; there is little commerce.

Anchorage.—The usual anchorage for vessels of deep draft, and those waiting for orders, is southeastward of City Island, southward of a line drawn from the south end of Hart Island to the south end of City Island.

*Shown on charts **272**, scale $\frac{1}{10,000}$; **116**, scale, $\frac{1}{80,000}$; price of each $0.50.

Vessels of less than 14 feet draft anchor anywhere southward of a line drawn from the northern end of Hart Island to Town dock on City Island. Town dock is the large dock ⅝ mile above the south end of City Island.

The limits here indicated are not fixed by regulation, but are based upon the depth of water in different parts of the roads, and are used locally as a convenient guide.

The western shore of Hart Island should not be approached closer than 120 yards. The southern shore of City Island can be approached as close as 120 yards; the eastern side of City Island, south of Jacobs shipyard, should be given a berth of 150 yards; above Jacobs shipyard keep well eastward of a line running through the ends of the wharves. The bottom is soft.

"No vessel shall anchor within an area ½ mile wide, the central line of which extends from the point of the wharf at Fort Totten to Stepping Stones light; thence along the southeastern shore of Harts Island and East Nonations, between Middle Reef and Lower Green Flats, to the northwest dock at Fort Slocum on Davids Island."

Pilots.—City Island is one of the headquarters for East River (Hell Gate) and Sound pilots. Pilots for small harbors on the Connecticut and Long Island shores, as far east as Great Captain Island, can also be found here.

Towboats.—Vessels desiring a towboat, and not having met with one before reaching City Island, can telegraph to New York from the reporting station, should any unusual conditions make it necessary, and get a towboat in one and one-half hours. Ordinarily there is no difficulty in getting a towboat in this part of the Sound or in East River.

A **reporting station** is located near the south end of City Island from which passing vessels are reported, by direct wire, at the Maritime Exchange, New York City, and to the Associated Press. Foreign vessels, if their signal letters are flying while between Sands Point and the Stepping Stones, will be reported at the Maritime Exchange as soon as their letters are made out. Foreign steamers expected to arrive, passing City Island in the night, will be reported if they give four blasts on the steam whistle as they pass the island.

Supplies.—Provisions and some ship-chandler's stores can be had at City Island. Water can be had from water boats and alongside of the dock.

Repairs.—Repairs to vessels and to the machinery of steamers can be made at City Island. There are several marine railways; the largest railway is capable of hauling out a vessel of about 800 tons, is 165 feet on blocks, 14 feet forward, 21 feet aft.

Quarantine.—The quarantine regulations are the same as for the port of New York. The headquarters of the health officer for the port of New York is at Staten Island. (See "Quarantine," page 56, and consult Appendix II.)

Tides.—The mean rise and fall of the tides is 7.4 feet; high and low water occur the same time as at Willets Point. For other tidal data see Willets Point in the table on page 24.

Ice.—In the winter drift ice sometimes interferes with navigation to the extent that sailing vessels are obliged to take a towboat.

Description of lighthouses and other general matters will be found on pages 9–25.

SAILING DIRECTIONS, CITY ISLAND HARBOR.

1. ***From Eastward.***—In approaching, follow the directions given for Long Island Sound, in section 6, page 66. When the harbor is opened out, head northward and anchor, according to draft, between Hart and City islands (see "Anchorage" on the preceding page and the caution following section 1 A).

Remarks.—The southern end of Hart Island should receive a berth of over 200 yards when eastward of it and over 150 yards when southward. On passing the southern point of Hart Island a small, dark, rocky islet (**Rat Island**) will be seen lying nearly midway between Hart and City islands, in the northern part of the harbor. **High Island** is a small island, the highest part of which, near its eastern end, has a small hut near the top; this island is backed by a few trees, and lies about 350 yards northeastward of the northern end of City Island. The hut on High Island in range with Rat Island leads through a channel with 21 feet to an excellent anchorage in 20 to 30 feet, about 450 yards eastward from the upper wharf on City Island.

1 A. ***From Westward.***—Round Throgs Neck at a distance of about 300 yards and steer 14° true (**NNE** mag.), heading fair between Hart and City islands. Anchor, according to draft, between the islands (see "Anchorage" on the preceding page and the caution following).

Remarks.—Stepping Stones lighthouse should be left over 200 yards on the starboard hand.

Big Tom, a rock lying 600 yards 246° true (**WSW** ⅝ **W** mag.) from the southern point of City Island, is awash at low water, and is marked off its southern side by a buoy (spar, red, No. 32); this buoy should be left at least 700 yards on the port hand.

Caution.—Large deep-draft vessels frequently anchor southeastward of City Island. Such vessels should keep clear of *Deep Reef*. This is a small, rocky patch with about 5 fathoms over it and 9 to 13 fathoms all around it. The marks for this spot are the northern wharf on the east side of City Island in range with the little hut on High Island, and the sea wall on the southern end of City Island in range with a dark church spire in Westchester. A vessel at anchor with her cable across this reef is apt to lose her anchor if caught in a gale.

EAST CHESTER BAY.*

East Chester Bay is a shallow bay, full of oyster beds, the entrance to which lies between City Island and Throgs Neck. Only vessels of light draft (less than 8 feet) can lie afloat in the bay at low water. **East Chester Creek**, or Hutchinson River, is a shallow stream emptying into the head of the bay. Under Government appropriations a channel has been dredged from the entrance of the river to a point 3,000 feet above Lockwoods with a depth of 9 feet at mean high water; this channel is maintained by dredging. It is proposed to deepen it to 12 feet at mean high water. Vessels of 8 feet draft, carrying coal and lumber, go up as far as Lockwoods, lying in the mud at low water while unloading. Strangers generally take a pilot; one can be had at City Island. The usual anchorage for vessels waiting for a tide or a fair wind is southwestward of City Island, south of Big Tom buoy (spar, red, No. 32).

Tides.—See heading "City Island Harbor."

Sailing directions would not be of practical use; the dredged channel is 100 feet wide.

LITTLE NECK BAY.*

Little Neck Bay makes into the north shore of Long Island at the eastern end of the East River, where the latter joins Long Island Sound. The bay is about 2 miles long, with an average width of about ¾ mile. Its eastern point at the entrance is **Elm Point**, which is about ¾ mile southeast of Stepping Stones lighthouse, and on the western side of the entrance is Willets Point, marked by a fortification and barracks (see "Caution," page 132). The depth of water decreases from 9 feet abreast of Willets Point, leaving the upper part of the bay bare at low water. Vessels bound up to the village of **Little Neck** can only go up at high water; 5 feet is their greatest draft.

Strangers bound up to the wharf at the head of the creek require some one acquainted with the locality to pilot them. Pilots will be found at City Island. The entire bay is closed by ice during the winter.

EAST RIVER.†

is the name given to the narrow strait which connects Long Island Sound with New York Bay, and separates Long Island from Manhattan Island (borough of Manhattan). At its eastern end the river is about ⅝ mile wide between Throgs Neck and Willets Point, and thence its course is westward and southwestward for about 14 miles, being in many places extremely narrow, and in no place more than 1 mile wide. Its channel is much obstructed by rocks and islands, and the currents have great velocity, especially in the narrow passage between Wards Island and Hallets Point, known as Hell Gate. Strangers in sailing vessels should not attempt to pass through Hell Gate without a pilot or towboat.

Descriptions of lighthouses, with other general matters, will be found on pages 9–25; consult also pages 55–56. The **quarantine regulations** for East River are the same as for the Port of New York. The headquarters of the health officer for the Port of New York is at Staten Island, just above Fort Wadsworth. (See Appendix II.)

Throgs Neck, on the north shore, at the eastern entrance to the East River, is opposite **Willets Point** (large granite fort near water's edge). At the southern end of the neck on Fort Schuyler is Throgs Neck lighthouse (see table, page 16). During thick weather vessels bound into the East River sometimes anchor on Hammond Flats or off Whitestone (see "Anchorages," East River). In winter there is much drift ice off Throgs Neck at times, but it seldom prevents vessels from being towed through the East River. There is a storm-warning display station at Throgs Neck.

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*Shown on charts **272**, scale $\frac{1}{10,000}$; **116**, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on the following charts: **369a**, Hudson and East rivers, W. 67th street to Blackwells Island, scale $\frac{1}{10,000}$; **369b**, Hell Gate and East River from Blackwells Island to Lawrence Point, scale $\frac{1}{5,000}$; **273**, Throgs Neck to Randall Island, scale $\frac{1}{10,000}$, price of each $0.50. Shown, also, in whole or in part, on charts **369**, New York Bay and Harbor, scale $\frac{1}{40,000}$, price $0.75; **116**, Long Island Sound, Stratford Shoal to New York, scale $\frac{1}{80,000}$, price $0.50; **120**, New York Bay and harbor, scale $\frac{1}{80,000}$, price $0.50.

Caution.—On the walls of the granite fort on Willets Point is the following notice: "*Torpedoes! Don't anchor.*" The "Torpedo Ground" is southeastward of the line drawn from Stepping Stones lighthouse to the long wharf at Willets Point.

"No vessel shall anchor within an area ¼ mile wide, the central line of which extends from the root of the wharf at Fort Totten (Willets Point), Long Island Sound, to the root of the wharf at Fort Schuyler (Throgs Neck)."

Whitestone is on the south shore, 1 mile westward of Throgs Neck. The New York Herald has a telegraph and boarding station at the landing.

On **Whitestone Point**, westward of Whitestone, is a light and fog bell (see table, page 16).

Pilots for the East River and Long Island Sound can sometimes be found at Whitestone, and towboats can be had from New York by telegraphing.

College Point is on the south shore, 1½ miles westward of Whitestone. A ferry runs from here to Ninety-ninth street, New York. Other steamers also make trips to New York. There is 11 feet of water at the end of the wharf, where coal and water for tugs or other small steamers can be obtained. College Point has some trade; 8 to 10 feet of water can be carried in at low water; 9 feet is found alongside the principal wharves; 12 feet is the deepest draft entering.

Strangers bound to College Point from eastward generally take a pilot or a towboat at City Island or at Whitestone; if from westward, a towboat is generally taken at New York.

Flushing Bay, on the south shore, between College Point on the east and Sanford Point on the west, is a shallow bay, 1¾ miles long in a northwest and southeast direction, and 1 mile wide between the points at the entrance, narrowing gradually to ½ mile at its head.

A channel about 200 feet wide and 6 feet deep has been dredged through the flats to the entrance of Flushing Creek; a dike built of piles driven in the mud runs along the western side of the dredged channel for a distance of 4,663 feet, but about 1,600 feet of the northern end of the dike was destroyed by ice and has not been rebuilt. A fixed red light is shown from a lantern suspended from a mast on the north end of the dike. The depth in the channel in 1908 was about 8 feet and the channel had narrowed.

Flushing Creek, a narrow, crooked stream, empties into the head of the bay. **Flushing**, a village having some trade in coal, lumber, and building material, is about ½ mile above the entrance on the east bank of Flushing Creek. There is a line of steamers running from Flushing to New York.

The usual draft of vessels bound to Flushing is 8 feet; draft that enters at low water, 5 feet; there is from 3 to 10 feet of water alongside the wharves.

White Pot Landing is at the head of navigation on Flushing Creek; only small, light-draft vessels go up to the landing. Several bridges cross the creek; the estimated width of draws in these bridges is about 30 feet.

Strangers bound to Flushing take a pilot or a towboat; if of over 50 tons, they take a towboat. Pilots can be had at City Island, at Whitestone, or at New York City. Towboats will be found in the East River or can be had at Flushing.

In the winter ice obstructs navigation, generally during January and February, and sometimes Flushing Bay is frozen over from its head to College Point.

Rikers Island lies 1⅜ miles westward of College Point. The main channel leads northward of this island. A channel leads across the entrance of Flushing Bay south of Rikers Island and south of South Brother Island, joining the main channel of East River between South Brother Island and Lawrence Point, where it is marked by several buoys and two lights (which also serve as day beacons), one at Lawrence Point Ledge, just south of the channel, and the other on South Brother Ledge, near the eastern edge of the channel. This channel has a depth of 18 feet, but there are several spots with only 8 and 9 feet over them, and others with 11 to 16 feet. Strangers should not attempt to pass through south of Rikers Island.

North Brother Island lies 289° true (**NW** by **W** ½ **W** mag.) from the northern end of Rikers Island, distant ½ mile; North Brother lighthouse (see table, page 18) is on its southwestern end. The channel with best water leads north of this island. A channel with a depth of 15 feet at low water leads south of the island, between it and South Brother Island, and is the one generally used by vessels of less than 18 feet draft (according to the stage of the tide), as it is the more direct.

Port Morris lies northwest from North and South Brother islands.

Randall Island is the island southwestward of Port Morris, **Bronx Kills**, a narrow, shallow body of water, separating them; municipal buildings are scattered over the island. **Sunken Meadow**, marked on its eastern side by a light, lies eastward of the island, and is separated from it by a body of water about 120 yards wide.

Lawrence Point lies on the eastern side of the East River Channel, opposite Randall Island and Sunken Meadow.

Wards Island lies southward of Randall Island and Sunken Meadow, and is separated from them by Little Hell Gate, a narrow and shoal body of water leading into Harlem River. The insane asylum, and some hospitals are located on this island.

Hallets Point is southward of Wards Island. A light is shown and fog bell rung from a small, white pyramidal wooden tower on the northern end of the point (see table, page 18, Hell Gate light). The main channel leads close past this point. **Pot Cove** is the bight eastward of Hallets Point.

Hell Gate is the name of the part of East River south of Wards Island and north of the northern end of Blackwells Island. The great velocity of the tidal currents makes this part of the river dangerous for sailing vessels to navigate. The most dangerous rocks in the channel have been removed or cut down so as to have from 18 to 23½ feet over them at low water, and there is now a clear channel 150 yards wide with a least depth of 26 feet, and 300 yards wide with a depth of 18 feet.

Flood Rock lies about 300 yards 266° true (**W ½ N** mag.) from the light on Hallets Point. The least water over it is 18 feet.

Mill Rock, 250 yards long, lies northwestward of Hallets Point and is protected by a sea wall; it is marked at its northern and southern ends by lights (see table, page 18). The shore of Astoria, southward of Hallets Point, is rocky, but has deep water 30 yards outside the wharf line.

Blackwells Island divides East River, forming two channels, one on the east side of the island and one on the west; the western channel is the wider and has the better water. The northern end of the island is marked by a lighthouse maintained by the city of New York, and a sea wall is built along on both sides to its southern end. Off the southern end is a narrow ledge nearly ½ mile long; Blackwells Island Reef light is on a temporary crib near the southern end of the reef.

Opposite the eastern side of Blackwells Island are Astoria and Ravenswood (borough of Queens), and opposite the western side is the borough of Manhattan. Buildings of the Department of Charities and Correction are located on the island, and a cantilever bridge (**Queensboro Bridge**) 135 feet above mean high water crosses from New York City (Manhattan Borough) to Long Island City (borough of Queens) over Blackwells Island about ½ mile from its southern end.

Newtown Creek empties into the East River on the eastern shore, about ¾ mile southward of the southern end of Blackwells Island. The channel, with a depth of 17 feet and width of 125 feet, extends to the head of the creek at Metropolitan Avenue.

The **Williamsburg suspension bridge** crosses the river just below Pier No. 60 and just above Broadway at Williamsburg. This bridge has the same height as the Brooklyn bridge 1 mile below the navy yard.

The **United States Navy Yard**, on Wallabout Bay, is on the south shore below Williamsburg bridge, where the East River makes a bend westward.

The **Manhattan suspension bridge**, not completed in 1908, crosses the East River just below the navy yard, and is the same height above high water as the Brooklyn bridge.

The **Brooklyn suspension bridge** crosses the East River 1 mile below the navy yard. The height of this bridge above mean high water is 135 feet at the center and 119 feet at the piers. Allowing for changes of temperature, a masted vessel when passing under the bridge should not depend on a greater height than 130 feet, at mean high water, for a width of about 400 feet at the center of the bridge.

The Battery is the southernmost point of the borough of Manhattan. It is a small, grassy park with tall trees, and faced on the water side by a sea wall. The barge office and custom-house landing are eastward of the park on the East River, and **Castle Garden** and the building of the New York Department of Docks westward of the park on the Hudson River (North River).

Governors Island lies in the middle of the East River, where it joins the Upper bay. Fort Columbus and the buildings of the military headquarters are on the northeast end of the island, and an area nearly ½ mile long is being reclaimed southwestward of the island. The main channel leads north of the island. *Buttermilk Channel*, with a depth of 30 feet, leads along the wharves of Brooklyn south of the island.

East River Channel between the Battery and Governors Island.—This channel is good at all stages of the tide for vessels of 23 feet draft or less, care being taken not to approach too close to Governors Island or The Battery. There is a good range leading through the deeper water of this channel which should be used at low water by all vessels of over 23 feet draft. The range is a target on the peak of the warehouse on pier 10, Brooklyn, in line with the center of the middle (west) tower of St. Margaret's Hotel (most prominent brick building, with three towers, south of Brooklyn Bridge) in Brooklyn.

Vessels of 25 to 26 feet draft can pass through this channel at low water, but they must keep close on the range, as for a distance of 800 feet along the range westward of a line through the end of pier 3 (New York) and the Produce Exchange tower, the northern end of Dimond Reef is only 150 feet southward of the range, and the shoal water off the Battery is 300 feet northward of the range. At high water vessels of 25 to 26 feet draft pass through the middle of a channel about 870 feet wide by keeping on the range.

Vessels of 26 to 30 feet draft at high water must also keep close on the range, and take care not to be set on to Dimond Reef, the northern end of which is only 150 feet southward of the range. The shoal water off the Battery is 300 feet northward of the range.

Pier numbers.—The New York City piers are numbered. Pier No. 1 of the East River system is near The Battery, the numbering being continued northeastward from it. Some of the piers have their numbers painted on the pierhead, showing plainly from the river. This plan is followed up to pier 70, East River; northward of this the number of the street from the foot of which the pier extends is painted on the pierhead.

Tidal currents in East River, see Appendix I.

ANCHORAGES IN EAST RIVER.

Rules and regulations, with a map showing the prescribed anchorage limits in the East River and New York Bay and Harbor, are given in Appendix II.

Hammond Flats, just westward of Throgs Neck, off the north shore, is an anchorage for all classes of vessels, in about 5 fathoms, with good holding ground. Toward Old Ferry Point (the next point on the north shore westward of Throgs Neck) the water deepens abruptly to 16 and 18 fathoms. Vessels anchoring here should come-to in the eastern half of the bight, just north of a line drawn from the end of Throgs Neck to Old Ferry Point. There are no dangers, but the water shoals abruptly close inshore from 18 feet to 4 or 5 feet.

Off **Whitestone** good anchorage, in 18 feet to 8 fathoms, is found eastward of the point. There are no dangers, but the water shoals abruptly close inshore. Avoid Whitestone Point, which makes off rocky northward for about 175 yards and is shoal on its western side.

The stretch between **Whitestone Point** and **College Point** is not much used as an anchorage.

Flushing Bay is available for light-draft vessels. Deep-draft vessels may anchor in the deep channel off the entrance to Flushing Bay, between College Point and Rikers Island, in 5 to 7 fathoms. The flats in Flushing Bay are soft mud, and afford excellent anchorage for vessels of light draft.

Westward of **Rikers Island** the channel is narrow, the water deep, with poor holding ground, and the tidal currents have great velocity, making it unsafe for vessels to anchor before reaching the wharf at the foot of East Thirty-first street, New York City.

A **good anchorage** in 4 to 10 fathoms is found between East Thirty-second street and East Twenty-fourth street wharves, on the New York side of the river.

For the defined limits of the anchorages see Appendix II.

"No vessel shall anchor within an area ¼ mile wide, the central line of which extends from the root of the wharf at Fort Totten (Willets Point), Long Island Sound, to the root of the wharf at Fort Schuyler (Throgs Neck)."

SAILING DIRECTIONS, EAST RIVER, THROGS NECK TO GOVERNORS ISLAND.

The following directions lead in the deepest water, but owing to the little width of the channel between Hallets Point and Wards Island without local knowledge it is hardly possible to avoid Pot Rock, a spot with 22½ feet over it at low water. The velocity of the currents, and the large number of vessels in the river between Rikers Island and Governors Island, makes great caution necessary; strangers should not attempt to pass through at night, and are advised to take a local pilot at City Island if bound through in the daytime.

1. ***From Throgs Neck to Lawrence Point (Sunken Meadow light).***—Passing 300 to 400 yards southward of Throgs Neck steer 275° true (**WNW ¾ W** mag.) for 1¼ miles, and when Whitestone Point light is on the port beam steer 260° true (**W ⅛ S** mag.) for 2½ miles.

When Hunts Point bears on the starboard beam distant about 400 yards, steer 284° true (**WNW** mag.) for a little over ⅝ mile, and when Rikers Island light (on the north end of Rikers Island) is on the port beam distant 250 yards, steer 299° true (**NW ⅝ W** mag.) and round the north end of North Brother Island.

When northwestward of North Brother Island bring Oak Bluff light astern on a 219° true (**SW ¼ W** mag.) course, and pass about 80 yards southward of Sunken Meadow light, taking care to leave black spar buoy No. 9 (nearly opposite the light) at least 20 yards on the port hand. Then follow the directions in section 2.

Note.—The currents have considerable velocity around North Brother Island, and when near Sunken Meadow light strong rips and swirls are encountered during both flood and ebb; during spring tides the buoys marking the Middle Ground off Lawrence Point are at times towed under by the currents.

Remarks and dangers.—On the 275° true (**WNW ¾ W** mag.) course the south end of **Old Ferry Point** will be ahead; this point can be approached as close as 100 yards. Whitestone Point must be given a berth of at least 175 yards to avoid the shoals which make off from it. The light on **Whitestone Point** is near high-water mark and backed by trees.

The 260° true (**W ⅛ S** mag.) course leads about midway between **Clauson Point** and College Point, and passes about 250 yards north of the black spar buoy on **College Point Reef**; the latter has 4 feet over it and lies 350 yards 24° true (**NE** by **N** mag.) from the dock on the north end of the point. Rikers Island will be ahead on this course.

Shoals make off nearly 200 yards from **Hunt Point** and are marked off the end by a buoy (spar, red, No. 2).

The bights on the north side of the channel and on the south side between Whitestone and College Point are shoal and should be avoided.

The 284° true (**WNW** mag.) course heads for the north end of North Brother Island and avoids a 24-foot spot lying 250 yards 179° true (**S ¾ W** mag.) from the south end of **Barretto Point** (the point on the north shore abreast the north end of Rikers Island).

The northeastern side of Rikers Island should not be approached closer than 150 yards.

The 299° true (**NW ⅝ W** mag.) course heads for Oak Bluff light, and when nearly abreast the north end of North Brother Island, the red spar buoy marking **Oak Bluff Rock** (with 16 feet over it) should be left on the starboard hand.

A spit with 14 feet near its end makes off 350 yards 110° true (**SE** by **E ½ E** mag.) from the north end of North Brother Island.

Rounding the north end of North Brother Island, black spar buoy, No. 3A, marking the shoal off the northwest point of North Brother Island, will be left on the port hand. There is deep water close to the wharves at Port Morris.

When rounding North Brother Island extra caution is necessary to avoid collision with passing vessels, and tows off Port Morris.

On the 219° true (**SW ¼ W** mag.) course Sunken Meadow light will be a little on the starboard bow and the black spar buoy on the north side of the Middle Ground abreast Lawrence Point (if it is not towed under by the current) will be seen a little on the port bow. The **Middle Ground** has depths of 16 and 18 feet over it and is marked on its south end by a red spar buoy, and on its northwest side by a black spar buoy.

2. ***From Lawrence Point to the lower end of Blackwells Island Reef off East Fortieth Street.***—When Sunken Meadow light is on the starboard beam, distant 80 yards, steer about 212° true (**SW ⅜ S** mag.). Follow a mid-river course until abreast of the lower end of Wards Island, and then steer about 261° true (**W** mag.) so as to leave Hallets Point about 100 yards on the port hand.

Round Hallets Point giving it a berth of 50 to 150 yards, and steer 225° true (**SW ¾ W** mag.) so as to pass in mid-channel west of Blackwells Island. Standing along the west side of the island, follow a mid-river course or favor the bank on the starboard hand. When the lower end of Blackwells Island is reached follow the wharf line on the starboard hand, taking care to keep less than 250 yards from it, to avoid Blackwells Island Reef, until abreast Fortieth Street and Blackwells Island Reef buoy (spar, red and black horizontal stripes) is abaft the port beam (Blackwells Island Reef light will then be abaft the port beam). Then follow the directions in section 3.

Remarks and dangers.—On the 212° true (**SW ⅜ S** mag.) course Wards Island should not be approached closer than 100 yards until the vessel is abreast of the grassy slope about ⅝ mile from Sunken Meadow light. When abreast this part of Wards Island, a sharp lookout must be kept for any vessel rounding Hallets Point and bound east; a steamer should here give one long blast of the whistle to warn any unseen approaching vessel.

The **currents** have great velocity between Lawrence Point and the north end of Blackwells Island; their greatest velocity is off Hallets Point, where extra caution is necessary to avoid collision with passing vessels. See also the current diagram and notes in Appendix I.

Rounding Hallets Point, the southwest side of Wards Island must be given a wide berth to avoid **Holmes Rock**, **Hogs Back**, and **Frying Pan**, the first two showing bare and the latter with 18 feet over it. These can be avoided by keeping within 300 yards of the Hallets Point bank. **Pot Rock**, with 22½ feet over it, lies in mid-channel southwestward from the south end of Wards Island and 460 yards 69° true (**E** by **N** mag.) from the light on Hallets Point.

To avoid Flood Rock and the 19 to 21 foot spots between Hallets Point and Mill Rock, keep inside of 200 yards from Hallets Point while the light on the point bears southward 81° true (**E** mag.).

A spit with 17 feet near its end makes off 70 yards in a northeasterly direction from the end of Blackwells Island at the light-tower.

The shore of Blackwells Island should be given a berth of 70 yards, and when abreast of East Sixty-fifth street it should not be approached closer than 100 yards on account of a 16-foot shoal which makes off from the island at this point. The cantilever bridge crosses the river at Sixtieth street.

Blackwells Island Reef, showing partly bare at half tide, extends 900 yards (nearly ½ mile) in a southwesterly direction from the lower end of the island. The reef has a general width of about 125 yards, and is marked off its end by a buoy (spar, red and black horizontal stripes), and by a light on the temporary crib near the southern end of the reef off Forty-second street.

3. ***From abreast East Fortieth Street to Governors Island.***—When about midway between Blackwells Island Reef buoy and the wharf at the foot of East Fortieth street, steer about 176° true (S ½ W mag.) and follow the wharf line on the port hand at a distance of less than 300 yards until the Houston and Grand street ferry slips in Williamsburg have been passed.

Pass under the Williamsburg Bridge in mid-river and continue a mid-river course past the Navy Yard and under the Manhattan and Brooklyn suspension bridges.

Then, if bound up the Hudson (North) River, follow the wharf line on the starboard hand, giving it a berth of 300 yards, or more, while passing the South Ferry and The Battery. Directions for deep-draft vessels to pass between Governors Island and The Battery are given in section 6 A, page 150.

Or, if bound through Buttermilk Channel, follow the wharf line on the port hand at a distance of less than 300 yards while eastward of Governors Island. See also section 6, page 150.

Remarks and dangers.—On the 176° true (S ½ W mag.) course, **Nes Rock** and **Shell Reef** buoys will be left on the starboard hand. When abreast the Houston street ferry slip, **Third Street Reef**, with 17 feet over it and lying 175 yards from the end of Third street wharf, in New York, should be left on the starboard hand.

When between the Williamsburg and Brooklyn bridges deep-draft vessels should give the wharves a berth of 100 yards or more.

Governors Island should not be approached on its northern, eastern, and southern sides closer than 175 yards.

HARLEM RIVER *

enters Hell Gate on the western side of Wards Island. From the mouth it extends in a northerly direction, joining **Spuyten Duyvil Creek**,* the latter connecting with Hudson River 11¾ miles above The Battery. The channel of Harlem River is narrow and crooked, and navigable only for steamers or vessels towing. This river is of considerable commercial importance. Harlem River and Spuyten Duyvil Creek are being improved by the Government; in 1908 the width of the channel between the East River and North (Hudson) River was 100 to 400 feet and the least depth was 15 feet; the channel is being widened and deepened.

Between Hell Gate and the Hudson River the river is crossed by thirteen bridges with draws ranging from 100 feet to 164 feet in width. The center of the arches of High Bridge are 100 feet above mean high water and the span of the arches is 77.7 feet; the clear waterway between the piers is 55 feet. Washington Bridge, a little over ¼ mile above High Bridge, has an arch span 500 feet wide and 136 feet above mean high water in the center. Hudson River Railroad bridge, crossing Spuyten Duyvil Creek where it enters the Hudson, has a draw over 50 feet wide. Sailing vessels entering the river from the East River take a towboat, the master of the towboat being the pilot. If coming from eastward, a towboat is taken in the East River eastward of Rikers Island. If from westward, a towboat is taken below Blackwells Island. Towboats will also be found at the wharves in the river to tow vessels out.

SOUTH COAST OF LONG ISLAND.†

The south coast of Long Island has a general 247° true (W by S mag.) trend for 68½ miles from Montauk Point to Fire Island Inlet; and thence trends about 264° true (W ¼ N mag.) for a little over 35 miles to Norton Point, the southwestern end of Coney Island (at Gravesend Bay) and the northern point at the entrance to the Lower Bay of New York. It is a clean shore, and may be safely approached as close as 1 mile with not less than 5 fathoms anywhere

* Shown on chart **274**, scale $\frac{1}{10,000}$, price $0.25.

†This coast is shown on charts **1000**, Sailing chart (Mercator projection); **8**, Approaches to New York, Gay Head to Cape Henlopen, scale $\frac{1}{400,000}$; **52**, Montauk Point to New York and Long Island Sound (Mercator projection); **117**, **118**, **119**, Southern coast of Long Island, 3 sheets, scale $\frac{1}{80,000}$, price of each $0.50.

between Montauk Point and Rockaway Inlet, except off Fire Island Inlet and the inlets westward, where the shore should be given a berth of at least 1½ miles. When viewed from seaward it presents but few characteristic features; it is composed of a series of sand hillocks backed by low dark woods; and the only break in the monotony of the outline is made by the inlets and the summer cottages and hotels near the beach. There are a number of **life-saving stations** on this coast; a list of them will be found on page 23. The lighthouses (see table, page 18) are easily recognized.

Montauk Point, the eastern extremity of the island, will appear, when seen from seaward, as a high, sandy bluff with perpendicular faces and somewhat undulating surface covered only with grass. On the top of the bluff and close to its edge stands the lighthouse (see table, page 18) with the keeper's dwelling and the fog signal near its base. Northward the country gradually descends, while southwestward several small coves cut the line of bluffs so as to present an appearance of low, grassy lands alternated with high, sandy bluffs.

Bearings and distances from Montauk Point lighthouse are given on page 10.

For **variation of the compass,** see page 22.

About 14 miles westward of Montauk Point and ½ mile back from the beach is the village of **Amagansett**, and westward of this, along the whole line of the Long Island Railroad and some distance back from the beach, are a number of towns and villages. **Southampton** is 27 miles westward of Montauk and 1½ miles eastward of Shinnecock Bay, sometimes called **Great West Bay.**

The eastern end of **Shinnecock Bay** is about 28½ miles westward of Montauk; this is a large but shallow bay, about 8 miles long, and is separated from the ocean by a narrow sand beach. **Shinnecock Hills** are about 2½ miles back from the beach, and Shinnecock lighthouse is on the north side of the bay 1 mile back from the beach (see table, page 18); this lighthouse is on **Ponquogue Point,** about midway between the eastern and western ends of the bay.

From Shinnecock lighthouse to Fire Island lighthouse the coast presents an unbroken line, composed of innumerable sand hillocks backed by woods. This appearance is caused by a narrow strip of sand from 200 to 800 yards in width, which separates from the ocean the large but shallow bays known as **Moriches Bay** and **Great South Bay.** Moriches Bay, which is the easternmost, begins about 2 miles westward of Shinnecock Bay and extends nearly 12 miles westward to Smith Point.

Westward of Fire Island Inlet to Coney Island the shore has the same characteristics as farther eastward but the summer cottages and hotels are more numerous. The western part of Great South Bay extends westward inside of the beach for a distance of about 12 miles from Fire Island lighthouse, its western part being known as South Oyster Bay. Westward of this bay the land back of the beach is low and marshy with numerous water courses navigable for small craft.

Jamaica Bay is the westernmost of the bays in the south coast of Long Island and commercially the most important. It is entered through Rockaway Inlet, which is described on page 138.

FIRE ISLAND INLET.*

Fire Island Inlet is 28 miles eastward of Ambrose Channel light-vessel and about 68 ½ miles westward of Montauk Point; it is easily recognized by Fire Island lighthouse and the wireless telegraph poles and large hotel just eastward of the lighthouse. The inlet is the sea approach to Great South Bay and the towns on its north shore, and with a smooth sea can be entered by vessels of 11 feet draft, for which there is good anchorage north of the lighthouse and near the northern side of the bay. The entrance to the inlet is obstructed by a shifting bar which extends westward from the western end of Fire Island Beach for a distance of about 5 miles from the lighthouse nearly parallel with Oak Island Beach, and about 1¼ miles from it. Strangers should take a pilot, lying to off the entrance until one comes out in answer to the signal.

The channel over the bar which is buoyed, and in 1909 has a depth of 9 feet, is about 3½ miles westward of the lighthouse, and after crossing the bar it leads eastward to the entrance between the western end of Fire Island Beach (East Point) and the eastern end of Oak Island Beach (West Beach Point); from the entrance its general course follows the north shore of Fire Island Beach for a distance of 6 miles, where it leads northward and eastward to Bellport and Patchogue. About 1 mile eastward of the lighthouse, a channel leads northward to Islip, Bay Shore and Babylon; these channels are narrow, the one to Bellport and Patchogue has been improved by dredging and had (in 1908) a least depth of 8½ feet in its shoalest part.

Great South Bay is 28 miles long and very irregular in shape, its width ranging from ½ to 3½ miles; it is shallow, a large part having depths of 1 to 4 feet; the several channels through the shoals have deeper water and for a distance of 15 miles along the north shore there is an area having depths of 8 to 11 feet. Here the vessels, that are of too deep a draft to go to the wharves of the towns, anchor and discharge parts of their cargoes. The bay is the resort of light-draft oyster and fishing boats and numerous small yachts owned in the vicinity. **Bellport, Patchogue, Sayville, Islip, Bay Shore, Babylon** and **Amityville** are towns on the north shore. A draft of about 7 feet can be taken to

* Shown on chart **119**, scale $\frac{1}{80,000}$, price $0.50.

Patchogue, and a draft of 10 feet at high water through a dredged channel 100 feet wide with a least depth of 8½ feet, to the anchorage in the bay. A draft of about 6 feet can be taken to Bay Shore and Babylon, and about 9 feet to the anchorage in the bay. The larger vessels bringing cargoes into the bay employ a towboat for towing over the bar and in the bay. Tugs can be had from Patchogue by giving notice when the vessel is expected to arrive. There is considerable trade in lumber, coal, and building material, and fish and oysters are shipped to New York in small vessels of less than 6 feet draft.

Improvements are in progress to obtain a channel 200 feet wide and 10 feet deep to the anchorage off Patchogue, and maintain a channel 100 feet wide and 8 feet deep to the wharves at Patchogue.

The currents in the entrance after crossing the bar have an estimated velocity of 2 to 3 miles at strength and are influenced greatly by the force and direction of the wind. In the bay the currents have little velocity except in the narrow channels between the shoals and within a radius of 3 miles from the lighthouse, where at times their estimated velocity is 1 to 1½ miles.

Tides.—Outside of Fire Island Inlet the mean rise and fall of tides is about 3.5 feet; high and low water occur about 10m. earlier than at Sandy Hook. For tides inside the inlet see table, page 24.

GENERAL REMARKS, FIRE ISLAND INLET.

Fire Island Inlet is the only harbor of refuge for small vessels on the southern coast of Long Island, but vessels must enter before the sea is too high. The approaches have no outlying natural dangers, and in working along this coast for the inlet it is safe to go as close as 1 mile to the shore, with not less than 5 fathoms; but for a distance of 6 miles westward of Fire Island lighthouse the shore should be given a berth of 2 miles or more.

The bar across the entrance shifts, but the depth in the channel over the bar varies but little from 10 feet. No reliable directions can be given. Strangers should not attempt to enter the inlet without a pilot.

Fire Island light-vessel, lying 9¼ miles 172° true (*S* ⅛ *W* mag.) from Fire Island lighthouse is a prominent aid to navigators approaching New York Bay from eastward.

Fire Island whistling buoy is a mammoth nun, painted red and surmounted by a whistle. It is a guide for vessels bound to New York, being nearly on the sailing line from outside Nantucket Shoals. From this buoy Fire Island lighthouse bears 354° true (*N* ¼ *E* mag.), distant 6 miles.

Fire Island bell buoy is nun-shaped, with lattice body, and is painted red. It is placed outside of heavy weather breakers, in 8 fathoms of water, about 4 miles west-southwestward of Fire Island lighthouse. Inside it the water shoals suddenly. It is a guide both for coasters and for vessels bound into the inlet.

ROCKAWAY INLET.*

From Fire Island Inlet to Rockaway Inlet the distance is 28½ miles and the direction 263° true (**W** ⅛ **N** mag.). This stretch of coast has several inlets; all of them are shallow, and shifting sand bars obstruct their entrances. The principal are Jones Inlet and East Rockaway Inlet, the latter with a depth of about 7 feet on the bar. The summer resort of Long Beach is eastward of the inlet. These have buoys, shifted as necessary to show the best water over the bars, but even the smallest vessels require a pilot.

Lying about 3½ miles from the beach, between Fire Island Inlet and Rockaway Inlet and about 3¼ miles apart in a 270° true (**W** ⅞ **N** mag.) direction, are three red whistling buoys. The easternmost of these buoys (No. 2) is 16 miles westward of Fire Island lighthouse, and the westernmost (No. 6) about 7½ miles 61° true (**ENE** ¼ **E** mag.) from Ambrose Channel light-vessel.

Rockaway Inlet makes into Jamaica Bay, between Rockaway Beach on the east and south and Plumb and Barren islands on the north. To enter the inlet a shifting sand bar must be crossed, and this makes a local pilot necessary. The best water in the channel over the bar is generally 12 to 14 feet. When over the bar the depth varies from 4 to 10 fathoms throughout an almost unobstructed channel from 175 to 500 yards in width, which extends along the north side of Rockaway Beach. The shore on both sides is subject to great changes, and its shape and extent as delineated upon the charts can not always be relied upon.

Rockaway Beach, the western end of which forms the eastern point at the entrance to the inlet, is a long, narrow sandy island. It is a popular summer resort.

* Shown on charts **542**, scale $\frac{1}{20,000}$, price $0.50; **369**, scale $\frac{1}{40,000}$, price $0.75; **120**, scale $\frac{1}{80,000}$, price $0.50.

Barren Island, on the northern side of the inlet, is composed of alternate marsh and sand, and is of irregular shape. There are a number of buildings on the island, which has communication by ferry with Canarsie Landing.

Jamaica Bay, into which the inlet leads, is a large but shallow bay 5¼ miles long with a greatest width of 3½ miles, but so full of marsh islets and islands as to render its navigation utterly impossible except to very light-draft vessels with local pilots on board. No intelligible description can be given of the islets and the numerous channels among them. None but vessels whose masters are fully acquainted with these waters enter the inlet at present.

The current of flood and ebb in the inlet sets nearly in the direction of the axis of the channel, the former having an estimated velocity of a little over 1 mile and the latter a little over 2 miles per hour.

Canarsie Landing is about 2½ miles northward of Barren Island; 6 feet at low water can be taken up to this landing through a dredged channel 50 feet wide. During the summer steamboats run between Canarsie and Rockaway Beach, connecting by rail with Brooklyn.

Westward of Barren Island is **Plumb Island**, and westward of the latter is **Coney Island**, which extends in a westerly direction for about 3½ miles, its western end, **Norton Point** forming the northern point at the entrance to New York Bay. **Coney Island** is a large summer amusement resort; the high "Centennial Tower" and large white buildings of the resort are prominent.

Tides.—The mean rise and fall of tides at Rockaway Inlet is 4 feet; high water occurs 12m. later, and low water 14m. later, than at Sandy Hook. At Canarsie Landing the mean rise and fall of tides is 4.2 feet, and high water occurs 52m. later than at Rockaway Inlet.

GENERAL REMARKS, ROCKAWAY INLET.

In approaching Rockaway Inlet care must be taken to avoid *Rockaway Shoals*, which extend off the entrance to a distance of nearly 1¾ miles and are very abrupt, the depth diminishing in some places from 5 fathoms to 6 feet within 200 yards. The channel leading in through these shoals is marked by buoys, which are changed from time to time as necessary.

Strangers should not attempt to enter without a pilot, as the channel is continually shifting. Permanent sailing directions can not be given.

A large bell buoy (black and white perpendicular stripes) is placed in 6½ fathoms of water off the southern end of Rockaway Shoals, both as a guide to the channel into the inlet and as a warning to passing vessels to keep outside the shoals. From this buoy Ambrose Channel light-vessel bears 137° true (*SE ⅞ S* mag.) distant 5¼ miles. This buoy is taken up during the winter, but a spar buoy of the same color is kept at this locality all the year.

NEW YORK BAY AND HARBOR.*

New York Bay affords the principal access by water to New York City and surrounding ports. It is of irregular shape and is divided by a passage 1 mile wide, known as **The Narrows**, into an **Upper** and **Lower Bay**.

LOWER BAY.

The entrance, between **Sandy Hook** on the south and **Coney Island** on the north, is about 6 miles wide. An extensive bar, through which several channels lead, extends across the entrance. By the best of these channels (see channels), at high water, the deepest draft vessels can go up to the city.

The Lower Bay extends to The Narrows; it is triangular in shape, and portions of it have special names.

Sandy Hook Bay is the southern part of the Lower Bay, lying westward of Sandy Hook and eastward of **Point Comfort**, about 6 miles westward of the Hook beacon. The bay is an excellent anchorage for vessels of less than 24 feet draft, the depth of water ranging from 5 fathoms, just inside the Hook, to 15 feet near its southern part; the shoaling is gradual and the bottom good holding ground. Vessels of over 24 feet draft can not find good anchorage out of the channel until above Quarantine. Extensive shoals make off northward and eastward from Point Comfort, but as the depth of water decreases gradually, the lead will give sufficient warning of too close an approach to the shore, The best anchorage is in the eastern part of the bay, giving the shore of Sandy Hook a berth of about ½ mile.

"No vessel shall anchor within an area ½ mile wide, the central line of which extends from the southern dock at Fort Wadsworth in a 201° true (**SSW ⅝ W** mag.) direction to the spar buoy marking the wreck off Point Comfort; thence in a 120° true (**SE ½ E** mag.) direction for about 5 miles to the southeastern cable buoy in Sandy Hook bay; thence in a 52° true (**NE** by **E ⅜ E Easterly mag.**) direction to the shore in the Horseshoe."

*Shown on charts **120**, scale $\frac{1}{80,000}$, price $0.50; **369**, scale $\frac{1}{40,000}$, price $0.75; and in part on charts **369**[4], **369**[5], scale $\frac{1}{10,000}$, price of each $0.50.

Navesink River and **Shrewsbury River**, through one common entrance, empty into the southern extremity of Sandy Hook Bay eastward of the Highlands of Navesink. These two rivers are shallow, but are being improved under the supervision of the United States Engineers, the object being to obtain a channel with a depth of 6 feet at low water from the deep water of Sandy Hook Bay to **Branchport** on the Shrewsbury River and **Red Bank** on the Navesink River. The channel from Sandy Hook Bay into the rivers has a depth of about 6 feet, and is only used by small steamers and sailing vessels of 6 feet or less draft. One drawbridge crosses the main entrance eastward of Navesink lighthouses, and another about 2 miles farther up, near the mouth of the Shrewsbury River. Strangers should not attempt to enter these rivers without a pilot.

Raritan Bay is the name given to the body of water lying between Point Comfort and the southern shore of Staten Island; its depths are 7 to 18 feet, but a buoyed channel, with a depth of 21 feet, leads from the deep waters of the bay along the southern shore of Staten Island to **Princess Bay**, and with a depth of 21 feet into **Arthur Kill** and 21 feet into **Raritan River** at the western end of the bay. Arthur Kill is a deep, narrow body of water which makes from Raritan Bay in a northerly direction, separating Staten Island from New Jersey, and leading into **Newark Bay**, and through the latter bay and **Kill van Kull** communicates with the waters of the Upper Bay.

Gravesend Bay is a small bay which makes into the Long Island shore between The Narrows and the western end of Coney Island. In the entrance and northern part of the bay good anchorage in 11 to 16 feet of water will be found, but the southeastern part is shoal, having a depth of 1 to 6 feet. On the eastern shore of the bay are several wharves used by steamers running to Bath Beach, which is a summer resort.

The northwestern part of the Lower Bay is covered by extensive flats with 1 to 16 feet over them, known as **Staten Island Flats**, making off southeastward from Staten Island. Parts of these flats are known as **Old Orchard Shoal** and **West Bank**, the latter bordering on the main channel up the bay. Near the southeastern side is Old Orchard Shoal lighthouse, and near the eastern edge of West Bank are West Bank lighthouse (see table, page 20), and Swinburne and Hoffman islands, the latter artificial islands on the shoalest part of the bank. Swinburne Island, the southernmost one, has a number of red and yellow brick buildings. **Hoffman Island** is about ¾ mile northward of Swinburne Island and 1½ miles southward of Fort Wadsworth lighthouse. It is surrounded by a sea wall and riprap, and has long, red brick houses two stories high.

Sandy Hook, the southern, and **Norton Point**, the northern point at the entrance, are both low and sandy. On Sandy Hook is **North Hook beacon**, with fog-signal (siren) hut near it, and about ½ mile west of the beacon is a fog-signal (bell) tower (see page 20). These buildings and a dwelling house are near the point of the hook; southward of these are a fort, some low houses, Sandy Hook lighthouse, South Hook beacon, a life-saving station (see page 20), and a storm warning display station. There is also a signal station from which vessels are reported to the Maritime Exchange in New York City. **Norton Point**, the western end of Coney Island, is marked by Coney Island lighthouse (see table, page 20). Several hotels and other buildings are on the point, and thence eastward the beach of Coney Island presents an almost continuous line of large white buildings of the summer amusement resort. *Iron piers*, the landing place of steamboats to Coney Island, make out from the south shore of Coney Island, 1½ miles eastward of Coney Island lighthouse, and are quite prominent.

Prominent objects.—The most prominent landmark southward of the entrance, in approaching from seaward, is the high, wooded ridge forming the **Highlands of Navesink**, on the side of which, in a cleared space, are two conspicuous lighthouses. The flashing white light shown here is visible 22 miles in clear weather (see table, page 18). North of the entrance the **Centennial Tower** and the large white buildings on Coney Island are prominent.

The principal guides to the immediate entrance are Ambrose Channel light-vessel (see page 18), off Ambrose and Gedney channels, and Scotland light-vessel (see page 18), off South Channel.

Staten Island (Richmond Borough, a part of Greater New York), which forms the northwestern shore of New York Lower Bay, is a large island with a length of 11½ miles. It lies northeast and southwest, and its ridge of high, wooded hills, is one of the most conspicuous features of the immediate approaches to New York.

Channels.—Several buoyed channels lead across the bar which extends across the entrance from Sandy Hook to Coney Island. Three of these—False Hook, South, and Gedney channels—approach each other in a northwesterly direction toward the bay until they meet, still on the bar, in a basin from which two other channels, the Main and Swash, lead into the lower bay. Northward of these three channels are Ambrose and Fourteen Foot channels. Light-draft vessels can cross the bar close to the Coney Island shore by what is locally known as the Coney Island Channel.

Ambrose Channel, which is being dredged by the Government, is to be 2,000 feet wide and 40 feet deep; in January, 1909, it had a width of about 1,000 feet with a depth of 40 feet. This channel leads through the bar in a 297° true (**NW ¾ W** mag.) direction for West Bank lighthouse until Romer Shoal lighthouse bears 188° true (**S by W ½ W** mag.). The channel then leads in a 323° true (**NNW ½ W** mag.) direction to the intersection of North Hook beacon and Sandy Hook lighthouse in range, and then leads 348° true (**N ¼ W** mag.) on the range up the bay to The Narrows. The channel, as it is improved for navigation, is marked by a number of gas buoys, and it is proposed to establish range lights for its navigation.

The regulations for the navigation of Ambrose Channel, prescribed by the Secretary of War, dated March 12, 1909, permit the navigation of this channel both day and night by vessels of 29 feet or more draft and over 600 feet in length, all government vessels, foreign and coastwise steamships, and other steam vessels not having vessels, barges, scows or other floating objects in tow, and is restricted to such vessels. Sailing vessels and steam vessels having in tow other vessels, rafts or objects of whatever description, will not be permitted to use this channel until its completion.

Vessels authorized to use Ambrose Channel, must pass through it at a speed that will not interfere with the operation of the dredges, and in no case at a speed greater than 14 knots (16¼ statute miles) per hour, or 25 minutes from buoy ACE, No. 1 to buoy ACE, No. 24. In case of emergency, government vessels, and pilot and police boats will be excepted from the operation of this paragraph.

The navigation of the uncompleted part of the channel where dredging operations are in progress is prohibited.

Gedney Channel has a depth of 30 feet at mean low water. A red first-class nun buoy and four red gas buoys (red lights) mark its northern edge, and four black gas buoys (white lights) mark its southern edge, and lead up to the range which serves as a guide through Main Channel; Gedney Channel also leads into Swash Channel. Gedney Channel gas and whistling buoy 27 feet high (black and white perpendicular stripes) lies off the entrance to Gedney Channel, on the intersection of the center lines of Gedney and Ambrose channels and a little northward of a line between the entrance of Gedney Channel and Ambrose Channel light-vessel, bearing from the latter 285° true (**NW** by **W** ⅞ **W** mag.) distant 2⅞ miles.

South Channel is the next channel of importance, and has a least depth of 21 feet. A straight course leads from its entrance near Scotland light-vessel through it and Swash Channel into the bay.

Main Channel leads from the inner end of Gedney Channel, in a 250° true (**W** by **S** mag.) direction between the shoal making out from the point of the Hook, on its southern side, and Flynns Knoll on its northern side; the least depth in the middle of the channel is 31 feet at mean low water. The northern side of the channel is marked by red buoys, the westernmost of these, No 12 (with perch and ball), marks the turning point into the main channel up the bay; close to this buoy is a gas buoy, showing a fixed red light. On the shoal extending northeastward from North Hook beacon there is a black bell buoy.

The main channel up the bay extends in a northerly direction westward of Southwest Spit, Flynns Knoll, and East Knolls, its southern part being known as the **Chapel Hill Cut**; it is marked by five red nun buoys on its eastern side, and six black can buoys on its western side. These buoys are replaced by spar buoys in winter. The channel from Southwest Spit buoy No. 12 to West Bank lighthouse has a general width of about 1,000 feet, with a depth of 30 feet. This width is maintained by dredging.

The **Swash Channel** leads from the junction of the Gedney and South Channels in a northwestly direction between Romer Shoal and East Knolls, and its course follows close to the southern edge of Romer Shoal. It is a narrow channel with a depth of 25 to 29 feet, but in which are several lumps, over which there is a depth of only 22 feet. At the junction of the Gedney and Swash channels are two red buoys, one a nun with perch and square, the other gas-lighted (fixed red light 15 seconds, eclipses 5 seconds).

False Hook Channel leads along and close to the eastern shore of Sandy Hook, and joins the main channel eastward of the point of the Hook. It is buoyed and has a depth of 19 feet, but is not safe for strangers.

Coney Island Channel leads nearly parallel with the south shore of Coney Island, about ¼ mile from the beach near its western end. It is marked by buoys, and is being improved by dredging a channel 600 feet wide and 20 feet deep; in 1908 the depth in the channel was 12½ feet.

Fourteen Foot Channel leads across East Bank northward of Ambrose Channel, and has a depth of 14 feet; but it is not buoyed, is seldom used, and should not be attempted by strangers.

Ranges.—*At night* the use of the range lights enables vessels to enter readily in clear weather by the Main or Swash channels. *By day* it is often difficult, if not impossible, to pick up the ranges. The lighted buoys of Gedney Channel make its entrance easy. The **Point Comfort beacons** (Point Comfort and Waackaack) form a range for the Main Channel until Sandy Hook lighthouse and South beacon (in range) become the guides. When inside the Hook and off Southwest Spit, **Conover** and **Chapel Hill beacons** form the range (astern) for going up the bay. For South and Swash channels **Elm Tree** and **New Dorp beacons** form the range, see table, page 20.

THE NARROWS

is that part of New York Bay which lies between the extreme western point of Long Island and the eastern point of Staten Island, and connects the Lower and Upper bays. It is 1 mile wide, is deep (having 8 to 16 fathoms of water), and unobstructed if the eastern shore be given a berth of ¼ mile. On its western side is **Fort Wadsworth**, and on its eastern side **Fort Hamilton** and **Fort Lafayette**. The latter is about ¼ mile from the Long Island shore on the edge of the flats; and is a circular brickwork. There is a fog-signal station, but no light, here. East of Fort Lafayette, on the wharf at Fort Hamilton, is a tide indicator which can be seen by vessels passing up or down through The Narrows. For a description of this tide indicator see page 143. A channel 200 feet wide and 13 feet deep has been dredged on the east side of Fort Lafayette. Above Fort Wadsworth on Staten Island are **Clifton**

(Rosebank), Stapleton, Tompkinsville, and **New Brighton**; the latter has communication with Manhattan Island by ferry. Westward of New Brighton, on the south side of Kill van Kull, are **West New Brighton, Port Richmond,** and **Mariners Harbor.**

Just above Fort Wadsworth in The Narrows are the **Quarantine Headquarters** and **Boarding Station**; vessels subject to visitation by the health officer are boarded when abreast of or a little north of Fort Wadsworth. On the eastern side of The Narrows is **Fort Hamilton,** and 1 mile farther northward is **Bay Ridge.** This is all a part of Greater New York.

UPPER BAY AND HARBOR.

The Upper Bay extends from The Narrows to **The Battery** (the southern point of Manhattan Island) at the confluence of the **Hudson** and **East** rivers. It is about 4 miles long north and south and from 2 to 3¾ miles wide east and west.

The whole of the western part of the bay is covered by extensive flats, with 1 to 6 feet over them, known as **Jersey Flats.** For a description of these flats see dangers under section 5, Sailing Directions, New York Bay.

Kill van Kull, with 4 to 7 fathoms of water, connects the bay with Newark Bay and Arthur Kill, and separates the northern shore of Staten Island from **Bergen Neck** (Bayonne) and **Bergen Point.**

Gowanus Bay is the name of the bight in the Long Island shore about 3 miles above The Narrows. The bay is shallow, and an extensive shoal, Gowanus Flats, lies off it. Two dredged channels lead into Gowanus Bay; the one from southward, known as **Bay Ridge Channel,** in 1908 had a depth of 35 feet, and a depth of about 30 feet at the wharves at South Brooklyn; the channel from northward, known as **Red Hook Channel,** has a depth of 26 to 30 feet, and follows the wharves from Red Hook into Gowanus Bay. Improvements are in progress to dredge these two channels to a depth of 40 feet and width of 1,200 feet. **Erie Basin** is on the north side of the entrance to the bay, and is usually entered from the Red Hook Channel; it is important on account of its dry docks and facilities for repairing vessels. The channel depth in Gowanus Creek, which empties into the head of Gowanus Bay, is 26 feet. The shore of South Brooklyn southward of Gowanus Creek has wharves and warehouses along the water front largely used by foreign shipping.

The **main channel up the bay,** from The Narrows to the city, leads between Jersey Flats and Gowanus Flats, and has a depth of 5 to 15 fathoms and a width of about ½ mile. The shoaler water is found on the eastern side of the channel.

Governors Island, lying in the northeastern part of the bay, at the mouth of the East River, is occupied by **Fort Columbus.** On the northwestern point of the island are **Castle William** and a light and fog-signal station, and on the eastern end of the island is a fog bell (see page 20). The shoal extending nearly ½ mile southwestward from Governors Island is being reclaimed, and work is in progress filling in behind a riprap embankment and sea wall on the shoal. The main channel into East River leads north of the island, and the Buttermilk Channel south and east of the island.

Buttermilk Channel leads from the bay into East River, between Governors Island and Brooklyn, and forms the access to Atlantic Docks. The depth in the channel is 30 feet, with several small 27-foot spots near its southern end. It is broad and unobstructed and about 800 feet wide at its narrowest part from Atlantic Avenue Ferry to the Atlantic Docks. A black bell buoy at the southern entrance and a black spar buoy abreast of Governors Island mark the northern edge of the channel.

Hudson River flows into the Upper Bay from northward, its mouth being between Manhattan Borough (New York City) on the east and Jersey City and Hoboken on the west. For a distance of about 10 miles from The Battery this river is locally known as **North River. East River** flows into the head of the Upper Bay from northeastward, between Brooklyn Borough (city of Brooklyn) and Queens Borough (Long Island City and Flushing) on the south and east, and Manhattan Borough (New York City) and Borough of the Bronx (Port Morris and Westchester) on the north and west. These two rivers, together with Harlem River and Spuyten Duyvil Creek, which connect the Hudson and East rivers north of the city of New York, form the water front of the city.

The **wharves** and **piers** of New York City along the water front of the Hudson and East rivers are numbered, the numbers beginning at The Battery and following in sequence eastward along the East River and northward along the Hudson River water fronts of the city.

Anchorage.—The anchorage limits and harbor regulations are given in Appendix II.

Pilotage is compulsory for foreign vessels, vessels from a foreign port, and all vessels sailing under register. Pilots generally cruise westward of a line drawn from Fire Island to Sea Girt. Pilot boats are always found near Scotland and Ambrose Channel light-vessels. The pilot laws, regulations, and rates will be found in Appendix II.

The **buoyage** of New York Bay and the adjacent waters accords with the uniform system adopted in United States waters (see introductory, page 5). Many of the gas, can, nun, and bell buoys are replaced by spar or spar-shaped buoys during the winter.

Quarantine regulations for the port are changed from time to time as is found necessary by the local authorities (see Appendix II and Quarantine Headquarters on page 142). The National Quarantine laws and regulations will be found in Appendix IV.

A **time ball** is dropped daily, except Sunday, in New York City, from the Western Union telegraph building, 195 Broadway, exactly at noon of the 75th meridian; that is, at 5h. 0m. 0s. Greenwich mean time. The instant of noon is marked by the beginning of the fall of the ball. A notice is furnished for publication in the New York daily papers stating whether the ball has fallen at the correct time, and giving the amount of error if there has been any. This time signal is maintained and operated by the Western Union Telegraph Company. The ball is dropped by electric signal from the United States Naval Observatory, in accordance with arrangements made under the authority of the Navy Department.

A **Branch** of the **United States Hydrographic Office**, subordinate to the Navy Department, is established at the Maritime Exchange, Nos. 78–80 Broad street, New York City. Bulletins are posted here giving information of value to seamen, who are also enabled to avail themselves of publications pertaining to navigation and to correct their charts from standards. No charge is made for this service.

A **tide indicator**, maintained by the **Coast and Geodetic Survey**, is erected on the wharf at Fort Hamilton so as to be seen by vessels passing through The Narrows. On this indicator is shown the exact stage of the tide in The Narrows, and whether the tide is rising or falling. The arrowhead in the middle of the semicircle when pointing upward indicates a rising tide, and when pointing downward a falling tide. The pointer near the arrowhead points to the height of the tide (in feet), which is indicated by figures on the semicircle, the zero agreeing with mean low water. A similar tide indicator is mounted in the Maritime Exchange, Nos. 78–80 Broad street, New York City, which shows the stage of the tide at Pier A, Hudson River.

Storm warning displays of the United States Weather Bureau are shown in New York City from the American Surety Building, No. 100 Broadway; they are also displayed at Sandy Hook, Nortons Point, Governors Island, and Perth Amboy. (See Appendix III.)

Reporting stations.—Vessels are reported to the Maritime Exchange at New York from the following points: Fire Island, Sandy Hook, Highlands of Navesink, and Quarantine.

Ice.—The large number of ferryboats, towboats, and steamers navigating the waters of this harbor usually keep the channels open, but in severe winters ice seriously interferes with navigation for short periods.

For **variation of the compass** see page 22.

For **tides** see page 24, also the tide tables for the Atlantic Coast of the United States, in which the tides are predicted for every day of the current year for Sandy Hook and Governors Island.

CURRENTS—NEW YORK BAY AND HARBOR.

In approaching New York Bar from seaward the flood current, when between Rockaway and Navesink, rarely reaches 1 mile per hour, and sets fair for the entrance, except that it is disposed to press upon the outside shores of Sandy Hook and Coney Island.

The ebb current issuing from the harbor is stronger than the flood, even in the lower river season, the excess being never less than 10 per cent, except near Coney Island and the outside shore of Sandy Hook, where the flood and ebb approach equality.

Observations made under direction of the Coast and Geodetic Survey have enabled it to deduce the following general rules with regard to currents in New York Bay and Harbor:

In the Gedney, Main, and Swash channels, high-water slack occurs about 22m. after high water at Sandy Hook, as given in Coast and Geodetic Survey Tide Tables; it lasts about 25m., when the current begins to run ebb, and 3h. 40m. after high water at Sandy Hook it reaches its maximum velocity of 2.2 miles per hour.

Low-water slack occurs about 51m. after low water at Sandy Hook; it lasts about 25m., when the current begins to run flood, and at 3h. 23m. after low water at Sandy Hook it reaches its maximum velocity of 1.8 miles per hour.

The strength of the ebb occurs 40 minutes before, and of the flood about 5 hours after the southing of the moon.

In the Main and Swash channels the flood current starts in on the north side of the channel 15m. later than on the south side, and the ebb current starts out on the south side of the channel 15m. earlier than on the north side.

The currents at half ebb in the Swash Channel set eastward strongly.

In Ambrose Channel, high-water slack occurs about 49m. after high water at Sandy Hook; it lasts about 25m., when the current begins to run ebb, and at 4h. 23m. after high water at Sandy Hook it reaches its maximum velocity of 2.2 miles per hour.

Low-water slack occurs at 1h. 10m. after low water at Sandy Hook; it lasts about 25m., when the current begins to run flood, and at 4h. 26m. after low water at Sandy Hook it reaches its maximum velocity of 1.9 miles per hour.

The strength of the ebb occurs at about the southing of the moon and of the flood about 6 hours after.

In the Fourteen Foot Channel both the ebb and flood currents set obliquely across the channel.

Near West Side of East Bank there is usually a slack before the flood current lasting about 10 minutes.

In The Narrows, high-water slack occurs about 2h. 0m. after high water at Sandy Hook (or 1h. 30m. after high water at Governors Island); it lasts from 15m. to 30m., when the current begins to run ebb, reaching a maximum velocity of 2.3 miles per hour at 4h. 30m. after high water at Sandy Hook.

Low-water slack occurs about 2h. 30m. after low water at Sandy Hook (or 1h. 40m. after low water at Governors Island); it lasts from 15m. to 30m., when the current begins to run flood, reaching a maximum velocity of 1.8 miles per hour at 5h. 12m. after low water at Sandy Hook (or 4h. 18m. after low water at Governors Island).

The strength of the ebb occurs at about the southing of the moon, and of the flood about 7 hours after.

Both ebb and flood currents appear first on the east side of the channel.

In the path of the Hudson, from The Narrows to the Tappan Sea, it is running flood 15 feet below the surface fully 1 hour before the turning from ebb to flood at the surface.

In Hudson River, off Thirty-ninth street, high-water slack occurs about 3h. 8m. after high water at Governors Island; it lasts from 40m. to 55m., when the current begins to run ebb, reaching a maximum velocity of 3 miles per hour at 6h. 17m. after high water at Governors Island.

Low-water slack occurs about 3h. 3m. after low water at Governors Island; it lasts about 35m., when the current begins to run flood, reaching a maximum velocity of 2 miles per hour at 5h. 43m. after low water at Governors Island.

In East River the maximum flood velocity occurs 1½ hours before the time of the maximum flood in the channel of the Hudson River off Governors Island.

See also current tables following.

NEW YORK BAY AND HUDSON RIVER.

	Locality of Station.					
	Hudson River, New York, off Thirty-ninth street.		The Narrows, New York Harbor.		Lower Bay, near West Side of East Bank.	
	Compass direction.	Velocity.	Compass direction.	Velocity.	Compass direction.	Velocity.
		Miles.		*Miles.*		*Miles.*
Hours before H. W. at Governors Island: 2	NE. ½ N.	1.0	NNW.	1.5	N. ¾ W.	1.6
1	NE. ½ N.	1.8	NNW.	1.7	N. ¾ W.	1.5
0	NE. ½ N.	2.0	NNW.	1.4	N. ¾ W.	0.8
Hours after H. W. at Governors Island: 1	NE. ½ N.	1.7	NNW.	0.2	N. ¾ W.	0.1
2	NE. ½ N.	1.0	S. by E.	0.6	S. by E.	1.0
3	NE. ½ N.	0.1	S. by E.	1.5	S. by E.	1.8
Hours before L. W. at Governors Island: 2	SW. by S.	1.8	S. by E.	2.3	S. by E.	2.2
1	SW. by S.	2.6	S. by E.	2.0	S. ½ E.	1.9
0	SW. by S.	3.0	S. by E.	1.7	S. ½ E.	1.4
Hours after L. W. at Governors Island: 1	SW. by S.	2.6	S. by E.	1.1	S. ¼ W.	0.6
2	SW. by S.	1.7	S. by E.	0.2	N. ¾ W.	0.2
3	SW. by S.	0.4	NNW.	0.8	N. ¾ W.	0.9

	Locality of Station.					
	Lower Bay, Fourteen Foot Channel.		Lower Bay, Ambrose Channel.		Swash, Main, and Gedney Channels.	
	Compass direction.	Velocity.	Compass direction.	Velocity.	Compass direction.	Velocity.
		Miles.		*Miles.*		*Miles.*
Hours before H. W. at Sandy Hook: 2	Wly.	1.6	NW.	1.9	Wly.	1.7
1	Wly.	1.3	NW.	1.5	Wly.	1.5
0	Wly.	0.8	NW.	1.0	Wly.	0.8
Hours after H. W. at Sandy Hook: 1	Ely.	0.2	SE.	0.2	Ely.	0.2
2	Ely.	0.6	SE.	1.0	Ely.	1.1
3	Ely.	1.5	SE.	1.7	Ely.	1.9
Hours before L. W. at Sandy Hook: 2	Ely.	1.9	SE.	2.2	Ely.	2.1
1	Ely.	1.7	SE.	2.1	Ely.	1.9
0	Ely.	1.2	SE.	1.5	Ely.	1.1
Hours after L. W. at Sandy Hook: 1	Ely.	0.0	SE.	0.2	Ely.	0.2
2	Wly.	0.9	NW.	1.0	Wly.	0.8
3	Wly.	1.4	NW.	1.7	Wly.	1.5

GENERAL REMARKS ON THE APPROACHES TO NEW YORK BAY AND HARBOR FROM SEA.

The Gulf Stream first warns vessels approaching New York from southeastward by its high temperature—say from 70° to 75° F., between the latitudes of 36° and 39° N.—the water outside of the stream being about 51° F. in the summer time. The distance from Sandy Hook in a southeasterly direction to the outer edge of the Gulf Stream is about 430 miles and to its inner edge 240 miles. On striking soundings after crossing the stream—say in from 75 to 100 fathoms—a slight diminution of temperature will be perceived, and the water will change in color from a dark to a light blue. Depth is a better indication of position off this part of the coast than the character of the bottom, as the same characteristics may be found in widely different positions. A frequent use of the lead and close study of the charts will always give sufficient warning of danger.

To the above means of ascertaining the vessel's position with reference to the coast are to be added several features in the character of the approaches.

DEPTHS.

Five Fathom Bank, off Delaware Bay Entrance, with a least depth of 15 feet, lies 15½ miles 99° true (*ESE* ⅝ *E* mag.) from Cape May lighthouse, its northern end in latitude 38° 59′ 30″ N. and its southern end 38° 50′ N. The bank extends about 9½ miles in a north and south direction with depths of 5 fathoms or less over it. In several places this bank has only 3½ fathoms, but 10 to 15 fathoms will be found just eastward of it. Two buoys mark the shoaler spots near the southern end of the bank, and two light-vessels (Five Fathom Bank light-vessel and Northeast End light-vessel) are moored eastward of it as guides to clear it.

Mud gorge.—The surveys of the sea approaches to New York have developed a continuous channel or ancient river course cut in the sea bed from off Sandy Hook bar out nearly to the ocean basin. The sea bed, for a distance of nearly 100 miles off Sandy Hook, until a depth of 40 to 60 fathoms is reached, is composed of *sand*. In some places the sandy bottom has black specks, in others yellow specks, and again pebbles and broken shells are found in it. The continuous gully cutting southeastward through this bed of sand has a bottom of *mud or clay;* near its outer or seaward end this is a green ooze mixed with sand; farther in it becomes a blue clay mixed with some sand; but whatever the character of the bottom in particular parts of the gully, its general features are so different from those of the sand bed through which it cuts that there is no room for mistake. It must be borne in mind, however, that the deep channel in which a bottom of mud is found is narrow in places, requiring quick work with the lead to pick it up.

The first indications of this remarkable channel are found about 4 miles southeastward of Ambrose Channel light-vessel, where the depth of water is about 19 fathoms. For about 10 miles from this point the channel or gully follows a southerly course, with a width of ¾ to 1 mile, and a depth increasing gradually from 19 to 33 fathoms between banks over which the depth is the same as that of the adjacent sea bed—about 15 to 18 fathoms. The gully turns more eastward in the next 5 miles, after which it has a general direction about 120° true (*SE* ½ *E* mag.) for nearly 60 miles to a sand bar extending across it. Throughout the second 15 miles the depth remains nearly constant at about 35 fathoms, the banks having depths of 22 to 27 fathoms. Thence to the bar, a distance of about 45 miles, the depth in the channel remains about the same—41 to 43 fathoms—while the banks gradually sink to the same level. The bar, over which the depth is also about 43 fathoms, is near the outer limit of the sand bed already mentioned.

Outside the bar, which is about 10 miles wide, the channel is found again as a deep ravine extending eastward about 25 miles farther, with a depth of from 200 to about 475 fathoms between banks over which the depth, increasing offshore, is from 45 to 200 fathoms. The average width of this ravine is about 3 miles. Specimens of bottom from it are the same as from its banks and the adjacent flats—a green, sandy mud. A narrow ridge, over which the depth is about 200 fathoms, separates the outer end of the ravine from the ocean basin.

Cholera Bank lies about 10 to 12 miles 111° true (*SE* by *E* ⅜ *E* mag.) from Ambrose Channel light-vessel, and is but little elevated above the surrounding bottom. It extends in

an easterly and westerly direction for several miles, with an average width of about 1 mile and depth from 10 to 11 fathoms.

In the vicinity of Ambrose Channel light-vessel and a few miles eastward of it the depths are liable to be irregular, owing to the large amount of dredged material which is being dumped in depths of 15 fathoms. A lump with 5¾ fathoms over it and surrounded by depths of over 10 fathoms lies about 550 yards southwestward from the light-vessel.

SOUNDINGS.

Approaching New York Entrance.—The lead will be found most useful to warn vessels of too close an approach to the shore; and many vessels have been wrecked on the coasts of New Jersey and Long Island through neglect to take frequent soundings when the positions of the vessels were uncertain. From the position of the two shores relative to each other and to the entrance to New York Bay, it follows that a 216° true (**SW** mag.) course will deepen the water if the vessel is on the Long Island side of the approach, and will shoal it if she is off the New Jersey coast. A 36° true (**NE** mag.) course will deepen the water if the vessel is off the New Jersey side of the approach, and will shoal it if she is off the Long Island coast.

Eastward of Fire Island lighthouse the water shoals quite rapidly toward the Long Island shore; but inside of a line drawn from Fire Island lighthouse to Barnegat lighthouse there is no marked difference in the soundings as either shore is approached. But if a sounding be obtained in the mud gorge (which is readily distinguished by its depth and bottom) when the vessel is westward of this line a 343° true (**N ¾ W** mag.) course will lead for Ambrose Channel light-vessel or the Long Island shore eastward of the light-vessel.

If not sure of her position, a vessel when standing either westward or northward for the entrance should not shoal the water to less than 12 fathoms, unless the weather is fair and frequent soundings are taken.

In thick or foggy weather frequent soundings should be taken with an armed lead. The soundings are not sufficiently characteristic along this part of the coast to make it possible to give precise rules for determining the ship's position by the depth of water or character of the bottom. There is, however, one rule which, if strictly adhered to, will keep the vessel out of danger until the weather clears and her position can be accurately determined, viz: Should at any time a sounding of 10 fathoms or less be obtained, the course should be immediately changed southeastward until the water deepens to 14 fathoms; after which care should be taken to keep outside of that depth.

The 20-fathom line off the Jersey coast also serves as a guide to vessels approaching from southward in thick weather. If a vessel from southward, striking 20 fathoms when northward of Barnegat, steers about 331° true (**N** by **W ¾ W** mag.), she would be apt to keep in not less than 20 fathoms and can thus work up toward the light-vessel. This course will be apt, also, to strike the mud gorge already described, which, with the aid of the chart of the approaches to New York, may be followed up for the light-vessel. Inasmuch as the current—owing to prevailing northeasterly winds—sets westward toward the Jersey coast, it will be well, should less than 20 fathoms be obtained before the soundings in the mud gorge indicate a near approach to the light-vessel, to haul eastward until the water deepens, and then proceed again northward. Should the weather continue thick, the ship's head should be put offshore, keeping outside of 20 fathoms until the weather clears.

In beating to windward in thick weather, vessels on the inshore tack, southward of Barnegat, should go about as soon as they strike 10 fathoms; and when northward of Barnegat as soon as they strike 12 fathoms. A stranger overtaken by thick weather when, from his reckoning and the character of the soundings, he has reason to believe he is too near the coast, should put the ship's head offshore and stand off and on under easy sail, taking frequent soundings.

CURRENTS.

Approaching from eastward from the vicinity of Nantucket Shoals light-vessel, a slight allowance should be made for the southwesterly set of the current—caused by prevailing northeasterly winds. Should the wind be northward of east it has been customary to allow,

in order to make the course good, a set of the current southwestward of at least 12 miles in every twenty-four hours.

Between Gay Head and Montauk Point the tidal currents have a perceptible set, the flood northward and ebb southward. The estimated velocity in about 25 fathoms of water is about ½ mile per hour; closer inshore this velocity increases.

Observations made between Nantucket and Cape May have developed the existence of weak tidal currents veering around the compass, accompanied by a general drift of the sea southwestward amounting to about 7 miles in twenty-four hours.

Tidal currents on south coast of Long Island.—Under ordinary circumstances the set of the flood is directly along the beach; off Montauk the ebb sets southward and the flood northward. Between Shinnecock and Fire Island the ebb sets sometimes eastward and sometimes northeastward, in the latter case obliquely onto the beach. Between Fire Island and Sandy Hook the current of ebb sets generally southeastward; while the flood (especially in the neighborhood of the inlets) has a tendency to set northwestward and has considerable velocity, at times from 1½ miles to 2 miles an hour. The current in the vicinity of Montauk has considerable velocity, the flood from 1½ miles to 2 miles an hour, the velocity of the ebb being greater. Between Shinnecock and Fire Island, however, it rarely reaches the velocity of 1 mile.

In thick weather and during strong winds from southward—especially southeast snowstorms—strangers on this coast are advised under no circumstances to go inside of 15 fathoms, sounding frequently.

Tidal currents on the coast of New Jersey, when uninfluenced by the winds, as a general rule, follow the trend of the shore except close in near the entrance of the several inlets, where the current of flood sets inshore and that of ebb offshore.

Pilot boats usually cruise offshore westward of a line from Fire Island to Sea Girt. For information relative to pilots see Appendix II.

SAILING DIRECTIONS, NEW YORK BAY AND HARBOR.

See the general remarks preceding on approaching New York Bay from sea.

The channels leading across the bar at the entrance to New York Lower Bay and their depths are described on pages 140–141. The sailing directions for these channels are given in sections in the order of their importance. No directions for the Fourteen Foot Channel are given as it is not buoyed and is used only by light-draft vessels whose masters are well acquainted with it.

The directions in section 1, through Gedney and Main channels, are good for a least depth of 30 feet.

The directions in section 1 A, through Ambrose Channel, are good for vessels of the deepest draft.

The directions in section 1 B, through Gedney and Swash channels, are good for a least depth of 22 feet.

The directions in section 1 C, through South and Swash channels, are good for a least depth of 21 feet.

In following the sailing directions reference should be made to the table of lights on pages 18–21 for description of them and the location of the ranges.

Strangers should not attempt to enter the harbor in thick weather.

It should be remembered that in the bay and harbor the gas, bell, nun, and can buoys are generally replaced during the winter season by spar buoys.

1. ***Entering through Gedney and Main Channels.***—Passing 350 yards north of Ambrose Channel light-vessel, steer 281° true (**WNW ¼ W** mag.) for 2⅞ miles and pass close to Gedney Channel gas and whistling buoy. Continue the 281° true (**WNW ¼ W** mag.) course, passing between the gas buoys marking Gedney Channel, until buoy No. GG 7 is on the port beam, when the vessel should be on the Main Channel range (Point Comfort beacon

in range with Waackaack beacon). Then change the course to 250° true (**W** by **S** mag.) and stand in through the Main Channel, keeping on the range (see the remarks following).

Remarks.—On the 281° true (**WNW** ¼ **W** mag.) course Romer Shoal and West Bank lighthouses (see table, page 20) will be on the starboard bow, Staten Island ahead, and North Hook beacon, South beacon, and Sandy Hook lighthouse will be on the port bow. The buoys marking Gedney Channel will be made ahead; on the north side of the channel are a red first-class nun buoy (No. 2 GE) and four red gas buoys (red lights), and on the south side are four black gas buoys (white lights). The buoys marking Ambrose Channel are northward of these buoys.

On the 250° true (**W** by **S** mag.) course the first buoys left on the starboard hand are a red nun buoy with perch and square and a red gas buoy close to it. These buoys are at the junction of the Main and Swash channels and are left on the starboard hand standing in through either channel. After passing them a number of buoys will be passed, the color and number indicating on which side they are to be left. If the range can not be seen, follow the line of the red buoys. The course leads nearly ¼ mile northward of the black bell buoy on the shoal, making out ⅝ mile in a general 58° true (**ENE** mag.) direction from North Hook beacon.

For a description of the lighthouses and ranges, see table, pages 18–21.

Dangers.—*North of the red buoys* of Gedney Channel there is a shoal, with 17 to 23 feet, extending northward to Ambrose Channel, and westward connecting with Romer Shoal.

South of the line of black buoys of Gedney Channel, between it and South Channel, the general depth is 20 to 22 feet.

Flynns Knoll, lying north of the Main Channel, is a sand shoal 1 mile long 283° true (**WNW** mag.) and has from 10½ to 17 feet over it. At its western end it sends off a spur ½ mile long, known as **Southwest Spit**, with from 13½ to 17 feet over it. Marking the southern side of these shoals are four red nun buoys, Nos. 4, 6, 8, and 10, and Southwest Spit gas buoy.

2. ***Through Main Channel and around Southwest Spit.***—Standing in on the 250° true (**W** by **S** mag.) course, as directed in section 1 preceding, after the North Hook beacon is passed, South Hook beacon and Sandy Hook lighthouse will gradually come in range. As soon as they are in range, bearing 112° true (*SE* by *E* ¼ *E.* mag.), steer 292° true (**NW** by **W** ¼ **W** mag.) and keep the range for nearly ¾ mile. The vessel should then be near Southwest Spit buoys (nun, red, with perch and ball, and a red gas buoy with a red light), and nearly on the Chapel Hill range (see page 20); a black can buoy should be ahead, distant about 300 yards. As soon as Conover beacon and Chapel Hill beacon are in range, bearing 186° true (*S* by *W* ⅜ *W* mag.), bring them over the stern and steer 6° true (**N** by **E** ⅜ **E** mag.), keeping the range, and proceed as directed under section 3 following. (See the remarks following.)

Remarks.—On the 250° true (**W** by **S** mag.) course Point Comfort and Waackaack beacons will be in range ahead. North Hook beacon, at the northern extremity of Sandy Hook, will be nearly two points on the port quarter when South Hook beacon and Sandy Hook lighthouse come in range.

On the 292° true (**NW** by **W** ¼ **W** mag.) course, Conover and Chapel Hill beacons (often difficult to pick up) will be abaft the port beam, and a black can buoy will be ahead.

The lighthouses and beacons are described in the table on page 20.

Red buoys, which should be given a berth of about 300 yards, will be seen northward of the sailing lines. The western red buoys, one surmounted by a perch and ball, the other gas-lighted, showing a fixed red light, mark the turning point into **Chapel Hill Cut**, and should be left about 200 yards on the starboard hand.

About 500 yards westward of Southwest Spit buoy (nun, red, with perch and ball) and on the western side at the entrance to the dredged cut up the bay, is a black can buoy. The eastern edge of the red sector in West Bank light cuts the western edge of the dredged cut.

Dangers.—Pitch of the Hook, a shoal with 11 feet over it, makes off from the northern end of the Hook in a general 58° true (**ENE** mag.) direction about ⅝ mile from North Hook beacon. The end of the shoal is marked on its northern side by a black bell buoy.

Flynns Knoll and Southwest Spit are described under section 1 preceding.

3. ***Through Chapel Hill Cut and up the Bay.***—When Conover and Chapel Hill beacons are in range, bearing 186° true (*S* by *W* ⅜ *W* mag.), steer 6° true (**N** by **E** ⅜ **E** mag.) about 6⅜ miles, following the buoyed channel on this course, and keeping the range while it is visible; on this course West Bank lighthouse should be left 350 yards on the port hand. When Coney Island lighthouse (on western end of Coney Island, see page 20) bears 112° true (*SE* by *E* ¼ *E* mag.), proceed as directed under section 4 following. (See the remarks following.)

Remarks.—A number of buoys will be passed, the color and number indicating on which hand they are to be left, and West Bank lighthouse will be a little on the port bow.

A white buoy lying about ⅜ mile northwestward of buoy No. C 5 is not to be considered.

After passing black can buoy No .7, the Junction buoy (nun, red and black horizontal stripes, surmounted by a perch and square), at the western end of Swash Channel, will be left about 200 yards on the starboard hand.

Romer Shoal lighthouse will be left about 1⅜ miles on the starboard hand.

Swinburne Island and Hoffman Island, westward of the course, are low, artificial islands on the shoalest part of West Bank, with several buildings upon them.

Coney Island lighthouse (see page 20) will be left 1 mile on the starboard hand.

Following the course up the bay, Fort Wadsworth and the lighthouse will be seen on the hills on the western shore of The Narrows. On the eastern shore is Fort Hamilton, off which is Fort Lafayette, low and circular in shape (here there is a fog signal, but no light. See page 20). Fort Hamilton should be a little on the port bow. The tide indicator is at Fort Hamilton wharf, see page 143.

Dangers.—**Flynns Knoll** is described on page 148.

East Knolls, separating the Main and Swash channels, has from 10½ to 18 feet over it, and is about 1½ miles long 328° true (**NNW** mag.) and ¾ mile wide.

West Knolls, westward of the channel and nearly abreast East Knolls, is about ⅞ mile long 19° true (**NNE** ½ **E** mag.), with 15 to 18 feet over it, and over 3 fathoms on all sides.

Romer Shoal is described on page 152.

Staten Island Flats make off from the eastern shore of that island from 1¾ to 2⅝ miles, with depths over them from 1 to 16 feet. Round Shoal, Old Orchard Shoal, and West Bank are parts of these flats.

West Bank, which borders the western side of the Main Channel, forms the northeastern part of Staten Island Flats and makes off in a 174° true (**S** ¼ **W** mag.) direction from Fort Wadsworth lighthouse nearly 4 miles. It has from 1 to 10 feet over the greater part of it. Its eastern side is bold-to, but is well marked by black buoys and by Swinburne and Hoffman islands; these islands should not be approached closer than ⅜ mile. West Bank lighthouse, in 21 feet of water, marks its southern end and is near the western edge of the channel.

East Bank, an extensive sand shoal, extends southward from Coney Island, and has from 3 to 18 feet over it. Shoal lumps are scattered all over the bank, and care is necessary when near it. In passing it, to keep clear, keep Coney Island lighthouse bearing eastward of 11° true (**N** by **E** ¾ **E** mag.).

4. ***Through the Narrows.***—When Coney Island lighthouse bears 112° true (*SE* by *E* ¼ *E* mag.), Fort Wadsworth lighthouse bearing 326° true (*NNW* ¼ *W* mag.), steer 339° true (**N** by **W** mag.) for 3½ miles through The Narrows to a position from ⅜ to ⅝ mile off the wharves of Tompkinsville, and then proceed as directed in section 5 following.

Remarks.—On the 339° true (**N** by **W** mag.) course Robbins Reef lighthouse will be a little on the starboard bow. The vessel should pass nearly midway between Fort Lafayette and Fort Wadsworth. The quarantine boarding station is on Staten Island just above Fort Wadsworth.

Rosebank and Stapleton, on Staten Island, will be passed, and the course leads up to abreast Tompkinsville. When past Fort Lafayette do not go eastward of a line joining it and Robbins Reef lighthouse, until within 1 mile of the latter, in order to keep clear of the south point of Gowanus Flats. When abreast of Tompkinsville the Lighthouse Depot should bear about 278° true (**WNW** ½ **W** mag.).

Dangers.—**Craven Shoal** will be left on the port hand; this is a small, detached lump with 18 feet over it, lying 1¼ miles 155° true (**S** by **E** ⅜ **E** mag.) from Fort Wadsworth lighthouse, and ⅝ mile 54° true (**NE** by **E** ⅝ **E** mag.) from Hoffman Island. On its eastern side are a bell buoy and a spar buoy (red and black horizontal stripes).

There are no dangers in The Narrows if the eastern shore be given a berth of ¼ mile.

5. ***From Tompkinsville to New York.***—The course from off Tompkinsville is about 26° true (**NE** ⅞ **N** mag.), passing between ⅜ and ½ mile eastward of Robbins Reef lighthouse, and carrying not less than 5½ fathoms of water. If intending to anchor, conform to the limits prescribed in Appendix II.

Remarks.—Directly ahead is Manhattan Borough (New York City), at the extreme lower end of which is The Battery. The **Brooklyn Bridge** and **Governors Island** (occupied by Fort Columbus) are prominent on the starboard bow. On the port bow are Bedloe Island and Ellis Island. The highest point of the colossal statue "**Liberty Enlightening the World,**" on Bedloe Island, is more than 300 feet above the water.

Southward of Bedloe Island there are two dredged channels, marked by buoys, with a depth of about 20 feet, leading in to the National Docks and to Greenville Piers. On the western side of the channel between Stapleton and The Battery are a number of white buoys which mark the anchorage limits.

Dangers.—The channel is unobstructed; the dangers limiting it are **Gowanus Flats** and **Governors Island** on the starboard hand, and on the port hand the **Jersey** (or **Bergen**) **Flats.** Several buoys will be passed—red ones on the starboard hand, black ones on the port hand.

Gowanus Flats, with 7 to 18 feet over them, make off in a southwesterly direction for 2¼ miles from Red Hook (the point south of Governors Island). Gowanus Flats southwest end bell buoy (red, No. 12½) lies nearly 1¼ miles 153° true (**S** by **E** ⅝ **E** mag.) from Robbins Reef lighthouse, eastward of the course up the bay and westward of the Bay Ridge Channel entrance to Gowanus Bay. Bay Ridge Channel, with a depth of 35 feet, and Red Hook Channel, with a depth of 26 to 30 feet, make in to Gowanus Bay along the eastern side of the flats.

The Whitehall Building (the westernmost very tall whitish building facing The Battery back of Castle Garden) kept bearing eastward of 25° true (**NE** by **N** mag.) will clear Gowanus Flats.

Jersey Flats are very shoal, being bare in places, with a ruling depth of 3 to 6 feet. **Robbins Reef** and **Oyster Island Flats** form parts of this shoal. The eastern edge of the flats is marked by Robbins Reef lighthouse, Bedloe Island, Ellis Island, gas buoys at the entrances to National Docks and Greenville Piers channels, and a number of black buoys. There is a bell buoy near the southeastern point of the flats, southeastward of Robbins Reef lighthouse.

Governors Island and the bell buoy (black) off the south end of the island are left on the starboard hand going up the main channel. For a distance of ⅜ mile southwestward of the buoy the shoal has depths of 21 to 25 feet.

6. ***To enter East River through Buttermilk Channel.***—Standing up New York Upper Bay, when St. Margaret's Hotel (the large, high building to the right of the stone pier of the Brooklyn Bridge) is in range with the easterly tangent of Governors Island, bearing 50° true (**NE** by **E** ¼ **E** mag.), head up on the range until abreast the lower end of Governors Island. Then follow the wharves of Brooklyn at a distance of not over 250 yards until abreast of pier 18, Brooklyn, and then follow a mid-channel course up the river.

Remarks and dangers.—Standing up the bay Governors Island will be on the starboard bow, and the stone piers at both ends of the Brooklyn Bridge will be seen northeastward of the island. St. Margaret's Hotel is the first very tall building on the heights just to the right of the southern pier of the Brooklyn Bridge. In 1908 the deepest water in the Buttermilk Channel was from 100 to 600 feet off the ends of the wharves in Brooklyn.

A **shoal** makes off nearly 125 yards from the eastern and northern sides of Governors Island, and is marked at its southern edge by a buoy (spar, black, No. 1).

In 1908 the **shoal** extending southwestward from Governors Island is being reclaimed; a sea wall has been erected to include the shoal, and dredges are at work filling in behind the sea wall.

6 A. ***To enter the East River on the Range north of Governors Island.***—When Brooklyn bridge shows northward of Castle William (Governors Island), look for St. Margaret's Hotel (Brooklyn), and when the hotel is nearly in range with Castle William the range mark on pier 10, Brooklyn, will be seen to the left of it. Commence turning with a port helm so as to be pointed on the range (see remarks following) by the time Castle William bears about 126° true (*SE* mag.). Keep close on the range, course 78° true (**E** ¼ **N** mag.), until the vessel has pier 8 (New York) in line looking up the pier; then follow a mid-channel course up the river.

Remarks.—The range is the outer corner of the warehouse on pier 10, Brooklyn (marked by a square white target with diagonal slats), in line with the center of the middle tower of St. Margaret's Hotel (most prominent brick building with 3 towers, to the right of Brooklyn Bridge); it leads through the deepest water between Governors Island and The Battery and is good at mean low water, if closely followed, for vessels of 26 feet or less draft. At high water the range leads about in the middle of a channel 870 feet wide with a least depth of 29 feet (see page 133).

Dangers.—**Dimond Reef** lies about 150 feet southward of the range line and has a least depth of 25 feet over it.

Shoals with a depth of less than 26 feet extend southward from The Battery to within 300 feet of the range line.

Coenties Reef, with a depth of 25½ feet over it, lies 275 yards from the end of pier 7 (New York) and about 320 feet northward of the range line.

1 A. ***Entering through Ambrose Channel.***—Pass 350 yards northward of Ambrose Channel light-vessel and steer 281° true (**WNW ¼ W** mag.) for 2⅞ miles to the gas and whistling buoy; leave this buoy close-to on either hand and steer 297° true (**NW ¾ W** mag.) heading for West Bank lighthouse. Continue the 297° true (**NW ¾ W** mag.) course 6 miles, passing about midway between the red buoys and black buoys which mark the sides of the channel for navigation.

When Romer Shoal lighthouse bears 189° true (*S* by *W* ⅝ *W* mag.) steer 323° true (**NNW ½ W** mag.) about ⅞ mile heading for Swinburne Island until West Bank lighthouse bears 271° true (**W ⅞ N** mag.) and North Hook beacon and Sandy Hook lighthouse are in range. Then steer 348° true (**N ¼ W** mag.) on the range until Coney Island lighthouse bears about four points abaft the starboard beam; then steer 339° true (**N** by **W** mag.) through the middle of The Narrows and follow the directions in section 4, page 149.

Remarks.—The above courses lead through the middle of the channel when completed; a slight variation in these courses may be necessary before the channel is completed, but the buoys are numerous and should in every case be followed, giving them a berth of about 250 feet. Some of the buoys marking the channel are gas buoys.

Extracts from the regulation governing the use of Ambrose Channel are given on page 141.

Dangers.—**Romer Shoal** (see page 152) forms the southern limit of the channel, and a part of East Bank rises abruptly on the northern side of the channel.

Craven Shoal (see Dangers in section 4) should be a little over ¼ mile on the port beam when on the 348° true (**N ¼ W** mag.) course and Coney Island lighthouse bears four points abaft the starboard beam.

1 B. ***Entering through Gedney and Swash channels.***—Follow the directions in section 1, page 147, and when on the 250° true (**W** by **S** mag.) course red buoy No. B 2, with perch and square, is abaft the starboard beam, haul northward and bring Elm Tree and New Dorp beacons (see page 20) in range bearing 311° true (**NW ½ N** mag.). Keep this range (passing about 400 yards southward of Romer Shoal lighthouse) until past the red bell buoy at the western end of Swash Channel. Then change course to 6° true (**N** by **E ⅜ E** mag.) with Conover and Chapel Hill beacons in range astern and pass about 400 yards eastward of West Bank lighthouse. When Coney Island lighthouse bears 112° true (*SE* by *E* ¼ *E* mag.) follow the directions in section 4, page. 149.

Remarks.—On the 311° true (**NW ½ N** mag.) course Scotland light-vessel will be directly astern, and West Bank lighthouse will be on the starboard bow; Romer Shoal buoys (nuns, Nos. S 2 and S 4) and Romer Shoal lighthouse will be left on the starboard hand, and black buoys (Nos. S 1 and S 3), also a red and black horizontally striped buoy, will be left well on the port hand.

At the western end of the Swash Channel, besides the red bell buoy (on the northern side), there is a junction buoy (red and black horizontal stripes surmounted by a perch and square) on the southern side of the channel at its junction with the main channel up the bay.

The currents of half ebb in the Swash Channel set eastward with considerable velocity, and care must be taken not to be set on to Romer Shoal.

Dangers.—**Flynns Knoll** and **East Knolls**, lying southward of Swash Channel, are described on pages 148 and 149, respectively.

Romer Shoal, with 3 to 18 feet over it, extends about 3½ miles in a northwesterly and southeasterly direction, and lies between Swash Channel and Ambrose Channel. It is marked by buoys and by Romer Shoal lighthouse, which is near the middle of the shoal on the Swash Channel side.

1 C. ***Entering through South and Swash channels.***—From Scotland light-vessel steer 311° true (**NW** ½ **N** mag.), passing close to the two mid-channel buoys (black and white perpendicular stripes) and keeping Elm Tree and New Dorp beacons in range ahead until between the bell buoy (red) and the junction buoy (red and black horizontal stripes with perch and square) at the western end of Swash Channel. Then change the course to 6° true (**N** by **E** ⅜ **E** mag.), pass about 400 yards eastward of West Bank lighthouse, and stand up the bay, following the directions in section 4, page 149.

Remarks.—In crossing the Main Channel, from South Channel to Swash Channel, black buoy No. B 1 and red buoy No. B 2 (with perch and square, a gas buoy near it) will be left 500 yards on the starboard hand, and Palestine Shoal buoy (nun, red and black horizontal stripes) and a red nun buoy, No. 2½, southeastward of it will be left 500 yards on the port hand.

See Remarks and Dangers under section 1 A preceding. See also Currents, on pages 144.

1 D. ***Entering through False Hook Channel.***—This channel has a least depth of 19 feet, but it should not be attempted by vessels drawing over 16 feet or by strangers.

With Navesink lighthouses bearing westward of 239° true (*WSW* mag.), bring Sandy Hook lighthouse to bear 320° true (**NNW** ¾ **W** mag.) and steer for it. This course will lead about 400 yards westward of Outer Middle Ground buoy (spar, red, No. 2) near the entrance. When this buoy bears 81° true (*E* mag.), distant about 400 yards, steer 334° true (**N** by **W** ½ **W** mag.) and pass 200 to 300 yards westward of *The Oil Spot* buoy (spar, red, No. 4). Continue the 334° true (**N** by **W** ½ **W** mag.) course nearly parallel to the beach until North Hook beacon bears 272° true (*W* by *N* mag.) and a red and black horizontally striped nun buoy is about 400 yards on the starboard beam. Then change course to 20° true (**NNE** ⅝ **E** mag.), passing northward of False Hook Shoal buoy (nun, red and black horizontal stripes), close westward of Bayside range cut buoy (can, black, No. B 3), and across the Main Channel, and when on the Swash Channel range stand in as directed in section 1 C preceding.

Or, when well northward of False Hook Shoal buoy (nun, red and black horizontal stripes) steer about 306° true (**NW** mag.) so as to pass over 300 yards eastward of the black bell buoy. When about ¼ mile northward of the bell buoy, steer 250° true (**W** by **S** mag.) through Main Channel and follow the directions in section 2, page 148.

Remarks.—On the 334° true (**N** by **W** ½ **W** mag.) course the eastern shore of Sandy Hook will be given a berth of about ¼ mile, but it may be approached as close as ⅛ mile.

Dangers.—Outer Middle Ground, with 18 to 21 feet over it; **Oil Spot**, with 10 to 19 feet over it, and **False Hook Shoal**, with 16 to 18 feet over it, lie eastward of the channel (between it and South Channel) in a 328° true (**NNW** mag.) direction, and are inclosed by five buoys, two red buoys on the western side, two black buoys on the eastern side, and a buoy (red and black horizontal stripes) at the northern end of False Hook Shoal, about 89° true (**E** ¾ **S** mag.) from North Hook beacon.

A **shoal** with 11 to 17 feet over it makes out for about ⅝ mile in a general 58° true (**ENE** mag.) direction from North Hook beacon. Its northeastern extremity is marked by a black bell buoy, which should be given a berth of at least 450 yards while southward of it.

APPENDIX I.

EXPLANATION OF THE CURRENT DIAGRAM OF THE SHIP CHANNEL, EAST RIVER, NEW YORK.

The diagram represents the average condition of the surface currents along the middle of the channel (sailing line) from abreast Execution Rocks Lighthouse through the East River to Governors Island. Strong winds may affect the currents so as to vary the times of their change as much as one hour in extreme cases.

The small scale of the diagram prevents the insertion of many details of minor importance.

By the expression "East Current" the current setting from Governors Island toward Execution Rocks is designated, and by "West Current" the current setting from Execution Rocks toward Governors Island is designated.

Distances along the sailing line are given at the top and bottom of the diagram; the divisions represent 1 mile. The small figures within the colored surface denote the velocity of the current in miles and tenths per hour at certain points along the sailing line, as shown by the distances at top or bottom of the diagram.

The times of high water at Governors Island, as given for each day of the current year in Coast and Geodetic Survey tide tables, is taken as zero and is thus shown on the sides of the diagram, together with the hours before and after high water at that place: the divisions between the hours represent 30 minutes of time.

The width between high water and low water curves at any point (measured upward) represents the duration of fall, and the width from the low water to the high water curve (measured upward) represents the duration of rise. The duration of the current at any point along the sailing line is measured by the width of the current belt at that point.

EXAMPLE.—A vessel bound west is abreast of Execution Rocks Light at 1 p. m. July 18, 1904, and maintains a speed of 10 miles; what will be the state of the tide and how will she encounter the currents as she passes through the East River to Governors Island?

The Coast and Geodetic Survey Tide Tables for 1904 give the time of the nearest high water at Governors Island at 12.14 p. m., hence the vessel is abreast Execution Rocks 46 minutes after high water at Governors Island. From the zero, the right-hand margin of the diagram, lay off 46 minutes upward on the diagram, and from this point draw a line AB parallel to the speed line of 10 knots on the diagram, bound westward. The line will represent approximately the track of the vessel with regard to the tides and currents.

An inspection of this line will show that the vessel will carry a favorable (west) current with an average velocity of about ½ mile per hour until up to Lawrence Point, and from thence to the south end of Blackwells Island she will have slack water; from the latter point to Governors Island she will have a weak favorable (west) current.

It will be seen from the line that at Execution Rocks the vessel has a rising tide and that it lacks 2 hours and 20 minutes of being high water, that she passes through Hell Gate at high water, and on her arrival off Governors Island it will be 2 hours and 45 minutes after high water at the island.

In cases where the vessel encounters a current of considerable velocity, a speed line should be first drawn for the speed of the vessel through the water, and the velocity of the currents on this line be used as a correction to find the vessel's speed over the bottom; a new speed line corresponding to the speed of the vessel over the bottom can then be drawn, and this latter line will show the track of the vessel with regard to the tides and currents.

If at any point along the track line the time of high water or low water is desired, measure the vertical distance to the high-water or low-water curve; this will give the time of high or low water, with reference to high water at Governors Island. When at any point along the track line, the time since the current turned is found by measuring downward to the current curve; or the time before it will turn by measuring upward to the curve.

Should a vessel not maintain a regular speed, or be delayed, the time (referred to high water at Governors Island) of arrival at any point along the sailing line may be noted and a new line drawn to indicate the continuation of her track. Similarly, a vessel beating may note the time of crossing the sailing line, and then read from the diagram the state of the tide and current at any place along the sailing line.

REMARKS ON THE TIDAL CURRENTS IN EAST RIVER.

The currents at different points along the East River are greatly modified by local conditions.

Off Old Ferry Point the slack before ebb lasts about 20 minutes and the slack before flood about 18 minutes. The currents are quite irregular in this region.

Between Lawrence Point and Middle Ground slack water usually lasts less than 10 minutes. The current flows directly along the channel.

Off Polhemus Dock slack water usually lasts from 5 to 10 minutes. The currents follow the channel. Close to Polhemus Dock, within 200 feet, eddy currents are often found.

Between Hallets Point and Hogs Back 8 miles have been measured on the flood; but elsewhere between Lawrence Point and Blackwells Island 3 and 4 miles at strength of ebb and flood are characteristic.

Off Hallets Point both ebb and flood set directly toward the Frying Pan Shoal. The flood current (setting eastward) sweeps close around Hallets Point and makes less eddy in the cove eastward of it than is found there on the ebb.

Between Great Mill Rock and Wards Island the flood current has numerous though not violent eddies. The slack water is of only a few minutes' duration. The main stream passes to the southward of Flood Rock.

Between Hallets Point and Flood Rock the most rapid current on the ebb is very close to Flood Rock; the currents are direct and strong, with comparatively few eddies.

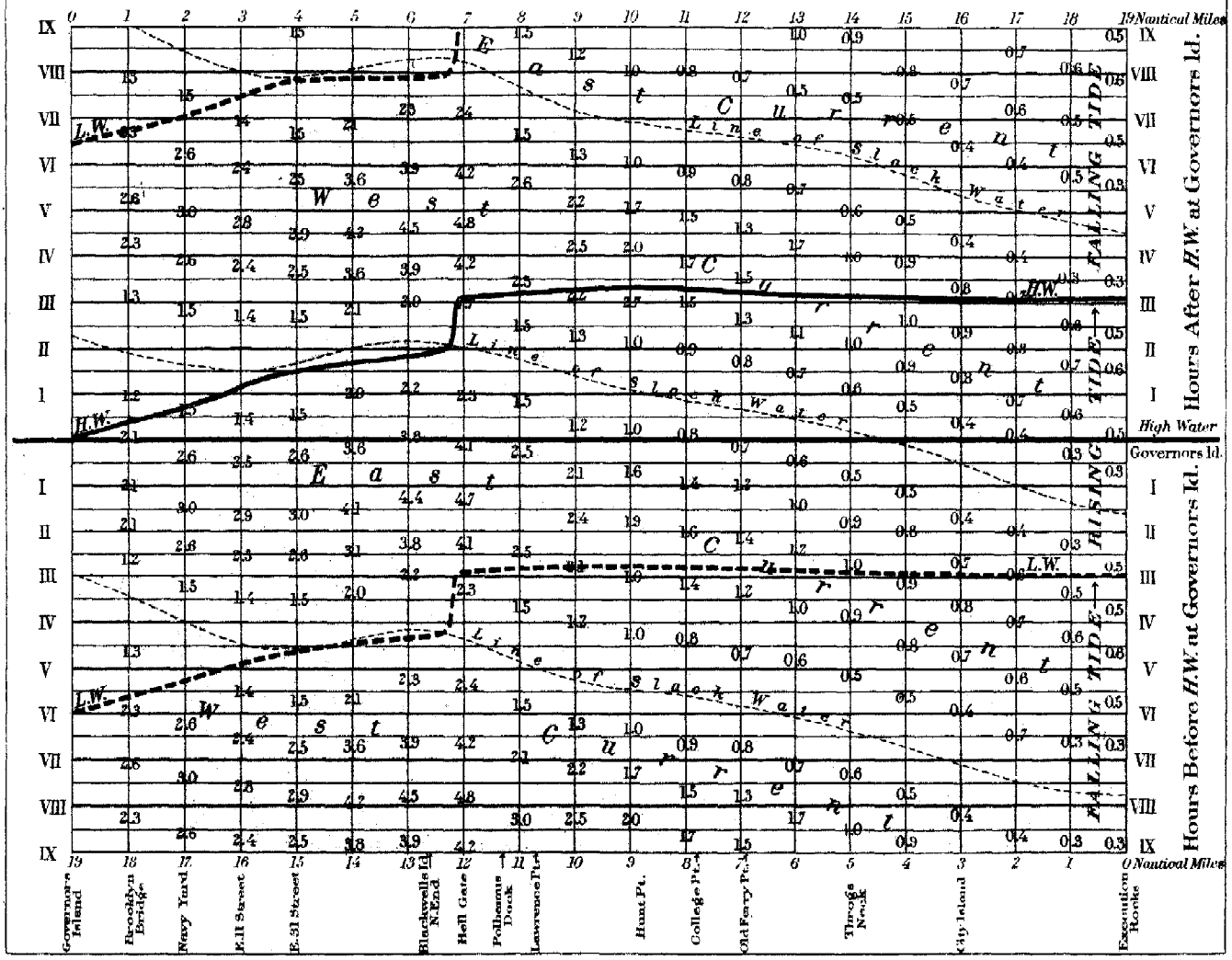
There are strong eddies off Blackwells Island Lighthouse and off Hatters Dock (the northern point of entrance to Hallets Cove).

In Blackwells Island Western Channel slack water usually lasts less than 10 minutes. The currents follow the channel, and turn at nearly the same time throughout its length.

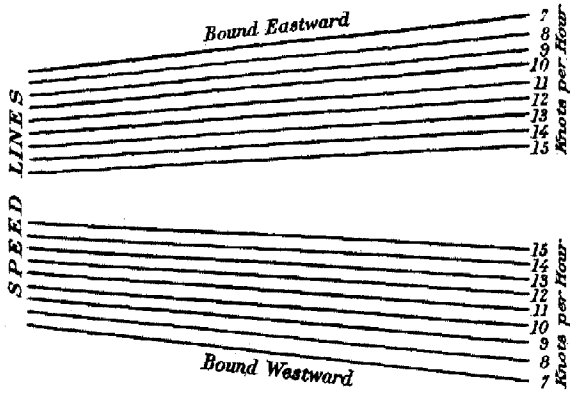
In Blackwells Island Eastern Channel slack water usually lasts less than 5 minutes. The current generally begins to follow the channel within 30 minutes of its slack. It has at no time any considerable velocity crosswise the channel. On the Blackwells Island side the current is about the same as in the channel, even to within a few feet of the sea wall. Both on the ebb and flood there is little current in the vicinity of the sea wall on the Long Island side. The currents turn at nearly the same time throughout the length of this channel.

Off East Twenty-third street slack water lasts from 4 to 8 minutes. The strength of the ebb is nearly 3 miles.

CURRENT DIAGRAM OF SHIP CHANNEL, EAST RIVER, NEW YORK



THE NORRIS PETERS CO., WASHINGTON, D. C.



APPENDIX II.

PILOTS AND PILOTAGE HARBOR CONTROL, QUARANTINE, ETC.

CONNECTICUT.

PILOTAGE.

Extracts from Chapter 278, General Statutes of Connecticut, 1902.

Sec. 4762. Rates of pilotage. The superior court of any county shall, on the application of any person, fix the rates of pilotage in the waters within such county, * * * .

Sec. 4763. Vessels subject to pilotage; exemptions; penalty. All inward and outward bound vessels of foreign bottom, drawing nine or more feet of water, entering any port in this State for the purpose of loading or unloading, shall be subject to the payment of pilotage, if spoken by a pilot before entering such port; but vessels engaged in the coasting trade and coming by way of New York, fishing smacks, vessels engaged in the oyster trade, canal boats, barges, and tugboats shall not be so subject. Every person not duly licensed as a pilot, except the master or person in charge of the vessel to be piloted, who shall act as pilot after such vessel shall have been spoken by a duly licensed pilot who is ready and willing to take charge of such vessel, shall be fined not more than thirty dollars.

BRIDGEPORT HARBOR.

The following rates of pilotage were established on April 4, 1902, by an order of the Superior Court of Fairfield County:

"For the inward pilotage of all vessels drawing nine feet of water or over, except square-rigged vessels, one dollar and fifty cents for each and every foot of water such vessel may draw; for the outward pilotage of all vessels, except square-rigged vessels, drawing on the outward passage nine feet of water or over, one dollar for each and every foot of water such vessel may draw; for the inward pilotage of all square-rigged vessels drawing nine feet of water or over, two dollars for each and every foot of water such vessel may draw; and for the outward pilotage of all square-rigged vessels drawing on the outward passage nine feet of water or over, two dollars for each and every foot of water said vessel may draw. And it is further ordered, adjudged, and decreed that from the first day of November to the first day of April in every year licensed pilots shall be entitled to demand and receive for the inward or outward pilotage in the waters of said town of Bridgeport of any vessel drawing nine feet of water or over, in addition to the rates of pilotage hereinbefore established, the further sum of twenty-five cents for each and every foot of water said vessel may draw."

HARBOR CONTROL.

Extracts from Chapter 278, General Statutes of Connecticut, 1902.

Sec. 4752. Harbor masters. The governor shall appoint, once in three years, a harbor master, and may appoint a deputy harbor master, for each of the harbors of New Haven, Norwich, Bridgeport, Stamford, Norwalk, Stonington, New London, and Branford, and may appoint a suitable number of harbor masters and deputy harbor masters in any town in this State which has navigable waters within its limits. * * *

Sec. 4753. Jurisdiction in Branford harbors. The jurisdiction of the harbor masters for the harbors of Branford shall include the harbor of Branford and Branford river, as far up said river as Hobart's bridge, so called, the harbor of Stony creek, and the waters between and adjoining the adjacent islands known as the Thimble islands.

Sec. 4754. Powers. Penalty for resisting. Each harbor master may station all vessels riding at anchor in the harbor under his care, and remove, from time to time, such vessels within such channel as are not employed in receiving or discharging their cargoes, to make room for the passage of other vessels up or down such channel, and shall be the sole judge

of the fact whether any vessel so at anchor is so in the channel as to obstruct or hinder the passage of any other vessel, and may determine how far within such harbor, and in what instances, masters or others having charge of vessels at anchor within such channel shall remove the same; and upon the application of the owner or lessee of any wharf, dock, or pier in such harbor shall station any vessel lying at or adjacent to such wharf, dock, or pier, or remove it therefrom to make room for the dockage or passage of any other vessel, when in the judgment of such harbor master the interest and convenience of commerce or navigation shall require; and may exercise all the powers and duties with reference to such vessels which he might exercise with reference to vessels at anchor in such harbor. Every person who shall obstruct, resist, or wilfully refuse to obey the order of any harbor master or deputy harbor master in the execution of the duties of his office shall forfeit fifty dollars, to be recovered, with costs, in the name of such harbor master or deputy harbor master, in which action such vessel may be attached as in other actions; * * * .

Sec. 4756. Vessels may be removed. When the master or owner of any vessel lying within the navigable waters of this State, or the person having the same in charge, shall wilfully neglect or refuse to obey the orders of any harbor master performing his duties under the provisions of this chapter, such harbor master may cause such vessel to be removed at the expense of the owners, and may recover the expense of such removal of any owner of such vessel, in an action founded upon this statute.

Sec. 4757. Penalty for neglect of duty. When any harbor master neglects, upon the application of any person engaged in the navigation of the harbor under his charge, to remove or cause to be removed any vessel riding at anchor therein and obstructing its channel, he shall pay to such person twenty dollars, with costs, to be recovered in an action on his official bond or on this statute; and in deciding as to such neglect, for the purpose of such action, no opinion or decision of such harbor master shall be considered by the court.

Sec. 4758. Jurisdiction in New Haven harbor. The New Haven harbor master shall have, in relation to all vessels lying at any of the wharves, docks, or piers between Tomlinson's bridge and Heaton's wharf, the same powers or duties as in relation to vessels lying in the channel of said harbor.

Sec. 4759. New Haven harbor; removal of vessels from channel; penalty. If any vessel shall be unnecessarily moored in the channel in New Haven harbor, which extends from the sluice in and through the wharf of the New Haven and Northampton company to the main channel, the master, or person in command of such vessel at the time she so moored, shall be fined ten dollars, and also one dollar an hour for each hour above twelve that such vessel shall be so moored.

Sec. 4767. Speed of vessels limited; penalty. If any vessel propelled by steam shall move at a greater rate of speed than six miles per hour, when approaching or passing, and while within two hundred feet of, any wharf, pier, or dock in the city of Hartford between the bridge over the Connecticut River and the southern limits of said city, or Long wharf and pier in New Haven harbor, when any vessel shall be lying abreast at any berth below the north end of the platform on the east side of the wharf, or the wharf or pier in Bridgeport harbor known as "Mather's dock," or any wharf, pier, or marine railway in Norwalk harbor, or any wharf in the city of Middletown, or any dock, pier, or wharf in the city of New London or New London harbor, or in the city of Norwich, or between the cities of New London and Norwich, or any wharf on either side of Mystic river between Mystic bridge and a point two hundred yards south of the wharf of Joseph S. Avery, the person in command of such steamboat or vessel shall forfeit one hundred dollars to the county in which the offence is committed and shall also be liable to pay threefold damages to any person whose property shall be injured in consequence of the violation of this section.

Sec. 4769. Penalty for throwing refuse into harbor. Every proprietor or charterer of any steamer or vessel, from which any furnace refuse shall be thrown into the waters of any harbor or river in this State, shall be fined for the first offence one hundred dollars, and for every subsequent offence two hundred dollars.

Sec. 4773. Dumping in harbors prohibited. Every person who shall deposit any substance except oyster shells in New Haven harbor, or off its mouth within three hundred feet outside of the water bar, so called, or in the waters adjacent to said harbor below Yellow and Old Mill bridges, or in Stamford harbor, or off its mouth inside a direct line drawn from Captain's island light, off Greenwich, to the buoy on Old Cow reef off Shippan point, shall be fined not less than fifty nor more than five hundred dollars, or imprisoned not more than six months, or both; * * * .

Sec. 4775. Dumping in Norwalk harbor prohibited; penalty. Every person who shall deposit or assist in depositing any mud or other substance, except oyster shells or other materials necessary for making oyster beds, in Norwalk harbor, or at any place off the town of Norwalk inside of a line running due east and west from a point due south a distance of one mile from Green's reef government buoy, or who shall deposit any substance in any of said waters during the night season, shall be fined not less than fifty nor more than five hundred dollars, or imprisoned not more than six months or both. * * *

QUARANTINE.

Extracts from Chapter 151, General Statutes of Connecticut, 1902.

Sec. 2536. Quarantine regulations for vessels. The health officer of a town, city, or borough, or the board of health of a city or borough, contiguous to navigable waters may assign, within the limits of such town, city, or borough or the waters contiguous thereto, the port or place in any harbor, road, river, or bay where vessels coming within such limits shall, if need be, perform quarantine. Every vessel which shall come from any foreign port or place, or between the first of June and the first of November from any port or place in the United States south of the capes of Delaware Bay or in the British provinces, and come to anchor in any such harbor, road, bay, river, or contiguous waters, if any place for quarantine shall have been assigned as aforesaid, shall come to anchor and lie at such place so assigned, and at no other place, until discharged in the manner hereinafter provided. The master of every vessel coming to anchor as aforesaid shall forthwith make signal for a health officer by hoisting colors in the shrouds or, if need be, may send a person on shore who shall notify immediately the health officer of the port, or, if there be no health officer, a member of the board of health, of the arrival of such vessel, and forthwith return on board. The provisions of this section shall not apply to a vessel which shall have entered any port or place north of said capes where there are quarantine regulations and been visited by a health officer, received a clean bill of health, and been permitted to go, and has actually gone to the wharves and unloaded thereat; and such clean bill of health or a certified copy thereof shall be left with or filed at the office of the health officer or board of health having jurisdiction over said port within twenty-four hours after the arrival of such vessel.

Sec. 2537. Quarantine of vessels from certain ports. When the health authority of any town, city, or borough, shall deem it expedient that vessels arriving in such town, city, or borough, or in the waters contiguous thereto, from any port in the United States north of the capes of Delaware Bay, should perform quarantine; such health authority may by an order, duly published or posted, subject such vessels to quarantine in the same manner as if they arrived from a foreign port or place.

Sec. 2538. Quarantine in New Haven harbor. Every vessel subject to quarantine arriving in the harbor of New Haven, on board of which there shall be no sickness at the time of such arrival, or on board of which during the passage there shall have been no case of malignant or contagious disease, may come to and make fast at the end of any public wharf in said harbor, without incurring any penalty for violation of the quarantine laws; but no person shall be allowed to leave said vessel except to make fast to the wharf until said vessel shall have been visited by a health officer and by him discharged from quarantine. If the health officer on visiting any such vessel shall find such sickness on board as, in his opinion, shall make it proper for him to cause such vessel to continue subject to quarantine, he shall order it to be removed to such place as shall be assigned as a place of quarantine. This section shall not apply to any vessels coming from any foreign port other than a port in the Dominion of Canada or Newfoundland.

Sec. 2539. Vessel visited by health officer. On notice given to a health officer or member of the board of health of the arrival of any vessel as aforesaid, he shall visit it without delay, and may, on examination, give a certificate of health, discharging it from quarantine, or cause it to continue subject to quarantine; every vessel so subjected to quarantine shall perform quarantine under the regulations of such health officer or board of health.

Sec. 2540. Fees for visiting vessel. The health officer or board of health may establish the fees, not exceeding five dollars, which the health officer shall be entitled to receive for visiting a vessel as aforesaid, and the master or owner of such vessel shall pay the same to such health officer or board of health.

Sec. 2541. Fraudulently eluding quarantine. No master of any vessel liable to perform quarantine as aforesaid shall fraudulently attempt to elude quarantine by false declaration of the port or place from whence he came, or land, or suffer to be landed from his vessel any person or thing except in the manner above provided, nor permit any person to board such vessel, before it shall have been visited as aforesaid.

Sec. 2542. Quarantine of vessels having sickness on board. Every vessel, from any port or place, having sickness on board shall be subject to inspection and quarantine before making fast to any wharf. Every master of a tugboat who shall violate, or assist any other person to violate, the quarantine regulations of a port shall be fined not more than one hundred dollars, or imprisoned not more than three months, or both.

Sec. 2543. Vessel ordered to be cleansed. When a health officer or a member of the board of health shall on visiting any vessel as aforesaid think it necessary that it should be cleansed or purified, he shall direct its master to hoist a white flag on the head of the mainmast, there to be kept during the daytime, and shall without delay direct the time and manner in which the cargo on board such vessel shall be in part or in whole cleansed or purified, and such vessel, or such part thereof as may be infected, shall be cleansed in such method as shall be directed. When such vessel shall contain any person ill of a contagious or infectious disease

he shall be removed on shore to such place as said health officer or board may direct and shall be nursed and provided for in the manner prescribed by law. * * *

Sec. 2544. Certificate of health fraudulently obtained. If the health officer or board of health shall find that any certificate of health granted by them was obtained by fraud or false representation, or be of opinion that any vessel, person, or cargo should perform further quarantine for the purpose of being cleansed or purified, on notice thereof being given to such person, or the owner, master, super cargo, or consignee of such vessel or cargo, as the case may be, the same shall in all respects be liable to be proceeded with as if no certificate of health had been given.

Sec. 2547. Enforcement of orders of health authorities. When any person shall refuse to obey a legal order given by a health officer, health committee, or board of health, or shall endeavor to prevent it from being carried into effect, a justice of the peace may issue his warrant to a proper officer, or to an indifferent person, therein stating such order and requiring him to carry it into effect, and such officer or indifferent person shall execute the same.

Sec. 2548. Disposition of fines and penalties. All fines imposed for the violation of any provisions of this chapter, or any regulation of a health officer or board of health, shall be paid to the town, city, or borough in which the offence is committed.

Sec. 2551. Refusal to be vaccinated; penalty. Every person who shall refuse to be vaccinated, or prevent a person under his care and control from being vaccinated, on application being made by the health officer * * * shall be fined not more than five dollars.

Sec. 2552. Violation of orders of health authority. Every person who shall violate any provision of this chapter, or any legal order of a health officer or board of health, for which no other penalty is provided, shall be fined not more than five hundred dollars, or imprisoned not more than six months, or both.

NEW YORK.

PILOT LAWS IN REFERENCE TO VESSELS ENTERING BY WAY OF SANDY HOOK.

Extracts from the New York City Consolidation Act of 1882.

Sec. 2100. * * * Any pilot bringing in a vessel from sea shall, by himself or one of his boat's company, be entitled to pilot her to sea when she next leaves the port, unless, in the meantime, a complaint for misconduct or incapacity shall have been made against such pilot or one of his boat's company, and proved before the Board of Commissioners of Pilots; provided, however, that if the owner of any vessel shall desire to change such pilot, then the said commissioners may assign any other pilot on the same pilot boat to pilot said vessel to sea.

[*Secs. 2101-2102* of this act, fixing the fees for pilotage, were repealed by an act of the State legislature, passed April 3, 1884, and the latter act, as amended in 1889, established the fees now authorized, which are given in the table on page 159.]

* * * * * * *

If the master or owners of any vessel shall request the pilot to moor said vessel to any place within Sandy Hook, and not to be taken to the wharf or harbor of New York, or the vessel be detained at quarantine, the same pilotage shall be allowed, and the pilot entitled to his discharge.

When any ship or vessel bound for the port of New York, and boarded by any pilot appointed by the Board of Commissioners of Pilots of the City of New York, at such distance to the southward or eastward of Sandy Hook Lighthouse, as that said lighthouse could not be seen from the deck of such ship or vessel in the daytime, and in fair weather, the addition of one-fourth to the rates of pilotage hereinbefore mentioned shall be allowed to such pilot, provided the commander of such vessel shall have agreed to pay such addition. But such additional rate may be waived by the pilot boarding or offering his services to any vessel, and if waived he shall be taken on board and shall be entitled to pilot such vessel, and to be paid at the ordinary rates established by law. In case of the refusal of the commander of any vessel to take such pilot after such waiver, he and the owner or consignee of the vessel shall be liable to pay such pilot at the ordinary rate, the same as if he had piloted the vessel to the port of New York. In case the same additional rate of pilotage is not waived by the pilot so boarding or speaking any vessel, the commander, owner, or consignee shall not be liable to pay any pilotage, except that in case of failing to take a licensed pilot before such vessel reaches the port of New York, the pilotage shall be paid at the ordinary rate to the pilot who first offers his services. * * *

Sec. 2103. The rates of pilotage for any intermediate distance shall be determined by the Board of Commissioners, and promulgated in their rules and regulations for the government of pilots.

Sec. 2104. Between the first day of November and the first day of April, inclusive, four dollars shall be added to the full pilotage of every vessel coming into or going out of the port of New York.

Sec. 2105. For every day of detention in the harbor of an outward bound vessel, after the services of a pilot have been required and given, except detention shall be caused by such adverse winds and weather that the vessel can not get to sea; and for every day of detention of an inward bound vessel by ice longer than two days on passage from sea to wharf, three dollars shall be added to the pilotage. If any pilot shall be detained at quarantine or elsewhere, by the health officer, for being or having been on board a sickly vessel as pilot, the master, owner or agent, or consignee of such vessel shall pay to such pilot all necessary expenses of living and three dollars per day for each and every day of such detention. This section shall not apply to vessels propelled wholly or in part by steam, owned or belonging to citizens of the United States, and licensed and engaged in the coasting trade.

Sec. 2107. For services rendered by pilots in moving or transporting vessels in the harbor of New York, the following shall be the fees: For moving from North to East river, or vice versa, * * * a merchant vessel, five dollars, except such vessel shall have arrived from sea, or is ready for and bound to sea on the day such services for transportation are rendered; but if the services are rendered thereafter such payment shall be made. For moving any vessel from the quarantine to the city of New York, one-quarter of the sum that would be due for the inward pilotage of such vessels. For hauling any vessel from the river to a wharf, or from a wharf into the river, three dollars, except on the day of arrival of or departure of such vessel. The provisions of this section shall not apply to vessels propelled wholly or in part by steam, owned or belonging to citizens of the United States, and licensed and engaged in the coasting trade.

Sec. 2109. The pilotage shall be payable by the master, owner, consignee, or agent entering or clearing the vessel at the port of New York, who shall be jointly and severally liable therefor.

Sec. 2110. A pilot who is carried to sea when a boat is attending to receive him shall receive at the rate of one hundred dollars per month during his necessary absence.

Sec. 2111. Masters of vessels shall give an account to the pilot when boarding of the draft of such vessels; and in case the draft given is less than the actual draft, the master shall forfeit the sum of twenty-five dollars, which may be sued for and recovered by the commissioners, as is provided in section twenty-one hundred and twenty-three, in respect to other fines and penalties.

Sec. 2119. No master of any vessel navigated under a coasting license and employed in the coasting trade, by the way of Sandy Hook, shall be required to employ a licensed pilot when entering or departing from the harbor of New York; but this provision shall not be construed to alter the legal rate of compensation of any pilot who may be so employed; but in case the services of a pilot shall have been given, the pilot shall be entitled to the rates established by this title. If the master of any vessel above one hundred and fifty and not exceeding three hundred tons burden, and owned by a citizen of the United States, and sailing under a coasting license to or from the port of New York, by the way of Sandy Hook, shall be desirous of piloting his own vessel, he shall first obtain a license for such purpose from the Commissioners of Pilots, who are hereby authorized and required to grant the same, if such master shall, after an examination had by said commissioners, be deemed competent; which said license shall be and continue in force one year from the date thereof, or until the determination of any voyage during which the license may expire. For such license, the master to whom it shall be granted shall pay to the said commissioners four cents per ton. All masters of foreign vessels and vessels from a foreign port, and all vessels sailing under register, bound to or from the port of New York by the way of Sandy Hook, shall take a licensed pilot; or in case of refusal to take such pilot, shall himself, owners or consignees pay the said pilotage as if one had been employed; and such pilotage shall be paid to the pilot first speaking or offering his services as pilot to such vessel. Any person not holding a license as pilot under this title, or under the laws of the State of New Jersey, who shall pilot, or offer to pilot, any ship or vessel to or from the port of New York by the way of Sandy Hook, except such as are exempt by virtue of this title, or any master, or person on board a steam tug or towboat, who shall tow such vessel or vessels, shall be deemed guilty of a misdemeanor, and, on conviction, shall be punished by a fine not exceeding one hundred dollars or imprisonment not exceeding sixty days; and all persons employing a person to act as a pilot, not holding a license under this title, or under the laws of the State of New Jersey, shall forfeit and pay to the Board of Commissioners of Pilots the sum of one hundred dollars. This section shall not apply to vessels propelled wholly or in part by steam, owned or belonging to citizens of the United States, and licensed and engaged in the coasting trade.

BY-LAWS OF THE BOARD OF COMMISSIONERS OF PILOTS, 1903.†

(*Extracts.*)

9th. All boats shall have conspicuous numbers in their sails * * * .

14th. Pilots are required to board the nearest vessel having a signal flying for a pilot, except in case there should be a vessel in sight with a signal of distress, under a penalty of fifty dollars.

16th. Pilots are required to transport a vessel to any part of the port of New York, when applied to, under a penalty of twenty-five dollars * * * .

20th. Pilotage for taking vessels from the old to the new Quarantine, etc.

a. For vessels having had death or sickness on board, double outward pilotage, etc.

b. For vessels from sickly ports, but having had no sickness on board, single outward pilotage.

c. Pilotage of vessels from New York to Perth Amboy, or from Perth Amboy to New York, except on the voyage to or from sea, shall be one dollar and a half per foot of the vessel's draft.

d. Pilotage of vessel from the North River or from the East River to Bayonne or Yonkers, or vice versa, ten dollars each way.

e. For moving any vessels from the North River, the East River, Atlantic Dock, Erie Basin, Kill von Kull, or any pier or dock in the upper bay of New York Harbor (excepting such places as have a different rate established for them), to an anchorage in the said upper bay, or vice versa, five dollars each way, unless such moving is done on the same calendar day as the vessel enters or leaves the port.

f. In case of vessels bound over Sandy Hook Bar to or from points in Newark Bay, Staten Island Sound, the Passaic, Hackensack or Raritan rivers, only one full pilotage shall be paid, of which two-thirds shall be paid to the pilot piloting the vessel over Sandy Hook Bar, and one-third to the local pilot:—

Provided, however, that if the Bar pilot is competent to pilot the vessel the whole way, he shall be entitled to do so, and to receive the full pilotage the same as if the vessel was piloted to or from New York, Jersey City or Brooklyn.

g. Vessels boarded north or west of a line drawn from the lights of the Highlands of Navesink to the Black Buoy No. 1, of the Bar, thence to the Red Buoy No. 2, of Gedney Channel, shall pay half pilotage only. If boarded above the Narrows, quarter pilotage.

h. No pilotage, except the regular inward pilotage, shall be allowed when vessels are detained from the *nonvisiting* of the health officer.

i. Vessels returning from sea in consequence of head winds or stress of weather, shall pay full pilotage.

25th. A pilot boat, when in sight of a vessel wanting a pilot, shall, if there are no pilots on board, signalize the fact by running her flag or signal up and down twice in the daytime; and at night by making a like signal with her masthead light.

26th. * * * Whenever the services of a pilot by the way of Sandy Hook shall be required to pilot any vessel sailing from any other port in the United States to the port of New York, application shall first be made in writing by the master, owner or consignee of such vessel, to this Board, for such pilot, * * * .

27th. Should the master of a vessel arriving from sea but not going to her berth on the same day, request the pilot to remain in charge for the purpose of taking her to the dock he is required to do so, and for such services he shall be paid by the vessel three dollars for each calendar day on which he is so employed (exclusive of the day of arrival), in addition to the pay for transportation and other services established by * * * the pilotage act.

31st. The master of every vessel bound to or from the port of New York, when in the act of receiving or discharging a New York pilot, shall bring his vessel to a stop, and shall give all necessary assistance to the pilot, consistent with the safety of his vessel, to enable said pilot to board or leave the vessel safely; under a penalty, payable by the vessel and recoverable by this Board, of twenty-five dollars for every omission to comply with this regulation.

Any pilot who willfully or through negligence causes unnecessary delay to a vessel in the act of boarding or leaving her, shall be subject to a like penalty of twenty-five dollars, recoverable by this Board, for each offense.

Pilots are required to anchor vessels of which they have charge, in accordance with the regulation promulgated by the United States anchorage officer.

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† The office of the Commissioner of Pilots is at 17 State street, New York City.

RATES OF PILOTAGE FROM APRIL 1 TO NOVEMBER 1.

DRAFT.	INWARD.				OUTWARD.	
	RATE.	PILOTAGE.	OFFSHORE.	TOTAL.	RATE.	PILOTAGE.
6 feet 0 inches	$2.78	$16.68	$4.17	$20.85	$2.02	$12 12
6 " 6 "	2.78	18.07	4.52	22.59	2.02	13.13
7 " 0 "	2.78	19.46	4.86	24.32	2.02	14.14
7 " 6 "	2.78	20.85	5.21	26.06	2.02	15.15
8 " 0 "	2.78	22.24	5.56	27.80	2.02	16.16
8 " 6 "	2.78	23.63	5.91	29.54	2.02	17.17
9 " 0 "	2.78	25.02	6.25	31.27	2.02	18.18
9 " 6 "	2.78	26.41	6.60	33.01	2.02	19.19
10 " 0 "	2.78	27.80	6.95	34.75	2.02	20.20
10 " 6 "	2.78	29.19	7.30	36.49	2.02	21.21
11 " 0 "	2.78	30.58	7.64	38.22	2.02	22.22
11 " 6 "	2.78	31.97	7.99	39.96	2.02	23.23
12 " 0 "	2.78	33.36	8.34	41.70	2.02	24.24
12 " 6 "	2.78	34.75	8.69	43.44	2.02	25.25
13 " 0 "	2.78	36.14	9.03	45.17	2.02	26.26
13 " 6 "	2.78	37.54	9.38	46.92	2.02	27.27
14 " 0 "	3.38	47.32	11.83	59.15	2.33	32.62
14 " 6 "	3.38	49.01	12.25	61.26	2.33	33.78
15 " 0 "	3.38	50.70	12.67	63.37	2.33	34.95
15 " 6 "	3.38	52.39	13.10	65.49	2.33	36.11
16 " 0 "	3.38	54.08	13.52	67.60	2.33	37.28
16 " 6 "	3.38	55.77	13.94	69.71	2.33	38.44
17 " 0 "	3.38	57.46	14.36	71.82	2.33	39.61
17 " 6 "	3.38	59.15	14.79	73.94	2.33	40.77
18 " 0 "	4.13	74.34	18.58	92.92	3.08	55.44
18 " 6 "	4.13	76.40	19.10	95.50	3.08	56.98
19 " 0 "	4.13	78.47	19.62	98.09	3.08	58.52
19 " 6 "	4.13	80.53	20.13	100.66	3.08	60.06
20 " 0 "	4.13	82.60	20.65	103.25	3.08	61.60
20 " 6 "	4.13	84.66	21.16	105.82	3.08	63.14
21 " 0 "	4.88	102.48	25.62	128.10	3.56	74.76
21 " 6 "	4.88	104.92	26.23	131.15	3.56	76.54
22 " 0 "	4.88	107.36	26.84	134.20	3.56	78.32
22 " 6 "	4.88	109.80	27.45	137.25	3.56	80.10
23 " 0 "	4.88	112.24	28 06	140.30	3.56	81.88
23 " 6 "	4.88	114.68	28.67	143.35	3.56	83.66
24 " 0 "	4.88	117.12	29.28	146.40	3.56	85.44
24 " 6 "	4.88	119.56	29.89	149.45	3.56	87.22
25 " 0 "	4.88	122.00	30.50	152.50	3.56	89.00
25 " 6 "	4.88	124.44	31.11	155.55	3.56	90.78
26 " 0 "	4.88	126.88	31.72	158.60	3.56	92.56
26 " 6 "	4.88	129.32	32.33	161.65	3.56	94.34
27 " 0 "	4.88	131.76	32.94	164.70	3.56	96.12
27 " 6 "	4.88	134.20	33.55	167.75	3.56	97.90
28 " 0 "	4.88	136.64	34.16	170.80	3.56	99.68
28 " 6 "	4.88	139.08	34.77	173.85	3.56	101.46
29 " 0 "	4.88	141.52	35.38	176.90	3.56	103.24
29 " 6 "	4.88	143.96	35.99	179.95	3.56	105.02
30 " 0 "	4.88	146.40	36.60	183.00	3.56	106.80
30 " 6 "	4.88	148.84	37.21	186.05	3.56	108.58
31 " 0 "	4.88	151.28	37.82	189.10	3.56	110.36
31 " 6 "	4.88	153.72	38.43	192.15	3.56	112.14
32 " 0 "	4.88	156.16	39.04	195.20	3.56	113.92
32 " 6 "	4.88	158.60	39.65	198.25	3.56	115.70
33 " 0 "	4.88	161.04	40.26	201.30	3.56	117.48
33 " 6 "	4.88	163.48	40.87	204.35	3.56	119.26
34 " 0 "	4.88	165.92	41.48	207.40	3.56	121.04
34 " 6 "	4.88	168.36	42.09	210.45	3.56	122.82
35 " 0 "	4.88	170.80	42.70	213.50	3.56	124.60

From November 1 to April 1.—A vessel entering the port of New York by the way of Sandy Hook during this season adds four dollars to the amount set opposite her draft, in column marked "Pilotage," in the foregoing table. If subject to offshore pilotage, by agreement, four dollars is added to the amount set opposite her draft, in the column marked "Total." Outward bound—add four dollars to the amount set opposite draft of vessel, in the column marked "Outward Pilotage."

PILOT LAWS IN REFERENCE TO EAST RIVER.†

Extracts from the New York City Consolidation Act of 1882, as amended 1903.

Sec. 5. It shall be lawful for the first pilot who tenders his services to demand and receive from any foreign vessel or vessel under register, or from the consignee or owner of said vessel, from the eastward of Sands Point or Execution Rocks, or take charge of any such vessel at or to the eastward of Sands Point or Execution Rocks, and pilot her to the port of New York, or to pilot her from the port of New York to Sands Point or Execution Rocks,—for every vessel, one dollar and fifty cents for each and every foot of water such vessel may draw; and from the westward of Sands Point or Execution Rocks to the port of New York, one dollar for each and every foot of water such vessel may draw; and for pilotage from the port of New York to the eastward or westward of either of the before-mentioned points and places, they shall be entitled to receive the same compensation as is above provided when the said vessel is bound to the port of New York. And every pilot shall, for such services, be entitled, in addition to the above-mentioned rates of compensation, to demand and receive the further sum of twenty-five cents for each and every foot of water which any steamer or square-rigged vessel may draw, which they shall pilot to or from the port of New York; and every such pilot who shall have piloted any ship or vessel into the port of New York by the way of Hellgate shall be entitled to a preference in piloting the said ship or vessel out of the said port on the next outward voyage of the said ship or vessel, if the said voyage be by the way of Hellgate. And further, from the first day of November to the first day of April in every year, every such Hellgate pilot shall be entitled to demand and receive for every steamer or square-rigged vessel the sum of two dollars, and for every schooner, sloop, or barge the sum of one dollar, in addition to the rates of compensation for pilotage hereby established. And for every day which any Hellgate pilot shall be detained by any ship or vessel, over and above twenty-four hours, he may demand and receive from the vessel, owner or consignee of said vessel, two dollars a day for each and every day he shall so be detained. But no pilotage shall be charged to any vessel under a coastwise license unless such vessel actually employs a pilot. And every master or commander of any vessel who shall give to such Hellgate pilot an untrue account of the draft of water or tonnage of his vessel, shall forfeit and pay the sum of twenty-five dollars, to be sued for and recovered by the Board of Wardens [of the port of New York].

Sec. 6. A person other than a lawfully authorized branch Hellgate pilot, who pilots, or offers to pilot, or tows, or offers to tow, any boat or vessel (except barges, vessels under fifty-five tons burden, and canal boats actually used in navigating the canals) through that part of the East River commonly called Hellgate, is guilty of a misdemeanor. This section does not apply to vessels propelled wholly or partly by steam owned or belonging to citizens of the United States, and licensed and engaged in the coasting trade.

Sec. 7. The master, owner, or consignee of any ship or vessel, to whom any Hellgate pilot shall have rendered, upon the request of the master of said ship or vessel, any extra service for the preservation of said ship or vessel while in distress, shall pay to said pilot, in addition to the compensation set forth in section 5, such amount for extra services as the Board of Wardens shall determine to be a reasonable reward.

Sec. 8. This act shall not be construed to apply to the passenger steamboats plying on regular passenger routes this side or to the westward of Cape Cod. And all foreign vessels, and vessels under register navigating the channel of Hellgate, who shall be spoken, shall be subject to the pilotage fees, as provided in section [5?], to the first pilot who tenders his services.

Sec. 13. The said Board of Wardens shall furnish every pilot aforesaid with printed instructions, to be shown by such pilot to the master or commander of every vessel as soon as he shall go on board to take charge of such vessel to pilot her into the said port, under the penalty of ten dollars for each and every neglect or refusal.

RULES AND REGULATIONS.

The Board of Port Wardens of the Port of New York have adopted the following regulations for the government of Hellgate pilots, October, 1874, and as changed from time to time necessary to meet legislative action therein, and changed local conditions:

(*Extracts.*)

Art. 1. Any Hellgate pilot piloting a vessel entering through Hellgate to any part of the North River shall have the preference of piloting such vessel outward, provided she clear by the way of Hellgate. If said pilot is unable to pilot said vessel outward he must then notify the company of Hellgate pilots, upon the Hellgate Pilots' Station Boat, that the pilot next in

† Extracts from Pilot Laws, and Rules and Regulations of the Board of Port Wardens, for the government of Hellgate pilots, published in pamphlet form in 1906. Hellgate pilots are under the control of the Board of Port Wardens of the port of New York. This pilot service is entirely distinct from that by way of Sandy Hook, the latter being under the control of the Board of Pilot Commissioners.

turn on said Station Boat shall pilot said vessel as described, and those in command or control of any other vessel, subject to the Hellgate pilot law, proceeding outward, from New York Bay or the North or East rivers, by the way of Hellgate, shall give at least twenty-four (24) hours' notice, to the company of Hellgate pilots, upon the Hellgate Pilots' Station Boat, of the time of clearing, in order that a prompt and recorded detail of a Hellgate pilot may be made.

Art. 2. The pilot first speaking any vessel coming into port, and tendering his services as pilot, shall be entitled to the fees of pilotage; provided such pilot shall not at the time have another vessel actually in charge.

Art. 6. No pilot shall leave an incoming vessel under his charge until her arrival off the Battery, or place of her destination; nor an outgoing vessel until she arrives at the place designated by law, without the consent of the master.

Art. 7. No pilot shall by any unfair means, or by a reduced price, take any vessel from another pilot; and in case of his so doing shall forfeit to the pilot displaced the full amount of the pilotage.

Art. 11. A pilot in charge of a vessel must remain on board until notified by the master that his services are no longer wanted, under a penalty of forfeiting the pilotage. The omission of the master to inform the pilot that his services are no longer wanted will entitle him to detention money, unless such detention is momentary, for the landing of passengers.

Art. 15. The first pilot speaking a vessel in tow of a tow boat, and boards the tug and displays his flag (unfurled and easily discernible) until he has passed through Hellgate shall be entitled to the pilotage of said vessel.

Art. 17. Any pilot speaking a steamer or any vessel subject to pilotage, whether inward or outward bound, and whose services are refused and is afterward boarded by another pilot who shall accept or agree to accept a less rate of compensation than is prescribed by law, shall forfeit all claims to the pilotage, and the pilot first speaking her having full claim to the pilotage, and the second violation of this rule will be followed by a fine or suspension.

Made necessary by Chapter 513 of the laws of 1903, establishing "a Station Boat," etc.

Rule 1. The business will be carried on by a single deck sailing vessel of not less than twenty-five (25) tons net, and to be in active commission at all times on the Eastern Stations, and to be known as the Hellgate Pilots' Station Boat. The outside station to be situated within a radius of three miles to the eastward of Execution Rocks. When the circumstances are such as to render it unsafe for the boarding of vessels at the outside station the boat will be situated at City Island, which will be known as the inside station. All inward bound vessels shall be spoken and boarded by pilots from the station boat, and any pilot boarding or speaking any vessel outside the station boat shall refund the pilotage to the pilot who speaks the vessel coming from the station boat and shall forfeit his preference to piloting such vessel from the port on her next outward voyage, provided it is by the way of the East River.

RATES OF PILOTAGE, EAST RIVER.

DRAFT.	Sloops and Schooners, fore and aft.		Brigs, Staysail and Topsail Schooners, Barks, Ships, and Steamers.	
	City Island at $1.00.	Sands Point at $1.50.	Rikers Island at $1.25.	Sands Point at $1.75.
5 feet	$5.00	$7.50	$6.25	$8.75
6 "	6.00	9.00	7.50	10.50
7 "	7.00	10.50	8.75	12.25
8 "	8.00	12.00	10.00	14.00
9 "	9.00	13.50	11.25	15.75
10 "	10.00	15.00	12.50	17.50
11 "	11.00	16.50	13.75	19.25
12 "	12.00	18.00	15.00	21.00
13 "	13.00	19.50	16.25	22.75
14 "	14.00	21.00	17.50	24.50
15 "	15.00	22.50	18.75	26.25

It shall be lawful to demand from every ship, bark, or brig the sum of two dollars, and for every schooner and sloop one dollar, from the first day of November to the first day of April in every year, in addition to the rates of pilotage established as winter pilotage.

HARBOR CONTROL, ETC., PORT OF NEW YORK.

Act passed by the Congress of the United States.

AN ACT to prevent obstructive and injurious deposits within the harbor and adjacent waters of New York City, by dumping or otherwise, and to punish and prevent such offenses.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the placing, discharging, or depositing, by any process or in any manner, of refuse, dirt, ashes, cinders, mud, sand, dredgings, sludge, acid, or any other matter of any kind other than that flowing from streets, sewers, and passing therefrom in a liquid state, in the tidal waters of the harbor of New York, or its adjacent or tributary waters, or in those of Long Island Sound, within the limits which shall be prescribed by the supervisor of the harbor, is hereby strictly forbidden, and every such act is made a misdemeanor, and every person engaged in or who shall aid, abet, authorize, or instigate a violation of this section, shall, upon conviction, be punishable by fine or imprisonment, or both, such fine to be not less than two hundred and fifty dollars nor more than two thousand five hundred dollars, and the imprisonment to be not less than thirty days nor more than one year, either or both united, as the judge before whom conviction is obtained shall decide, one half of said fine to be paid to the person or persons giving information which shall lead to conviction of this misdemeanor.

Sec. 4. That all mud, dirt, sand, dredgings, and material of every kind and description whatever, taken, dredged, or excavated from any slip, basin, or shoal in the harbor of New York, or the waters adjacent or tributary thereto, and placed on any boat, scow, or vessel for the purpose of being taken or towed upon the waters of the harbor of New York to a place of deposit, shall be deposited and discharged at such place or within such limits as shall be defined and specified by the supervisor of the harbor. * * *

ANCHORAGE LIMITS, PORT OF NEW YORK.

Act passed by the Congress of the United States.

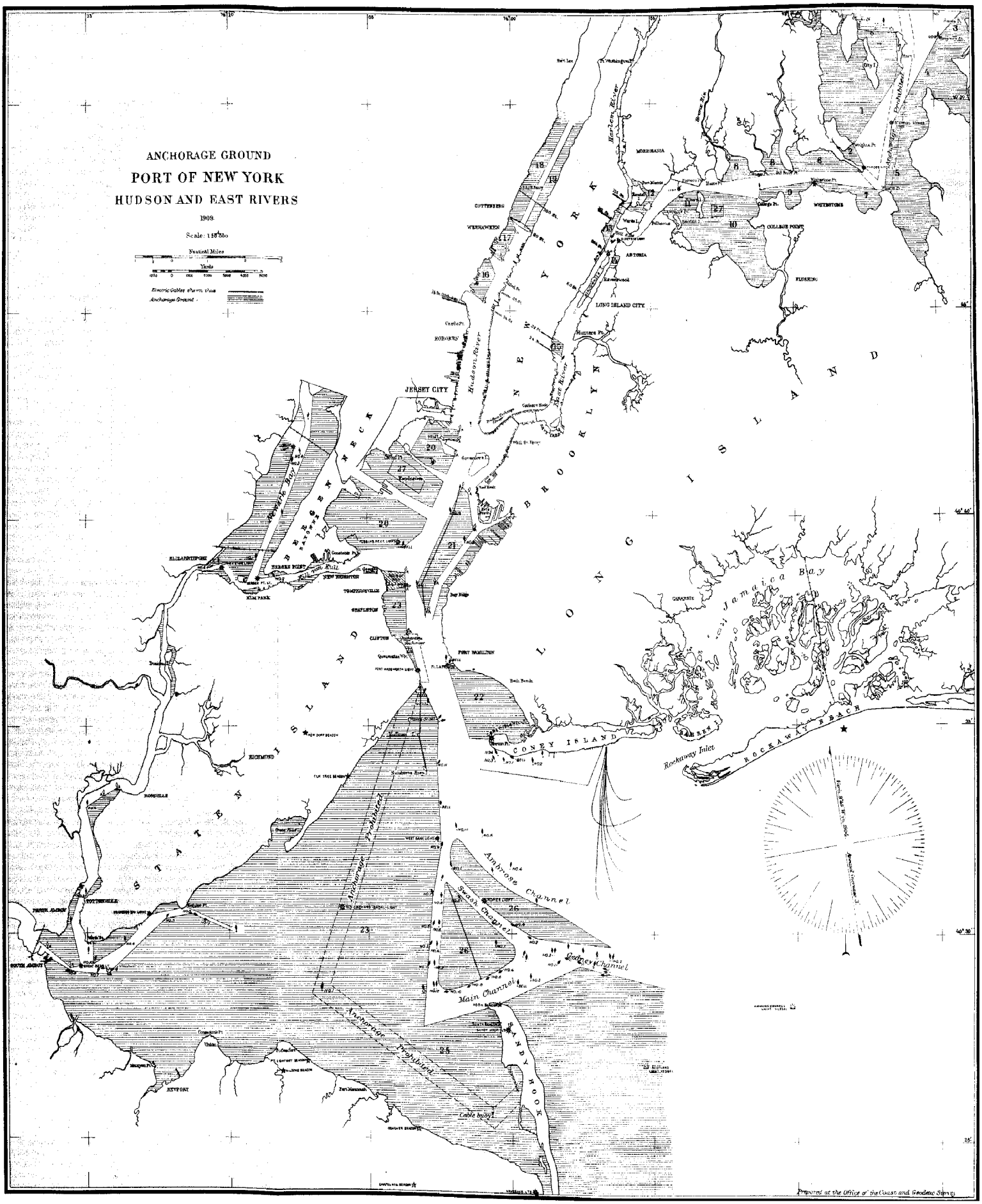
AN ACT relating to the anchorage of vessels in the port of New York.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury is authorized, empowered, and directed to define and establish an anchorage ground for vessels in the bay and harbor of New York, and in the Hudson and East Rivers, to adopt suitable rules and regulations in relation thereto, and to take all necessary measures for the proper enforcement of such rules and regulations.

SEC. 2. That in the event of the violation of any such rules or regulations by the owner, master, or person in charge of any vessel, such owner, master, or person in charge of such vessel shall be liable to a penalty of one hundred dollars, and the said vessel may be holden for the payment of such penalty, and may be seized and proceeded against summarily by libel for the recovery of the same in any United States district court for the district within which such vessel may be, and in the name of the officer designated by the Secretary of the Treasury.

SEC. 3. That this act shall take effect immediately.

Approved, May 16, 1888.


ANCHORAGE GROUND
PORT OF NEW YORK
HUDSON AND EAST RIVERS
1909.
Scale: 1:15000
Nautical Miles
Yards
Electric Cables shown thus
Anchorage Ground
NEW YORK
BROOKLYN
LONG ISLAND
STATEN ISLAND
NEW JERSEY
JERSEY CITY
HOBOKEN
GUTTENBERG
WEEHAWKEN
MORRISANIA
ASTORIA
LONG ISLAND CITY
WHITESTONE
COLLEGE POINT
FLUSHING
ELIZABETHPORT
ELIZABETH
KILL VAN KULL
NEW BRIGHTON
TOMPKINSVILLE
STAPLETON
CLIFTON
FORT HAMILTON
CONEY ISLAND
Jamaica Bay
Rockaway Inlet
ROCKAWAY BEACH
RICHMOND
ROSEVILLE
SOUTH AMBOY
KEYPORT
Hudson River
East River
Ambrose Channel
Swash Channel
Gedney Channel
Main Channel
Anchorage Prohibited
SANDY HOOK
Cable buoy
Prepared at the Office of the Coast and Geodetic Survey

RULES AND REGULATIONS GOVERNING THE ANCHORAGE OF VESSELS IN THE PORT OF NEW YORK.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, April 25, 1907.

The following described anchorage grounds for vessels in the bay and harbor of New York, and in the Hudson and East rivers, respectively, are hereby defined and established, and the following revised rules and regulations governing the same are published for the government of the owner, master, pilot, or other persons having charge of a steam vessel towing or otherwise conducting a vessel to an anchorage in the port of New York, pursuant to the act of Congress approved May 16, 1888:*

(*a*) Vessels shall anchor only within the following specified limits, and a vessel anchoring within any of the below described boundaries must anchor entirely within said boundaries, so that no portion of the hull shall extend beyond said boundary after veering chain or when riding to a tideway.

(*b*) No vessel shall anchor in any of the channels except in cases of great emergency, and then as near the edge of the channel as possible, so as not to impede or interfere with the free navigation of the same, and only until such time as they can procure assistance; and no vessel shall anchor so as to obstruct the approach to any pier or impede the movement of any ferryboat.

(*c*) All stakeboats used for assembling barges, canal boats, and other vessels preparatory to being made up in tows, and vessels used for storing explosives and moored only in the anchorage for explosives, as described in paragraph 2, No. 27, page 9, may be moored under permits granted by the supervisor of anchorages and moored only in such places as he may designate.

(*d*) A vessel upon being notified to move into the anchorage limits must at once get under way or make a signal for a tug.

(*e*) Permits may be granted by the supervisor of anchorages to wrecking plants to anchor in the channel for the purpose of recovering sunken property, subject to his supervision. Such wrecking plants must comply with all the navigation laws in regard to lights, fog signals, etc., and in granting such permit the Government assumes no responsibility.

(*f*) Points where cables and pipes cross the anchorage grounds are marked in red on the accompanying maps, and all vessels are cautioned not to anchor so as to interfere with them.

(*g*) All ash scows, the property of the municipalities bordering on the waters of the port, may be anchored in such places as the supervisor of anchorages may designate.

(*h*) The creation of any obstruction, not affirmatively authorized by law, to the navigable capacity of any waters, in respect of which the United States has jurisdiction, is hereby prohibited.

(*i*) No vessels shall occupy permanent berths in the anchorages except as provided for in these anchorage rules and regulations.

(*j*) The supervisor of anchorages shall assign berths in the respective anchorages to all vessels applying for them.

(*k*) All officers of revenue vessels at the port of New York are charged with the enforcement of these rules and regulations, and are empowered to remove from her anchorage any vessel not anchoring within the prescribed limits.

EAST RIVER ANCHORAGES.

1. To the northward of a line from the south point of Hart Island to Wrights Point.
2. To the westward of a line from Wrights Point to Throgs Neck.
3. To the southward of a line from buoy off Sands Point to buoy off Gangway Rock.
4. To the southward of a line from buoy off Gangway Rock to center of Stepping Stones lighthouse.
5. To the eastward of a line from the center of Stepping Stones lighthouse to Willets Point.
6. On Hammond Flats, to the northward of a line from Throgs Neck to Old Ferry Point.
7. To the southward of a line from Willets Point to Whitestone Point.

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*Amendments of Departmental Circular No. 175, Bureau of Navigation, dated July 3, 1908, are included.

8. On the north side of the channel, north of a line between Old Ferry Point and Hunts Point.

9. On the south side of the channel, south of a line between Whitestone Point and buoy (No. 1) off College Point, and to the eastward of a line running from said buoy to College Point.

10. In Flushing Bay, to the southward of a line from College Point to the north end of Rikers Island.

11. To the southward of a line from the north end of Rikers Island to the north end of South Brother Island, thence to Lawrences Point.

12. To the westward of a line from Stony Point to northeast end of Wards Island; and between Wards Island and Randalls Island, and between Randalls Island and Port Morris.

13. To the westward of a line from the foot of One hundred and sixteenth street, New York, to the north end of Avenue B, New York, but no vessels shall anchor on this anchorage within 150 feet of any wharf or pier, or so as to impede the movements of a ferry, or so as to prevent ready access to or from the piers.

14. To the eastward of a line from Hatters Dock to Gibbs Point (Hallets Cove, Astoria).

15. To the southward of Thirty-second Street Pier and the northward of Twenty-fourth Street Pier, and to the westward of a line passing through the horizontal-striped buoy off Nineteenth street, running thence N by E ⅛ E (cor. mag.). Vessels may anchor anywhere within these limits, provided they do not obstruct the approach to any pier or impede the movements of any ferryboat; and the officer in charge of anchorage grounds may, whenever he deems it advisable, move or cause to move any vessel not, in his opinion, complying with this proviso.

Range for outer boundary of this anchorage: When steering on this range (N by E ⅛ E, cor. mag.) you should look squarely into the new Forty-second Street Ferry Slip, on the center of the axis of which is a prominent dark chimney.

SOUTH ANCHORAGE, HUDSON RIVER.

16. Vessels may anchor in the Hudson River to the westward of a line 100 yards west of the center line of said river; that the northeast boundary of this anchorage shall be a line drawn from the southeast corner of Gokey's drydock just below the Weehawken terminal of the West Shore ferries to the end of the Thirty-fourth Street Pier, New York; that the southern limit of this anchorage be a line from the end of the Erie Railroad Company's Coal Pier, Hoboken, to the end of the Twenty-fifth Street Pier, New York, about SE ⅜ E.

MIDDLE ANCHORAGE, HUDSON RIVER.

17. Vessels may anchor in the Hudson River within the limits of the port of New York to the westward of the center line of said river running about NE ½ N (cor. mag.) from Castle Point, Hoboken, through the white anchorage buoy off Sixtieth street to the northward of a line running from the southeast corner of West Shore Pier No. 3, Weehawken, to the center of the Fifty-fourth Street Pier, New York, about SE ½ E (cor. mag.) and to the southward of a line running from the outer end of the Guttenburg Pier to the outer end of the West Seventieth Street Pier, New York.

In no case shall a vessel anchor within 200 yards of the shore in either of these Hudson River anchorages.

UPPER ANCHORAGE, HUDSON RIVER.

18. To the northward of a line drawn from the pier on the Guttenburg side directly across the river to Eightieth street, New York (cor. mag.), to the westward of a line parallel to and 125 yards to the westward of the center line of the river.

NOTE.—Small vessels may anchor inside the pierhead lines as established by the Board of Engineers, United States Army, along the east bank of the Hudson River between Eighty-first street and One hundred and twenty-first street, and between One hundred and thirty-second street and One hundred and fifty-eighth street; in the discretion of the supervisor of anchorages, but the officer in charge of anchorage grounds may, whenever he deems it advisable, move or cause to move any vessel not, in his opinion, complying with this proviso.

NAVAL ANCHORAGE, HUDSON RIVER.

19. An anchorage is set aside for naval vessels to moor in a single line on the east side of Hudson River north of Seventy-ninth street, and thence to Fort Washington Point, and above that point if necessary. Its southernmost limit shall be north of the northernmost cable crossing the river at Seventy-ninth street, and extending northeastwardly on the east side of the river. Anchors shall be let go to the eastward of a line drawn 250 yards from the end of the pier at Seventy-ninth street to 250 yards from the end of the pier at the foot of One hundred and twenty-ninth street; thence to a point 330 yards from the pier at the foot of One hundred and fifty-eighth street; and thence northeasterly, following the general line of the 24-foot curve on the east side of the river and 250 yards distant from the salient point of this

curve. No ships shall anchor within a limit of 300 yards of the prolongation of One hundred and thirtieth street, in order to give free passage for the Fort Lee ferryboats. The destroyers and other light-draft naval vessels may anchor on the west side of the river west of the 18-foot curve as shown on Coast Survey chart No. 369[8].

WESTERN ANCHORAGE, UPPER BAY.

20. To the southward of a range passing through Wall Street Ferry, Brooklyn, and the white buoy to the north and east of Ellis Island; to the westward of a line running SW by S (nearly) from the said white buoy to a point one-half mile east from Robbins Reef lighthouse, and to the northward of a line from Constables Point to Robbins Reef bell buoy; thence to the aforementioned point ½ mile E of Robbins Reef lighthouse.

In order to prevent vessels fouling the Ellis Island cable, the buoy marking the northern limit of the channel to Ellis Island and the buoy marking the southern entrance to said channel have been moved so as to leave a space of 800 yards of clear water between the anchorage grounds north of the Ellis Island Channel and the anchorage grounds south of said channel, but the ranges otherwise retain their same magnetic bearings.

No vessels shall anchor in the Black Tom or Greenville dredged channels nor near the entrances to said channels so as to obstruct the approaches or interfere in any way with the free navigation of the same.

NOTE.—Vessels are especially cautioned not to anchor in Ellis Island Channel, thereby endangering the cable in said channel. In addition to the penalty for illegal anchorage, the owners of vessels which foul the above-mentioned cable will be liable for the damage resulting therefrom, including the cost of clearing, which should be done, in order to reduce the injury to a minimum, by signaling for the Western Union Company's tug.

EASTERN ANCHORAGE, UPPER BAY.

21. To the southward of a line passing through the Statue of Liberty on Bedloes Island, the two white buoys marking the north limit of anchorage ground and the southern point of the north entrance to the Erie Basin; to the eastward of a range passing through Produce Exchange tower and buoy No. 14 and bell buoy off Owls Head, and thence marked on the eastern and southeastern limits by four white anchorage buoys along the western edge of the widened Bay Ridge and Red Hook channels. These buoys will eventually be replaced by proper channel buoys marking the edge of the dredged channel. On and after July 1, 1901, vessels will not be allowed to anchor to the eastward and southward of said line of buoys. Small vessels may, in the discretion of the supervisor of anchorages, anchor to the southward and eastward of the Bay Ridge Channel, provided they are inside of the pierhead lines as established by the Board of Engineers, United States Army. Small vessels may, in the discretion of the supervisor of anchorages, anchor at the mouth of Gowanus Bay, to the eastward of a line tangent to the southwestern edge of Erie Basin Bulkhead, and running thence S by E (cor. mag.), but so as to leave a clear channel of 150 yards along the northern shore. The supervisor of anchorages may, in his discretion, remove any vessel not complying with the provisions hereof.

EASTERN ANCHORAGE, LOWER BAY.

22. To the eastward of a line drawn through Fort Lafayette to Ambrose Channel gas buoy No. 14, approximately S by E (mag.) and to the northward of a line drawn from Coney Island Lighthouse, on Norton Point, to Hoffman Island, approximately WNW ¾ W (mag.).

STATEN ISLAND ANCHORAGE.

23. To the southward of a line from St. George Ferry Flagstaff to the white buoy off St. George Landing, and to the westward of a line running S ⅝ W (nearly) from the white buoy off St. George Landing, through the white buoy off Tompkinsville, and as far south as the white buoy off Clifton, Staten Island. To the westward of a line running SSE ¼ E (nearly) from Fort Tompkins to the buoy on Craven Shoal; thence to buoys Nos. 11, 9, and 7; thence to Conovers Beacon.

The part of anchorage 23 lying between the northern boundary and the white buoy 800 yards south of said boundary is reserved for ships of war of all nations and vessels of the United States Government.

QUARANTINE ANCHORAGE.

24. To the southward of a line passing through Clifton, Staten Island, and the white buoy off this point, and to the westward of a line from the buoy off Clifton, Staten Island, to the bell at Fort Wadsworth.

Vessels arriving at quarantine and awaiting inspection may anchor temporarily to the westward of a range passing through Craven Shoal Buoy and Robbins Reef Lighthouse, but as soon as cleared by the quarantine officer must vacate this temporary anchorage, and if detained in quarantine, must at once move into the quarantine anchorage.

SANDY HOOK ANCHORAGE.

25. To the southward of a line extending from North Hook Beacon Lighthouse to Point Comfort Beacon Lighthouse.

26. Vessels may anchor on Dry Romer Shoal and Flynns Knoll. Care must be observed not to foul the United States Signal Corps cable (shown in red on the chart), which crosses Flynns Knoll.

ANCHORAGE FOR EXPLOSIVES.

27. Vessels carrying gunpowder or other explosives may anchor only as follows:

First. On the shoal ground to the eastward of Rikers Island, East River, from one-fourth to five-eighths of a mile from this island.

Second. On the New Jersey Flats between a line drawn parallel to and 1,500 feet to the south of the Black Tom dredged channel and a line drawn parallel to and 1,500 feet north of the Greenville dredged channel, and to the westward of a line from Bedloes Island to Robbins Reef, provided that they do not anchor within 1,000 yards of Bedloes Island, or within 500 yards of any pier.

Third. Vessels (carrying explosives) of too great draft to use the above anchorages may anchor only in Gravesend Bay, on a line drawn from Fort Hamilton to the western tip of Nortons Point, Coney Island, but not within 1,000 yards of the shore. All vessels laden with explosives while within the port will display at all times a red flag of at least 16 square feet surface at the masthead. Vessels so laden and without masts will display the flag at least 10 feet above the uppermost deck. All such vessels must be at all times in charge of competent persons and must comply with the navigation laws in regard to lights and fog signals.

OSCAR S. STRAUS,
Secretary.

ANCHORAGE LIMITS, KILL VAN KULL, NEWARK BAY, ARTHUR KILL, AND RARITAN BAY.

Rules and Regulations relating to the anchorage of vessels in the waters of Kill van Kull, Newark Bay, Arthur Kill, and Raritan Bay, November, 1899, as amended June 27, 1900.

The following described anchorage grounds for vessels in the waters of Kill van Kull, Newark Bay, Arthur Kill, and Raritan Bay are hereby defined and established for the information of the owners, masters, pilots, or other persons anchoring vessels or having charge of steam vessels towing or otherwise conducting vessels to an anchorage, pursuant to the act of Congress approved March 3, 1899, extending the act of May 16, 1888, relating to the anchorage of vessels in the port of New York.

No vessel shall anchor in any of the channels, except in cases of great emergency, and then as near the edge of the channel as possible so as not to impede or interfere with the free navigation of the same, and no vessel shall anchor so as to obstruct the approach to any pier, or impede the movement of any ferry boat.

Any violation of these rules and regulations will subject the owner, master, or person in charge of the vessel so offending to a penalty of $100.

KILL VAN KULL ANCHORAGE.

1. To the northward of a line running through red buoy No. 2 from Newark Bay Lighthouse to south end of city wharf, Bergen Point, and thence running east by north through chimney of Pacific Coast Borax Works.

2. To the southward of a line running E ⅓ N from north end of Starins Dock, foot of North street, Port Richmond, to the north end of McWilliams Dock, West Brighton, and thence to Livingston Point.

3. To the southward of a line running W ½ N from Standard Varnish Works, Port Richmond, to north end of Milling Dock.

4. To the westward of a line running N by W ¾ W from north end of long dock, Mariners Harbor, to Corner Stake, and to the southward of a line running W ½ S from Corner Stake to the east end of Government Dyke.

NEWARK BAY ANCHORAGE.

1. To the westward of a line running NE ½ N from east end of Shooters Island to black buoy No. 1.

2. To the eastward of a line running NE by N ½ N from Newark Bay Lighthouse to a point 500 feet east of east end of draw of Central Railroad bridge.

3. To the westward of a line running SW by S ¼ S from Passaic Lighthouse to a point 500 feet west of west end of draw of Central Railroad bridge.

4. To the eastward of a line running nearly NE by N from point 500 feet east of east end of draw of Central Railroad bridge to a point 500 feet east of east end of draw of the Lehigh

Valley Railroad bridge, and thence to point of land at intersection of the Passaic and Hackensack rivers, said line running N ⅞ E.

ARTHUR KILL ANCHORAGE.

1. To southeast of a line from buoy No. 4 to west end of Central Railroad bridge and north of a line from buoy No. 4 to buoy No. 2.
2. To the westward of a line running nearly N by E from wharf of Extracting Works through Buckwheat Island to Clarks Wire Works.
3. The passage between Pralls Island and Staten Island included between a line running NE ½ N from extreme west point of Pralls Island to a point on Staten Island, and a line from southern point of Pralls Island to old wharf off Linoleumville.
4. To the southward of a line from anchorage buoy placed 250 yards NW. of Smoking Point, to anchorage buoy, bearing W by S ⅜ S, and thence to buoy No. 4, off Sewaren, bearing SW by W ⅝ W.
5. To the eastward of a line from Krieschersville wharf to buoy No. 4.

TOTTENVILLE ANCHORAGE.

1. To the eastward of a line running NE by E from buoy No. 2 to point on Staten Island.

PERTH AMBOY ANCHORAGE.

1. To the northward and westward of a line running from red and black buoy to south end of Lehigh Valley coal docks.
2. To the westward of a line running from Great Beds Lighthouse to the red and black buoy on the north end of middle ground off Perth Amboy.

SOUTH AMBOY ANCHORAGE.

1 To the southward of a line from buoy No. 9 to eastern pier (Wyoming) of coal docks.
2. To the northward of a line running SE ¼ E from center of pier of Raritan River drawbridge, through anchorage buoy off coal docks, to anchorage buoy placed NE by N, 175 yards from buoy No. 9.

RARITAN BAY ANCHORAGE.

1. To the eastward of red buoy and westward of black buoy of the dredged channel.
2. To the southward of a line from buoy No. 3 to buoy No. 5.
3. To the eastward of a line running SW by W ⅛ W from buoy No. 5 to anchorage buoy, and to the southward of a line from said anchorage buoy to buoy No. 7 and thence to buoy No. 9.
4. To the northward of a line running from factory on Seguine Point to Princess Bay Lighthouse.
5. To the westward of a line running from Princess Bay Lighthouse to buoy No. 6.
6. To the westward of a line running from buoy No. 6 to buoy No. 10.
7. To the eastward of a line running due north from buoy No. 10.

KEYPORT HARBOR ANCHORAGE.

To the eastward of eastern boundary and to the westward of western boundary of dredged channel extending from old railroad dock to wharves of the New York and Keyport Steamboat Company.

QUARANTINE LAWS OF THE PORT OF NEW YORK.

Extracts from Chapter 268 of the Laws of New York, 1900.

ANCHORAGE.

Sec. 86. The anchorage for vessels under quarantine shall be within the waters of New York harbor at such place as may be designated by the health officer and commissioners of quarantine.

BOARDING STATION.*

Sec. 87. The boarding station for vessels from any place where disease subject to quarantine existed at the time of their departure, or which shall have stopped at any such place during their voyage, or on board of which during the voyage any case of such disease shall have occurred, arriving between the first day of April and the first day of November, shall be at such place as the health officer and quarantine commissioners may designate. And all such vessels immediately on their arrival shall anchor where directed and there remain with all persons arriving thereon until discharged by the health officer.

* The boarding station and quarantine anchorages are in 1908 just above Fort Wadsworth, on the western side of The Narrows.

Sec. 88. * * * The expense of the care and the support of every person received into such hospital shall be fixed and determined by the commissioners of quarantine, and shall be paid to the commissioners of quarantine by the master, owner or consignee of the vessel in which such person shall have arrived, and the payment thereof may be enforced by the same remedies as the payment of other quarantine charges. * * *

BOARDING VESSELS.

Sec. 104. The health officers shall board every quarantinable vessel as soon after her arrival as practicable, between sunrise and sunset * * * . *See also section 124 of this act.*

BILLS OF HEALTH.

Sec. 105. The health officers shall require the masters of all merchant ships and vessels at such port from any foreign port to present a bill of health, duly executed * * * at such port of departure * * * . Vessels touching other ports on the passage shall also bring a bill of health from each port, or shall have indorsed on the original bill of health by one of such United States officers thereat, * * * .

POWER OVER MASTER, OWNER OR CONSIGNEE OF VESSEL.

Sec. 108. If the master, owner or consignee of any quarantinable vessel shall neglect or refuse to do any act or thing lawfully directed to be done by the health officer, or to comply with any lawful order or direction of the health officer, or with any regulation relative to such vessel or any person or thing on board thereof, the health officer may employ such assistance as may be necessary to enforce any such order, direction, or regulation. * * * .

QUARANTINABLE DISEASES.

Sec. 109. The quarantinable diseases are yellow fever, plague, cholera, typhus or ship fever and small-pox, and any other infectious disease which has been or may be determined to be quarantinable by the health officer. Persons with insufficient evidence of vaccination and known to have been recently exposed to small-pox, shall be vaccinated as soon as practicable and detained until the vaccination shall have taken effect * * * .

QUARANTINABLE VESSELS AND PERIOD OF QUARANTINE.

Sec. 110. Every vessel arriving at the port of New York from any place where a quarantinable disease existed at the time of departure, or which shall have arrived at any such place and proceeded therefrom to New York, or on board of which during the voyage any case of any such disease shall have occurred, shall remain at quarantine until the health officer grant a permit for the discharge of such vessel or cargo or both. Every vessel arriving at the port of New York from any foreign port and every vessel from a domestic port shall, on their arrival at the quarantine ground, be subject to visitation by the health officer. No quarantinable vessel shall depart from quarantine without the written permission of the health officer which shall be delivered by the master of the vessel to the department of health of the city of New York, according to the destination of the vessel within twenty-four hours after the permit is received by him.

THE YELLOW FLAG.

Sec. 113. The health officer shall cause all vessels * * * in quarantine to be designated by a yellow flag, and shall prohibit communication with or passage within range of the same, except under such restrictions as he may designate compatible with the public safety.

PAYMENT OF EXPENSES OF QUARANTINE.

Sec. 117. The expenses incurred and services rendered by the health officer, or any of his subordinates or employees in the discharge of any duty imposed by law in relation to vessels, merchandise, baggage, dunnage, persons or burial of persons under quarantine shall be paid for to the health officer by the master of the vessel for which the expense shall have been incurred, or the services rendered, or in which such merchandise, baggage, dunnage and persons shall have arrived. Persons conveyed to and from the quarantine establishment in the quarantine steamboat shall pay the health officer for such transportation, unless conveyed for the master of a vessel, in which case the master shall pay for the same.

LIEN FOR SERVICES AND EXPENSES.

Sec. 118. All such expenses, services and charges shall be a lien on the vessels, merchandise or other property in relation to which they shall have been made, incurred or rendered, and if such master, owner or consignee shall omit to pay the same within three days after the presentation of such account, the commissioners may proceed to enforce such lien in the mannre provided in the lien law for the enforcement of liens upon vessels; * * * .

FEES AND COMPENSATION OF HEALTH OFFICERS.

Sec. 124. The health officer shall receive fees for his services at not exceeding the following rates, namely: For inspection of any vessel from a foreign port, five dollars. For inspection of every vessel from a domestic port, south of Cape Henlopen, between May first and November first in each year, steamers three dollars; other vessels, one dollar. For medical inspection of every one hundred or fraction of one hundred steerage passengers upon transatlantic steamers two dollars. For each special permit issued for the discharge of cargo, portion of cargo or baggage brought as freight, twenty-five cents. For sanitary inspection of every vessel after the discharge of cargo or ballast, ten dollars. For fumigation and disinfection of every vessel from an infected port, or of such vessel as in the judgment of the health officer shall require fumigation and disinfection by reason of exposure to infection or contagion, fifty dollars, or such sum not more than fifty dollars or less than five dollars as may in the judgment of the health officer be deemed reasonable. For boarding every vessel and giving a permit between sunset and sunrise, at the request of the owner, consignee or master of the vessel, when such pratique can be given without danger to the public health, five dollars. For vaccination of persons on vessels, each twenty-five cents. But no charge shall be made for the vaccination of any person who shall have been successfully vaccinated by the medical officer of the ship. * * *

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APPENDIX III.

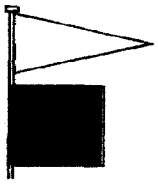
STORM WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

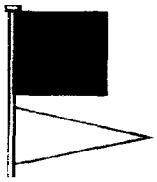
A red flag with a black center indicates that the storm is expected to be of marked violence.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from north through east to south); white, westerly (from south through west to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrant; below, from the southerly quadrant.

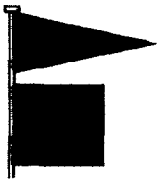
STORM WARNING FLAGS.



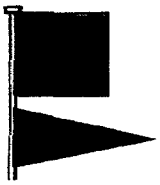
Northwesterly winds.



Southwesterly winds.



Northeasterly winds.



Southeasterly winds.

By night a red light will indicate easterly winds and a white light below a red light will indicate westerly winds.

Hurricane.

The "**Hurricane Display**" denotes the expected approach of a hurricane or of one of the severe and dangerous storms that occasionally move across the Gulf of Mexico and along the Atlantic Coast.

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APPENDIX IV.

REGULATIONS U. S. PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

APPROVED AUGUST 12, 1903.

(*Extracts.*)

DUTIES OF COMMISSIONED OFFICERS.

PROFESSIONAL DUTIES.

116. The professional duties of commissioned officers are to examine all applicants for relief, to prescribe for and furnish out-patient or hospital treatment as may be required, and to make physical examinations of the seamen of the several Government services and the merchant marine, under such regulations as shall hereinafter appear. Professional duties defined.

117. Commissioned officers will, upon the application of the United States shipping commissioner, or of the master or owner of any United States vessel engaged in the foreign, coastwise, or inland navigation trade, examine as to his physical condition any seaman brought to them for that purpose, and will give a certificate as to his fitness or unfitness for service. They will physically examine, in accordance with existing regulations governing physical examinations, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line or by the consul representing the nation to which the vessel belongs. A fee of one dollar will be charged for each examination of a foreign seaman, and fees so received will be deposited with the collector of customs in the same manner as donations to the marine-hospital fund. Officers will also, upon the application of the proper authority, examine cadets, enlisted men, and persons desiring to enlist in the Revenue-Cutter, Life-Saving, Coast-Survey, and Light-House services, or to instruct them in the mode of resuscitating persons apparently drowned. No fee will be charged for this service. They will also examine alien immigrants when detailed for that purpose. They will also, when officially requested, furnish to commanding officers of revenue cutters certificates as to the physical condition of enlisted men of the Revenue-Cutter Service who may be under treatment in hospital or as out-patients. * * * To examine seamen, cadets, enlisted men, etc., as to their physical condition.

119. Whenever officially requested by the local inspectors of steam vessels or other proper officers, commissioned officers will examine applicants for pilot's license as to sense of hearing, color perception, and general visual capacity, and will give a certificate accordingly. To examine applicants for pilot's license.

120. No fee will be charged by any officer of the Public Health and Marine-Hospital Service for the medical examination or professional treatment of seamen of the United States merchant marine or for making a certificate as to their physical condition, and no officer shall accept a fee for professional service relating to the public service. No fee to be charged.

SANITARY DUTIES.

123. It shall be the duty of commissioned officers to enforce the national health and quarantine laws and regulations; but no additional compensation shall be allowed said officers by reason of such service as they may be required to perform except actual and necessary traveling expenses. To enforce national quarantine rules and regulations, Apr. 29, 1878, s. 3; Feb. 15, 1893.

127. Upon the outbreak of smallpox at or near a relief station, commissioned officers will vaccinate such seamen as may come to the marine-hospital office for the purpose; and officers are authorized at all times to visit vessels to examine and vaccinate crews. To vaccinate seamen.

RELIEF STATIONS.

Definition.

404. A relief station of the Public Health and Marine-Hospital Service is a port or place where an officer of the Service is on duty to extend relief to seamen, or where an officer of the customs service is specifically authorized to extend said relief.

Classes.

405. Relief stations shall be divided into the following classes:

Class I. United States marine hospitals.

Class II. All other stations under command of a commissioned officer.

Class III. All stations under charge of an acting assistant surgeon where there is a contract for the care of sick and disabled seamen.

Class IV. All other relief stations not included in the above classes.

Provisions for relief.

406. At all relief stations where the number of patients warrants, an officer of the Service will be assigned to the command of the station, and whenever practicable the patients of the Service will be treated in hospitals maintained exclusively for their benefit. * * *

Provision for marine-hospital dispensaries.

408. At each relief station of the first and second class, and whenever practicable at each relief station of the third class where an acting assistant surgeon of the Service is on duty, there shall be a marine-hospital office, where applicants for relief shall be received and examined, and the necessary action taken according to the regulations.

Location of offices and dispensaries.

409. The marine-hospital office shall be located at the custom-house whenever practicable, and suitable office room for that purpose shall be set apart by the custodian of the custom-house building, subject to the approval of the Secretary of the Treasury.

BENEFICIARIES.

Persons entitled to relief.

411. The persons entitled to the benefits of the Public Health and Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service on board of those engaged in such care, preservation, or navigation. Officers and crews of the Light-House Establishment, officers and crews of the Revenue-Cutter Service, seamen employed on the vessels of the Mississippi River Commission; seamen employed on the vessels of the Engineer Corps of the Army, and keepers and crews of the United States Life-Saving Service are entitled to the facilities of the hospitals and relief stations under special rules hereinafter prescribed.

Coast and Geodetic Survey entitled to relief.

412. Officers on vessels of the Coast and Geodetic Survey and seamen thereon, who are not enlisted men from the Navy, are entitled to the benefits of the Service.

Yachtsmen entitled.

413. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

Seamen on United States Army transports, etc., entitled to treatment.

414. Seamen employed on United States Army transports or other vessels belonging to the Quartermaster's Department, United States Army, when not enlisted men of the Army, are entitled to the benefits of the Service.

Exceptions, R. S., s. 4804.

415. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the Service.

Wrecked seamen entitled.

417. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

Seamen sent by consular officers entitled. U. S. Rev. Stat., s. 4577.

418. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Service without reference to length of service.

Seamen must make application for relief.

419. A sick or disabled seaman, in order to obtain the benefits of the Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Public Health and Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the said Service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant.

420. Master's certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for sixty days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which must have been during the sixty days immediately preceding his application for relief, shall entitle him to treatment. The phrase "sixty days continuous service" shall not

U. S. Rev. Stat., 4803.

be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

421. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seamen on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable. Certificates from owners or agents as evidence.

422. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1915) of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the marine-hospital office or office of the customs officer when application is made for relief, whether the relief is furnished or the claim rejected. Masters must furnish certificate of service.

423. Any master of a vessel or other person who shall furnish a false certificate of service, with intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution. False certificates.

424. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation on account of ice or low water, such interval shall not be considered as excluding him from relief unless the sickness or injury for which he applies for relief be the direct result of employment on shore. Exceptions.

425. During the season when navigation is closed at any port, by reason of ice or low water, seamen applying for relief at such ports shall be entitled to same, provided they present the documentary evidence required in paragraph 420, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and provided it does not appear that the disease or injury is the result of employment on shore, or the result of vicious habits. Closure of navigation.

426. The time during which a seaman has been under treatment in hospital as a patient of the Service shall not be reckoned as absence from vessel in respect to debarring him from further relief. Period of treatment not to be reckoned as absence from vessel.

427. Whenever an applicant for relief presents himself at the marine-hospital office or the custom-house without a master's certificate or shipping commissioner's discharge and it is impracticable to obtain such certificate, the affidavit of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for the benefits of the Service. Affidavits may be accepted as evidence.

428. When the period of the seaman's service as shown by his certificate on last vessel is less than sixty days, his affidavit as to previous service may be accepted. Brief service on last vessel not a bar to relief.

431. When a seaman applies for relief after an absence of sixty days or more from his last vessel, and it satisfactorily appears that such absence was due to sickness or injury acquired in the line of duty, and that it was impracticable for him to apply to the proper officer for treatment, a statement of the facts, together with a copy of the application and other papers in support of same, shall be forwarded, with the recommendation of the medical officer, to the Surgeon-General for decision. Applications for relief after sixty days' absence from vessel.

432. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel. * * * Seamen to sign certificates.

434. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment he must, to entitle him to treatment, furnish a new certificate of service, showing that he is still following his vocation as seaman, or give satisfactory evidence that such service has been prevented by closure of navigation or by sickness, the latest dates of service and, in case of lack of recent service, its explanation, to appear in each new relief certificate. Out-patients to furnish new service certificates.

435. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid by the Service. Expenses for sickness during voyage.

436. The expenses for the care and treatment of seamen suffering from contagious diseases, who are entitled to the benefits of the Service, and who, in accordance with the State or municipal health laws and regulations are taken to quarantine or other hospitals under charge of the local health authorities, will not be paid unless such seamen were admitted at the time by the request of an officer of the Service. Seamen admitted to local quarantine hospitals.

437. In no case shall money be paid to a seaman or to his family or friends by the Service as reimbursement for expenses incurred during his sickness or disability. Money not to be paid to seamen for expenses of sickness.

Seamen injured in brawls not to receive treatment.

439. Seamen who may be injured in street brawls or while committing a breach of the peace, and are therefore confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the Service.

Seamen taken ill on vessels entitled.

440. Seamen taken sick or injured while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

Certificates of discharge.

441. A certificate of discharge may, at the discretion of the officer in charge of the case, be given to a hospital patient, but such certificate when presented at another relief station shall not be taken as sufficient evidence of the applicant's title to marine-hospital relief, but may be considered as collateral to other satisfactory data submitted by the seaman.

Only temporary relief contemplated.

442. Temporary relief only is contemplated, and admission to hospital is not ntended to permit an indefinite residence therein for cause other than actual disease or injury.

THE REVENUE-CUTTER SERVICE.

Admitted without regard to length of service.

444. The officers and crews of the Revenue-Cutter Service will receive hospital or out-patient treatment, as hereinafter provided, on certificate signed by the commanding officer or executive officer of a revenue cutter, without regard to length of service. The certificate shall contain a description of the applicant for relief. Officers on leave or waiting orders may sign their own certificate.

THE ENGINEER CORPS, UNITED STATES ARMY.

Seamen employed on vessels of the Engineer Corps, U. S. A., entitled.

453. Seamen employed on vessels under the charge of the Engineer Corps of the United States Army shall be admitted to the benefits of the Marine-Hospital Service without charge at stations of the first, second, and third class upon the written request of the commanding officers of said vessels.

THE LIGHT-HOUSE SERVICE.

Officers and crews of the Light-House Establishment entitled.

460. Officers and crews of the several vessels belonging to the Light-House Establishment, including light-ships, may be admitted to the benefits of the Public Health and Marine-Hospital Service upon the application of their respective commanding officers. No charge will be made for care and treatment.

THE COAST AND GEODETIC SURVEY.

460*a*. Officers and seamen on vessels of the Coast and Geodetic Survey shall be entitled to relief under the same regulations governing the treatment of seamen on documented vessels (see par. 412), except as hereinafter provided.

460*b*. When immediate medical aid is considered absolutely essential for any number of the crew of a vessel of the Coast and Geodetic Survey, and the services of the Public Health and Marine-Hospital Service can not be procured, the commanding officer of the vessel may, for the time being, until the services of the Public Health and Marine-Hospital Service can be obtained, avail himself of the most suitable local facilities, provided the charges are reasonable, and shall immediately report his action to the Superintendent of the Coast and Geodetic Survey, forwarding, as a part of the report, the statement of the attending physician, certifying the necessity for immediate treatment and the probable duration of same, said report and certificate to be forwarded to the Surgeon-General. Vouchers covering the expenses of such services and the necessary medicines, properly certified and accompanied by a full statement of the circumstances, shall be forwarded to the Superintendent of the Coast and Geodetic Survey, who will forward the vouchers, with all papers relating thereto, to the Surgeon-General for approval and settlement. This paragraph shall not be construed to authorize relief at the expense of the Public Health and Marine-Hospital Service in foreign ports or in ports of the Philippine Islands.

UNITED STATES ARMY AND NAVY.

Officers and seamen of various Government services may be admitted.

461. Officers and enlisted men of the United States Army and Navy may be admitted for care and treatment as patients of the service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Surgeon-General by the officer in charge of

the station, on a daily report (Form 1957) or relief certificate (Form 1916), accompanied by a copy of the request upon which such officer or enlisted man was admitted. They shall be furnished treatment at stations of the first, second, and third class only. The rate of charge to be made for the care and treatment of the said officers and enlisted men will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Patients of the above-named class are not subject to the provisions requiring transportation to marine hospitals.

FOREIGN SEAMEN.

462. The accommodations provided for the care and treatment of the patients of the Public Health and Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of the consular officer of the nation under whose flag they are sailing; or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment, at rates fixed annually by the Department. Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

463. A bill (Form 1928) in duplicate must be rendered by the officer of the Service * * * . One copy of this bill shall be delivered to the collector of customs, who shall at once collect the amount * * * . Bills for care and treatment. Form 1928.

464. Customs officers acting as agents of the Public Health and Marine-Hospital Service shall collect all bills for the care and treatment of seamen of the classes enumerated in paragraphs 461 and 462 * * * . Monthly accounts to be rendered.

465. Collectors of customs will notify the commanding officer of the vessel of the class enumerated in paragraphs 461 and 462, upon whose request the seaman was admitted, of the amount of the bill, and when paid will give a receipt therefor. * * * Notification of amount of bill.

466. The rate of charge to be made for the care and treatment of foreign seamen will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Foreign seamen are not subject to the provision of paragraphs 493 and 501 requiring transportation to marine hospitals. Charges for care and treatment.

RELIEF.

OUT-PATIENT RELIEF.

467. Sick and disabled seamen entitled under these regulations to the benefits of the Service whose diseases or injuries are of such a nature that they can properly be relieved by medicines, dressings, or advice, without admission to hospital, shall be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require. Cases to be treated as out-patients.

468. Seamen will not be furnished relief at their own homes, except by special authority from the Surgeon-General, and then only an allowance for medical attendance and medicines will be made at rates fixed by the Treasury Department. No relief furnished at homes of patients.

HOSPITAL RELIEF.

480. A sick or disabled seaman entitled to the benefits of the Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of an officer of the Service, or of a reputable physician designated by the Department to act at a place where no officer is stationed. Cases for hospital treatment.

STATIONS OF THE FIRST CLASS.

483. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE SECOND CLASS.

491. A bed ticket (Form 1919) shall be prepared and delivered to the applicant for relief in a sealed envelope addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the ticket will be invalid. To be valid only for day of issue.

STATIONS OF THE THIRD CLASS.

Permits for hospital relief.

499. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days.

STATIONS OF THE FOURTH CLASS.

Permits for hospital relief.

512. Customs officers, or acting assistant surgeons, when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit * * * should in no case exceed twenty days.

Permits valid only on day of issue.

515. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the permit will be invalid.

Foreign seamen et al. not treated.

479. Foreign seamen or employees of the various Government services, not beneficiaries, shall not be treated.

INSANE SEAMEN.

Relief for insane seamen. Mar. 3, 1875.

531. Insane seamen entitled to the benefits of the Service may be admitted to the Government Hospital for the Insane, Washington, D. C., upon the order of the Secretary of the Treasury.

DECEASED SEAMEN.

Relatives to be notified.

538. On the death of a patient while under the charge of the Service, notice to receive his effects shall be given by letter or otherwise to his nearest known relative. * * *

Burial expenses.

539. The necessary expenses of a plain burial for deceased patients of the Service will be paid, but no part of the expenses of the burial of any deceased seaman will be paid for at the expense of the Marine-Hospital Service unless said seaman was at the time of his death a patient of the Service. When friends or relatives of a deceased seaman claim the body and assume charge of the funeral arrangements, no part of the expenses of the same will be paid by the Marine-Hospital Service.

NATIONAL QUARANTINES.

QUARANTINE LAWS.

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service.

(*Extracts.*)

[Approved February 15, 1893, and amended August 18, 1894, and March 2, 1901.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any merchant ship or other vessel from any foreign port or place of [to] enter any port of the United States except in accordance with the provisions of this act and with such rules and regulations of State and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof shall forfeit to the United States a sum, to be awarded in the discretion of the court, not exceeding five thousand dollars, which shall be a lien upon said vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 2. That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer where such officer has been detailed by the President for that purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew; and said consular or medical officer is required, before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulation be allowed, to be accounted for as is required in other cases.

The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore mentioned. Any vessel clearing and sailing from any such port without such bill of health, and entering any port of the United States, shall forfeit to the United States not more than five thousand dollars, the amount to be determined by the court, which shall be a lien on the same, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

The provisions of this section shall not apply to vessels plying between foreign ports on or near the frontiers of the United States and ports of the United States adjacent thereto; but the Secretary of the Treasury is hereby authorized, when, in his discretion, it is expedient for the preservation of the public health, to establish regulations governing such vessels.

SEC. 5. That the Secretary of the Treasury shall from time to time issue to the consular officers of the United States and to the medical officer serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing the best sanitary condition of such vessels, their cargoes, passengers, and crew, before their departure for any port in the United States, and in the course of the voyage; and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases; and it shall not be lawful for any vessel to enter said port to discharge its cargo, or land its passengers, except upon a certificate of the health officer at such quarantine station certifying that said rules and regulations have in all respects been observed and complied with, as well on his part as on the part of the said vessel and its master, in respect to the same and to its cargo, passengers, and crew; and the master of every such vessel shall produce and deliver to the collector of customs at said port of entry, together with the other papers of the vessel, the said bills of health required to be obtained at the port of departure and the certificate herein required to be obtained from the health officer at the port of entry; and that the bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular officer or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

SEC. 6. That on the arrival of an infected vessel at any port not provided with proper facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station.

SEC. 7. That whenever it shall be shown to the satisfaction of the President that by reason of the existence of cholera or other infectious on contagious diseases in a foreign country there is serious danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

SEC. 10. That the Supervising Surgeon General, with the approval of the Secretary of the Treasury, is authorized to designate and mark the boundaries of the quarantine grounds and quarantine anchorages for vessels which are reserved for use at each United States quarantine station; and any vessel or officer of any vessel, or other person, other than State or

municipal health or quarantine officers, trespassing or otherwise entering upon such grounds or anchorages in disregard of the quarantine rules and regulations, or without permission of the officer in charge of such station, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than three hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court. Any master or owner of any vessel, or any person violating any provision of this Act or any rule or regulation made in accordance with this Act, relating to inspection of vessels or relating to the prevention of the introduction of contagious or infectious diseases, or any master, owner, or agent of any vessel making a false statement relative to the sanitary condition of said vessel or its contents or as to the health of any passenger or person thereon, shall be deemed guilty of a misdemeanor and subject to arrest, and upon conviction thereof be punished by a fine of not more than five hundred dollars or imprisonment for not more than one year, or both, in the discretion of the court.

SEC. 11. That any vessel sailing from any foreign port without the bill of health required by section two of this Act, and arriving within the limits of any collection district of the United States, and not entering or attempting to enter any port of the United States shall be subject to such quarantine measures as shall be prescribed by regulations of the Secretary of the Treasury, and the cost of such measures shall be a lien on said vessel, to be recovered by proceedings in the proper district court of the United States and in the manner set forth above as regards vessels from foreign ports without bills of health and entering any port of the United States.

QUARANTINE REGULATIONS. †

(*Extracts.*)

4. Under the act of Congress approved August 18, 1894, vessels plying between Canadian ports on the St. Croix River * * * and ports in the United States; also vessels plying between Mexican ports on the Rio Grande River and adjacent ports in the United States, are exempt from the provisions of section 2 of the act granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service, approved February 15, 1893, which requires vessels clearing from a foreign port for a port in the United States to obtain from the consular or medical officer a bill of health. During the prevalence of any of the quarantinable diseases at the foreign port of departure, vessels above referred to are hereby required to obtain from the consular officer of the United States, or from the medical officer of the United States, when such officer has been detailed by the President for this purpose, a bill of health, or a supplemental bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury.

INSPECTION OF VESSELS LEAVING FOREIGN PORTS AND PORTS IN THE POSSESSIONS OR OTHER DEPENDENCIES OF THE UNITED STATES FOR PORTS IN THE UNITED STATES OR ITS POSSESSIONS OR OTHER DEPENDENCIES.

5. The officer issuing the bill of health shall satisfy himself, by inspection if necessary, that the conditions certified to therein are true, and is authorized, in accordance with the law, to withhold the bill of health or the supplemental bill of health until he is satisfied that the vessel, the passengers, the crew, and the cargo have complied with all the quarantine laws and regulations of the United States.

6. Inspection is required of—

(*a*) All vessels from ports at which cholera, yellow fever, or plague prevails, or at which smallpox or typhus fever prevails in epidemic form.

(*b*) All vessels carrying steerage passengers; but need only include the inspection of such passengers and their living apartments, if sailing from a healthy port.

7. Inspection of the vessel is such an examination of the vessel, cargo, passengers, crew, personal effects of same, including examination of manifests and other papers, food and water supply, the ascertainment of its relations with the shore, the manner of loading and possibilities of invasion by small animals as will enable the inspecting officer to determine if these regulations have been complied with.

8. When an inspection is required, it should be made by daylight, as late as practicable before sailing. The vessel should be inspected before the passengers go aboard, the passengers just before embarkation, and the crew on deck; and no communication should be had with the vessel after such inspection except by permission of the officer issuing the bill of health.

INSPECTION.

59. Every vessel subject to quarantine inspection, entering a port of the United States, its possessions or dependencies, shall be considered in quarantine until given free pratique. Such vessel shall fly a yellow flag at the foremast head from sunrise to sunset, and shall observe all the other requirements of vessels actually quarantined.

† These regulations are subject to change.

60. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry:

(*a*) All vessels from foreign ports except those enumerated in paragraph 4.

(*b*) Any vessel with sickness on board.

(*c*) Vessels from domestic ports where cholera, plague, or yellow fever prevails, or where smallpox or typhus fever prevails in epidemic form.

(*d*) Vessels from ports suspected of infection with yellow fever, having entered a port north of the southern boundary of Maryland without disinfection, shall be subjected to a second inspection before entering any ports south of said latitude during the quarantine season of such port.

61. The inspections of vessels required by these regulations shall be made between sunrise and sunset, except in case of vessels in distress. * * *

62. In making the inspection of a vessel, the bill of health and clinical record of all cases treated during the voyage, crew and passengers' lists and manifests, and when necessary, the ship's log shall be examined. The crew and passengers shall be mustered and examined and compared with the lists and manifests and any discrepancies investigated.

64. No person, except the quarantine officer, his employees, United States customs officers, pilots, or other persons authorized by the quarantine officer, shall be permitted to board any vessel subject to quarantine inspection until after the vessel has been inspected by the quarantine officer and granted free pratique, and all such persons so boarding such vessel shall, in the discretion of the quarantine officer, be subject to the same restrictions as the personnel of the vessel.

65. Towboats or any other vessels having had communication with vessels subject to inspection shall themselves be subject to inspection.

QUARANTINE.

68. Vessels arriving under the following conditions shall be placed in quarantine:

(*a*) With quarantinable disease on board or having had such disease on board during the voyage.

(*b*) Any vessel which the quarantine officer considers infected.

(*c*) If arriving at a port south of the southern boundary of Maryland in the season of close quarantine, April 1 to November 1, directly or via a northern port, from a tropical American port, unless said port is known to be free from yellow fever.

(*d*) In case of vessels arriving at a northern port without sickness on board from ports where yellow fever prevails, the personnel shall be detained under observation at quarantine to complete five days from the port of departure.

(*e*) Towboats and other vessels having had communication with vessels subject to quarantine shall themselves be quarantined if they have been exposed to infection.

69. Vessels arriving under the following conditions need not be subject to quarantine:

A. Vessels from yellow fever ports bound for ports in the United States north of the southern boundary of Maryland, with good sanitary condition and history, having had no sickness on board at ports of departure, en route or on arrival, provided they have been five days from last infected or suspected port.

B. Vessels engaged in the fruit trade may be admitted to entry without detention, provided that they have complied in all respects with the special rules and regulations made by the Secretary of the Treasury with regard to vessels engaged in said trade.

GENERAL REQUIREMENTS AT QUARANTINE.

71. No direct communication shall be allowed between any vessel in quarantine and any person or place outside, and no communication whatever between quarantine or any vessel in quarantine and any person or place outside except under the supervision of the quarantine officer.

75. Vessels detained at any national quarantine will be subject to such additional rules and regulations as may be promulgated from time to time by the Surgeon-General.

SPECIAL REGULATIONS RELATING TO NAVAL VESSELS.

151. Vessels of the U. S. Navy may be granted the hereinafter stated exemptions from quarantine regulations, but are subject to quarantine inspection upon arrival at a port of the United States.

152. The certificates of the medical officers of the U. S. Navy as to the sanitary history and condition of the vessel and its personnel may be accepted for naval vessels by the quarantine officer boarding the vessel in lieu of an actual inspection.

153. Vessels of the U. S. Navy having entered the harbors of infected ports, but having held no communication which is liable to convey infection, may be exempted from the disinfection and detention imposed on merchant vessels from such ports.

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APPENDIX V.

RULES TO PREVENT COLLISIONS OF VESSELS.

[Compiled for insertion in volumes of the U. S. Coast Pilot.]

AN ACT in regard to collisions at sea.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in every case of collision between two vessels it shall be the duty of the master or person in charge of each vessel, if and so far as he can do so without serious danger to his own vessel, crew, and passengers (if any), to stay by the other vessel until he has ascertained that she has no need of further assistance, and to render to the other vessel, her master, crews, and passengers (if any), such assistance as may be practicable and as may be necessary in order to save them from any danger caused by the collision, and also to give to the master or person in charge of the other vessel the name of his own vessel and her port of registry, or the port or place to which she belongs, and also the names of the ports and places from which and to which she is bound. If he fails so to do, and no reasonable cause for such failure is shown, the collision shall, in the absence of proof to the contrary, be deemed to have been caused by his wrongful act, neglect, or default.

SEC. 2. That every master or person in charge of a United States vessel who fails, without reasonable cause, to render such assistance or give such information as aforesaid shall be deemed guilty of a misdemeanor, and shall be liable to a penalty of one thousand dollars, or imprisonment for a term not exceeding two years; and for the above sum the vessel shall be liable and may be seized and proceeded against by process in any district court of the United States by any person; one-half such sum to be payable to the informer and the other half to the United States.

SEC. 3. That this act shall take effect at a time to be fixed by the President by Proclamation issued for that purpose.

Approved September 4, 1890. Proclamation dated November 18, 1890, to take effect December 15, 1890.

INTERNATIONAL RULES.

I.—ENACTING CLAUSE, SCOPE, AND PENALTY.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collisions at sea shall be followed by all public and private vessels of the United States upon the high seas and in all waters connected therewith, navigable by sea-going vessels.

ART. 30. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland waters.

PRELIMINARY DEFINITIONS.

In the following rules every steam vessel which is under sail and not under steam is to be considered a sailing vessel, and every vessel under steam, whether under sail or not, is to be considered a steam vessel.

The word "steam vessel" shall include any vessel propelled by machinery.

A vessel is "under way" within the meaning of these rules when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules when applied to lights shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam vessel when under way shall carry—(*a*) On or in front of the foremast, or if a vessel without a foremast, then in the fore part of the vessel, at a height above the hull of not less than twenty feet, and if the breadth of the vessel exceeds twenty feet, then at a height above the hull not less than such breadth, so, however, that the light need not be carried at a greater height above the hull than forty feet, a bright white light, so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A steam vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than six feet apart, and when towing more than one vessel shall carry an additional bright white light six feet above or below such lights, if the length of the tow measuring from the stern of the towing vessel to the stern of the last vessel towed exceeds six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*), excepting the additional light, which may be carried at a height of not less than fourteen feet above the hull.

Such steam vessel may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

SPECIAL LIGHTS.

ART. 4. (*a*) A vessel which from any accident is not under command shall carry at the same height as a white light mentioned in article two (*a*), where they can best be seen, and if a steam vessel in lieu of that light, two red lights, in a vertical line one over the other, not less than six feet apart, and of such a character as to be visible all around the horizon at a distance of at least two miles; and shall by day carry in a vertical line one over the other, not less than six feet apart, where they can best be seen, two black balls or shapes, each two feet in diameter.

(*b*) A vessel employed in laying or in picking up a telegraph cable shall carry in the same position as the white light mentioned in article two (*a*), and if a steam vessel in lieu of that light, three lights in a vertical line one over the other not less than six feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all around the horizon at a distance of at least two miles. By day she shall carry in a vertical line, one over the other, not less than six feet apart, where they can best be seen, three shapes not less than two feet in diameter, of which the highest and lowest shall be globular in shape and red in color, and the middle one diamond in shape and white.

(*c*) The vessels referred to in this article, when not making way through the water, shall not carry the side lights, but when making way shall carry them.

(*d*) The lights and shapes required to be shown by this article are to be taken by other vessels as signals that the vessel showing them is not under command and can not therefore get out of the way.

These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in article thirty-one.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing vessel under way and any vessel being towed shall carry the same lights as are prescribed by article two for a steam vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of small vessels under way during bad weather, the green and red side lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR SMALL STEAM AND SAIL VESSELS AND OPEN BOATS.

ART. 7. Steam vessels of less than forty, and vessels under oars or sails of less than twenty tons gross tonnage, respectively, and rowing boats, when under way, shall not be required to carry the lights mentioned in article two (*a*), (*b*), and (*c*), but if they do not carry them they shall be provided with the following lights:

First. Steam vessels of less than forty tons shall carry—

(*a*) In the fore part of the vessel, or on or in front of the funnel, where it can best be seen, and at a height above the gunwale of not less than nine feet, a bright white light constructed and fixed as prescribed in article two (*a*), and of such a character as to be visible at a distance of at least two miles.

(*b*) Green and red side lights constructed and fixed as prescribed in article two (*b*) and (*c*), and of such a character as to be visible at a distance of at least one mile, or a combined lantern showing a green light and a red light from right ahead to two points abaft the beam on their respective sides. Such lanterns shall be carried not less than three feet below the white light.

Second. Small steamboats, such as are carried by seagoing vessels, may carry the white light at a less height than nine feet above the gunwale, but it shall be carried above the combined lantern mentioned in subdivision one (*b*).

Third. Vessels under oars or sails of less than twenty tons shall have ready at hand a lantern with a green glass on one side and a red glass on the other, which, on the approach of or to other vessels, shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

Fourth. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

The vessels referred to in this article shall not be obliged to carry the lights prescribed by article four (*a*) and article eleven, last paragraph.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot vessels when engaged on their station on pilotage duty shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side lights lighted, ready for use, and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

A pilot vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand, ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels when not engaged on their station on pilotage duty shall carry lights similar to those of other vessels of their tonnage.

A steam pilot vessel, when engaged on her station on pilotage duty and in waters of the United States and not at anchor, shall, in addition to the lights required for all pilot boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry in addition to the lights required for all pilot boats the red light above mentioned, but not the colored side lights. When not engaged on her station on pilotage duty, she shall carry the same lights as other steam vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. Fishing vessels and fishing boats, when under way and when not required by this article to carry or show the lights hereinafter specified, shall carry or show the lights prescribed for vessels of their tonnage under way.

(*a*) Open boats, by which is to be understood boats not protected from the entry of sea water by means of a continuous deck, when engaged in any fishing at night, with outlying tackle extending not more than one hundred and fifty feet horizontally from the boat into the seaway, shall carry one all-round white light.

Open boats, when fishing at night, with outlying tackle extending more than one hundred and fifty feet horizontally from the boat into the seaway, shall carry one all-round white light, and in addition, on approaching or being approached by other vessels, shall show a second white light at least three feet below the first light and at a horizontal distance of at least five feet away from it in the direction in which the outlying tackle is attached.

(*b*) Vessels and boats, except open boats as defined in subdivision (*a*), when fishing with drift nets, shall, so long as the nets are wholly or partly in the water, carry two white lights where they can best be seen. Such lights shall be placed so that the vertical distance between them shall be not less than six feet and not more than fifteen feet, and so that the horizontal distance between them, measured in a line with the keel, shall be not less than five feet and not more than ten feet. The lower of these two lights shall be in the direction of the nets, and both of them shall be of such a character as to show all around the horizon, and to be visible at a distance of not less than three miles.

Within the Mediterranean Sea and in the seas bordering the coasts of Japan and Korea sailing fishing vessels of less than twenty tons gross tonnage shall not be obliged to carry the lower of these two lights. Should they, however, not carry it, they shall show in the same position (in the direction of the net or gear) a white light, visible at a distance of not less than one sea mile, on the approach of or to other vessels.

(*c*) Vessels and boats, except open boats as defined in subdivision (*a*), when line fishing with their lines out and attached to or hauling their lines, and when not at anchor or stationary within the meaning of subdivision (*h*), shall carry the same lights as vessels fishing with drift nets. When shooting lines, or fishing with towing lines, they shall carry the lights prescribed for a steam or sailing vessel under way, respectively.

Within the Mediterranean Sea and in the seas bordering the coasts of Japan and Korea sailing fishing vessels of less than twenty tons gross tonnage shall not be obliged to carry the lower of these two lights. Should they, however, not carry it, they shall show in the same position (in the direction of the lines) a white light, visible at a distance of not less than one sea mile on the approach of or to other vessels.

(*d*) Vessels when engaged in trawling, by which is meant the dragging of an apparatus along the bottom of the sea—

First. If steam vessels, shall carry in the same position as the white light mentioned in article two (*a*) a tri-colored lantern so constructed and fixed as to show a white light from right ahead to two points on each bow, and a green light and a red light over an arc of the horizon from two points on each bow to two points abaft the beam on the starboard and port sides, respectively; and not less than six nor more than twelve feet below the tri-colored lantern a white light in a lantern, so constructed as to show a clear, uniform, and unbroken light all around the horizon.

Second. If sailing vessels, shall carry a white light in a lantern, so constructed as to show a clear, uniform, and unbroken light all around the horizon, and shall also, on the approach of or to other vessels, show where it can best be seen a white flare-up light or torch in sufficient time to prevent collision.

All lights mentioned in subdivision (*d*) first and second shall be visible at a distance of at least two miles

(*e*) Oyster dredgers and other vessels fishing with dredge nets shall carry and show the same lights as trawlers.

(*f*) Fishing vessels and fishing boats may at any time use a flare-up light in addition to the lights which they are by this article required to carry and show, and they may also use working lights.

(*g*) Every fishing vessel and every fishing boat under one hundred and fifty feet in length, when at anchor, shall exhibit a white light visible all around the horizon at a distance of at least one mile.

Every fishing vessel of one hundred and fifty feet in length or upward, when at anchor, shall exhibit a white light all around the horizon at a distance of at least one mile, and shall exhibit a second light as provided for vessels of such length by article eleven.

Should any such vessel, whether under one hundred and fifty feet in length or of one hundred and fifty feet in length or upward, be attached to a net or other fishing gear, she shall on the approach of other vessels show an additional white light at least three feet below the anchor light, and at a horizontal distance of at least five feet away from it in the direction of the net or gear.

(*h*) If a vessel or boat when fishing becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall in daytime haul down the day signal required by subdivision (*k*); at night show the light or lights prescribed for a vessel at anchor; and during fog, mist, falling snow, or heavy rain storms make the signal prescribed for a vessel at anchor. (See subdivision (*d*) and the last paragraph of article fifteen.)

(*i*) In fog, mist, falling snow, or heavy rain storms drift-net vessels attached to their nets, and vessels when trawling, dredging, or fishing with any kind of drag net, and vessels line fishing with their lines out, shall, if of twenty tons gross tonnage or upward, respectively, at intervals of not more than one minute make a blast; if steam vessels, with the whistle or siren, and if sailing vessels, with the fog horn, each blast to be followed by ringing the bell. Fishing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above-mentioned signals; but if they do not, they shall make some efficient sound signal at intervals of not more than one minute.

(*k*) All vessels or boats fishing with nets or lines or trawls, when under way, shall in daytime indicate their occupation to an approaching vessel by displaying a basket or other efficient signal where it can best be seen. If vessels or boats at anchor have their gear out, they shall, on the approach of other vessels, show the same signal on the side on which those vessels can pass.

The vessels required by this article to carry or show the lights hereinbefore specified shall not be obliged to carry the lights prescribed by article four (*a*) and the last paragraph of article eleven.

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

The white light required to be shown by this article may be fixed and carried in a lantern, but in such case the lantern shall be so constructed, fitted, and screened that it shall throw an unbroken light over an arc of the horizon of twelve points of the compass, namely, for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile. Such lights shall be carried as nearly as practicable on the same level as the side lights.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length, when at anchor, shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length, when at anchor, shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light, and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

A vessel aground in or near a fair-way shall carry the above light or lights and the two red lights prescribed by article four (*a*).

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal-lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments and duly registered and published.

STEAM VESSEL UNDER SAIL BY DAY.

ART. 14. A steam vessel proceeding under sail only but having her funnel up, shall carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS FOR FOG, AND SO FORTH.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

First. By "steam vessels" on the whistle or siren.

Second. By "sailing vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. (In all cases where the rules require a bell to be used, a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels.) A sailing vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam vessel having way upon her shall sound, at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, OR TOWED.

(*e*) A vessel when towing, a vessel employed in laying or picking up a telegraph cable, and a vessel under way, which is unable to get out of the way of an approaching vessel through being not under command, or unable to maneuver as required by the rules, shall, instead of the signals prescribed in subdivisions (*a*) and (*c*) of this article, at intervals of not more than two minutes, sound three blasts in succession, namely: One prolonged blast followed by short blasts. A vessel towed may give this signal and she shall not give any other.

SMALL SAILING VESSELS AND BOATS.

Sailing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above-mentioned signals, but, if they do not, they shall make some other efficient sound signal at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is closehauled on the port tack shall keep out of the way of a vessel which is closehauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. When two steam vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the side lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam vessels are crossing, so as to involve risk of collison, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSEL.

ART. 20. When a steam vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed.

NOTE.—When in consequence of thick weather or other causes, such vessel finds herself so close that collision can not be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision. (See articles twenty-seven and twenty-nine.)

CROSSING AHEAD.

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules every vessel, overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the

overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally passed and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel, she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHT OF WAY OF FISHING VESSELS.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR PASSING STEAMERS.

ART. 28. The words "short blasts," used in this article, shall mean a blast of about one second's duration.

When vessels are in sight of one another, a steam vessel under way, in taking any course authorized or required by these rules, shall indicate that course by the following signals on her whistle or siren, namely:

One short blast to mean, "I am directing my course to starboard."

Two short blasts to mean, "I am directing my course to port."

Three short blasts to mean, "My engines are going at full speed astern."

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See p. 183.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. The international code signal of distress indicated by N. C.

Third. The distance signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.

Fourth. A continuous sounding with any fog-signal apparatus.

At night—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. Flames on the vessel (as from a burning tar barrel, oil barrel, and so forth).

Third. Rockets or shells throwing stars of any color or description, fired one at a time, at short intervals.

Fourth. A continuous sounding with any fog-signal apparatus.

INLAND RULES.

NOTE.—*The paragraphs indicated by a vertical line are identically the same as corresponding paragraphs in the International Rules.*

I.—ENACTING CLAUSE, SCOPE, AND PENALTY.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collision shall be followed by all vessels navigating all harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries, and are hereby declared special rules duly made by local authority:

SEC. 2. That the supervising inspectors of steam vessels and the Supervising Inspector-General shall establish such rules to be observed by steam vessels in passing each other and as to the lights to be carried by ferryboats and by barges and canal boats when in tow of steam vessels, not inconsistent with the provisions of this Act, as they from time to time may deem necessary for safety, which rules when approved by the Secretary of the Treasury, are hereby declared special rules duly made by local authority, as provided for in article thirty of chapter eight hundred and two of the laws of eighteen hundred and ninety. Two printed copies of such rules shall be furnished to such ferryboats and steam vessels, which rules shall be kept posted up in conspicuous places in such vessels.

SEC. 3. That every pilot, engineer, mate, or master of any steam vessel, and every master or mate of any barge or canal boat, who neglects or refuses to observe the provisions of this Act, or the regulations established in pursuance of the preceding section, shall be liable to a penalty of fifty dollars, and for all damages sustained by any passenger in his person or baggage by such neglect or refusal: *Provided*, That nothing herein shall relieve any vessel, owner, or corporation from any liability incurred by reason of such neglect or refusal.

SEC. 4. That every vessel that shall be navigated without complying with the provisions of this Act shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense.

PRELIMINARY DEFINITIONS.

In the following rules every steam vessel which is under sail and not under steam is to be considered a sailing vessel, and every vessel under steam, whether under sail or not, is to be considered a steam vessel.

The word "steam vessel" shall include any vessel propelled by machinery.

A vessel is "under way," within the meaning of these rules, when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam vessel when under way shall carry (*a*) on or in front of the foremast, or, if a vessel without a foremast, then in the forepart of the vessel, a bright white light so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to

two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A seagoing steam vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

(*f*) All steam vessels (except seagoing vessels and ferryboats) shall carry in addition to green and red lights required by article two (*b*), (*c*), and screens as required by article two (*d*), a central range of two white lights; the after light being carried at an elevation at least fifteen feet above the light at the head of the vessel. The headlight shall be so constructed as to show an unbroken light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after light so as to show all around the horizon.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam vessel when towing another vessel shall, in addition to her side lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, and when towing more than one vessel shall carry an additional bright white light three feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceed six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*) or the after range light mentioned in article two (*f*).

Such steam vessels may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing vessel under way or being towed shall carry the same lights as are prescribed by article two for a steam vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR FERRYBOATS, BARGES, AND CANAL BOATS IN TOW.

See section 2, enacting clause, scope and penalty, page 191.
See also Pilot Rules, pages 200–201.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of vessels of less than ten gross tons under way during bad weather, the green and red side lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ART. 7. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot vessels, when engaged on their station on pilotage duty, shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side lights lighted, ready for use, and shall flash or show them at short intervals to indicate the direction in which they are heading, but the green light shall not be shown on the port side nor the red light on the starboard side.

A pilot vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the

colored lights above mentioned, have at hand ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels, when not engaged on their station on pilotage duty, shall carry lights similar to those of other vessels of their tonnage.

A steam pilot vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry, in addition to the lights required for all pilot boats, the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. (*a*) Fishing vessels of less than ten gross tons, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side lights; but every such vessel shall, in lieu thereof, have ready at hand a lantern with a green glass on one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

(*b*) All fishing vessels and fishing boats of ten gross tons or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*c*) All vessels, when trawling, dredging, or fishing with any kind of dragnets or lines, shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, the white light a distance of not less than three miles and the red light of not less than two miles.

LIGHTS FOR RAFTS OR OTHER WATER CRAFT.

(*d*) Rafts, or other water craft not herein provided for, navigating by hand power, horse power, or by the current of the river, shall carry one or more good white lights, which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam Vessels.*

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another, except a steam vessel with an after range light showing all around the horizon, shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length when at anchor shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length when at anchor shall carry in the forward part of the vessel, at a height not less than twenty and not exceeding forty feet above the hull, one such light; and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

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*See Pilot Rules, p. 202.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments, and duly registered and published.

STEAM VESSELS UNDER SAIL BY DAY.

ART. 14. A steam vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS FOR FOG, AND SO FORTH.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

1. By "steam vessels" on the whistle or siren.
2. By "sailing vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn; also with an efficient bell. A sailing vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam vessel under way shall sound, at intervals of not more than one minute, a prolonged blast.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING OR TOWED.

(*e*) A steam vessel when towing shall, instead of the signals prescribed in subdivision (*a*) of this article, at intervals of not more than one minute, sound three blasts in succession, namely, one prolonged blast followed by two short blasts. A vessel towed may give this signal and she shall not give any other.

RAFTS OR OTHER WATER CRAFT.

(*f*) All rafts or other water craft, not herein provided for, navigating by hand power, horse power, or by the current of the river, shall sound a blast of the fog horn, or equivalent signal, at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain-storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is closehauled on the port tack shall keep out of the way of a vessel which is closehauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. RULE I. When steam vessels are approaching each other head and head, that is, end on, or nearly so, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE III. If, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam-whistle.

RULE V. Whenever a steam vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam vessel when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam whistle, which signal shall be answered by a similar blast, given by any approaching steam vessel that may be within hearing. Should such signal be so answered by a steam vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VIII. When steam vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead

until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

RULE IX. The whistle signals provided in the rules under this article for steam vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow, or heavy rainstorms, when vessels can not so see each other, fog-signals only must be given.

SUPPLEMENTARY REGULATIONS.

See section 2, enacting clause, scope and penalty, page 191.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSELS.

ART. 20. When a steam vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of the two vessels is to keep out of the way, the other shall keep her course and speed. [See articles twenty-seven and twenty-nine.]

CROSSING AHEAD.

ART. 22. Every vessel which is directed by the rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

RIGHT OF WAY OF FISHING VESSELS.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fairway used by vessels other than fishing vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR PASSING STEAMERS.

See article 18.

ART. 28. When vessels are in sight of one another a steam vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

LIGHTS ON UNITED STATES NAVAL VESSELS AND REVENUE CUTTERS.

ART. 30. The exhibition of any light on board of a vessel of war of the United States or a revenue cutter may be suspended whenever, in the opinion of the Secretary of the Navy, the commander in chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—
A continuous sounding with any fog-signal apparatus, or firing a gun.
At night—
First. Flames on the vessel, as from a burning tar barrel, oil barrel, and so forth.
Second. A continuous sounding with any fog-signal apparatus, or firing a gun.

PILOT RULES

FOR

THE INLAND WATERS OF THE ATLANTIC AND PACIFIC COASTS.

Rules and regulations for the government of pilots of vessels propelled by steam, gas, fluid, naphtha, or electric motors, and of other vessels propelled by machinery, navigating the harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal, the Red River of the North, and rivers emptying into the Gulf of Mexico and their tributaries, adopted by the Board of United States Supervising Inspectors, Steamboat-Inspection Service, on February 26, 1908, and approved by the Acting Secretary of Commerce and Labor on August 20, 1908, under the authority of an act of Congress approved June 7, 1907, and the act of Congress approved February 14, 1903, establishing the Department of Commerce and Labor.

These rules shall be effective on and after August 20, 1908.

PRELIMINARY.

In the following rules the words *steam vessel* and *steamer* shall include any vessel propelled by machinery.

A vessel is *under way*, within the meaning of these rules, when she is not at anchor, or made fast to the shore or aground.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SIGNALS.

The whistle *signals* provided in these rules shall be sounded on an efficient whistle or siren sounded by steam or by some substitute for steam.

A *short blast* of the whistle shall mean a blast of about one second's duration.

A *prolonged blast* of the whistle shall mean a blast of from four to six seconds' duration.

One short blast of the whistle signifies intention of or assent to steamer first giving the signal to direct course to own starboard, except when two steamers are approaching each other at right angles or obliquely, when it signifies intention of steamer which is to starboard of the other to hold course and speed.

Two short blasts of the whistle signify intention of or assent to steamer first giving the signal to direct course to own port, except when two steamers are approaching each other at right angles or obliquely, when the signal signifies desire of or assent to steamer which is to port of the other to cross the bow of steamer to starboard.

Three short blasts of the whistle shall mean, "My engines are going at full speed astern."

When vessels are in sight of one another a steam vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

RULE I. If, when steam vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam whistle, the DANGER SIGNAL.

Whenever the danger signal is given the engines of *both steamers shall be stopped and backed* until the headway of the steamers has been fully checked; nor shall the engines of either steamer be again started ahead until the steamers can safely pass each other, and the proper signals for passing have been given, answered, and understood.

RULE II. Steam vessels are forbidden to use what has become technically known among pilots as "CROSS SIGNALS," that is, answering one whistle with two, and answering two whistles with one. In all cases, and under all circumstances, a pilot receiving either of the whistle signals provided in the rules, which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, shall at once sound the danger signal and observe the rule applying thereto (Rule I).

RULE III. The SIGNALS FOR PASSING, by the blowing of the whistle, shall be given and answered by pilots, in compliance with these rules, not only when meeting "head and head," or nearly so, but at all times, when the steam vessels are in sight of each other, when passing or meeting at a distance within half a mile of each other, and whether passing to the starboard or port.

The whistle signals provided in the rules for steam vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow or heavy rain storms, when vessels can not so see each other, fog signals only must be given.

SITUATIONS.

RULE IV. When steam vessels are APPROACHING EACH OTHER HEAD AND HEAD, THAT IS, END ON, OR NEARLY SO, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE V. Whenever a steam vessel is NEARING A SHORT BEND OR CURVE IN THE CHANNEL, where, from the height of the banks or other cause, a steam vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam whistle, which signal shall be answered by a similar blast, given by any approaching steam vessel that may be within hearing. Should such signal be so answered by a steam vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

WHEN STEAM VESSELS ARE MOVED FROM THEIR DOCKS OR BERTHS, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VI. WHEN STEAM VESSELS ARE RUNNING IN THE SAME DIRECTION, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side lights, shall be deemed to be *an overtaking vessel;* and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

RULE VII. WHEN TWO STEAMERS ARE APPROACHING THE NARROWS KNOWN AS "HELL GATE," on the East River at New York, side by side, or nearly so, running in the same direction, the steamer on the right or starboard hand of the other (when approaching from the west), when they shall have arrived abreast of the north end of Blackwells Island, they shall have the right of way, and the steamer on the left or port side shall check her way and drop astern. In like case when two steamers are approaching from the east, and are abreast of Negro Point, the steamer on the right or starboard hand of the other shall have the right of way, and shall proceed on her course without interference, and the steamer on the port side of the other shall keep at a safe distance astern (not less than three lengths) until both steamers have passed through the difficult channel.

RULE VIII. When two steamers are APPROACHING EACH OTHER AT RIGHT ANGLES OR OBLIQUELY SO AS TO INVOLVE RISK OF COLLISION, other than when one steamer is overtaking another, the steamer which has the other on her own port side shall hold her course and speed; and the steamer which has the other on her own starboard side shall keep out of the way of the other by directing her course to starboard so as to cross the stern of the other steamer, or, if necessary to do so, slacken her speed or stop or reverse. The steamer having the other on her own port bow shall blow one blast of her whistle as a signal of her intention to cross the bow of the other, holding her course and speed, which signal shall be promptly answered by the other steamer by one short blast of her whistle as a signal of her intention to direct her course to starboard so as to cross the stern of the other steamer or otherwise keep clear.

If from any cause whatever the conditions covered by this situation are such as to prevent immediate compliance with each other's signals, the misunderstanding or objection shall be at once made apparent by blowing the danger signal, and both steamers shall be stopped, and backed, if necessary, until signals for passing with safety are made and understood.

RULE IX. When two steamers are APPROACHING EACH OTHER AT RIGHT ANGLES OR OBLIQUELY, other than when one steamer is overtaking another, so that the steamer having the other on her own starboard side may cross the bow of the other WITHOUT INVOLVING RISK OF COLLISION, the steamer having the other on her own *starboard* side, may cross the bow of the other. If the steamers are within half a mile of each other the steamer having the other on her own starboard side shall give, as a signal of her intention to cross the bow of the other, two short and distinct blasts of her whistle, which, if assented to, the other steamer shall promptly answer by two similar blasts of her whistle, when the steamer having the other on her own starboard bow may cross the bow of the other, in which case the steamer having the other on her own port side shall keep out of the way of the other. If, however, the steamer having the other on her own port side deems it dangerous for the other steamer to cross her bow, she shall sound the danger signal, in which case both steamers shall be stopped, and backed if necessary, until signals for passing with safety are made, answered, and understood.

RULE X. When a STEAM VESSEL AND A SAILING VESSEL are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

RULE XI. Every steam vessel which is directed by these rules to KEEP OUT OF THE WAY of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

RULE XII. IN NARROW CHANNELS every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

RULE XIII. In obeying and construing these rules due regard shall be had to all DANGERS OF NAVIGATION AND COLLISION, and to any SPECIAL CIRCUMSTANCES which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR FOG, AND SO FORTH.

RULE XIV. In fog, mist, falling snow, or heavy rain storms, whether by day or night, signals shall be given as follows:

A steam vessel under way, except when towing other vessels or being towed, shall sound, at intervals of not more than one minute, on the whistle or siren, a prolonged blast.

A steam vessel when towing other vessels shall sound, at intervals of not more than one minute, on the whistle or siren, three blasts in succession, namely, one prolonged blast followed by two short blasts.

A vessel towed may give, at intervals of not more than one minute, on the fog horn, a signal of three blasts in succession, namely, one prolonged blast followed by two short blasts, and she shall not give any other.

A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

SPEED TO BE MODERATE IN FOG, AND SO FORTH.

RULE XV. Every steam vessel shall, in a fog, mist, falling snow, or heavy rain storms, go at a *moderate speed*, having careful regard to the existing circumstances and conditions.

A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel the position of which is not ascertained shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

POSTING OF PILOT RULES.

On steam and other motor vessels of over 100 gross tons two copies of the placard form of these rules (Form 803) shall be kept posted up in conspicuous places in the vessel, one copy of which shall be kept posted up in the pilot house. On steam and other motor vessels of over twenty-five gross tons and not over one hundred gross tons, two copies of the placard form of the pilot rules shall be kept on board, one copy of which shall be kept posted up in the pilot house. On steam and other motor vessels of twenty-five gross tons and under, two copies of the placard form of the pilot rules shall be kept on board, and, where practicable, one copy thereof shall be kept conspicuously posted up in the vessel. (Authority: Section 2, act of Congress approved June 7, 1897.)

LIGHTS TO BE CARRIED BY FERRYBOATS ON THE INLAND WATERS OF THE ATLANTIC AND PACIFIC COASTS.

[Authority: Section 2, act of Congress approved June 7, 1897.]

Ferryboats propelled by machinery and navigating the inland waters of the Atlantic and Pacific coasts shall carry the range lights and the colored side lights required by law to be carried on steam vessels navigating those waters, except that *double-end ferryboats* shall carry a central range of clear, bright, white lights, showing all around the horizon, placed at equal altitudes forward and aft, also on the starboard side a green light, and on the port side a red light, of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on their respective sides.

The green and red lights shall be fitted with inboard screens projecting at least 3 feet forward from the lights, so as to prevent them from being seen across the bow.

Local inspectors in districts having ferryboats shall, whenever the safety of navigation may require, designate for each line of such boats a certain light, white or colored, which shall show all around the horizon, to designate and distinguish such lines from each other, which light shall be carried on a flagstaff amidships, fifteen feet above the white range lights.

LIGHTS FOR BARGES AND CANAL BOATS IN TOW OF STEAM VESSELS ON THE INLAND WATERS OF THE ATLANTIC AND PACIFIC COASTS.

[Authority: Section 2, act of Congress approved June 7, 1897.]

On the inland rivers, bays, sounds, and harbors of the United States—except on the waters of the Hudson River and its tributaries from Troy to Sandy Hook, the waters of the East River and Long Island Sound, and the waters entering thereon, and to the Atlantic Ocean, to and including Narragansett Bay, R. I., and tributaries, and Lake Champlain—barges and canal boats towing astern of steam vessels, when towing singly, or what is known as tandem towing, shall each carry a green light on the starboard side and a red light on the port side.

When two or more boats are abreast, the colored lights shall be carried at the outer sides of the bows of the outside boats.

Barges or canal boats towing alongside a steam vessel shall, if the deck, deck houses, or cargo of the barge or canal boat be so high above water as to obscure the side lights of the towing steamer, when being towed on the starboard side of the steamer, carry a green light upon the starboard side; and when towed on the port side of the steamer, a red light on the port side of the barge or canal boat; and if there is more than one barge or canal boat abreast, the colored lights shall be displayed from the outer side of the outside barges or canal boats.

Barges and canal boats, when being towed by steam vessels on the waters of the Hudson River and its tributaries from Troy to Sandy Hook, the East River, and Long Island Sound (and the waters entering thereon, and to the Atlantic Ocean), to and including Narragansett Bay, R. I., and tributaries, and Lake Champlain, shall carry lights as follows:

Barges and canal boats being towed astern of steam vessels, when towing singly or what is known as tandem towing, shall each carry a white light on the bow and a white light on the stern.

Barges and canal boats, when towed at a hawser two or more abreast, when in one tier, shall carry a white light on the bow and a white light on the stern of each of the outside boats; when in more than one tier, each of the outside boats shall carry a white light on its bow; and the outside boats in the last tier shall each carry, in addition, a white light on the outer after part of stern.

Barges or canal boats towed alongside a steam vessel, if on the starboard side of said steam vessel, shall display a white light on her own starboard bow; and if on the port side of said steam vessel, shall display a white light on her own port bow; and if there is more than one barge or canal boat alongside, the white lights shall be displayed from the outboard side of the outside barge or canal boat: *Provided*, That car floats of 200 feet or over in length shall have a white light at each outboard corner of said floats.

When barges or canal boats are massed in tiers and towed at a hawser, as is usual on the Hudson River, there shall be carried on the forward port side of the port boat of each tier a white light, and on the forward starboard side of the starboard boat in each tier a white light, and on the after port side of the port boat in the stern tier a white light, and on the after starboard side of the starboard boat in the stern tier a white light.

The white lights for barges and canal boats referred to in the preceding rules shall be carried at least ten feet and not more than thirty feet abaft the stem or extreme forward end of the vessel, above the deck rail of the vessel on single-decked vessels, and on the upper deck of double or three-decked barges or canal boats; and shall be of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

The colored side lights referred to in these rules for barges and canal boats in tow shall be fitted with inboard screens, so as to prevent them from being seen across the bow, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on either side. The minimum size of glass globes shall not be less than six inches in diameter and five inches high in the clear.

Any barge or canal boat in tow of a steam vessel, when the last boat of a tow, and not required by these rules to carry a light on the stern, on being overtaken by another vessel, shall show from her stern to such last-mentioned vessel a flare-up light; or, in lieu thereof, a white light fixed and carried in a lantern, which shall be so constructed, fitted, and screened that it shall throw an unbroken light over an arc of the horizon of twelve points of the compass, viz, for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile.

Provided, That nothing in these rules shall be construed as compelling barges or canal boats in tow of steam vessels, passing through any waters en route or directly to or from a port where lights for barges or canal boats are different from those of the waters whereon such vessels are usually employed, to change their lights from those required on the waters from which their trip begins or terminates; but should such vessels engage in local employment on waters requiring different lights from those where they are customarily employed, they shall comply with the local rules where employed.

LIGHTS FOR SCOWS IN TOW.

All scows being towed by hawser behind steam vessels shall carry a regulation white light at each end of each scow (such lights to be carried not less than eight feet above the surface of the water, and so as to show all around the horizon), except that when scows are massed in tiers, two or more abreast, each of the outside boats shall carry a white light on its outer bow; and the outside boats in the last tier shall each carry, in addition, a white light on the outer part of the stern.

LIGHTS FOR RAFTS AND OTHER WATER CRAFT NAVIGATING THE INLAND WATERS OF THE ATLANTIC AND PACIFIC COASTS, PROPELLED BY HAND POWER, HORSEPOWER, OR BY THE CURRENT OF THE RIVER.

[Authority: Art. 9 (d), act of Congress approved June 7, 1897.]

Any vessel, except rafts and rowing boats under oars, navigating by *hand power, horsepower, or by the current of the river*, shall carry one white light forward, not less than eight feet above the surface of the water.

Rafts propelled by hand power or by the current of the river, or which shall be anchored or moored in or near a channel or fairway, shall carry white lights, as follows:

Rafts of one crib and not more than two in length shall carry one white light. Rafts of three or more cribs in length and one crib in width shall carry one white light at each end of the raft. Rafts of more than one crib abreast shall carry one white light on each outside corner of the raft, making four lights in all.

The *white light* required by these rules for rafts and other water craft shall be carried, from sunset to sunrise, in a lantern so fixed and constructed as to show a clear, uniform, and unbroken light, visible all around the horizon, and of such intensity as to be visible on a dark night with a clear atmosphere at a distance of at least one mile. The lights for rafts shall be suspended from poles of such height that the lights shall not be less than eight feet above the surface of the water.

RULE RELATING TO THE USE OF SEARCHLIGHTS.

The Board of Supervising Inspectors, at their annual meeting of January, 1905, adopted the following rule relating to the use of searchlights:

Any master or pilot of any steam vessel who shall flash or cause to be flashed the rays of the searchlight into the pilot house of a passing vessel shall be deemed guilty of misconduct and shall be liable to have his license suspended or revoked.

RULE PROHIBITING UNNECESSARY SOUNDING OF THE STEAM WHISTLE.

[Authority: Act of Congress approved February 8, 1907.]

The Board of Supervising Inspectors, at their annual meeting of January, 1907, adopted the following rule:

Unnecessary sounding of the steam whistle is prohibited within any harbor limits of the United States. Whenever any licensed officer in charge of any steamer authorizes or permits such unnecessary whistling, upon conviction thereof before any board of inspectors having jurisdiction such officer shall be suspended from acting under his license as the inspectors trying the case may deem proper.

REGULATIONS FOR TOWS.

[*From Department Circular No. 180, Bureau of Navigation, December 7, 1908. Authority: Act of Congress, approved May 28, 1908.*]

1. Tows of seagoing barges navigating the inland waters of the United States are limited in length to four vessels, including the towing vessel or vessels.

2. Hawsers are limited in length to 75 fathoms, measured from the stern of one vessel to the bow of the following vessel; and should in all cases be as much shorter as the weather or sea will permit.

3. In cases where the prescribed length of hawser is, in the opinion of the master of the towing vessel, dangerous on account of the state of weather or sea, hawsers need not be shortened to that length until reaching the localities named below.

(*a*) Tows bound for Hampton Roads or beyond, before passing Thimble Light.

(*b*) Tows bound up the Chesapeake, to the northward of Baltimore Light.

(*c*) Tows bound up the Delaware, between Fourteen Foot Bank and Cross Ledge lighthouses.

Hawsers may also be lengthened in the same places, under the same circumstances, when tows are bound out.

4. In case of necessity, on account of wind or weather, hawsers of vessels navigating between Race Rock and Gay Head may be lengthened out in the discretion of the master of the towing vessel; but this paragraph shall not apply to Narragansett Bay north of Beavertail light.

5. In all cases where tows can be bunched it should be done.

(*a*) Tows navigating in the North and East rivers of New York must be bunched above a line drawn between the Statue of Liberty and the entrance to Erie Basin. When tows are

entering Long Island Sound from the westward, the lines may be lengthened out to the prescribed length after passing Fort Schuyler; and when bound for New York from Long Island Sound tows must be bunched before passing Whitestone Point.

(*b*) Tows must be bunched above the mouth of the Schuylkill River, Pennsylvania.

6. Section 15 of the act approved May 28, 1908, provides:

> That the master of the towing vessel shall be liable to the suspension or revocation of his license for any willful violation of regulations issued pursuant to section fourteen in the manner now prescribed for incompetency, misconduct, or unskillfulness.

7. Any violation of these regulations shall be reported in writing as soon as practicable to the board of local inspectors of steam vessels most convenient to the officer or other person who may witness the violation.

INLAND WATERS ON THE ATLANTIC COAST OF THE UNITED STATES WHERE THE INLAND RULES OF THE ROAD ARE TO BE FOLLOWED; * * *

(*Bearings are magnetic and given approximately.*)

NANTUCKET SOUND, VINEYARD SOUND, BUZZARDS BAY, NARRAGANSETT BAY, BLOCK ISLAND SOUND, AND EASTERLY ENTRANCE TO LONG ISLAND SOUND.—A line drawn from Chatham light-houses, Mass., S by E ⅜ E, about 6 miles, to Northeast Slue Channel whistling buoy (Pollock Rip); thence S by W ⅝ W, about 11 miles, to Great Round Shoal light-vessel; thence SSW ⅝ W, 7⅝ miles, to Sankaty Head light-house; from the westerly end of Tuckernuck Island NW by W ½ W, about 5½ miles, to Wasque Point, Chappaquiddick Island; from Gay Head light-house W ¾ S, 35 miles, to Block Island (SE) light-house; thence W ¾ S, 15 miles, to Montauk Point light-house, on the easterly end of Long Island, N. Y.

NEW YORK HARBOR.—From Navesink (southerly) light-house NE ⅝ E, easterly, to Scotland light-vessel; thence NNE ½ E, through Gedney Channel whistling buoy to Rockaway Point life-saving station.

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Coast and geodetic survey.

. . . United States coast pilot. Atlantic coast. Part IV. From Point Judith to New York. Fifth edition. Washington: Govt. Print. Offi. 1909.

212 p. 3 maps, 1 illustration, 30 cm. [The first edition of this volume was prepared by Lieut. George H. Peters, U. S. N., assisted by Ensign Edwin H. Tillman, U. S. N., and Mr. John Ross. In the present (fifth) edition the text has been revised and brought up to date by Mr. John Ross and Mr. Herbert C. Graves, under the direction of J. J. Gilbert, assistant, Coast and geodetic survey, Inspector of hydrography and topography.]

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