DEPARTMENT OF COMMERCE AND LABOR

COAST AND GEODETIC SURVEY

O. H. TITTMANN

SUPERINTENDENT

UNITED STATES COAST PILOT

ATLANTIC COAST

PART III

FROM CAPE ANN TO POINT JUDITH

SECOND EDITION

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DEPARTMENT OF COMMERCE AND LABOR,
COAST AND GEODETIC SURVEY,
WASHINGTON, D. C., *August 1, 1903.*

This volume covers the coast from Cape Ann to Point Judith, including the harbors and navigable inland passages.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations carried on in 1902 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 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. Edwin H. Tillman, U. S. N., assisted by Mr. John Ross. In the present (second) edition the text has been revised and brought up to date by Mr. John Ross and Mr. Herbert C. Graves, under the direction of Herbert G. Ogden, Assistant, Coast and Geodetic Survey, Inspector of Hydrography and Topography.

Great courtesy has been shown by local authorities in furnishing information desired for incorporation in this work.

The aids to navigation are correct to August 1, 1903.

As absolute accuracy in a work of this class is scarcely possible, navigators will conf 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.

All bearings and courses are *magnetic.*

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, lighted 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.

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 channel ways 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 will be 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.

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

◊ Red buoys, with even numbers, to be left on starboard hand in entering; if green, yellow, or white, the color is printed close to the buoy.

♦ Black buoys, with odd numbers, to be left on the port hand in entering.

Φ Black and white perpendicular stripes, without numbers, mid-channel or fairway buoys.

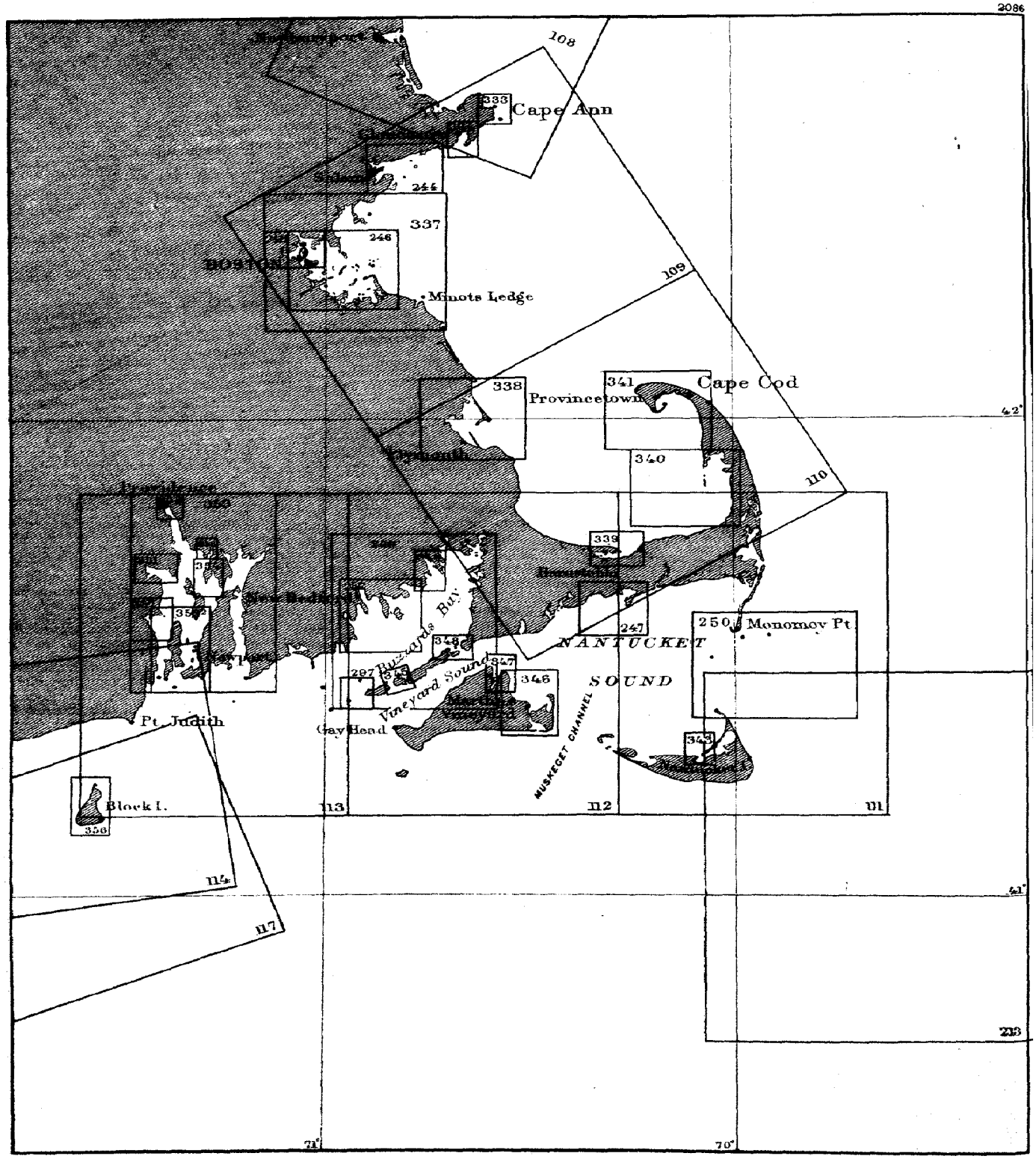
Φ or H. S., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

◊ Lighted buoys, different colors as above.

◊ ***WHISTLE,*** whistling buoys, different colors as above.

◊ ***BELL,*** bell buoys, different colors as above.

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


2086
108
333
Cape Ann
Salem
244
337
246
Boston
Minots Ledge
109
338
Provincetown
341
Cape Cod
42°
Plymouth
340
110
339
New Bedford
Buzzards Bay
247
250
Monomoy Pt
NANTUCKET
SOUND
348
347
346
287
Vineyard Sound
Gay Head
Pt Judith
MUSKEGET CHANNEL
343
Block I.
356
113
112
111
114
41°
117
233
71°
70°

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The following addenda include the changes which occurred to September 5, 1903, while the volume was in press:

PAGES 20-21.

Hog Island Lighthouse.—The dark sector covering Hog Island has been discontinued.

PAGES 117-118.

A recent examination shows the existence of a small spot with 18 and 19 feet over it a little over $\frac{3}{8}$ mile ESE. $\frac{3}{4}$ E. from Dumpling Rock Lighthouse, on the west side and clear of the West Channel ranges.

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART III.

FROM CAPE ANN TO POINT JUDITH.*

GENERAL REMARKS.

This volume, Part III of the "United States Coast Pilot, Atlantic Coast," covers the coast from Cape Ann to Point Judith; the coast of the United States westward of Point Judith, as far as Sandy Hook and including Long Island Sound, is covered by Part IV, and that eastward of Cape Ann by Parts I–II, which also contains a general description of the Gulf of Maine.

Within the limits covered by this volume, the natural features of the coast are very irregular and varied, as is also the hydrography along it. Between Cape Ann and Plymouth entrance, the coast is rocky, generally bold-to, with numerous islands, dry rocks, and sunken ledges lying near but detached from the shore, with deep channels between. The shores of Cape Cod Bay, the eastern and southern shores of Cape Cod, and shores of Nantucket Island are generally sandy with extensive sand shoals extending out well from the shore in many places; this is notably the case eastward of Monomoy Point and Nantucket Island; see description of Monomoy and Nantucket shoals. The coast of Marthas Vineyard is mostly sandy with bowlders scattered along the shore in many places. The south shores of the Elizabeth Islands and the coast from the entrance to Buzzards Bay to Point Judith, including Narragansett Bay, are bold-to and generally rocky, with occasional sand strips, but off the shore numerous rocks, ledges, and shoals, with good channels between them, will be found. The shores of Buzzards Bay have many outlying rocks and ledges; near the head of the bay are extensive sand shoals.

Above, only general features of certain parts of this extensive coast are mentioned; descriptions of certain parts, and accurate information pertaining to the different bodies of water are given under the headings, Massachusetts Bay, Boston Bay, Cape Cod Bay, Nantucket and Vineyard Sounds, Buzzards Bay, and Narragansett Bay. The principal obstacles and difficulties which menace navigation along this coast are the outlying dangers, variable tidal currents, and fogs; the greatest danger from these being in the vicinity of Monomoy and Nantucket shoals.

Prominent features.—For a stranger approaching the coast covered by this volume, there are few prominent natural landmarks which can be readily recognized. The high towers at Scituate, Provincetown, Narragansett Pier, and on Marthas Vineyard, together with the tall wireless telegraph skeleton towers on Cape Cod north of Nanset Beacons, are unmistakable marks when sighted from seaward. The lighthouses form the guides in approaching or running along the coast; at night, it is easy to pick up one light before losing another.

Harbors and anchorages.—The most important harbors are Gloucester, Salem, Boston, Provincetown, Vineyard Haven, New Bedford, Newport, and Providence. These and a number of harbors and anchorages of lesser importance are described under the different headings.

Aids to navigation are numerous, the harbor entrances and most prominent points being marked by lighthouses, and the principal dangers by buoys, beacons, or spindles; light-vessels are in position to mark some of the most frequented and difficult channels. The buoyage accords with the system adopted for United States waters. See page 5, and also the table of lighthouses on pages 12–21.

Pilots.—There are licensed pilots for the ports in the States of Massachusetts and Rhode Island; only certain classes of vessels are exempt from the payment of pilotage. For pilotage laws and rates of pilotage see "Pilot Laws" for States of Massachusetts and Rhode Island in Appendix II.

*These waters fall within the limits of the following charts: **1,000**, Sailing Chart, Mercator projection, Deg. Lat. = 3.7 inches; **51**, General Chart of the coast, Mercator projection, Deg. Lat. = 21.4 inches; **7**, General chart of the coast, scale $\frac{1}{400,000}$; **109, 110, 111, 112, 113**, 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 is an index map, showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts and other publications of the Survey also contain similar index maps; copies of this catalogue can be obtained free of charge on personal application at any of the sale agencies or by letter addressed to the Coast and Geodetic Survey Office, Washington, D. C.

Towboats are generally used by the larger sailing vessels when entering the harbors of Gloucester, Lynn, Boston, New Bedford, and Providence. Sailing vessels in ballast between New York and Boston sometimes employ a towboat for the whole distance, being towed through Nantucket and Vineyard sounds. See also "Towboats" under the different headings.

Harbor control.—Harbor masters are appointed for the harbors in the States of Massachusetts and Rhode Island, and they have charge of the anchorage and berthing of vessels in their respective harbors. For harbor regulations see Appendix II.

Lines within which the Inland Rules of the Road apply.—*Boston Harbor.*—From Point Allerton, **NNE.** ¼ **E.**, easterly, through Point Allerton Beacon to Northeast Grave Whistling Buoy; thence **NNE.** ¼ **E.** to Outer Breaker (Great Pig Rocks) Bell Buoy; thence **NE.** by **E.** ⅜ **E.** to Halfway Rock Beacon; thence **NE.** by **E.** ¼ **E.** to Eastern Point Lighthouse.

All Harbors in Cape Cod Bay, Mass.—A line drawn from Plymouth (Gurnet) Lighthouses **E.**, 16¼ miles, to Race Point Lighthouse.

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.** ⅜ **W.**, about 11 miles, to Great Round Shoal Light-vessel; thence **SSW.** ⅜ **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.

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

Quarantine.—The quarantine laws of the States of Massachusetts and Rhode Island govern the ports of those States. Local municipal officers have the power to make quarantine regulations for the ports under their control. See "Quarantine," Appendix II and Appendix IV.

Storm warning displays.—A table of the storm warning display stations of the United States Weather Bureau is given on page 24, and an explanation of the displays is given in Appendix III.

Marine Hospital.—There is a United States Marine Hospital at Chelsea (near Boston), and at Vineyard Haven, Mass. There are relief stations of Class III of the United States Public-Health and Marine-Hospital Service at Gloucester and New Bedford, Mass., and Newport and Providence, R. I.; and emergency relief stations of Class IV at Barnstable, Chatham, Dennis, Edgartown, Hyannis, Provincetown, and Salem, Mass.

Supplies.—Coal can be had at Boston, New Bedford, Newport, Fall River, and Providence, and a limited supply may be had at Gloucester, Salem, Provincetown, and Hyannis. Water, provisions, and some ship-chandler's stores can be obtained at the above places and at many of the smaller cities and towns. A complete line of ship's supplies can be obtained at Boston.

Repairs.—There are docking facilities at Boston, New Bedford, and Providence, where also repairs can be made to the machinery of steamers. Sailing vessels and steamers of large size can be docked only at Boston. See "Repairs" under the headings, Boston, New Bedford, and Providence.

The prevailing winds in summer are southwesterly and in winter northerly.

Fogs are liable to occur at any season, but are more frequent from April to October than at any other time during the year. They are usually brought by easterly and southerly winds and occasionally by southwesterly winds. Westerly and northerly winds clear away the fog.

Ice.—In severe winters some of the harbors are closed to navigation by ice, and there is more or less drift ice in all the harbors, in Cape Cod Bay, on Monomoy and Nantucket shoals, and in Nantucket and Vineyard sounds. In the principal harbors steamers and tugs usually keep a channel open. See "Ice" under the different headings.

TIDES.*

GENERAL TABLE.

Locality.	Lunitidal Intervals.† High water.		Lunitidal Intervals.† Low water.		Correction for standard time.	Rise and Fall (Range). Mean tides.	Spring tides.	Neap tides.	Rise of highest tide observed.
	h.	m.	h.	m.	m.	Feet.	Feet.	Feet.	Feet.
Gloucester Harbor	11	02	4	49	−17	8.9	10.2	7.5	13.1
Salem Harbor	11	16	5	03	−16	9.2	10.6	7.7	13.3
Boston, Navy Yard	11	27	5	17	−16	9.6	11.0	8.1	13.8
Boston Lighthouse	11	09	4	56	−16	9.5	10.9	8.0	13.6
Plymouth Harbor	11	19	5	08	−17	10.2	11.7	8.6	14.6
Barnstable Harbor	11	36	5	25	−19	10.1	11.6	8.5	14.5
Provincetown Harbor	11	29	5	17	−19	9.2	10.6	7.7	13.3
Monomoy Point	12	00	5	38	−20	3.7	4.3	3.1	5.5
Nantucket (Great Point) Lighthouse	12	10	5	40	−20	3.0	3.7	2.2	4.6
Chatham Roads	0	06	6	04	−20	3.5	4.3	2.6	5.2
Nantucket Harbor	0	04	6	00	−20	3.1	3.8	2.3	4.7
Hyannis Harbor	12	23	5	35	−19	3.1	3.8	2.3	4.7
Edgartown Harbor	12	16	5	21	−18	2.0	2.4	1.5	3.0
Vineyard Haven Harbor	11	43	5	03	−18	1.7	2.1	1.2	2.7
Woods Hole	8	36	2	09	−17	1.7	2.1	1.2	2.7
Quicks Hole, south side	7	38	1	29	−17	3.1	3.8	2.3	4.7
Gay Head Lighthouse	7	31	1	20	−17	3.0	3.7	2.2	4.6
Cuttyhunk Lighthouse	7	36	0	59	−16	3.5	4.3	2.6	5.2
New Bedford Harbor	7	57	1	18	−16	4.2	5.2	3.1	6.3
Bird Island Lighthouse	7	55	0	59	−17	4.3	5.3	3.1	6.5
Beavertail Lighthouse	7	40	1	09	−14	3.8	4.7	2.8	5.7
Newport Harbor	7	48	1	00	−15	3.5	4.4	2.6	5.3
Fall River Harbor	8	10	0	51	−15	4.9	5.8	4.0	7.0
Providence Harbor	8	12	0	57	−14	4.4	5.4	3.4	6.6

*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.

VARIATION OF THE COMPASS.

The magnetic variations for 1903, and annual increase at points mentioned, are as follows:

Locality.	Variation.	Annual increase.
	°	′
Cape Ann whistling buoy	13½ W.	2
Bakers Island Lighthouse, Salem Entrance	13	2
Boston Light-vessel	13	2
Cape Cod Bay	12¾	2
Off Nanset Lighthouses	13	2
Handkerchief Light-vessel, Nantucket Sound	12½	2
Nantucket Shoals Light-vessel	12	2
Cape Poge	12	2
Gay Head	11¾	2
Hen and Chickens Light-vessel, Buzzards Bay	12	2
Brenton Reef Light-vessel, Narragansett Bay Entrance	11¾	2
Off Bristol, R. I.	12	2

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the **Second and Third Lighthouse Districts** of the United States. These districts extend from Hampton, New Hampshire, to a point on the coast opposite Shrewsbury Rocks, New Jersey. The Light list for the Atlantic and Gulf coasts of the United States and the Buoy lists for the Second and Third Districts give full descriptions of the aids to navigation.

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	CAPE ANN (N.)	42 38 21 70 34 31	Fixed white	1	161¾	19
2	CAPE ANN (S.)	42 38 13 70 34 32	Fixed white	1	165½	19
3	Eastern Point	42 34 (49) 70 39 (54)	Flashing red every 5 seconds	4	56½	13
4	Dog Bar Breakwater Beacon	42 34 (56) 70 40 (16)				
5	Tenpound Island	42 36 07 70 39 58	Flashing white every 5 seconds	6	43½	12
	SALEM HARBOR:					
6	Baker Island	42 32 12 70 47 11	Fixed white	4	111	16¼
7	Baker Island Beacon		Fixed white	4	91¼	15¼
8	Hospital Point	42 32 48 70 51 23	Fixed white	3½	69¾	13¾
9	Fort Pickering	42 31 36 70 52 01	Fixed white	6	28¼	10½
10	Derby Wharf	42 31 00 70 53 03	Fixed red	6	22	7½
11	Marblehead	42 30 (20) 70 50 (03)	Fixed white	5	130	11¼
12	Egg Rock	42 26 01 70 53 54	Fixed red	5	90	8½
	LYNN HARBOR:					
13	White Rocks	42 25 (35) 70 57 (15)	{Fixed red {Fixed white	Post lantern.	{24 {16	
14	Black Rocks	42 25 (55) 70 56 (57)	Fixed red	Post lantern.	20	
15	Sandy Point	42 26 (26) 70 56 (36)	Fixed red	Post lantern.	20	
16	Black Marsh Channel	42 26 (53) 70 56 (35)	Fixed red	Post lantern.	20	
17	Upper Turn Beacon	42 27 (12) 70 56 (34)	Fixed white	Post lantern.	20	
	BOSTON BAY:					
18	*Boston Light-vessel, No. 54*	42 20 (22) 70 45 (26)	Two fixed red	Refl'r	{38 {38	11½
19	MINOTS LEDGE	42 16 11 70 45 35	Flashing white, signaling "143" every 30 seconds, thus: 1 flash, eclipse 3 seconds; 4 flashes, eclipse 3 seconds; 3 flashes, eclipse 15 seconds.	2	84½	14¾
20	BOSTON	42 19 41 70 53 26	Flashing white every 30 seconds	2	102	15¾
21	BOSTON (Auxiliary)		Fixed white between two fixed red sectors; one red sector between NE. ⅞ E. and NE. by E. ⅜ E.; the other red sector between ENE. ⅛ E. and ENE. ⅞ E.	Refl'r	34	
22	Narrows	42 19 (22) 70 55 (11)	Fixed red	5	45	8½
23	Windmill Point Beacon	42 18 (10) 70 55 (20)	Fixed red	Lens lantern.	20	
24	Range. {Lovells Island Front	42 19 (59) 70 55 (49)	Fixed white	4	31	
25	Range. {Lovells Island Rear		Flashing red every 5 seconds	4	40	

CAPE ANN TO POINT JUDITH.

These pamphlets, which are corrected and reprinted from time to time, 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 Second Lighthouse District, Post-Office Building, Boston, Mass., and Inspector of the Third Lighthouse District, Tompkinsville, Staten Island, N. Y. They can also be had on application at the United States Branch Hydrographic Offices, Customhouse, Boston, Mass., and Maritime Exchange, Produce Exchange Building, New York City.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Two gray-stone towers; lanterns, black. Work rooms, stone color; covered walks and northerly dwelling, white; one southerly dwelling light-drab and one white. Brick fog-signal house near easterly shore of island, and white oilhouse about midway between towers.	112½	10-inch steam whistle; alternate blasts of 8 and 4 seconds; alternate silent intervals of 4 and 44 seconds.
2		112½	
3	White conical tower with black lantern; white dwelling to eastward and white bell tower to westward; white covered way connects tower, dwelling, and bell-tower; white oilhouse 135 feet NW. and a white signal mast, 65 feet high, 131 feet ESE. ⅝ E. from light-tower.	30¾	A 4,000-pound bell struck by machinery a double blow every 20 seconds.
4			*To be established.*
5	Brown conical tower; lantern, black. White dwelling E. of tower	25	
6	Two white towers; lanterns, black. Southeasterly tower, conical; northwesterly tower, low octagonal pyramid, connected with a white dwelling by a covered way, 64 feet long. White bell-tower N. of southeasterly tower. White brick oilhouse 320 feet W. by N. from northwesterly tower.	54¼	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
7		34½	
8	White pyramidal tower; lantern, black. Dwelling and outhouses, white; red-brick oilhouse 103 feet easterly from tower.	40	
9	Brown conical tower with white base; lantern, black. White bridge from tower to shore.	32¼	
10	Red square tower, with black lantern	17½	
11	Square, pyramidal, skeleton iron tower with central stair cylinder; brown from foundation to gallery floor, black above; a white covered way, 150 feet long, connects with dwelling. Dwelling and outhouses white.	100	
12	Black lantern and square gallery, on square, pyramidal, white brick tower, attached to white wooden dwelling.	32	
13	Black spindle surmounting a black pile dolphin		
14	Black spindle surmounting a black pile dolphin		
15	Black spindle surmounting a black pile dolphin		
16	Black spindle surmounting a black pile dolphin		
17	Red spindle surmounting a red pile dolphin		
18	Steam light-vessel, two masts, schooner-rigged, no bowsprit. Mastheads white, with a red, circular, iron cage-work daymark at each. Hull red, with "BOSTON" in white on each side and "54" in white on each bow. A black smokestack and the fog signal between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
19	Dark-gray, conical granite tower, with black lantern	89	Bell struck by machinery every 30 seconds.
20	White conical tower; lantern, black. White dwelling large, rain sheds; white; brick fog-signal house with frame annex, and square white building grouped closely about tower. Another white dwelling and small white structure to westward of group. Small white oilhouse to southward of westerly dwelling.	80½	1st-class steam siren; blasts 5 seconds, alternate silent intervals of 10 and 40 seconds.
21	Small, white wooden structure	9	
22	Black lantern on white hexagonal dwelling; pile foundation	45	Bell struck by machinery every 20 seconds.
23	White post		
24	Black lantern on white conical tower	26	
25	Black lantern on white conical tower	37	

TABLE OF LIGHTS.

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.
	BOSTON BAY—Continued.	° ′ ″				
26	Deer Island	42 20 (24) 70 57 (18)	Fixed white varied by a red flash every 30 seconds.	5	53	12¾
27	Long Island Head	42 19 (49) 70 57 (29)	Fixed white	3½	119½	16¾
28	Range. Broad Sound Channel Inner Front	42 19 (40) 70 59 (02)	Flashing white every 5 seconds	4	53	------
29	Range. Broad Sound Channel Inner Rear	------	Fixed red	4	70	------
30	Range. Spectacle Island Front	42 19 (41) 70 59 (07)	Fixed red	Refl'r	29	------
31	Range. Spectacle Island Rear	42 19 (39) 70 59 (04)	Fixed red	Refl'r	54	------
32	Range. South Boston Front	42 19 (57) 71 01 (18)	Two fixed red, electric arc	Refl'r	{34} {34}	------
33	Range. South Boston Rear	42 19 (54) 71 01 (46)	Fixed red, electric arc	Refl'r	45	------
34	Scituate Breakwater	------	Fixed red	Post lantern.	31	------
	CAPE COD BAY:					
35	Range. Plymouth (Gurnet)	42 00 12 70 36 04	Fixed white; *obscured between N. by W. ¾ W. and N. ¼ E.*	4	102¼	15¾
36	Range. Plymouth (Gurnet) Beacon	------	Fixed white	4	102¼	15¾
37	Duxbury Pier	41 59 15 70 38 57	Fixed red	5	34¾	8½
38	Race Point	42 03 45 70 14 37	Fixed white varied by a white flash every 90 seconds; *obscured when bearing about SE. by E. ⅜ E.*	4	41¼	11¾
39	Wood End	42 01 17 70 11 38	Flashing red every 15 seconds	5	45	12
40	Long Point	42 01 59 70 10 09	Fixed white	5	35½	11¼
41	Mayo Beach	41 55 (49) 70 02 (05)	Fixed white	Refl'r	36	------
42	Billingsgate Island	41 52 18 70 04 10	Fixed white	4	41¼	11¾
43	Sandy Neck	41 43 22 70 16 53	Fixed white	5	47¾	12¼
44	CAPE COD	42 02 23 70 03 40	Flashing white every 5 seconds	1	183	19¾
45	NAUSET BEACH	41 51 (39) 69 57 (05)	Fixed white	4	97	15½
46	------	------	Fixed white	4	97	15½
47	------	------	Fixed white	4	97	15½
48	CHATHAM (N.)	41 40 18 69 57 01	Fixed white	4	79¾	14½
49	CHATHAM (S.)	41 40 17 69 57 01	Fixed white	4	79¾	14½
	EASTERLY ENTRANCE TO NANTUCKET SOUND:					
50	*Pollock Rip Shoals Light-vessel, No. 73*	41 36 (40) 69 53 (47)	{Fixed white (foremast) {Fixed red (mainmast) Three lanterns encircling each masthead.	Lens lantern.	{30 {42	10½ 11¾
51	*Pollock Rip Light-vessel, No. 47*	41 32 (17) 69 54 (36)	Two fixed red	Refl'r	{37} {37}	11¼
52	MONOMOY POINT	41 33 34 69 59 39	Fixed white with a fixed red sector between W. ¼ S. and W. ⅞ N.	4	47	12¼

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
26	Brown conical tower; lantern, black; on black, cylindrical foundation pier expanding in trumpet shape under main gallery, gallery covered by roof.		Bell struck by machinery every 10 seconds.
27	White brick tower; lantern, black. White dwelling 30 feet SW. of tower, and connected to it by a white covered way, white oilhouse near the crest of the bank, 170 feet WSW. ⅜ W., white barn 145 feet SSW. ¾ W., and white fuel house 100 feet S. by W. ½ W. of tower.	45½	
28	Black lantern on red conical tower	24	
29	Black lantern on red conical tower	35	
30	White, octagonal, pyramidal, shingled tower	13	
31	White, octagonal, pyramidal, shingled tower	23	
32	Lanterns 10 feet apart horizontally, suspended from a white mast, with black ironwork, on roof of covered way.		
33	White mast with black ironwork		
34	Lantern suspended from a spar		
35	Two white octagonal, pyramidal towers, connected by covered way; lanterns, black; dwelling, white, with green blinds. White oilhouse about 90 feet SW. by W. and white signal mast, 65 feet high, 264 feet NE. by E. from southerly tower.	34	
36		34	
37	Brown conical tower surrounded by a gallery; lantern, black	42	A 1,000-pound bell struck by machinery every 15 seconds.
38	Brown tower; lantern, black. Two white dwellings and barn. A brick fog-signal house about 150 feet northerly and a white signal mast, 65 feet high, 280 feet WSW. from tower.	35	10-inch or 12-inch steam whistle; blasts 4 seconds, alternate silent intervals of 8 and 44 seconds.
39	White pyramidal tower; lantern, black. White dwelling 50 feet to NE	34	Bell struck by machinery every 15 seconds.
40	White square tower; lantern, black. White dwelling to the southward, and bell-tower to the northward.	32	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
41	Brown tower; lantern, black. White dwelling, westerly of tower and close to it	25	
42	Red square tower, connected with dwelling by a short covered way; lantern, black	33½	
43	White tower; lantern, black. White dwelling, 20 feet westerly of tower	46¾	
44	White tower and dwellings, connected by white covered ways; lantern, black. White fog-signal house to northeastward of dwelling.	55	First-class Daboll trumpet; blasts 8 seconds, silent intervals 30 seconds.
45	Three white conical towers, shingled, 150 feet apart, ranging N. and S.; lanterns, black; dwelling and barn white. White signal mast, 65 feet high, 83 feet SSE. ⅞ E. from middle tower; white oilhouse about 150 feet westward from north tower.	22	
46		22	
47		22	
48	Two white conical towers 100 feet apart, ranging N. and S.; lanterns, black. White dwelling between the towers. White brick oilhouse 90 feet S. from south tower.	42½	
49		42½	
50	Flush-deck steam light-vessel; two masts, schooner-rigged, no bowsprit; red, circular, wire daymark at each masthead. Hull red, with "POLLOCK RIP SHOALS" in white on each side, and "73" in white on each bow and each quarter. Masts, brown; black smokestack and the fog signal between the masts. Boats, red; lamphouses, white.		12-inch steam chime whistle; blasts 3 seconds, silent intervals 12 seconds. If whistle be disabled a bell will be rung by hand.
51	Two masts, schooner-rigged, no bowsprit; red hoop-iron day mark at each masthead. Hull red, with "POLLOCK RIP" in white on each side, and "47" in white on each bow and on stern. A black smokestack and the fog signal are between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be rung by hand.
52	Red tower, connected with white dwelling by covered way; lantern, black. White oilhouse 123 feet NNW. and white signal mast, 65 feet high, 197 feet SSE. ½ E. from tower.	34¾	

TABLE OF LIGHTS.

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.
		° ′ ″				
53	*Shovelful Shoal Light-vessel, No. 3*	41 32 (42) 69 59 (17)	Fixed red	Refl'r	40	11½
54	*Handkerchief Light-vessel, No. 4*	41 29 (14) 70 04 (00)	Two fixed white	Lens lantern. R'fl'r	40 40	11½
55	*Great Round Shoal Light-vessel, No. 42*	41 24 (10) 69 54 (55)	Two fixed white	Refl'r	45 45	12
56	NANTUCKET (Great Point)	41 23 24 70 02 46	Fixed white with a fixed red sector between E. ⅝ S. and SE. by E. ½ E.	3	69¾	13¾
57	SANKATY HEAD	41 17 01 69 57 57	Fixed white varied by a white flash every minute.	2	166	19
58	*Nantucket Shoals Light-vessel, No. 66*	40 37 (05) 69 36 (33)	Two fixed white 12 seconds, eclipse 3 seconds; four lanterns encircling each masthead; electric. If the electric-light apparatus should become inoperative, the lights will show fixed white *without eclipses* and will be *less brilliant* than the electric lights.	Lens lantern.	57 57	13
59	GAY HEAD	41 20 55 70 50 08	Flashing white and red; every fourth flash red; interval between flashes 10 seconds; *obscured between N. ½ W. and N. by E.*	1	170	19¼
	NANTUCKET SOUND:					
60	Brant Point	41 17 24 70 05 27	Fixed white	4	26	10¼
61	Range. Nantucket Cliff Front	41 17 38 70 06 24	Fixed white	Refl'r	15¾	
62	Range. Nantucket Cliff Rear	41 17 36 70 06 25	Fixed red	Refl'r	26¼	
63	Nantucket West Breakwater Beacon		Fixed red	Lens lantern.	12	
64	Nantucket East Breakwater Beacon		Fixed white	Lens lantern.	12	
65	Stage Harbor	41 39 32 69 59 03	Fixed white	4	40	11½
66	Bass River	41 39 06 70 10 11	Fixed white	5	41	11½
67	Bishop and Clerks	41 34 28 70 15 02	Flashing white with a flashing red sector between N. ½ W. and NNE. ½ E., interval between flashes 30 seconds.	4	56¼	13
68	Range. Hyannis	41 38 11 70 17 20	Fixed red	Refl'r	42½	
69	Range. Hyannis Beacon	41 38 (00) 70 17 (22)	Fixed red	Refl'r	22	
70	*Cross Rip Light-vessel, No. 5*	41 26 (43) 70 17 (29)	Fixed red	Refl'r	39	11½
71	*Succonnesset Shoal Light-vessel, No. 6*	41 31 (56) 70 26 (15)	Fixed white	Refl'r	40	11½
72	Cape Poge	41 25 16 70 27 06	Flashing white and red, every third flash red; interval between flashes 5 seconds.	4	53¾	12¾
	VINEYARD SOUND:					
73	Edgartown	41 23 27 70 30 13	Fixed white	4	48	12¾
74	Cottage City South Breakwater Beacon	41 27 (38) 70 33 (25)	Fixed green	Post lantern.	14½	
75	Cottage City North Breakwater Beacon	41 27 (40) 70 33 (26)	Fixed red	Post lantern.	14½	
76	East Chop	41 28 (13) 70 34 (05)	Flashing red every 10 seconds	4	79	14½

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
53	Two masts, schooner-rigged, no bowsprit, red hoop-iron daymark at main masthead. Hull black, with white stripe covering bulwarks; "SHOVELFUL" in black on each side, and "3" in black on each quarter.		Bell or horn.
54	Two masts, schooner-rigged, no bowsprit, black hoop-iron daymark at each masthead. Hull, straw-color, with "HANDKERCHIEF" in black on each side, and "No. 4" in black on each quarter. Lens lantern at foremast head.		Bell or horn.
55	Two masts, schooner-rigged, no bowsprit, lead-colored iron daymark at each masthead. Hull, lead-color, with "GREAT ROUND SHOAL" in black on each side, and "42" in black on each bow and on the stern. A black smokestack and the fog signal are between the masts.		10-inch whistle operated by compressed air; blasts 5 seconds, silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
56	White tower with covered way and white frame dwelling; lantern, black. Small white oilhouse to southward of dwelling.	65½	
57	Tower white near the top and bottom, with red band in the middle; lantern, black. A white, framed, double dwelling and barn near southerly side of tower. White oilhouse 170 feet N. of tower.	62	
58	Flush-deck, steam light-vessel, two masts, schooner-rigged, no bowsprit. Circular white gallery under the lens lanterns at each masthead. Hull, red with "NANTUCKET SHOALS" in white on each side, and "66" in white on each bow and each quarter. A large and a small black smokestack and the fog signal are between the masts.		12-inch steam chime whistle; blasts 5 seconds, silent intervals 25 seconds. If whistle be disabled a bell will be rung by hand.
59	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds, white. White oilhouse near bluff, northwesterly from tower.	40	
60	White, cylindrical, shingled tower, on pile foundation; black lantern: footbridge to higher part of shore; dwelling connected by a short covered way, with discontinued lighthouse 596 feet W. $\frac{5}{16}$ N. from new tower.	26	
61	Two small, white, pyramidal structures, with red roofs	11	
62		23¼	
63	Black post on a conical pile of riprap stone		
64	Black post on a conical pile of riprap stone		
65	Brown tower; lantern, black; brown dwelling, 50 feet southerly of tower	36¼	
66	Black lantern on white dwelling	30	
67	Gray granite tower, with lead-colored fog-bell tower attached to the westerly side; lantern, black.	59½	Bell struck by machinery every 15 seconds.
68	White tower and dwelling connected by a short covered way; lantern, black; red-brick oilhouse 110 feet southerly from tower.	19¾	
69	Small frame shed, lead-color	15	
70	Two masts, schooner-rigged, no bowsprit; white hoop-iron daymark at each masthead. Hull, black, with white stripe; and "CROSS RIP" in white on each side, and "5" in white on each quarter.		Bell or horn.
71	Two masts, schooner-rigged; red hoop-iron daymark at mainmast head. Hull, straw-color, with "SUCCONNESSET" in black on each side, and "6" in black on each quarter.		Bell or horn.
72	White conical wooden tower, shingled; lantern, black. A white double dwelling southerly, and a white brick oilhouse 242 feet WSW. ¾ W. from tower.	34¼	
73	Black lantern on white dwelling. A bridge, ¼ mile long, connects station with the shore. Gray oilhouse on bridge.	36	
74	Red iron spindle		
75	Red iron spindle		
76	Brown tower; lantern, black. Dwelling and wood shed, white; white brick oilhouse 90 feet S. by E. from light-tower.	35¼	

TABLE OF LIGHTS.

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.
	VINEYARD SOUND—Continued.	° ′ ″				
77	West Chop	41 28 (51) 70 36 (01)	Fixed white with a fixed red sector between WNW. and N. by W. ¾ W.	4	83½	14¾
78	Nobska Point	41 30 57 70 39 20	Fixed white with a fixed red sector between W. ¼ N. and NW. by W. ⅝ W.	4	86½	15
79	Grassy Island Ledge Beacon	41 31 (16) 70 40 (35)	Fixed red	Post lantern.	13	------
80	Middle Ledge Beacon	41 31 (07) 70 41 (03)	Two fixed red	Post lantern.	{24} {18}	------
81	Tarpaulin Cove	41 28 08 70 45 29	Fixed white varied by a white flash every 30 seconds.	4	77½	14½
82	GAY HEAD	41 20 55 70 50 08	Flashing white and red; every fourth flash red; interval between flashes 10 seconds; *obscured between N. ½ W. and N. by E.*	1	170	19¼
83	*Vineyard Sound (Sow and Pigs) Light-vessel, No. 41*	41 22 (47) 71 00 (00)	Two fixed red	Refl'r	{34} {34}	11
84	*Hen and Chickens Light-vessel, No. 2*	41 27 (02) 71 01 (06)	Fixed white	Refl'r	25	10
	BUZZARDS BAY:					
85	Cuttyhunk	41 24 (52) 70 57 (00)	Fixed white	5	61	12¾
86	Dumpling Rock	41 32 (18) 70 55 (19)	Fixed white with a fixed red sector between NE. ½ N. and NE. ¾ E.	5	48	12¼
87	Butler Flats	41 36 14 70 53 42	Flashing white every 5 seconds	5	53	12¾
88	Range. Palmer Island	41 37 37 70 54 35	Fixed red	5	34¼	8½
89	Range. Wamsutta Mill	41 38 (54) 70 55 (35)	Fixed white	Electric	91½	------
90	Ned Point	41 39 (03) 70 47 (46)	Fixed white	Lens lantern.	40½	------
91	Bird Island	41 40 (10) 70 43 (04)	Fixed white varied by a white flash every 80 seconds.	5	37	11¼
92	Wings Neck	41 40 (49) 70 39 (42)	Fixed white	5	49¾	12¼
93	Sakonnet	41 27 11 71 12 10	Fixed white 30 seconds, followed by three red flashes, interval between flashes 10 seconds.	4	68¼	14
94	*Brenton Reef Light-vessel, No. 39*	41 25 (52) 71 22 (36)	Two fixed white	Refl'r	{38} {38}	11½
95	BEAVERTAIL	41 26 58 71 24 00	Eight white flashes, interval between flashes nearly 2 seconds, interval between groups of flashes 15 seconds.	4	64¼	13½
	NARRAGANSETT BAY:					
	EASTERN PASSAGE.					
96	Castle Hill	41 27 44 71 21 48	Flashing red every 30 seconds	5	40¼	11½
97	Fort Adams Fog-Signal Station	41 28 (53) 71 20 (15)	------	------	------	------
98	Lime Rock	41 28 39 71 19 35	Fixed red	6	28¼	7½
99	Newport Harbor	41 29 36 71 19 39	Fixed white 15 seconds, eclipse 5 seconds	4	31¼	10¾
100	Rose Island	41 29 44 71 20 36	Fixed red	6	48¼	7½
101	Gull Rocks	41 30 09 71 20 01	{Fixed white (E. light) {Fixed red (W. light)	Lens lantern.	42¾	------

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
77	Cylindrical, white, brick tower, with brick service room attached; lantern, black; two white dwellings. Fog-signal house, white, with red roof, about 100 feet NE. of tower. White brick oilhouse 218 feet E. ⅝ S. of tower.	50½	10-inch steam whistle; blasts 3 seconds, silent intervals 27 seconds.
78	Brown tower; lantern, black. A brown dwelling, with white trimmings, 40 feet E. of the light-tower, to which it is connected by a white covered way. Bell-tower 320 feet SW., and red-brick oilhouse 160 feet ENE. 7/12 E. from light-tower.	35	Bell struck by machinery a single and a double blow alternately, intervals 30 seconds.
79	Red iron spindle with cask on end on top		
80	Lanterns hung one vertically below the other, on black iron spindle with cask on its bilge on top.		
81	White tower; lantern, black; white dwelling and barn; pyramidal, shingled bell-tower at water's edge, westerly from light-house.	34½	Bell struck by machinery every 15 seconds.
82	Red tower and dwelling, connected by a short covered way; lantern, black. Barn and sheds, white. White oilhouse, near bluff, northwesterly from tower.	40	
83	Two masts, schooner-rigged, no bowsprit; red hoop-iron daymark at each masthead. Hull red, with "VINEYARD SOUND" in white on each side, and "41" in white on each bow and on the stern. A smokestack and the fog signal are between the masts.		12-inch steam whistle; blasts 6 seconds, silent intervals 45 seconds. If whistle be disabled a bell will be rung by hand.
84	Two masts, schooner-rigged, no bowsprit; black hoop-iron daymark at mainmast head. Hull, black, with "HEN & CHICKENS" in white on each side, and "No. 2" in white on each quarter.		Bell or horn.
85	White, conical, shingled tower with black lantern; connected by a white covered way, with a white frame dwelling.	39¾	
86	Black lantern on white frame tower attached to northeasterly corner of white frame dwelling. White fog-signal house 85 feet and red-brick oilhouse 110 feet southerly of lighthouse. Timber bulkhead on easterly side of rock, outside of buildings.	35	Second-class Daboll trumpet; blasts 3 seconds, silent intervals 12 seconds. If trumpet be disabled a bell will be struck by hand.
87	Black cylindrical foundation surmounted by a conical, white, brick tower with a brown watchroom and black lantern. A white gallery with roof surrounds the base of the tower.		Bell struck by machinery a double blow every 15 seconds.
88	White tower, connected with higher part of island by a white covered way 95 feet long; lantern, black; white dwelling 278 feet SW. by W. ¼ W. from light-tower; square, white, pyramidal bell-tower, connected with shore by a bridge, 180 feet SSW. ½ W. from light-tower.	34	Bell struck by machinery every 10 seconds.
89			
90	White tower connected to white dwelling by covered way; lantern, black	33½	
91	White tower and white frame dwelling; lantern, black	31	Bell struck by machinery a double blow every 12 seconds.
92	White, hexagonal, frame tower 20 feet southwesterly from and connected to a white frame dwelling by a covered way; lantern, black.	32¾	Bell struck by machinery every 10 seconds.
93	White conical tower on brown cylindrical foundation; lantern, black	43	
94	Two masts, schooner-rigged, no bowsprit; circular, black, cagework daymark at each masthead. Hull, straw-color, with "BRENTON REEF, No. 39," in black on each side; black smokestack and two whistles between the masts.		12-inch and 6-inch steam whistles; blasts, low tone 3 seconds, higher tone 3 seconds, silent intervals 24 seconds.
95	Square granite tower, upper half white, attached to southeasterly angle of white dwelling. Fog-signal building about 80 feet southerly of tower.	45½	Second-class compressed-air siren; blasts 4 seconds, alternate silent intervals of 10 and 50 seconds.
96	Conical, granite tower, upper half white, on granite pier; lantern, black		Bell struck by machinery every 30 seconds.
97	Square, pyramidal frame tower, base white, upper part shingled, natural color		Bell struck by machinery every 10 seconds.
98	Lantern on northwesterly corner of white dwelling	13	
99	White, stone tower and attached dwelling	29	Bell struck by machinery every 15 seconds.
100	Black lantern on white dwelling, with Mansard roof	30	Bell struck by machinery a double blow every 15 seconds.
101	Wedge-shaped, wooden building, shingled, natural color, with truncated gable ends.	33	Bell struck by machinery every 5 seconds.

TABLE OF LIGHTS.

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.
	NARRAGANSETT BAY—Continued.					
	EASTERN PASSAGE—Continued.	° ′ ″				
102	Gould Island	41 32 03 71 20 37	Flashing white every 10 seconds	5	50¼	12½
103	Prudence Island	41 36 21 71 18 14	Fixed white	5	28	10½
104	Hog Island Shoal	41 37 (57) 71 16 (22)	Fixed white; dark sector between SE. ¾ E. and S. ⅝ W., covering Hog Island.	4	53½	12½
105	Muscle Bed Shoals	41 38 11 71 15 38	Fixed red	6	33	7½
106	Bristol Ferry	41 38 34 71 15 39	Fixed white	5	33	11
107	Borden Flats	41 42 16 71 10 29	Flashing white every 10 seconds	5	48	12
	NARRAGANSETT BAY:					
	WESTERN PASSAGE—					
108	Whale Rock	41 26 40 71 25 27	Fixed red	4	71	11¼
109	Dutch Island	41 29 48 71 24 17	Fixed white	4	54¼	12¾
110	Plum Beach	41 31 49 71 24 20	Flashing white every 5 seconds	4	53.75	13
111	Wickford Harbor	41 34 22 71 26 14	Fixed white	5	50	12½
112	Conanicut Island	41 34 25 71 22 20	Fixed red	5	45¼	8½
113	Warwick	41 40 01 71 22 43	Fixed white	4	52	12½
	PROVIDENCE RIVER:					
114	Conimicut	41 43 01 71 20 44	Fixed white with a fixed red sector between N. by W. ¼ W. and N. ¾ W.	4	58	13
115	Bullock Point	41 44 16 71 21 53	Fixed red	6	48	7½
116	Sabine Point	41 45 44 71 22 33	Fixed red	6	49	7½
117	Pomham Rocks	41 46 40 71 22 12	Fixed red	6	67	7½
118	Fuller Rock	41 47 39 71 22 49	Fixed red	6	26	7½
119	Sassafras Point	41 48 01 71 23 31	Fixed red	6	23	7½
120	POINT JUDITH	41 21 40 71 28 55	Flashing white every 15 seconds	4	65	13½

In the foregoing table the names of the lights are printed as follows, viz:

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, and harbor lights.

The geographical 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 geographical 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.

CAPE ANN TO POINT JUDITH.

Number.	Description of station.	Height, in feet, from base of structure to center of lantern.	Fog signal.
102	Conical tower, upper half white, lower half red-brick color, surmounted by a black lantern. Keeper's dwelling—first story, red brick; second story and roof, shingled, natural color; 30 feet southerly of tower.	30	Bell struck by machinery every 15 seconds.
103	White octagonal tower; white fog-signal structure northeasterly of tower	25	Bell struck by machinery every 15 seconds.
104	Black, cylindrical, iron pier, supporting a white gallery, surmounted by a white, conical, iron tower; white conical roof surrounds lower part of tower and covers gallery; lantern, black.		Compressed-air siren; blasts 3 seconds, silent intervals 10 seconds.
105	Lantern on gable of small red dwelling, on square granite pier	19	Bell struck by machinery every 20 seconds.
106	White square tower; dwelling attached; lantern, black	28	
107	White conical tower on brown cylindrical foundation; lantern, black	35	Bell struck by machinery every 15 seconds.
108	White conical tower on red cylindrical foundation; lantern, black	73	Bell struck by machinery a double blow every 20 seconds.
109	White square tower and attached dwelling	35	Bell struck by machinery every 15 seconds.
110	Black cylindrical pier expanding in trumpet shape at its upper end to form a gallery, above which rises a conical tower, lower half white, upper half brown, surmounted by a brown lantern. A brown conical roof surrounds the lower part of tower and covers the gallery.		Bell struck by machinery a double blow every 30 seconds.
111	White square tower and attached dwelling on a red iron pier; lantern, black	42	Bell struck by machinery every 20 seconds.
112	Square wooden tower on corner of frame dwelling. Tower and dwelling, white; lantern, black.	37	Compressed-air siren; blasts 3 seconds, silent intervals 17 seconds. If siren be disabled a bell will be struck by machinery a double blow every 10 seconds.
113	White square tower on old, stone dwelling; detached frame dwelling to northward	28	Compressed-air siren; blasts 3 seconds, silent intervals 3 seconds. If siren be disabled a bell will be struck by machinery a single and a double blow alternately, intervals 20 seconds.
114	White conical tower on brown cylindrical foundation; boat platforms on easterly and westerly sides.	60	Bell struck by machinery every 15 seconds.
115	White dwelling, with gable roof, from the middle of which rises a square tower, surmounted by black lantern with black railings. The structure stands on a rectangular granite pier.	35	
116	White octagonal tower, on granite dwelling with Mansard roof; lantern, black. The structure stands on a pier of rock-faced granite.	36	Bell struck by machinery every 9 seconds.
117	White square tower in the center of the front of a dwelling with red Mansard roof; lantern black; fog-signal house southwesterly of dwelling.	37	Bell struck by machinery a double blow every 20 seconds.
118	White, hexagonal, portable beacon, on granite pier; lantern, black	14	
119	White, hexagonal, portable beacon, on a granite pier; lantern, black	14	
120	Octagonal pyramidal tower, lower half white, upper half brown, connected with dwelling. Fog-signal building southerly of tower.	46	First-class compressed-air siren; blasts 5 seconds, silent intervals 40 seconds.

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.

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.

The fact should be noted that sound signals are not always reliable. The sound may be lost while really approaching it, after being heard; or even when approached until close-to, it may not be heard at all, though properly made. These conditions are the exception, not the rule. They are, however, always possible and render great care necessary.

All bearings are *magnetic*, and in the case of visibility of lights given from seaward.

BEARINGS AND DISTANCES.

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

Cape Ann Lighthouses.—The following are bearings and distances from Cape Ann Lighthouses:

	Miles.
Portsmouth Harbor (New Castle) Lighthouse, N. ⅛ E	26½
Boon Island Lighthouse, NNE	29
Cape Elizabeth (East) Lighthouse, NNE. ¾ E	58
Cape Elizabeth Light-vessel, NE. ¾ N	57
Seguin Lighthouse, NE	73
Monhegan Island Lighthouse, NE. ¾ E	87
Matinicus Rock Lighthouses, NE. by E. ⅝ E	102
Mount Desert (Rock) Lighthouse, ENE. ⅛ E	132½
Cape Cod Lighthouse, S. by E. ¾ E	42½
Race Point Lighthouse, S. ⅞ E	37½
Sandy Neck Lighthouse, S	56
Gurnet (Plymouth) Lighthouse, S. by W. ⅜ W	37¾
Minots Ledge Lighthouse, SW. by S	23½
Boston Light-vessel, SW. ⅝ S	19½
Boston Lighthouse, SW. ½ W	23
Long Island Head Lighthouse, SW. by W	25
Eastern Point Lighthouse, SW. by W. ½ W	5¼
Egg Rock Lighthouse, SW. by W ½ W	18¾

Eastern Point Lighthouse.—The following are bearings and distances from Eastern Point Lighthouse:

	Miles.
Cape Cod Lighthouse, SSE. ⅜ E	42
Race Point Lighthouse, S. by E. ⅝ E	36½
Sandy Neck Lighthouse, S. ½ E	54
Gurnet (Plymouth) Lighthouse, S. ¾ W	34¾
Minots Ledge Lighthouse, SSW. ¼ W	19⅛
Boston Light-vessel, SSW. ⅝ W	15
Whistling buoy off NE. Graves, SW. ⅜ W	15
Baker Island Lighthouse, WSW. ⅞ W	6

Boston Light-vessel.—The following are bearings and distances from Boston Light-vessel:

	Miles.
Baker Island Lighthouse, N. ⅝ E	11⅞
Cape Ann whistling buoy, NE	20⅝
Monhegan Island Lighthouse, NE. ½ E	106
Matinicus Rock Lighthouses, NE. by E. ¼ E	120
Mount Desert (Rock) Lighthouse, NE. by E. ¾ E	150
Peaked Hill Bar whistling buoy, SE. ⅜ E	31
Cape Cod Lighthouse, SE. ¼ E	35¾
Race Point Lighthouse, SE. ⅜ S	28
Billingsgate Island Lighthouse, SE. ⅞ S	41½
Sandy Neck Lighthouse, S. by E. ½ E	42½
Gurnet (Plymouth) Lighthouse, S. ½ E	21¼
Minots Ledge Lighthouse, S. by W. ¼ W	4¼
Boston Lighthouse, W. ½ N	5⅞
Whistling buoy off NE. Graves, NW. ⅝ W	5⅛
Nahant Head, NW. ⅜ N	8
Marblehead Lighthouse, N. ⅛ W	10½

Race Point Lighthouse.—The following are bearings and distances from Race Point Lighthouse:

	Miles.
Buoy off end of Billingsgate Shoal, S	14¾
Sandy Neck Lighthouse, S. by W. ⅛ W	20¼
Gurnet (Plymouth) Lighthouse, W	16½
Minots Ledge Lighthouse, NW. ⅜ W	26¼
Boston Lighthouse, NW. ¼ W	33
Nahant Head, NW. ⅝ N	36
Marblehead Lighthouse, NNW. ⅞ W	37¼
Baker Island Lighthouse, NNW. ½ W	37

Cape Cod Lighthouse.—The following are bearings and distances from Cape Cod Lighthouse:

	Miles.
Cape Elizabeth (East) Lighthouse, N. $\frac{7}{8}$ E	91½
Cape Elizabeth Light-vessel, N. by E. $\frac{1}{8}$ E	89
Seguin Lighthouse, N. by E. $\frac{7}{8}$ E	100¾
Monhegan Island Lighthouse, NNE. $\frac{7}{8}$ E	108
Matinicus Rock Lighthouses, NE. $\frac{1}{4}$ N	117½
Mount Desert (Rock) Lighthouse, NE. $\frac{5}{8}$ E	143
Minots Ledge Lighthouse, NW. $\frac{3}{4}$ W	34
Boston Lighthouse, NW. $\frac{5}{8}$ W	40½
Marblehead Lighthouse, NW. $\frac{3}{8}$ N	44
Baker Island Lighthouse, NW. $\frac{7}{8}$ N	43½
Isles of Shoals Lighthouse, N. by W	61
Boon Island Lighthouse, N. $\frac{1}{4}$ W	67½

Nantucket (Great Point) Lighthouse.—The following are bearings and distances from Nantucket (Great Point) Lighthouse:

	Miles.
Handkerchief Light-vessel, N. $\frac{1}{4}$ E	6
Monomoy Point Lighthouse, NNE. $\frac{1}{4}$ E	10⅝
Shovelful Shoal Light-vessel, NNE. $\frac{1}{2}$ E	9⅝
Pollock Rip Shoals Light-vessel, NE. $\frac{1}{2}$ N	15
Pollock Rip Light-vessel, NE. $\frac{1}{8}$ E	10⅞
Whistling buoy Entrance to South Channel, E. $\frac{1}{8}$ S	15½
Great Round Shoal Light-vessel, E. $\frac{5}{8}$ S	6
Sankaty Head Lighthouse, S. by E. $\frac{1}{2}$ E	7¼
Bell buoy off Nantucket Entrance, SW. $\frac{1}{2}$ S	5⅛
Cape Poge Lighthouse, WNW. $\frac{3}{8}$ W	18⅝
East Chop Lighthouse, NW. by W. $\frac{1}{8}$ W	24
Cross Rip Light-vessel, NW. by W. $\frac{3}{8}$ W	11⅝
Bishop and Clerks Lighthouse, NNW. $\frac{1}{2}$ W	14⅝
Bass River Lighthouse, N. $\frac{5}{8}$ W	16⅝

Handkerchief Light-vessel.—The following are bearings and distances from Handkerchief Light-vessel:

	Miles.
Monomoy Point Lighthouse, NE. $\frac{3}{8}$ E	5⅝
Shovelful Shoal Light-vessel, NE. by E. $\frac{1}{8}$ E	5
Pollock Rip Shoals Light-vessel, NE. by E. $\frac{1}{8}$ E	10⅝
Pollock Rip Light-vessel, E. by N	7⅝
Great Round Shoal Light-vessel, SE. $\frac{5}{8}$ S	8⅝
Bell buoy off Nantucket Entrance, S. by W. $\frac{3}{4}$ W	10⅝
Cross Rip Light-vessel, W. $\frac{1}{8}$ S	10⅝
Bishop and Clerks Lighthouse, NW	9⅞
Bass River Lighthouse, N. by W. $\frac{1}{8}$ W	10⅞

Nobska Point Lighthouse.—The following are bearings and distances from Nobska Point Lighthouse:

	Miles.
Succonnesset Light-vessel, E. $\frac{1}{2}$ S	9⅞
Cross Rip Light-vessel, SE. by E. $\frac{3}{4}$ E	17
Cape Poge Lighthouse, SE. $\frac{1}{8}$ E	10¾
West Chop Lighthouse, SE. $\frac{5}{8}$ S	8¼
Gay Head Lighthouse, SW. $\frac{1}{2}$ W	12⅞
Tarpaulin Cove Lighthouse, WSW. $\frac{1}{4}$ W	5⅝

Gay Head Lighthouse.—The following are bearings and distances from Gay Head Lighthouse:

	Miles.
Tarpaulin Cove Lighthouse, NE. $\frac{5}{8}$ N	8
Nantucket Shoals Light-vessel, SE. $\frac{1}{2}$ S	71
NW. point No Mans Land, S. by W	5⅝
Diamond Shoal Light-vessel, SW. $\frac{3}{8}$ S., southerly	431¼
Cape Charles Light-vessel, SW. $\frac{5}{8}$ W., westerly	342½
Five Fathom Bank Light-vessel, SW. by W. $\frac{1}{8}$ W	231
Fire Island Light-vessel, WSW. $\frac{3}{4}$ W	118½
Whistling buoy, WSW. $\frac{7}{8}$ W	8
Block Island (SE.) Lighthouse W. $\frac{3}{4}$ S	34¼
Block Island (N.) Lighthouse, W	34¼
Little Gull Island Lighthouse, W. $\frac{1}{4}$ N	58
Race Rock Lighthouse, W. $\frac{1}{8}$ N	55
Watch Hill Lighthouse, W. $\frac{3}{4}$ N	46
Point Judith Lighthouse, WNW. $\frac{7}{8}$ W	29
Brenton Reef Light-vessel, WNW	24⅝
Vineyard Sound Light-vessel, NW. by W. $\frac{3}{4}$ W	7⅝
Sakonnet Lighthouse, NW. by W. $\frac{1}{8}$ W	17⅝
Cuttyhunk Lighthouse, NW. $\frac{1}{4}$ N	6½

Hen and Chickens Light-vessel.—The following are bearings and distances from Hen and Chickens Light-vessel:

	Miles.
Dumpling Rock Lighthouse, **NE.** $\frac{1}{2}$ **E**	$6\frac{7}{8}$
Wings Neck Lighthouse, **NE.** by **E.** $\frac{1}{2}$ **E**	$21\frac{1}{8}$
N. end Penikese Island, **E.** $\frac{5}{8}$ **S**	$4\frac{3}{8}$
Cuttyhunk Lighthouse, **SE.** $\frac{1}{8}$ **S**	$3\frac{3}{4}$
Vineyard Sound Light-vessel, **S**	$4\frac{3}{8}$
Block Island (SE.) Lighthouse, **SW.** by **W.** $\frac{3}{4}$ **W**	$29\frac{3}{4}$
Block Island (N.) Lighthouse, **WSW.** $\frac{1}{2}$ **W**	$28\frac{1}{2}$
Point Judith Lighthouse, **W.** $\frac{1}{4}$ **S**	$21\frac{1}{2}$
Brenton Reef Light-vessel, **W.** $\frac{3}{4}$ **N**	16
Sakonnet Lighthouse, **WNW.** $\frac{7}{8}$ **W**	$8\frac{1}{4}$

Brenton Reef Light-vessel.—The following are bearings and distances from Brenton Reef Light-vessel:

	Miles.
Castle Hill Lighthouse, **NNE.** $\frac{3}{8}$ **E**	$1\frac{7}{8}$
Sakonnet Lighthouse, **E.** $\frac{1}{4}$ **S**	$7\frac{7}{8}$
Cuttyhunk Lighthouse, **ESE.** $\frac{3}{4}$ **E**	$19\frac{1}{4}$
Vineyard Sound Light-vessel, **ESE**	$17\frac{1}{4}$
NW. point No Mans Land, **SE.** by **E**	$26\frac{1}{2}$
Block Island (N.) Lighthouse, **SW.** $\frac{1}{4}$ **W**	15
Point Judith Lighthouse, **SW.** by **W.** $\frac{3}{8}$ **W**	$6\frac{1}{4}$
Whale Rock Lighthouse, **NW.** by **W.** $\frac{1}{8}$ **W**	$2\frac{1}{4}$
Beavertail Lighthouse, **NNW.** $\frac{1}{8}$ **W**	$1\frac{1}{2}$

Nantucket Shoals Light-vessel.—The following are bearings and distances from Nantucket Shoals Light-vessel:

	Miles.
Diamond Shoal Light-vessel, **SW.** $\frac{1}{4}$ **W**	$428\frac{1}{2}$
Cape Charles Light-vessel, **SW.** by **W.** $\frac{1}{2}$ **W**	$356\frac{1}{2}$
Five Fathom Bank Light-vessel, **WSW.** $\frac{1}{2}$ **W.**, westerly	255
Fire Island Light-vessel, **W.** $\frac{3}{4}$ **N.**, westerly	$163\frac{3}{4}$
Sandy Hook Light-vessel, **W.** $\frac{3}{4}$ **N.**, westerly	$192\frac{3}{4}$
Fire Island Lighthouse, **W.** by **N**	$164\frac{1}{2}$
Montauk Point Lighthouse, **NW.** by **W.** $\frac{5}{8}$ **W**	$105\frac{1}{2}$
Block Island (SE.) Lighthouse, **NW.** by **W.** $\frac{1}{8}$ **W.**, westerly	94
Point Judith Lighthouse, **NW.** $\frac{1}{2}$ **W.**, northerly	$95\frac{3}{4}$
Brenton Reef Light-vessel, **NW.** $\frac{1}{4}$ **W**	$93\frac{3}{4}$
W. End No Mans Land, **NW.** $\frac{1}{8}$ **N**	$67\frac{1}{2}$
Sankaty Head Lighthouse, **N.** $\frac{7}{8}$ **W**	$43\frac{1}{4}$

STORM WARNING DISPLAY STATIONS.

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

Gloucester, Mass.
Marblehead, Mass.
Boston, Mass.*
Hull, Mass.
Wellfleet, Mass.
Provincetown, Mass.
Race Point, Mass.
Cape Cod (Highland) Light, Mass.
Chatham, Mass.
Monomoy, Mass.
Hyannis, Mass.
Great Point, Mass.
Nantucket, Mass.*
Cross Rip Light-vessel, Mass.
East Chop, Mass.
Nobska Point Light, Mass.
Tarpaulin Cove, Mass.
New Bedford, Mass.
Fall River, Mass.
Newport, R. I.
Saunderstown, R. I.
Narragansett Pier, R. I.*
Point Judith, R. I.
Block Island, R. I.*
Block Island (SE.) Light, R. I.

SEACOAST TELEGRAPH AND REPORTING STATIONS.

The following seacoast reporting stations are maintained, from which passing vessels are reported. Vessels can communicate with the stations at Cape Cod Light and Block Island (SE.) Light by International Code Signals.

Hull, Mass.
Cape Cod Light, Mass.
Chatham, Mass.
Vineyard Haven, Mass.
Point Judith, R. I.
Block Island (SE.) Light, R. I.

* At these stations barometers will be compared with standards.

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations has been corrected to July 1, 1903. 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 cases of shipwreck.*

Name of Station.	State.	Locality.	Approximate Position.					
			Latitude, north.			Longitude, west.		
			°	′	″	°	′	″
Straitsmouth	Mass	½ mile west of Straitsmouth light	42	39	30	70	36	00
Gloucester	Mass	Old House cove, westerly side of harbor, 1¼ miles from town.	43	35	30	70	41	10
Nahant	Mass	On the neck, close to Nahant	42	25	45	70	56	00
City Point	Mass	Floating station in Dorchester Bay, Boston Harbor.						
Point Allerton	Mass	1 mile west of Point Allerton	42	18	20	70	54	00
North Scituate	Mass	2½ miles south of Minots Ledge light	42	14	00	70	45	30
Fourth Cliff	Mass	South end of Fourth Cliff, Scituate	42	09	30	70	42	10
Brant Rock	Mass	On Green Harbor Point	42	05	30	70	38	40
Gurnet	Mass	4½ miles northeast of Plymouth	42	00	10	70	36	10
Manomet Point	Mass	6½ miles southeast of Plymouth	41	55	30	70	32	40
Wood End	Mass	⅛ mile east of light	42	01	15	70	11	30
Race Point	Mass	1⅝ miles northeast of Race Point light	42	04	45	70	13	15
Peaked Hill Bars	Mass	2½ miles northeast of Provincetown	42	04	40	70	09	50
High Head	Mass	3½ miles northwest of Cape Cod light	42	03	55	70	06	50
Highland	Mass	¾ mile northwest of Cape Cod light	42	02	55	70	04	20
Pamet River	Mass	3½ miles south of Cape Cod light	42	00	00	70	01	15
Cahoons Hollow	Mass	2½ miles east of Wellfleet	41	56	45	69	59	05
Nauset	Mass	1¼ miles south of Nauset lights	41	50	40	69	56	45
Orleans	Mass	Abreast of Ponchet Island	41	45	35	69	55	55
Old Harbor	Mass	½ mile north of Chatham Inlet	41	41	45	69	56	00
Chatham	Mass	1¼ miles south-southwest of Chatham lights	41	39	10	69	57	10
Monomoy	Mass	2¼ miles north of Monomoy light	41	35	25	69	59	10
Monomoy Point	Mass	¾ mile southwest of Monomoy light	41	33	10	70	00	20
Coskata	Mass	2¼ miles south of Nantucket (Great Point) light	41	22	00	70	01	15
Surfside	Mass	2½ miles south of the town of Nantucket	41	14	30	70	06	00
Maddequet	Mass	6 miles west of Surfside	41	16	05	70	12	30
Muskeget	Mass	Near west end of Muskeget Island	41	20	20	70	18	50
Gay Head	Mass	Near light	41	21	04	70	50	08
Cuttyhunk	Mass	Near east end Cuttyhunk Island	41	25	25	70	54	45
Brenton Point	R. I	On Prices Neck	41	26	58	71	20	10
Narragansett Pier	R. I	Northern part of the town	41	25	45	71	27	20
Point Judith	R. I	Near light	41	21	40	71	29	00

*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.

MASSACHUSETTS HUMANE SOCIETY LIFE-SAVING STATIONS.

No. of station.	Locality of Station.	Remarks.
4	Emerson Point, Cape Ann	Lifeboat.
5	Brace Cove, Gloucester	Lifeboat. Hunt gun and apparatus.
6	Rocky Neck, East Gloucester	Lifeboat.
7	Stage Fort, Gloucester	Hunt gun and apparatus. Dory.
9	Baker Island, Salem Harbor	Dory.
10	Marblehead	Lifeboat. Hunt gun and apparatus.
13	Nahant	Lifeboat. Hunt gun and apparatus.
14	Deer Island, Boston Harbor	Lifeboat.
15	Boston Light	Hunt gun and apparatus.
17, 18	Stony Beach, Hull	Lifeboat. Hunt gun and apparatus.
19	Point Allerton	Lifeboat.
20	Nantasket Beach (between Point Allerton and Strawberry Hill).	Large lifeboat and small boat.
21	Nantasket Beach, Sagamore Hill	Lifeboat and dory. Hunt gun and apparatus.
22	Gun Rock Cove, Cohasset	Lifeboat.
23	Pleasant Beach, Cohasset	Lifeboat. Hunt gun and apparatus
25, 25A	Glades, North Scituate	Lifeboat. Hunt gun and apparatus.
26	North Scituate	Lifeboat.
27	Scituate Light	Lifeboat.
28	Scituate	Hunt gun and apparatus.
29	Bass Cove, Scituate	Large and small lifeboats.
30	Third Cliff, Scituate	Lifeboat. Hunt gun and apparatus.
31	Brant Rock	Lifeboat. Hunt gun and apparatus.
32	Manomet	Dory.
33	Barnstable	Lifeboat.
35	Race Point Light	Hunt gun and apparatus.
40	Nauset Harbor	Lifeboat. Hunt gun and apparatus.
41	Nashawena	Hunt gun and apparatus.
42	Cuttyhunk	Lifeboat. Hunt gun and apparatus.
43	Cuttyhunk (middle south side)	Hunt gun and apparatus.
44	Cuttyhunk Light	Lifeboat and dory. Hunt hand gun and apparatus.
50	Nantucket	Lifeboat. Hunt gun and apparatus.
51	Quidnet, Nantucket	Lifeboat. Hunt gun and apparatus.
52	Siasconset, Nantucket	Lifeboat. Hunt gun and apparatus.
54	Forked Ponds, Nantucket	Lifeboat and life dory. Hunt gun and apparatus.
55	Hummock Pond, Nantucket	Lifeboat and dory. Hunt gun and apparatus.
56	Broad Creek, Nantucket	Lifeboat and dory.
57	Tuckernuck, Nantucket	Lifeboat. Hunt gun and apparatus.
58	Cliffs, Nantucket	Lifeboat and dory.
60	Vineyard Haven	Lifeboat. Hunt gun and apparatus.
65	Cape Poge, Marthas Vineyard	Lifeboat and dory. Hunt gun and apparatus.
67	Squibnocket, Marthas Vineyard	Lifeboat. Hunt gun and apparatus.
68	Gay Head, Marthas Vineyard	Lifeboat. Hunt gun and apparatus.
69	Horse Neck Point	Lifeboat.

REMARKS ON APPROACHING OR STANDING ALONG THE COAST BETWEEN CAPE ANN AND POINT JUDITH.

Approaching Massachusetts Bay from sea.—The approach to the coast of Massachusetts north of Cape Cod is through the Gulf of Maine, the body of water lying westward of a line drawn from Cape Cod to Cape Sable. Between these points, and forming the the eastern limit of the gulf, lie Nantucket Shoals, Georges Bank, and Brown Bank, areas over which there is a depth of less than 50 fathoms. Nantucket Shoals and Georges Bank, on account of their many shoal spots and the strong tidal currents setting over them, are a menace to navigators approaching the coast or standing from Canadian ports to New York.

As far as the navigator is concerned Brown Bank need not be avoided; it may even assist, from soundings, to approximately locate a vessel's position.

Georges Bank, for a distance of 70 miles in a general **NE.** and **SW.** direction and a width of about 40 miles, has a general depth of less than 20 fathoms, and numerous scattered spots with depths ranging from 2 to 10 fathoms, among which are *Georges Shoal* and *Cultivator Shoal.* This part of Georges Bank, lying between latitude 41° 05′ N. and 42° 00′ N. and longitude 67° 17′ W. and 68° 35′ W., should be avoided; in heavy weather the sea breaks on the spots with 10 fathoms or less, and strong tide rips are encountered, the latter, however, not always indicating shoal water. The tidal currents have a maximum velocity of about 2 miles per hour over the shoaler parts of the bank; the flood sets northward and ebb

southward, the times of their turning corresponding very nearly with the time of high and low water at Boston.

Vessels passing south of the dangerous part of Georges Bank should not shoal the water to less than 25 fathoms. Approaching this part of the bank from eastward or southward the water shoals gradually. Approaching from westward the depths are irregular and the water shoals abruptly in places to 20 fathoms or less. On the north side of Georges Bank, between longitude 66° 00′ W. and 68° 00′ W., the 100-fathom and 50-fathom curves are but a few miles apart, and when approaching the dangerous part of the bank from northward, 50 fathoms may be taken as a good depth to avoid the shoals.

Nantucket Shoals is the general name of the numerous different broken shoals which lie southeastward of Nantucket Island, and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals extend 23 miles eastward and 39 miles southeastward from Nantucket Island, are shifting in their nature, and the depths vary from 3 and 4 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest offshore. The southeasternmost of these shoals (*Phelps Bank*) has a least depth of 10 fathoms. *Asia Rip*, a part of this bank, lies 40 miles **SSE.** ⅝ **E.** from Sankaty Head Lighthouse and 14¼ miles **NE.** by **E.** from Nantucket Shoals Light-vessel, in latitude 40° 47′ 30″ N., longitude 69° 23′ W. *Fishing Rip*, with depths of 4 to 8 fathoms over it, is about 5½ miles long in a **NNE.** ½ **E.** and **SSW.** ½ **W.** direction. The middle of the rip lies 29 miles **SE.** from Sankaty Head Lighthouse, and 25 miles **NNE.** ¾ **E.** from Nantucket Shoals Light-vessel. This rip is on the easterly edge of Nantucket Shoals, and along the eastern edge of the shoals there is a depth of 6¾ fathoms about 5 miles **SSW.**, and spots with 4½ to 7½ fathoms extend for a distance of 19 miles northward from the middle of the rip. The depth between Fishing Rip and Asia Rip is 10 to 27 fathoms. *Davis South Shoal* is near the southwestern part of Nantucket Shoals. It has a least depth of 15 feet, and the middle of the shoal lies 20 miles **S.** ⅛ **E.** from Sankaty Head Lighthouse. Soundings of 5¾ to 8 fathoms will be found for a distance of 8 miles southwestward of the shoal. The broken shoals and rips lying northward of Davis South Shoal and northwestward of Fishing Rip have depths ranging from 3 feet to 5½ fathoms over them. The tidal currents are strong and variable in direction, forming extensive rips and broken water over the shoals. A detailed description of these shoals is given in another part of this volume.

Nantucket Shoals Light-vessel, the leading mark for vessels passing southward of Nantucket Shoals, is moored in 30 fathoms of water off the southern end of the shoals (see table, page 16).

The only outlying dangers in the Gulf of Maine to be avoided by vessels bound to ports in Massachusetts are *Ammen Rock*, with 4 fathoms, and *Sigsbee Rock*, with 5 fathoms. The latter is in latitude 42° 53′ 30″ N. and longitude 69° 54′ 10″ W., and is 4¼ miles **SW.** ½ **W.** from Ammen Rock. These are a part of *Cashe Ledge*, which is about 6½ miles long in a **NNE.** and **SSW.** direction, with depths of 26 to 30 fathoms.

Vessels from ports in northern Europe or the British Provinces and bound to ports in the United States north of Cape Cod, approach the coast passing between Cape Sable and Georges Bank, between latitude 42° 00′ N. and 43° 10′ N. If bound to Boston they cross Brown Bank in about latitude 42° 30′ N. and longitude 65° 50′ W., and from this position a **WNW.** ⅛ **W.** course made good for about 215 miles should lead to Boston Light-vessel.

Vessels approaching the Gulf of Maine from southward, endeavor to make the 50-fathom curve on the southern edge of Georges Bank in latitude 40° 20′ N. and longitude 69° 00′ W.; then stand **N.** by **E.** on soundings of over 30 and less than 50 fathoms for about 50 miles; and then shape a **NNW.** course, taking care to keep in a greater depth than 20 fathoms until the course is laid to sight Cape Cod Lighthouse (this lighthouse and the wireless telegraph skeleton towers about 9 miles southward of it are the most prominent marks on Cape Cod).

The passage across Georges Bank between the easternmost of the Nantucket Shoals and the westernmost shoal spots of Georges Bank, about 30 miles wide, has been called *Great South Channel.*

Or, vessels coming from Cape Hatteras, Chesapeake Bay, Delaware Bay, or New York, make Nantucket Shoals Light-vessel, passing southward of it; then shape a course to pass about 5 miles eastward of Fishing Rip (4 fathoms); and then stand northward and westward, taking care not to shoal the water to less than 20 fathoms until the vessel heads inshore to sight Cape Cod Lighthouse.

Vessels of less than 24 feet draft may, when coming from southward or alongshore, enter the Gulf of Maine through Vineyard and Nantucket Sounds. This route avoids Nantucket Shoals, and is the one followed by vessels in the coasting trade. Gay Head and No Mans Land, at the western entrance to Vineyard Sound, are the landfalls for vessels approaching from sea.

Approaching Vineyard Sound, Buzzards Bay, or Narragansett Bay from sea.—The approach to the above waters in clear weather requires no special caution, as the land, or at night the lights, will be made and recognized in time to fix the vessel's position so as to avoid danger and set a course for the vessel's destination. Vessels from eastward generally sight No Mans Land and pass southward of it (Gay Head Light is partially shut out by No Mans Land between the bearings **N.** ½ **W.** and **N.** by **E.**); those from westward generally sight Montauk Point and Block Island, passing south of the latter.

In thick weather the greatest caution is necessary as soundings can not be depended on for locating the vessel's position, but inside a depth of 30 fathoms the lead must be constantly used to prevent too close an approach to danger. Coming from the vicinity of Nantucket Shoals Light-vessel, a vessel should not shoal the water to less than 15 fathoms, and it is advisable to remain offshore in a depth of over 20 fathoms. Coming from southward, or southwestward, to insure clearing the shoals off Montauk Point and Block Island, the usual route followed by coasting vessels is to stand in for the south shore of Long Island anywhere between Montauk Point and Shinnecock Lighthouse, sounding frequently, until in a depth of 15 to 16 fathoms, when the vessel will be from 3½ to 4½ miles from the beach. An **E.** by **N.** course made good, and keeping the lead in use so as not to shoal the water to less than 15 fathoms. will then lead along the beach at a distance of about 4½ miles and about 5 miles south of Montauk Point Lighthouse. Continuing on the **E.** by **N.** course, the water will gradually deepen to 24 and 26 fathoms, and then begin to shoal again until a depth of 10 to 12 fathoms is struck on the spur, with 12 fathoms or less water, which extends about 5 miles southeastward from Block Island. The distance the vessel should have made in a greater depth than 15 fathoms should be about 13 miles. When the water deepens to more than 15 fathoms, after crossing the spur, and does not again shoal, the vessel will have cleared Block Island. Approaching Block Island from southward, a depth of less than 10 fathoms indicates less than ¾ mile from the shore and the immediate necessity for hauling off.

The *tidal currents* have an estimated velocity of about 1¼ miles between Montauk Point and Block Island, and about 1 mile between Block Island and Gay Head; their greatest velocity is close to Montauk Point and close to Gay Head, where the estimated velocity is 2 to 3 miles. The flood has a general northerly set and the ebb a southerly set of about equal duration.

Standing along the coast between Cape Ann and Point Judith.—The lighthouses and other aids to navigation are sufficiently numerous to enable a stranger to run either at night or the daytime in clear weather. In thick weather it is advisable to haul offshore, or, if in the sounds, to anchor until the weather clears. There are numerous anchorages where a vessel with good ground tackle can ride out any gale. Of these, Provincetown Harbor is the harbor of refuge most frequently used by vessels approaching Massachusetts Bay from seaward. Newport Harbor and Dutch Island Harbor are the best anchorages for vessels approaching the coast from seaward between Gay Head and Block Island.

The navigator when crossing the banks and when approaching the coast should not neglect to take soundings at frequent intervals.

SAILING DIRECTIONS ALONG THE COAST BETWEEN CAPE ANN AND POINT JUDITH.

1. *From a position about 1 mile SE. by E. ½ E. from Cape Ann Lighthouse.*—*I. Bound into Boston Harbor by the Broad Sound Channels.*—A **SW.** by **W.** course made good for 20¼ miles will lead to a position about ¾ mile northward of the whistling buoy off The Graves. From this buoy follow the directions in section 1 B or 1 C, according to draft, of the sailing directions for Boston Harbor.

Remarks.—The course leads well clear of all dangers. In clear weather the shore northward will be plainly visible and several lighthouses will be seen. The course leads 1⅝ miles S. of Eastern Point Lighthouse and 1¾ miles southward of Halfway Rock (marked by stone beacon) off Salem entrance. Long Island Head Lighthouse should be made a little on the starboard bow and Boston Lighthouse on the port bow.

II. Bound into Boston Harbor by the Main Ship Channel.—Make good a **SW.** ⅝ **W.** course for 22 miles; Narrows Lighthouse should then show just open southward of Boston Lighthouse, bearing *W.*, and the course should be laid about **W.** by **S.** so as to pass nearly ½ mile southward of Boston Lighthouse; then enter as directed in section 2 of the sailing directions for Boston Harbor.

At night.—Follow the directions in the preceding paragraph until Egg Rock Light approaches a *NNW.* bearing. Keep eastward of a line joining Egg Rock and Minots Ledge lights, and enter as directed in section 1 of the sailing directions for Boston Harbor.

Remarks.—The dangers in approaching the entrance are described under section 1 of the sailing directions for Boston Harbor.

On the **SW.** ⅝ **W.** course Outer Brewster, Boston Lighthouse, and Point Allerton will be made a little on the starboard bow. Boston Light-vessel will be made off the port bow, and **Strawberry Hill**, with a high water tower, will be a very little on the port bow. Three-and-a-half Fathom Ledge and Martin Ledge, each marked by a red nun buoy, will be left about ¾ mile on the starboard hand. When Narrows Lighthouse opens southward of Boston Lighthouse, the red nun buoy marking Boston Ledge should be about 1 mile distant on the starboard bow, and Thieves Ledge whistling buoy a little over ¾ mile distant, a little forward of the port beam.

On the **W.** by **S.** course Boston Ledge buoy should be left about ⅝ mile on the starboard hand.

III. Bound to Plymouth Harbor.—A **S.** by **W.** ⅝ **W.** course made good for nearly 38 miles will lead up to the whistling buoy at the entrance, and to a position from which Gurnet Lighthouse will bear *NW.* by *W.* ¼ *W.*, distant about ¾ mile. To enter, proceed as directed in the sailing directions for that harbor.

Remarks.—The **S.** by **W.** ⅝ **W.** course leads well clear of all dangers. **Manomet Hill**, southward of the entrance, will be made ahead and can easily be seen in clear weather for a distance of 20 miles. The **Standish monument** on Captain Hill will be made on the starboard bow and can be seen from a distance of 15 to 18 miles. Gurnet Lighthouse will be made a little on the starboard bow.

IV. Bound to Provincetown Harbor.—A **S.** ⅝ **E.** course made good for 37 miles will lead to a position about 1½ miles *W.* of Race Point Lighthouse, from which follow the directions for entering Provincetown Harbor.

Remarks.—The high water tower in Provincetown will be a prominent mark on the port bow. Race Point is low, and in the daytime the lighthouse can not be seen a great distance. There are no dangers if a vessel passes more than ¼ mile westward of Race Point Lighthouse steering **S.** ⅝ **E.**

V. To abreast Cape Cod Lighthouse.—Make good a **S.** by **E.** ⅞ **E.** course for 42½ miles; Cape Cod Lighthouse should then bear *W.*, distant about 2 miles. From this position, if bound through Nantucket and Vineyard sounds, follow the sailing directions in section 1 or 1 A for those sounds; if bound outside of Nantucket Shoals, proceed as directed in section 2 following.

Remarks.—There are no dangers, but the northeastern side of Cape Cod should not be approached closer than 1 mile. *In thick weather*, keeping in a greater depth than 20 fathoms will insure giving the northeastern side of the cape a berth of 2½ miles.

2. ***From abreast Cape Cod Lighthouse to Nantucket Shoals Light-vessel.***—When 2 miles *E.* of Cape Cod Lighthouse make good a **S.** by **E.** $\frac{1}{8}$ **E.** course for 56 miles. Then make good a **S.** by **W.** course for 20 miles, and then make good a **SW.** $\frac{1}{4}$ **W.** course for 23¾ miles, which should lead up to Nantucket Shoals Light-vessel (see table, page 16), from which follow the directions in section 3, following.

Remarks.—On the **S.** by **E.** $\frac{1}{8}$ **E.** course care must be taken not to be set southwestward on to Nantucket Shoals by the current. The course leads about 4 miles eastward of Nauset Beacons and 10 miles eastward of Chatham Lighthouse, and too far eastward of Monomoy, Nantucket, and Sankaty Head lighthouses for them to be visible. No deep-draft vessel should attempt to sight Sankaty Head Lighthouse when eastward or southeastward of it.

The **S.** by **W.** course leads nearly 5 miles eastward of Fishing Rip, which has a least depth of 4 fathoms and is frequently marked by strong tide rips. (See the description of Monomoy and Nantucket shoals.)

The **SW.** $\frac{1}{4}$ **W.** course leads 2 miles northward of Phelps Bank (least water 10 fathoms), and directly for Nantucket Shoals Light-vessel. The latter can be left on either hand, taking care to clear the marking buoy which is near the light-vessel.

The soundings on the sailing lines are very irregular, and are of but little use in determining the position. When rounding Nantucket Shoals in thick and foggy weather, safety may be insured by taking frequent soundings, and hauling offshore when a sounding of less than 25 fathoms is obtained; such a means will, however, take a vessel farther offshore than the sailing lines given above.

3. ***From Nantucket Shoals Light-vessel.***—The bearings and distances on page 24 will assist the mariner in laying a course for points westward of Block Island.

I. Bound into Buzzards Bay.—A **NW. Westerly** course made good for 74 miles will lead up to the whistling buoy from which Gay Head Lighthouse bears *ENE.* $\frac{7}{8}$ *E.*, distant 8 miles. From this buoy steer **N.** $\frac{1}{2}$ **E.** about 9½ miles for Hen and Chickens Light-vessel, passing westward of Vineyard Sound Light-vessel. When nearly up to Hen and Chickens Light-vessel follow the sailing directions for Buzzards Bay.

Remarks.—The **NW. Westerly** course leads well clear of all dangers, and passes about 2½ miles southwestward of No Mans Land, where there is a depth of 8¾ fathoms, which is the least water on this course. The ebb current sets southward and flood northward.

II. Bound into Narragansett Bay.—A **NW.** $\frac{1}{4}$ **W.** course made good for 93¾ miles will lead to Brenton Reef Light-vessel, from which be guided by the sailing directions for entering Narragansett Bay.

Remarks.—The course leads clear of all dangers and about 3½ miles southwestward of No Mans Land. Gay Head, which is prominent and easily recognized (see description), should be about 8 miles distant when on the starboard beam. Gay Head, Cuttyhunk, and Sakonnet lighthouses will be made on the starboard bow, Beavertail ahead, and Point Judith Lighthouse on the port bow.

III. Bound through Block Island Sound to Long Island Sound.—Make good a **NW.** $\frac{3}{4}$ **W.** course for 96 miles. Point Judith Lighthouse should then bear *NE.* $\frac{1}{2}$ *N.*, distant 4 miles, and Block Island (N.) Lighthouse *SW.* $\frac{1}{2}$ *S.*, distant 5 miles, and the course for Long Island Sound entrance is **W.**

Remarks.—The course leads 10½ miles southwestward of No Mans Land, and Gay Head Lighthouse should be 15 miles distant when on the starboard beam. Beavertail and Point Judith lighthouses will be made on the starboard bow, and Block Island and the lignthouses on it on the port bow.

MASSACHUSETTS BAY*

is the large and deep body of water indenting the eastern shore of Massachusetts, and, for the purpose of this description, may be considered as the waters lying westward of a line joining Cape Ann and Cape Cod. It is about 20 miles wide (**E.** and **W.**) and over 50 miles long (**N.** and **S.**).

*Shown on charts **1000**, Mercator projection, Deg. Lat. = 3.7 inches; **7.** scale $\frac{1}{400,000}$; **109, 110,** scale $\frac{1}{80,000}$, price of each $0.50.

From Cape Ann, the northern point of the bay, the shore extends in a general **SW.** direction for about 20 miles to Nahant Head. That part making farther westward is known as Boston Bay (see description) and extends southward to Minots Ledge (lying about 11 miles **SSE.** from Nahant Head), from which the shore extends in a **S.** by **E.** direction for about 20 miles; southward of this the shore curves eastward and northward, and this part of the bay assumes a semicircular shape and is known as Cape Cod Bay.

On the shores of Massachusetts Bay there are a number of seacoast and harbor lights (see table, pages 12–15), which make navigation of the bay comparatively easy in clear weather.

Bays and harbors.—Within the limits of Massachusetts Bay there are a number of bays and harbors, the most important of which, named in order from Cape Ann westward and southward, are Gloucester Harbor, Marblehead Harbor, Salem Harbor, Nahant Bay, and Boston Bay. Inclosed in the limits of the last-named bay are Broad Sound, Lynn Harbor, Boston Harbor, Hingham Bay, and Cohasset Harbor. Farther southward are Duxbury, Kingston, and Plymouth, and then Cape Cod Bay, with the harbors of Barnstable, Wellfleet, and Provincetown. These harbors are described under separate headings.

Stellwagen Bank, in the entrance to Massachusetts Bay, lies almost exactly in line between Cape Ann and Cape Cod; is about 17½ miles long, 2 miles wide at its northern end, and nearly 8 miles wide at its southern; and has from 9½ to 20 fathoms of water over it. The bank extends in a **N.** and **S.** direction, its northern end being a little over 15 miles southward of Cape Ann Lighthouses, and its southern end 5 miles northward of Race Point. At its southwestern extremity, which is a little over 27 miles southeastward of Boston Lighthouse, is a spot with 9½ fathoms, the shoalest part of the bank; but the general depth over its area is from 12 to 15 fathoms.

Striking the northern part of this bank, in coming from eastward, it will shoal rapidly from 30 to 19 fathoms; crossing the middle of the bank on a **WNW.** course, there will be from 14 to 16 fathoms, "coarse sand and black specks;" and here the bank is a little over 4 miles wide. But in coming from southward and crossing the southwestern end of the bank the soundings will decrease rapidly from 25 to 12 fathoms, "fine sand;" and a least depth of 9½ fathoms may be encountered before leaving the bank.

Pilotage, quarantine, etc.—Extracts from the laws of Massachusetts, relating to pilots, pilotage, harbor control, and quarantine are given in Appendix II.

Storm warning displays of the U. S. Weather Bureau are shown at the places mentioned on page 24, and their meaning explained in Appendix III.

A list of **life-saving stations** is given on pages 25–26.

A list of **lighthouses** is given on pages 12–15.

Tides, see page 11.

Variation of the compass, see page 11.

GLOUCESTER HARBOR*

is the most important fishing port in the United States and an important harbor of refuge; it lies 5 miles southwestward of Emersons Point, the easternmost point of Cape Ann. The entrance is marked on its eastern side by Eastern Point Lighthouse (see table, page 12), which is the principal aid. There is an outer and an inner harbor, the former with a general depth of 5 to 6 fathoms and the latter 2½ to 4 fathoms.

A breakwater is under construction which, when completed, will extend 750 yards in a **NW.** by **W** direction from the shore near Eastern Point Lighthouse; in 1903 there is a red gas-lighted buoy off the end of the incompleted breakwater. The entrance westward of the breakwater is about ⅝ mile wide; but Round Rock Shoal lies nearly ¼ mile westward of the end of the breakwater, leaving a channel 250 yards wide and 3¼ to 4 fathoms deep eastward of the shoal, and ⅝ mile wide and 4¾ to 9 fathoms deep westward of the shoal. During heavy southeast gales the sea, at times, breaks nearly the whole distance across the entrance.

Southeast Harbor is the cove in the eastern part of Gloucester Harbor, northward of Black Bess Point and southward of **Tenpound Island** (marked by a lighthouse, see page 12). It has good anchorage in 4 to 5¼ fathoms.

Western Harbor is the cove, of semicircular shape, in the northern part of Gloucester Harbor, northward of Tenpound Island. It has good anchorage in from 3 to 4½ fathoms, but is not much used. A part of the town of Gloucester is built on its northern shore.

Inner Harbor, the northeastern part of Gloucester Harbor, has many small coves of which no description need be given. It is irregularly shaped, about 1,100 yards long and 600 yards wide, and has a general direction about **NE.** by **E.** and **SW.** by **W.**

*Shown on charts **108, 109,** scale $\frac{1}{80,000}$, price $0.50; **334,** scale $\frac{1}{20,000}$, price $0.20.

The best **anchorage** in the outer harbor for vessels coming in for shelter or bound to Gloucester is Southeast Harbor, which has clay bottom, good holding ground. This portion of the harbor is commonly known as **Pancake Ground**. Fishing nets, marked by buoys, generally occupy the inshore portion of Southeast Harbor in summer. Vessels anchor almost anywhere in the inner harbor, but the entrance to Harbor Cove must be left clear.

Wharves.—There are a number of wharves at Gloucester, several of which have depths alongside of 10 to 16 feet. There are several public landings for small vessels; large vessels have to pay wharfage.

Pilots may be found cruising off the entrance to the harbor, and as far eastward as Thatcher Island. A stranger desiring a pilot will obtain one by making signal, and standing off and on outside the entrance. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats can be obtained at the steamboat wharf, and generally go outside to meet large vessels sighted coming in; such vessels are usually towed in and out.

Harbor regulations are given in Appendix II. There are no special harbor dues.

Quarantine regulations are established from time to time by the board of health of Gloucester, and are enforced under the direction of the board.

Marine hospital.—Relief is furnished as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of class III. The hospital at Chelsea, Mass. (see heading Boston Harbor), is the one to which mariners entitled to hospital treatment are sent from Gloucester (see Appendix IV).

Marine railway.—Gloucester has several marine railways, which are capable of taking out small vessels only, the limit of size being about 200 tons. Boston is the nearest place where large vessels can be docked (see Boston Harbor).

Supplies.—Provisions and ship-chandler's stores can be obtained; also bituminous coal in limited quantities for steamers, put on board either at the coal wharves or by lighters. Fresh water is supplied by water boats or may be taken at the wharves. Most of the tugs working in this harbor carry fresh water to supply shipping.

Storm warning displays of the U. S. Weather Bureau are made at the customhouse, and on Eastern Point near the lighthouse (see Appendix III).

Communication.—Gloucester is on the line of the Boston and Maine Railroad, and has also daily steamboat communication with Boston.

Ice seldom extends outside Tenpound Island, at the entrance to the Inner Harbor. The tugs and steamers keep the Inner Harbor open.

Tides.—The highest tides result when easterly and southeasterly gales occur at full and change. (See table, page 11.)

Tidal currents.—The tidal currents do not to any great degree interfere with the movements of vessels, as they set directly in and out of the harbor, and their velocity is comparatively small. In the narrows, however, between Fort Point and Rocky Neck, the current is stronger, especially at half ebb, and the ebb sets on to Black Rock. Vessels coming out on the ebb favor the northwestern side of the channel in passing between Fort Point and the spindle on this rock. The ebb also sets on to Tenpound Island; the courses given in the sailing directions allow a sufficient berth, and if made good will lead safely by.

SAILING DIRECTIONS, GLOUCESTER HARBOR.

The directions in sections 1, 1 A, and 2 A lead in a least depth of 5 fathoms to the anchorages in the Outer Harbor, and a least depth of 19 feet into the Inner Harbor. Those in section 2 lead in a least depth of 3¾ fathoms eastward of Round Rock Shoal.

1. ***Approaching and Entering, from Northeastward, Eastward, or Southward.***—From a position ½ mile southward of The Londoner, steer **SW.** by **W.** ⅞ **W.** about 5½ miles until up to the red whistling buoy off Eastern Point.

Or, when Eastern Point Lighthouse is made steer for it, taking care, however, to give the shore eastward of the lighthouse a berth of ¼ to ½ mile. As the lighthouse is approached look out for the red whistling buoy lying a little over ½ mile *S.* by *W.* from it; and when the buoy is sighted steer for it and pass close southward of it, and then:

If desiring to pass eastward of Round Rock Shoal, follow the directions in section 2.

If desiring to pass westward of Round Rock Shoal, steer **NW.** ½ **N.** until Tenpound Island bears *NE.* Then steer **NE.** by **N.** until Eastern Point Lighthouse bears *SE.*, and follow the directions in section 2 A.

Remarks.—The **SW.** by **W.** ⅞ **W.** course leads for the whistling buoy off Eastern Point Lighthouse; the latter should be made on the starboard bow, and the shore eastward of the lighthouse should be given a berth of at least ¼ mile.

The **NW.** ½ **N.** course leads nearly 400 yards southward of the black spar buoy on Round Rock Shoal; the black bell buoy off Norman Woe Rock should be made broad off the port bow.

On the **NE.** by **N.** course Round Rock Shoal buoy will be left 300 yards on the starboard hand. In heavy southeasterly gales the sea breaks across the eastern side of the entrance from Eastern Point to Round Rock Shoal.

Dangers.—**The Londoner** is a ledge of rocks a little over ¼ mile long in a **NE.** and **SW.** direction, and 350 yards wide, lying 800 yards **ESE.** from Cape Ann South Lighthouse. Its southern end is dry at low water and is marked by an iron spindle with octagonal cage on top.

Eastern Point Ledge, with depths of 12 to 16 feet, makes off 375 yards southwestward from Eastern Point Lighthouse. It is marked off its end by a buoy (spar, red, No. 2). **Webbers Rock,** with 8 feet over it, is on the end of the ledge, about 200 yards **E.** by **N.** from the buoy.

Dog Bar makes westward from Eastern Point just above the lighthouse; it has 14 to 15 feet over its outer part, with much less toward the shore. The end of the bar is ⅜ mile **NW.** by **W.** from Eastern Point Lighthouse, and its southwestern side is marked by a buoy (spar, red, No. 4) and a gas-lighted buoy, painted red. The breakwater is being built on Dog Bar, and the gas-lighted buoy is off its end.

Round Rock Shoal has 13 to 18 feet over it, is about 250 yards long in a **NE.** by **N.** and **SW.** by **S.** direction, and about 150 yards wide. The shoal lies in the middle of the entrance, ⅜ mile **NW.** by **W.** ½ **W.** from Eastern Point Lighthouse; its southeastern end is marked by a buoy (spar, black, No. 1).

1 A. ***Approaching and Entering, from Southwestward or Westward.***—Bring Eastern Point Lighthouse to bear northward of *NE.* by *E.* and steer for it.

Or, if coming from Salem or Manchester Harbor, bring Baker Island Lighthouse to bear *WSW.* ¾ *W.* and steer **ENE.** ¾ **E.**

As Eastern Point Lighthouse is approached, stand in for the entrance, giving the shore on the port hand a berth of ½ mile, and when the black bell buoy off Norman Woe Rock is made steer so as to pass 400 yards eastward of it. Then steer **NE.** by **N.** until Eastern Point Lighthouse bears *SE.*, and follow the directions in section 2 A.

Remarks.—As the entrance is approached Norman Woe Rock, a dark, irregular-shaped rock with the sea breaking at its base, and lying nearly ¼ mile off the western shore about **W.** by **N.** from Eastern Point Lighthouse, will be seen on the port bow; the black bell buoy lies 400 yards **SE.** from the rock.

The **NE.** by **N.** course leads 300 yards westward of the black spar buoy on Round Rock Shoal, and Tenpound Island Lighthouse will be on the starboard bow.

Dangers.—The dangers southward and eastward of Baker Island are described under the heading Salem Harbor.

Norman Woe Rock, a high and dark, rocky islet, lies about 350 yards from the western shore. Shoal water makes from the rock to the shore; and a shoal with 7 to 16 feet over it extends nearly 300 yards in a **SE.** by **S.** direction, and is marked at its outer limit by a black bell buoy. The long and shallow bight between the rock and the shore from Norman Woe to Muscle Point is known as **Norman Woe Cove.**

Round Rock Shoal is described above.

2. ***From the whistling buoy to an Anchorage, passing Eastward of Round Rock Shoal.***—Passing close southward of the whistling buoy, steer **NNW.** ¼ **W.** until Tenpound Island Lighthouse bears **NE.** by **N.** Then steer for the lighthouse on this bearing, and when Eastern Point Lighthouse bears *SE.*, then:

To anchor in Southeast Harbor.—Steer **NE.** ¼ **E.**, and anchor in 4½ to 5 fathoms when Tenpound Island Lighthouse bears about *N.* by *W.* ½ *W.*

To anchor in Western Harbor.—Steer **N.** by **E.** ½ **E.**, leaving red spar buoys Nos. 6A and 6 about 150 yards on the starboard hand; and when Tenpound Island Lighthouse bears about *E.* ½ *S.*, steer **NE.** by **N.** and anchor over 300 yards from the north shore of the harbor, in 3 to 5 fathoms.

To the Inner Harbor.—Follow the directions in the preceding paragraph until Tenpound Island Lighthouse bears *E.* ½ *S.* Then steer **ENE.**, and leave Babson Ledge buoy on the port hand, and take care to leave the red spindle on Black Rock at least 100 yards on the starboard hand. Continue on the course up the middle of the harbor, and anchor where convenient in the wide part of the harbor below Fivepound Island.

Remarks.—The **NNW.** ¼ **W.** course leads very nearly for the black spar buoy on Round Rock Shoal, and red spar buoys Nos. 2 and 4 are each left 275 yards on the starboard hand.

The **NE.** by **N.** course for Tenpound Island Lighthouse leads fair between the red gas-lighted buoy off the end of the breakwater and the black spar buoy on Round Rock Shoal. Standing for the anchorage in Southeast Harbor, the shore should be given a berth of over 300 yards.

The **N.** by **E.** ½ **E.** course passes westward of the two red spar buoys at Tenpound Island Ledge. Field Rocks buoy (spar, black, No. 3) will be left well on the port hand, and Western Harbor will be ahead.

On the **ENE.** course into the Inner Harbor, care must be taken not to go too close to the shore of Rocky Neck. A number of vessels are usually anchored along the middle of the channel, and it is sometimes close work to pass them.

Dangers.—**Tenpound Island Ledge** is a small ledge with 8 feet over it, lying 700 yards **SW.** ⅝ **W.** from Tenpound Island Lighthouse. It is marked by two spar buoys, one (red, No. 6) on the western edge, the other (red, No. 6A), lying about 150 yards southwestward of the ledge, marks a 16-foot spot.

Field Rocks extend 450 yards from the northern shore of Fresh Water Cove abreast Tenpound Island Ledge; several of them are bare at low water, and their southern end is marked by a buoy (spar, black, No. 3), lying nearly ⅝ mile **W.** by **S.** from Tenpound Island Lighthouse.

A ledge, with 16 feet over its outer end, makes out 200 yards in a **SW.** direction from the southwestern end of Tenpound Island, and there is a depth of 4 feet on the ledge about 100 yards from the island. There is a 15-foot spot about 250 yards **NE.** by **E.** from Tenpound Island Ledge.

Babson Ledge is a small spot, with 14 feet over it, about 500 yards **N.** ¼ **E.** from Tenpound Island Lighthouse, and is marked by a buoy (spar, black, No. 5).

Black Rock, dry at half tide, lies 100 yards from the western end of Rocky Neck, and is marked by a spindle (iron, red, oblong cage on top). Shoal water extends from here southward to the eastern side of Tenpound Island.

Elisha Ledge, dry at low water, lies off the north shore of Rocky Neck, and about **ENE.** from Black Rock spindle. It is marked off its northern side by a buoy (spar, red, No. 8). The ledge lies about halfway between the buoy and the end of the wharf just eastward.

2 A. ***To an Anchorage.***—Having followed the directions in section 1 or 1 A, and having Eastern Point Lighthouse bearing *SE.*, distant about ¾ mile:

To Anchor in Southeast Harbor.—Steer **ENE.** and anchor in 4½ to 5 fathoms anywhere southward of Tenpound Island, giving the island a berth of 250 yards, and the shore eastward and southeastward of it a berth of not less than 350 yards.

To Anchor in Western Harbor.—Steer **NE.** by **N.**, leaving the two red spar buoys marking Tenpound Island Ledge 200 to 300 yards on the starboard hand, and Field Rocks buoy (spar, black, No. 3) about the same distance on the port hand. When past these buoys, and northward and westward of Tenpound Island, anchor anywhere westward of Babson Ledge buoy (spar, black, No. 5), but not nearer than 300 yards to the shore, in 3 to 5 fathoms. Light-draft vessels may anchor nearer the shore by using the lead as the northern shore is approached.

To the Inner Harbor.—Follow the directions in the preceding paragraph until Tenpound Island Light-house bears *E.* ½ *S.* Then steer **ENE.**, and leave Babson Ledge buoy on the port hand, and take care to leave the red spindle on Black Rock at least 100 yards on

the starboard hand. Continue on the course up the middle of the harbor, and anchor where convenient in the wide part of the harbor below Fivepound Island.

See the remarks and dangers under section 2, preceding.

MANCHESTER HARBOR *

is about 5 miles westward of Gloucester Harbor, and formed by an arm of the bay extending behind Gales Point in a northeasterly direction for 1 mile to the village of **Manchester**, the entrance being **N.** by **E.** from Baker Island Lighthouses; the approach to it is between **House Island** on the east and **Great Misery Island** on the west. The northern point at the entrance is a high, precipitous head, called **Glass Head**, and between this head and Gales Point the entrance is 600 yards wide. **Proctor Point** is on the eastern shore of Manchester Harbor, ⅛ mile above Gales Point, and directly opposite Glass Head, and the harbor here is not quite 200 yards wide.

There is anchorage off the entrance between Great Misery and House islands and the main shore westward of Glass Head. Mariners desiring to anchor for the night or in head winds may here find fair holding ground and good shelter except in southerly gales. The anchorage is ¾ mile wide, and has from 3 to 6 fathoms.

The narrow channel leading up to Manchester from the outer harbor is about 100 feet wide and 6½ feet deep as far as Proctor Point, above which it has 4 to 6 feet in a narrow dredged channel up to the town wharves. The draft of vessels going to Manchester averages about 7 feet, deepest draft about 10 feet.

Pilots are usually taken by strangers bound up to the town, the vessels anchoring in the harbor below until pilots come down in response to signals.

Towboats can be had from Beverly, and are used in towing barges up and down.

Supplies.—Fresh water can be obtained at Manchester; supplies and some ship-chandler's stores from Salem and Beverly. The nearest customhouse is at Gloucester.

Tides.—The mean rise and fall of tides is about 9 feet. See also tidal data for Gloucester and Salem on page 11.

GENERAL DIRECTIONS, MANCHESTER HARBOR.

Approaching and Entering to an Anchorage.—With Baker Island Lighthouses bearing between **WSW. ½ W.** and **NW. by W. ½ W.** steer for them. Pass about ¼ mile northward of Baker Island Lighthouses, and when they bear *S. ¼ W.* steer **N. ¼ E.**, keeping the bearing. Leave Whaleback spindle on the starboard hand, and Sauli Rock buoy on the port hand.

If intending to anchor in the roads, when well past Sauli Rock buoy steer for Chubb Island (about **NNW.**), and anchor in about 5 fathoms, sandy bottom.

If bound to the village, when the top of the high, wooded hill a little westward of Glass Head bears **N. by E. ½ E.**, steer for it. Anchor when the center of the southernmost of the two *Ram islands* (which has shrubs and small trees upon it) bears *SE.*, and no attempt should be made to go farther without a pilot.

Remarks.—When heading for Baker Island Lighthouses, as directed, all dangers will be cleared. On the **N. ¼ E.** course the spindle on Whaleback should be given a berth of 300 yards, and the buoy on Sauli Rock a berth of about 200 yards. Glass Head will be on the starboard bow and Chubb Island on the port bow.

Chubb Island is a bare, rocky islet lying off the main shore, in the outer roads, about ¾ mile westward of Glass Head.

Dangers.—Off the shore eastward of Manchester Harbor entrance and between Gloucester entrance and House Island are a number of islands, rocks, and ledges, the farthest outlying ones of which, named in order from eastward, are: **Kettle Island, Great Egg Rock, Paddock Rock, Boo-hoo Ledge, Salt Rock, Picketts Ledge, Gales Ledge,** and **Pilgrim Ledge.** The dangers mentioned, with exception of Paddock Rock, Gales Ledge, and Pilgrim Ledge, are bare at low water.

Paddock Rock, small, with 13 feet over it, lies about 600 yards **SW. by W. ½ W.** from Great Egg Rock, and is not marked.

Gales Ledge, 1 mile **NE. by E. ¼ E.** from Baker Island Lighthouse, is marked by a buoy (spar, red, No. 2) and has a least depth of 5 feet over it. A number of spots with 12 to 17 feet over them lie 600 yards **NE. by E. ¼ E.** from Gales Ledge.

Pilgrim Ledge lies 400 yards **W. ¼ N.** from Gales Ledge and has 18 feet over it.

The sailing directions lead well clear of these dangers.

* Shown on charts **109**, scale $\frac{1}{80,000}$, price $0.50; **244**, scale $\frac{1}{20,000}$, price $0.25.

Whaleback is a dangerous ledge lying directly in the passage into the harbor, being less than ¼ mile **SW.** by **S.** from House Island and about ⅜ mile **E.** from Great Misery Island. It is about 400 yards long in a **NNE.** and **SSW.** direction and 75 yards wide, and is bare at low water at the middle and near its northern end. A red iron spindle, with cage on top, marks the ledge near its center.

Sauli Rock lies 300 yards **E.** from the northeastern point of Great Misery Island. It is bare at low water and marked by a buoy (spar, red and black horizontal stripes).

SALEM HARBOR.*

This harbor is at the western end of a large, irregular indentation in the shore of Massachusetts Bay, 11 miles southwestward of Cape Ann, and 12 miles northward and eastward of Boston Harbor entrance. **Gales Point** is the northern, and **Marblehead Neck** the southern, point at the entrance to this large indentation, which includes within its limits the harbors of Manchester, Beverly, Salem, and Marblehead, the distance between the two points being 4 miles. This wide space is studded with islands, bare rocks, and sunken ledges, through which lead the several channels into the harbors.

Salem Harbor is much used as a harbor of refuge, particularly during the autumn. It is especially convenient for vessels seeking shelter bound eastward and met by an easterly gale, as the direction of the harbor is such that a foul wind for proceeding is a fair wind into the harbor, and a fair wind for proceeding is also a fair wind out. Strangers should not attempt to beat into Salem Harbor on account of the numerous ledges and shoals.

Inside of the islands and rocks obstructing the entrance, and southward of the northern shore, there is good anchorage in what may be properly termed the outer harbor. This anchorage ground is about 2 miles long (**E.** and **W.**) and from ½ to 1¼ miles wide (**N.** and **S.**).

The **Inner Harbor,** or Salem Harbor proper, is about 1½ miles long in a **SW.** by **S.** direction. The entrance is between Fort Pickering Lighthouse on the northwest and **Naugus Head,** the northwestern point of Marblehead Peninsula, on the southeast. Between these two points it is 700 yards wide, but it rapidly widens, after passing Naugus Head, to a width of nearly 1 mile. The deep-water channel, 3 to 4 fathoms, is quite narrow and lies nearer the eastern shore. Extensive flats fill the head of the harbor and make off from the western or town side.

South River is a shallow stream only 50 yards wide in places between the wharf lines, and about 7 feet deep in the channel; it separates Salem and South Salem. At the mouth of this stream is **Derby Wharf,** which is nearly 600 yards long in a **SE.** direction, and is marked at its end by **Derby Wharf Lighthouse;** this with Fort Pickering Lighthouse forms a range for approaching the Inner Harbor.

The **City of Salem** has some trade by water. The deepest draft of vessels entering the harbor is 20 feet; there is a depth of 15 feet alongside the coal pier, and about 5 feet alongside Derby Wharf.

Prominent objects.—Approaching from eastward, **Baker Island,** with two lighthouses on its northern end (see table, page 12) and a number of houses scattered over the island, and **Great Misery Island,** the high, bare island, with a clubhouse and water tank near its highest part, lying northward of Baker Island, are the most prominent. Westward of these islands is **Bowditch Ledge beacon,** a large granite beacon with black staff and cage on top. **Hospital Point Lighthouse** (see table, page 12) is on the north shore nearly 3¼ miles **WNW.** from Baker Island Lighthouses, and is the guide for standing in from eastward. On the north side of the entrance to the Inner Harbor is **Fort Pickering Lighthouse.**

Approaching from southward, **Halfway Rock,** a high, solitary rock, with a beacon on it, will be seen about 1⅛ miles south of Baker Island. Southward of Baker Island lie two bare, rocky islets, **North** and **South Gooseberry Islands,** and 1¼ miles **SW.** of these is **Cat Island,** long and narrow with a number of houses near the northern end. Marblehead Neck is high and rocky, and has many summer houses; **Marblehead Lighthouse** (see table, page 12) is on its northern point.

Channels.—Three principal channels lead into Salem Harbor, which are equally good for entering in the daytime in clear weather. These channels come together in the outer harbor, northward of Little Haste, and from there into Salem Harbor proper the depth is 3¼ to 5¼ fathoms.

Main Ship Channel, the most northern channel, has a least depth of over 5 fathoms until up to Little Haste; its entrance lies between Baker Island and Great Misery Island, and its general direction is about **WNW.**

Cat Island Channel, the middle channel, having its entrance near Halfway Rock, leads in a northwesterly direction, between Cat Island on the south and Eagle Island on the north; and has a least depth of 3¼ fathoms when entering between Gooseberry Ledge and Satan Rock, and a least depth of 5 fathoms when entering between Satan Rock and Cat Island.

* See footnote on page 35.

Marblehead Channel, the western channel, leads, in a northerly direction, between Cat Island and Marblehead, and has numerous spots with depths of 19 to 27 feet over them, over which the sea breaks in easterly gales. By avoiding these spots the channel is good for a least depth of about 5 fathoms. It and Cat Island Channel are also channels for approaching the entrance to Marblehead Harbor.

South Channel, a branch from Marblehead Channel, leads along the northern shore of Marblehead Peninsula, and southward of the numerous rocks and ledges lying eastward of the immediate entrance to Salem Harbor, and southward and eastward of the main channel. The South Channel is less than 100 yards wide in its narrowest part and has a depth of 12 feet.

Anchorages.—There is good anchorage in 5 to 7 fathoms westward of Bowditch Ledge and northward or eastward of Little Haste (see description of the harbor preceding); also off the entrance to Beverly Harbor. The quarantine anchorage lies within the following limits: Beginning at Eagle Island and running northwesterly to Coney Island, from Coney Island in a more northerly direction to Great Haste, from there easterly to Bowditch Ledge, and thence southwesterly to Eagle Island. In Salem Harbor the best anchorage is just inside of Naugus Head on the eastern side of the harbor.

Pilots will be found outside of Baker Island. A stranger bound for the port usually takes one, making signal if not spoken, and standing off and on outside until boarded. Pilotage is compulsory for certain classes of vessels in the ports of Massachusetts (see Appendix II).

Towboats can be obtained by making signal after getting in past Baker Island, but are not much used.

Quarantine regulations are established from time to time by the Board of Health of Salem. For anchorage of vessels subject to quarantine, see "Anchorages."

Marine Hospital.—Emergency relief is furnished at Salem, as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of Class IV (see Appendix IV). The nearest marine hospital is at Chelsea, Mass.

Supplies.—Provisions and some ship-chandler's stores can be obtained. Coal, either anthracite or bituminous, can be obtained at the wharves. Water can be had through hose alongside the wharves, and from a water boat from Beverly.

Repairs.—There is one small marine railway at South Salem, with a cradle 75 feet long. Light repairs to machinery can be made.

Ice.—The head of the harbor on the flats is usually closed by ice every winter during the months of January and February; but the formations rarely extend beyond the coal pier except in unusually severe winters, when they have been known to reach as far out as The Haste, and occasionally as far as Eagle Island.

Northerly and northwesterly winds are most favorable to local formations in Salem Harbor. Winds from southward and westward, during light formations, have a tendency to carry the ice off to sea, while those from **NE.** to **SE.** create a swell which usually breaks up the formations both in the harbor and its approaches.

For **tides** see table, page 11.

The **tidal currents** in Salem have little velocity, and mariners will generally be able to make a course good without regard to tide.

For **variation of the compass** at various points, see page 11.

SAILING DIRECTIONS, SALEM HARBOR.

For depths that can be taken through the several channels into Salem Harbor, see "Channels" on pages 36–37.

1. ***Approaching from Eastward and Entering, by the Main Ship Channel.***—When Baker Island Lighthouses are made, steer for them on any bearing between **WSW.** ½ **W.** through *W.* to **NW.** by **W.** ½ **W.** Pass about 450 yards northward of the lighthouses, and steer **WNW.** ¼ **W.** for Hospital Point Lighthouse; and when Bowditch Ledge beacon bears about *S.*, distant 250 yards, steer **W.** ½ **N.** until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range, bearing **SW.** by **W.** ¾ **W.** Then stand in on this range, and follow the directions in section 2.

At night.—Follow the directions above, and continue on the **WNW.** ¼ **W.** course for Hospital Point Light until Fort Pickering and Derby Wharf lights are in range. Then

follow the directions in section 2. When on the sailing line for Hospital Point Light, the light will show brighter than if northward or southward of the line. Keep in the brightest rays of that light.

Remarks and dangers.—When standing for Baker Island Lighthouses, **Great Misery Island**, a large, hilly island, with a clubhouse and water tank near its highest part, and **Little Misery**, close southward of Great Misery, will be seen northward of Baker Island. Passing north of Baker Island, leave the black spar buoy (No. 3) off the northern end of Baker Island about 150 yards on the port hand.

Gales Ledge is described on page 35.

Southeast Breakers, with 3 to 17 feet over them, lie about 1¾ miles **SSE. ½ E.** from Baker Island Lighthouses, and are marked off the southwestern side by a buoy (nun, red, No. 2); this buoy is numbered and colored for vessels passing into the Cat Island Channel. **Newcombs Ledge**, with 18 feet over it, lies ¼ mile **E. by S.** from the southern end of Southeast Breakers.

Middle Breakers, partly bare at low water, lie 1⅝ miles **SSE. ¾ E.** from Baker Island Lighthouses, and are marked by a spindle (iron, black ring and pendants on top).

Inner Breakers, parts of which show bare at low water, lie ⅜ mile **WNW.** from the spindle on Middle Breakers. From Inner Breakers a shoal extends northwestward nearly to Baker Island.

Searle Rock, with 8 feet over it, lies about ½ mile **SE. ¾ S.** from Baker Island Lighthouses, and is marked off its northern side by a buoy (spar, black, No. 1).

Two spots, with 16 and 18 feet over them, respectively, lie ½ mile **NNE.** from the spindle on Middle Breakers, and about 1⅛ miles **SE. ½ E.** from Baker Island Lighthouses. They are avoided by keeping the lighthouses bearing westward of **NW. by W.**

Whaleback, marked by a spindle (red cage on top), is described on page 36.

Baker Island Shoal extends northwestward about 300 yards, and westward about 500 yards, from the northern end of Baker Island. The northern end of this shoal is marked by a buoy (spar, black, No. 3).

On the **WNW. ¼ W.** course, **Hospital Point Lighthouse**, on the north shore, near the entrance to Beverly Harbor, should be kept ahead. Bowditch Ledge Beacon, a large conical stone beacon surmounted by a black wooden staff and cage, will show prominently on the port bow. The course leads about 300 yards south of Little Misery Island, and over 200 yards north of House Ledge buoy. The buoys westward of Great Misery Island should be left on the starboard hand.

Hardy Rock Shoal, Hardy Rocks, and **Rising States Ledge** lie southward of House Ledge and **W.** from the northern end of Baker Island. They are marked by two spar buoys (black, Nos. 5 and 7) and by a beacon (spar with two triangles on top).

House Ledge has 10 feet over it and lies about ⅜ mile **ESE. ¼ E.** from Bowditch Ledge beacon; it is on the south side of the Main Ship Channel and is marked by a buoy (spar, red and black horizontal stripes) placed off its northeastern side.

Bowditch Ledge lies on the south side of the Main Ship Channel about 1⅛ miles **WNW.** from Baker Island Lighthouses; it is marked by a beacon (granite, conical structure, with black wooden staff and cage on top). A shoal spot, with 14 feet, in a surrounding depth of 4 to 5 fathoms, lies 300 yards **ESE.** from the beacon.

Misery Ledge is small, has 17 feet over it, lies on the north side of the Main Ship Channel ¼ mile **N. by E. ¾ E.** from Bowditch Ledge beacon, and is marked on its southern side by a buoy (spar, red and black horizontal stripes).

John Ledge has 12 feet over it, lies about 300 yards **WNW. ¼ W.** from Misery Ledge, and is marked off its southern side by a buoy (spar, red and black horizontal stripes).

Misery Shoal, with 11 feet over it, and **Misery Rock**, with 6 feet over it, lie westward from Great Misery Island and northward and northeastward from Misery Ledge; they are both marked by buoys.

On the **W. ½ N.** course Beverly Harbor entrance will be ahead; **Great Haste**, a low, bare, rocky islet, Little Haste beacon, a black oak spar with cask on top, and Haste Shoal buoy will be on the port bow. **Fort Pickering Lighthouse** will be seen on the western side of Salem Harbor entrance, and **Derby Wharf Lighthouse** on the end of the wharf, 1 mile southwestward of it; Derby Wharf Lighthouse is hard to pick up in the daytime, as it is small and about the same color as the buildings showing back of it.

Great Haste is a low, bare, rocky islet surrounded by ledges, and lies 2½ miles **W. by N.** from Baker Island Lighthouses, and nearly 1 mile **SSE. ½ E.** from Hospital Point Lighthouse.

Little Haste, a rock, bare at low water, lies northwestward of Great Haste, and is marked by a black spar beacon with cask on top.

Haste Shoal makes off nearly 400 yards northward from Little Haste and is marked near its northern end by a buoy (spar, black, No. 11).

A small, shoal spot, with 17 feet over it, lies 300 yards about **N. by W.** from buoy No. 11, and on the range of Little Haste beacon and Marblehead Rock beacon. The sailing line leads southward of this shoal.

Haste Rock has 7 feet over it, lies near the eastern end of the ledge making eastward from Great Haste, and is marked off its northern side by a buoy (spar, black, No. 7).

1 A. ***Approaching from Southward or Southeastward and Entering, by the Cat Island Channel.***—When Halfway Rock is made, steer for it on any bearing between **W.** by **S.** (through *W.* and *N.*) and **NE.** by **E.**, and give the rock a berth of from 250 yards to ½ mile. Then bring it to bear *SE.* and steer **NW.** until the north end of Eagle Island is in range with the northern end of Baker Island, bearing *ENE.* ½ *E.*, and Marblehead Lighthouse is on the port beam. Then steer **N.** by **W.** ¾ **W.** until Bowditch Ledge beacon opens south of Little Misery Island and Hospital Point Lighthouse bears **NW.** ¼ **W.** Steer for the lighthouse on that bearing until Fort Pickering Lighthouse and Derby Wharf Lighthouse are in range, bearing **SW.** by **W.** ¾ **W.**, and then follow the directions in section 2.

At night.—Unless the night is clear, so that the buoys can be seen, a stranger should enter by the Main Ship Channel (see section 1).

Remarks and dangers.—**Halfway Rock,** lying in deep water off the entrance to this channel, is a prominent bare rock rendered conspicuous by a pyramidal frame beacon with stone foundation; on the top of the pyramid is a red keg. The nearest dangers are a little over ¾ mile northeastward, northward, and northwestward from it. **Southeast Breakers** are described under section 1.

On the **NW.** course **Coney Island,** low, bare, rocky islet, will be a little on the port bow; Gooseberry Ledge buoy, Brimbles spindle, Eagle Island, and Mid-channel Rock buoy will be left on the starboard hand in the order named; the latter when abeam should be distant 150 yards. Satan spindle, Cat Island, Martin Rock buoy, and Chappel Ledge buoy will be left on the port hand. The least water liable to be found while on this course is on a small 3¾-fathom spot lying 350 yards **NE.** ¾ **N.** from Satan Rock spindle.

Eagle Island is a small, bare, rocky island about ⅝ mile **NNE.** ¼ **E.** from the northern end of **Cat Island.** The latter island can be readily distinguished by the houses near its northern end; it lies about ⅝ mile **ENE.** from the northern end of Marblehead Neck. Mid-channel Rock buoy (spar, red, No. 4), which lies westward of Eagle Island, should be left at least 125 yards on the starboard hand, when entering.

Davis Ledge, with 12 feet over it, lies 1¼ miles **S.** from Baker Island Lighthouses.

A large shoal, showing dry ledges in places, about 1⅛ miles wide **E.** and **W.**, extends nearly 1 mile southward of Baker Island. The **Inner Breakers** form its southeastern extremity, and near its southern end are the **Dry Breakers,** lying about 400 yards **NNW.** from Davis Ledge. Near its western end are the small islands of North Gooseberry and South Gooseberry.

Gooseberry Ledge is small and has a depth of 15 feet; it lies on the north side of the Cat Island Channel about 1¼ miles **NW.** ¾ **N.** from Halfway Rock, and is marked by a buoy (spar, red and black horizontal stripes). There are spots with 17 and 18 feet over them eastward and northward of the ledge.

Satan Rock is a small, bare rock marked by a red spindle with black cage on top; it lies about ½ mile **E.** ½ **S.** from Cat Island beacon, and should be given a berth of 150 yards on its eastern and western sides and 275 yards on its north side.

Martin Rock has 11 feet over it, and lies about 350 yards **E.** from the northern end of Cat Island; it is marked on its eastern side by a buoy (spar, black, No. 1). The eastern shore of Cat Island southward of this buoy should be given a berth of over 200 yards.

The Brimbles are partly bare at low water, and lie nearly ⅜ mile **SE.** by **S.** from Eagle Island on the north side of Cat Island Channel, and are marked by a black spindle (iron, with four arms; the two arms facing the Cat Island Channel are red); the ledge is about 250 yards long in a **N.** and **S.** direction and about 150 yards wide.

Mid-channel Rock has 15 feet over it, and lies about 425 yards **WNW.** ¾ **W.** from the southern end of Eagle Island. It is marked near its southwestern side by a buoy (spar, red, No. 4).

On the **N.** by **W.** ¾ **W.** course Great Haste, a low, bare, rocky islet, and Hospital Point Lighthouse will be on the port bow. Eagle Island Bar buoy (spar, red, No. 6) will be left about 400 yards on the starboard hand, and two black spar buoys will be left well on the port hand.

Chappel Ledge has 16 feet over it, is about 100 yards in diameter, and lies ½ mile **NW.** ¼ **N.** from the northern end of Cat Island and is marked by a buoy (spar, red and black horizontal stripes) placed near its southeastern side. There is a small 19-foot spot about 100 yards eastward of this buoy.

Eagle Bar is an extensive shoal making off for a distance of over ⅜ mile northwestward from Eagle Island. It is marked off its northwestern end by a buoy (spar, red, No. 6).

Coney Ledge, showing a number of bare rocks at low water, makes off southeastward from Coney Island. It is marked near its eastern side by a buoy (spar, black, No. 3).

Coney Island Rock is a detached rock, with 11 feet over it, lying about 300 yards **NE.** ½ **E.** from Coney Island. It is marked at its eastern side by a buoy (spar, black, No. 5).

On the **NW.** ¼ **W.** course for Hospital Point Lighthouse, the buoys and beacon which are left on the port hand should be given a berth of 350 yards or more. Salem Harbor will be open southwestward, and Fort Pickering and Derby Wharf lighthouses will be seen on the western side of the harbor.

Haste Rock, lying about 600 yards **N.** from Coney Island, **Great Haste, Little Haste,** and **Haste Shoal** are described under section 1.

1 B. ***Approaching from Southward or Southwestward and Entering, by the Marblehead Channel.***—At low water and with a swell or heavy sea vessels should follow the directions in paragraph 1 (see also Marblehead Channel, page 37). At night vessels should not attempt to enter by the Marblehead or South channels.

With Minots Ledge Lighthouse bearing *S.* ¼ *E.* steer **N.** ¼ **W.**

Or, with Boston Lighthouse bearing *SSW.* ¾ *W.* steer **NNE.** ¾ **E.**

Or, with Long Island Head Lighthouse bearing *SW.* ⅜ *W.* steer **NE.** ⅜ **E.**

Or, with Egg Rock Lighthouse bearing *WSW.* ⅝ *W.* steer **ENE.** ⅝ **E.**

Any of the above courses will lead 300 yards south of the red bell buoy just eastward of Outer Breakers, and 1¼ miles *S.* by *W.* ¾ *W.* from Tinker Island.

I. Vessels of 20 feet or less draft at low water.—Leave the bell buoy about 200 yards on the port hand, and steer **NE.** ¾ **N.** for the western end of Baker Island; and when the south end of Marblehead Rock is in range with the north end of Marblehead Neck (Marblehead Lighthouse bearing *NW.*) steer **NNW.** until Marblehead Lighthouse bears abeam (*WSW.*). Then steer **N.** by **E.** ¼ **E.** with the beacon on Marblehead Rock astern, leaving Archer Rock buoy 200 yards on the starboard hand and Chappel Ledge buoy 200 yards on the port hand. Continue the course until Hospital Point Lighthouse bears **NW.** ¼ **W.**, and then steer for it on that bearing until Fort Pickering and Derby Wharf lighthouses are in range, bearing **SW.** by **W.** ¾ **W.** Then follow the directions in section 2.

Remarks and dangers.—On the **NE.** ¾ **N.** course from the bell buoy for the western end of Baker Island, a range should be taken over the western end of the island so as to insure not being set off the course which leads between spots with 3¾ and 4 fathoms over them. On the course, Tinker Island should be left a little over ½ mile distant when it is abeam, and Marblehead Rock and beacon will be on the port bow showing clear of Marblehead Neck. **Tinker Island** is the small, grassy island nearly ⅝ mile **S.** from the southern end of Marblehead Neck. The eastern shore of Tinker Island should not be approached closer than 200 yards, and vessels should not attempt to pass between the island and Marblehead Neck.

Outer Breakers have 8 feet over them, and lie a little over 3 miles **ENE.** ¼ **E.** from Egg Rock Lighthouse, and about 1½ miles southward of the southern end of Marblehead Neck. They are marked off their southeastern side by a red bell buoy. Northwestward of this buoy lie **Southwest Breakers, Great Pig Rocks, Dolphin Rock, Middle Ground, Sammy Rock, Ram Island, Little Pig Rocks,** and a number of detached rocks with 3 to 15 feet over them, extending in a broken line to the shore. Some of them are marked by buoys which are colored and numbered for vessels bound westward, but no stranger should attempt to pass inside the bell buoy.

Roaring Bull, bare at low water, and marked by a spindle (iron, red, cross on top) lies about 400 yards **SW.** by **S.** from Tinker Island. There is a small detached 16-foot spot about 500 yards **SW.** from the spindle.

Volunteer Rock, with 18 feet over it and not marked, lies a little over ⅝ mile **S.** ¼ **W.** from Marblehead Rock beacon, and 850 yards **SE.** by **S.** from the spindle on Tom Moores Rock. This rock is surrounded by depths of 21 to 24 feet.

Tom Moores Rock shows bare at one-third ebb, and lies a little more than 400 yards eastward from the eastern shore of Marblehead Neck, and about ½ mile **SSW.** ¾ **W.** from the beacon on Marblehead Rock. It is marked by a spindle (iron, black, cask on top). There is shoal water between the spindle and the shore.

On the **NNW.** course Marblehead Rock is left nearly ¼ mile on the port hand, and when Marblehead Lighthouse is abeam, Archer Rock buoy should be 350 yards distant about one point forward of the starboard beam. The numerous spots with 19 to 27 feet over them are avoided by keeping close on the course.

Marblehead Rock is a high, bare rock surmounted by a beacon painted white and black in horizontal stripes, and lies about 500 yards eastward of the northeastern end of Marblehead Neck.

Lasque Ledge, with 10 feet over it at its end, extends 350 yards in an easterly direction from the northern end of Marblehead Neck, and is marked at its end by a buoy (spar, black, No. 1). A 15-foot spot lies about 100 yards northward of this buoy.

The **N.** by **E.** ¼ **E.** course leads nearly ¼ mile eastward of Grays Rock; and when the latter is nearly abeam, Chappel Ledge buoy should be left 200 yards on the port hand. After passing this buoy vessels may steer **N.** until Hospital Point Lighthouse bears **NW.** ¼ **W.**, when the latter should be steered for.

Archer Rock is a detached rock, with 10 feet over it, lying about 600 yards **W.** by **S.** from the northern end of Cat Island. It is marked off its southern end by a buoy (spar, red and black horizontal stripes).

Ledges and shoals make off 350 yards westward and 250 yards northwestward from the northern half of Cat Island. On the ledges making off southward from the island is a beacon (black, spar, with large cask on top). Shoal water extends 150 yards southward of the beacon. About 200 yards **SW.** from this beacon is a detached 16-foot spot.

Chappel Ledge is described under section 1 A, page 39.

Grays Rock is a low, bare, rocky islet surrounded by shoal water for a distance of 125 yards; it lies about ⅞ mile **N.** by **E.** ¾ **E.** from Marblehead Lighthouse. Westward of Grays Rock is the entrance to the South Channel.

Coney Ledge, Coney Island Rock, and **Eagle Bar** are described under section 1 A.

Haste Rock, Great Haste, Little Haste, and Haste Shoal are described on page 38.

II. Vessels of less than 15 feet draft.—Leaving the bell buoy just eastward of Outer Breakers, about 200 yards on the port hand, steer **NNE.** ¼ **E.**; pass ¼ mile eastward of Tinker Island, and the same distance eastward of the spindle on Tom Moores Rock, and when the beacon on Marblehead Rock is on the port beam, distant 300 yards, steer **N.**

When Archer Rock buoy is on the starboard beam, distant 200 yards, steer **N.** by **E.** ¼ **E.** so as to pass 200 yards eastward of Chappel Ledge buoy. When the latter is a little abaft the beam, steer **N.** until Hospital Point Lighthouse bears **NW.** ¼ **W.** Then steer for the lighthouse on this course until Fort Pickering and Derby Wharf lighthouses are in range; then follow the directions in section 2.

Remarks.—Care must be taken not to be set westward when on the **NNE.** ¼ **E.** course. Marblehead Rock is bold on its eastern side, and can be approached on that side as close as 100 yards. Bowditch Ledge beacon should be ahead on this course.

On the **N.** course from Marblehead Rock, Grays Rock will be a little on the port bow, and Chappel Ledge buoy a very little on the starboard bow (nearly ahead).

On the **N.** course, after passing Chappel Ledge buoy, two black spar buoys will be left 300 and 400 yards, respectively, on the port hand.

For dangers, see the dangers under paragraph I, preceding.

2. *To an Anchorage in the Inner Harbor.*—Having followed the directions in section 1, 1 A, or 1 B, steer for Fort Pickering Lighthouse, keeping it in range with Derby Wharf Lighthouse, course **SW.** by **W.** ¾ **W.** When Old Hospital Point, the northern point of Salem Neck, bears *NW.*, and black spar buoy No. 13 is 200 yards distant on the port beam, steer **SW.** ¾ **W.**, passing 200 to 300 yards eastward of Fort Pickering Lighthouse. Continue this course, and anchor southward of Fort Pickering Lighthouse and off the end of the Philadelphia and Reading coal pier, in 3½ to 4½ fathoms, soft bottom.

Remarks.—When standing for Fort Pickering Lighthouse, the beacon on Abbott Rock will be a little on the starboard bow. When the course is changed to **SW.** ¾ **W.**, Middle Ground buoy (spar, black, No. 13) will be left about 200 yards on the port hand. Great Aqua Vitæ beacon, and the buoys marking the South Channel, will be seen on the port hand when nearly up to Fort Pickering Lighthouse. The sailing line leads about midway between Naugus Head and the coal wharf.

Dangers.—The **Middle Ground** extends ⅕ mile **SW.** by **W.** ¾ **W.** from Great Haste to Great Aqua Vitæ Ledge; it is awash in several places at low water, and is marked at its western side by a buoy (spar, black, No. 13).

Abbott Rock shows bare at low water, and lies nearly 600 yards **NE.** ½ **E.** from Fort Pickering Lighthouse; it is marked by a beacon (pyramidal stone structure surmounted by a staff with square red cage on top). A 14-foot shoal lies 300 yards **NE.** from the beacon, and another with 18 feet over it lies the same distance **SSW.** from it.

Great Aqua Vitæ Ledge lies about ⅜ mile **E.** by **S.** from Fort Pickering Lighthouse and at the southwestern end of the Middle Ground, and is marked by a beacon (pyramidal stone structure surmounted by a black staff and cage).

Knapp Rock has 8 feet over it, and lies about 100 yards westward from Great Aqua Vitæ Ledge; it is marked by a buoy (spar, red, No. 10), which is left well on the port hand by vessels entering from northeastward.

Halfside Rock lies nearly 500 yards **W.** by **S.** from Fort Pickering Lighthouse, and is marked off its eastern side by a buoy (spar, red, No. 12).

2 A. *Through the South Channel to the Anchorage.*—Follow the directions in section 1 B, and bring Marblehead Rock to bear *W.*, distant about 200 yards; then steer **N.** by **W.** ½ **W.** with Hospital Point Lighthouse ahead. The spindle on Kettlebottom should be kept a little on the port bow. Pass about 250 yards westward of Grays

Rock, and 100 yards eastward of Kettlebottom spindle (iron, black, with open sphere on top). Then steer **NW. ⅜ N.**, heading so as to pass midway between red spar buoy No. 4 and black spar buoy No. 3. When midway between these buoys, steer **WNW. ⅜ W.**, leaving black spar buoy No. 5 about 50 yards on the port hand, and red spar buoys Nos. 6, 8, and 10 about 100 to 150 yards on the starboard hand. When the latter buoy is a little abaft the beam, steer about **WSW. ½ W.**, and anchor off the end of the Philadelphia and Reading coal pier, in 3½ to 4½ fathoms, soft bottom.

Remarks.—The buoys are the principal guides for this channel; they can be readily followed in the daytime in clear weather, being so close to each other that the next buoy ahead can always be seen.

A detailed description of the dangers on both sides of this channel would be of no practical use; chart No. 244 should be examined to obtain an idea of their number and extent.

BEVERLY HARBOR.*

This small harbor lies north of Salem Neck, at the western end of Salem outer harbor, and is formed by the confluence of **Essex Branch** (locally known as **Danvers River**), **Beverly Creek**, and **North River**, three small streams which unite at this point, forming a basin of irregular shape. On the northern shore of the basin is the town of **Beverly**. The harbor is about ⅝ mile in diameter, full of flats and shoals, but with good water in the channel. It is crossed at its western end by two drawbridges (width of draws, 32½ and 40 feet). Hospital Point Lighthouse is the principal guide to the entrance, which is narrow and full of shoals.

The channel is marked by buoys and beacons; it is very narrow, and has a depth of 18 feet to the wharves. The channel will be widened to 200 feet by dredging its narrowest parts. A stranger should not attempt to enter at low water if drawing over 10 feet. The deepest draft of vessels entering the harbor is about 17 or 18 feet. From 12 to 16 feet of water is found at the ends of the wharves at low water.

The **best anchorage** is between the Middle Ground and Lobster Rocks beacon, or between the bridge and wharves. In going up toward the bridge the best water is near the wharves.

Danversport, about 1½ miles above Beverly, on Danvers River, is at the head of navigation. Vessels of 10 to 12 feet draft are taken up to Danversport.

North Salem, on the North River, is about 1 mile above Beverly. The deepest draft taken to North Salem is 10 to 12 feet.

Pilots can be found off Baker Island, and are generally taken by strangers. A vessel desiring a pilot, and not having been boarded by one off Baker Island, should come to anchor, with signal flying, when past The Haste, and wait for one to come on board. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats are frequently taken by vessels bound to Beverly, and can be had at the wharves, or by signaling for one when approaching the entrance of the harbor.

The **quarantine ground** is the same as for Salem Harbor (see page 37).

Supplies.—Provisions and some ship-chandler's stores can be obtained; also anthracite and bituminous coal in limited quantities, for steamers, put on board alongside wharves or in lighters. Water can be obtained alongside wharves through pipes and hose, and from a water boat.

Marine railway.—There is one marine railway, capable of hauling out vessels of about 500 tons.

Tides.—The mean rise and fall of tides are about the same as at Salem (see table, page 11).

The **tidal current** has considerable velocity, and sets athwart the channel in places; during the first half of the ebb it sets across Monument Bar.

SAILING DIRECTIONS, BEVERLY HARBOR.

Strangers of over 10 feet draft should not enter without a pilot, as the channel is narrow and crooked in places, and, although well marked by aids, requires some local knowledge to keep in the best water. No attempt should be made to enter at night.

Approaching and Entering.—Follow the directions in section 1, 1 A, or 1 B, Sailing Directions, Salem Harbor. When Fort Pickering and Derby Wharf lighthouses are in range, bearing **SW.** by **W. ¾ W.**, steer for them until Little Haste beacon or the northern end of

*See footnote on page 35.

Great Haste bears *SE.* by *E.* ½ *E.* Then steer **NW.** by **W.** ½ **W.**, keeping the beacon or island astern. When Monument Bar beacon (pyramidal stone structure with black staff and square cage on top) is in range with Lobster Rocks beacon (square stone structure), bearing *W.* ¼ *N.* steer about **W.** by **N.** Leave black spar buoy No. 1 about 100 yards on the port hand, and pass about 75 yards northward of Monument Bar beacon.

Round the beacon at this distance and steer about **SSW.**, heading about for Rams Horn beacon, and so as to pass at least 50 yards eastward of red spar buoy No. 4; when abreast this buoy haul a little westward, and pass about 50 yards southward of red spar buoy No. 6. When this buoy is passed steer for Lobster Rocks beacon, course about **NW.** ¼ **W.** When the beacon is about 150 yards distant ahead, haul northward, pass about midway between the beacon and Tuck Point, and anchor off the wharves of the town in 14 to 18 feet water, soft bottom.

Remarks.—On the **NW.** by **W.** ½ **W.** course, Porter Rock buoy (spar, red, No. 2) will be made ahead; this buoy is left on the starboard hand when rounding Monument Bar beacon. There is a pile dolphin on the west side of the channel opposite Monument Bar beacon. The narrowest part of the channel is abreast of red spar buoy No. 4.

Dangers.—**A shoal** extends ¼ mile northward from Old Hospital Point, and nearly that distance westward; the shoal is marked at its northern limit by a buoy (spar, black, No. 1), near its northwestern end by Monument Bar beacon, and on its western side by Rams Horn beacon. There are two small spots, with 12 feet over them, in the middle of the channel, and 150 yards northeastward of black spar buoy No. 1.

A shoal extends ¼ mile in a southeasterly direction from Tuck Point, and from there eastward along the bight (Mackerel Cove) to Woodberry Point; three red spar buoys mark the eastern outer limit of the shoal.

Rams Horn Rock, marked by a square granite beacon, with wooden staff and sugarloaf-shaped top, is on the east side of the channel, and about ¼ mile **SW.** by **S.** from Monument Bar beacon.

Lobster Rocks, a group of rocks, dry at half tide, are on the northeastern point of the flats on the western side of the channel, and are marked by a square granite cribwork beacon 200 yards **SW.** by **W.** ¾ **W.** from Tuck Point.

MARBLEHEAD HARBOR.*

This harbor, about 1 mile long and ⅝ mile wide, lies between Marblehead Neck and Marblehead Peninsula, which forms the southern shore of Salem Harbor. Its southern end is separated from the ocean by **Marblehead Beach,** a narrow strip of land connecting Marblehead Neck with the mainland.

Marblehead Harbor is of comparatively little commercial importance, but is the rendezvous for yachts while cruising in eastern waters. The Eastern Yacht Club has a large clubhouse here. Vessels of 20 feet draft can enter the harbor at mean low water; strangers of deeper draft should take a pilot. There is 8 to 11 feet alongside the wharves. The deep water extends close to the eastern and western sides of the harbor, but shoals cover the greater part of its head southward of Skinners Head and Boden Point.

The town of **Marblehead** occupies the northwestern shore of the harbor, and is connected with Salem by a railroad.

The entrance, about ⅝ mile wide, is between Marblehead Point on the southeast and Fort Sewall on the northwest. **Fort Sewall** is on the eastern side of Marblehead Peninsula eastward of the town, but is not so conspicuous as the cottages and summer houses a little back from it. **Marblehead Point** is the northern end of Marblehead Neck, and is marked by **Marblehead Lighthouse** (see table, page 12).

The anchorage is anywhere in the middle of the harbor in 18 to 30 feet of water, good holding ground, and is sheltered from all but northeasterly winds; with good ground tackle vessels have no difficulty in riding out a northeaster.

Pilots.—Strangers sometimes take a pilot, making a signal when off Marblehead Neck, and standing off and on until a branch pilot comes on board. Pilotage is compulsory for certain classes of vessels (see Appendix II).

Towboats are not generally used, but can be obtained from Beverly, Boston, or Gloucester in case of necessity.

Quarantine regulations are established by the local board of health and enforced under the direction of the board. Vessels subject to quarantine are not permitted to come inside of Fort Sewall until boarded by a health officer.

The nearest marine hospital is at Chelsea, Mass. (see Appendix IV).

Supplies.—Provisions can be had in Marblehead; water can be obtained from water boats.

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*See footnote on page 35.

Storm warning displays of the United States Weather Bureau are made at Marblehead, and can be readily seen by vessels in the harbor.

Ice.—This harbor is rarely obstructed by ice to such an extent as to become a hindrance to navigation. Fishermen have made it a refuge when it was impossible to get into Gloucester, Salem, or Lynn harbors. The formation of ice in Marblehead Harbor is entirely local, and remains but a short time (see ice, Salem Harbor).

Tidal data for this harbor is practically the same as for Salem Harbor (see page 11).

The **tidal currents** are weak, and do not interfere with navigation.

SAILING DIRECTIONS, MARBLEHEAD HARBOR.

1. ***Approaching and Entering, from Northeastward passing north of Baker Island.***—Follow the directions in section 1, Sailing Directions, Salem Harbor, and pass about 150 yards northward of the black spar buoy (No. 3) on Baker Island Shoal, steering **WNW. ¼ W.** for Hospital Point Lighthouse. When the eastern end of Great Misery Island bears *N. ½ E.*, steer **SW. ½ W.** Leave Hardy Rock buoy (spar, black, No. 5) and Hardy Rock beacon (spar, black, with two triangles on top) about 250 yards on the starboard hand. When midway between Eagle Island and the spindle on The Brimbles, steer **WSW.**, giving the north end of Cat Island a berth of 450 yards. Pass about midway between Marblehead Lighthouse and Fort Sewall and head up the middle of the harbor; anchor off the town on the western side of the harbor in 4 to 4½ fathoms water, soft bottom.

Remarks.—On the **SW. ½ W.** course **Eagle Island**, a low, bare, rocky islet, and Marblehead Lighthouse will be on the starboard bow, and Cat Island on the port bow; the course leads about 300 yards southeastward of Eagle Island.

The **WSW.** course leads northward of Cat Island, about midway between it and Chappel Ledge buoy, and fair into the entrance of the harbor. When past the northern end of Cat Island, Archer Rock buoy will be left 300 yards on the port hand; Lasque Ledge and Gordon Rock buoys will also be left on the port hand, and care should be taken to avoid the 15 and 16 foot spots about 100 yards northward of these buoys.

Dangers.—**Baker Island Shoal, Hardy Rock Shoal,** and **Hardy Rocks** are described on page 38.

Pope Head Shoal lies ½ mile **WSW.** from the southwestern end of Baker Island. **Popes Head,** two bare rocks, are in the middle of the shoal. The western end of the shoal has 12 feet over it, and is marked by a buoy (spar, black, No. 1).

Cutthroat Ledge has 6 feet over it, lies ⅝ mile **NE. ¼ N.** from Eagle Island, and is marked at its northern side by a buoy (spar, black, No. 9). There are several spots with 17 and 18 feet of water lying about 400 yards **SE. ¼ S.** from Cutthroat Ledge buoy.

Shoals extend northeastward from Eagle Island to Cutthroat Ledge, and also 160 yards eastward from the island.

The Brimbles, Mid-channel Rock, Martin Rock, and **Chappel Ledge** are described on page 39.

Archer Rock and **Lasque Ledge** are described on page 40.

Gordon Rock has 6 feet over it, and lies about 120 yards northward from Marblehead Lighthouse; northward of the rock is a buoy (spar, black, No. 3). A 16-foot spot lies about 250 yards **N.** by **E. ½ E.** from Marblehead Lighthouse.

Boden Rock, with 9 feet over it, lies about 150 yards from **Boden Point,** near the eastern shore of the harbor, a little more than ¼ mile inside of Marblehead Lighthouse. A buoy (spar, black, No. 5) is placed westward of the rock; vessels should not pass eastward of it. There is a 10-foot spot about 40 yards northeastward of the buoy.

1 A. ***Approaching and Entering, from Southwestward and Southward.***—Follow the directions in section 1 A, page 39, for entering Salem Harbor by Cat Island Channel. When about midway between Eagle Island and the northern end of Cat Island, haul westward and bring Fort Sewall to bear **WSW. ½ W.** and steer for it on that bearing. When well clear of Cat Island, and Grays Rock bears abeam, distant nearly ⅜ mile, steer **SW.** by **W. ½ W.** and anchor off the town as directed in section 1 preceding.

Or, follow the directions in section 1 B, page 40, for entering Salem Harbor by Marblehead Channel. When the beacon on Marblehead Rock bears *SW.*, distant about 250 yards, steer **NW.** by **N.**, and round the northern end of Marblehead Neck, giving it a berth of over 300 yards; when the lighthouse bears *SE.*, steer **WSW.** and anchor as directed in section 1 preceding.

Remarks.—The **WSW.** ½ **W.** course leads fair between the northern end of Cat Island and Chappel Ledge buoy, and nearly ¼ mile northward of Archer Rock buoy. Marblehead Lighthouse will be on the port bow.

In entering the harbor on the **SW.** by **W.** ½ **W.** course, pass about midway between Fort Sewall and Marblehead Lighthouse. Boden Rock buoy will be on the port bow.

On the **NW.** by **N.** course from Marblehead Rock beacon, Lasque Ledge buoy will be left over 200 yards on the port hand; and when the course is changed to **WSW.**, Gordon Rock buoy will bear eastward of the line to the lighthouse.

Dangers.—**Lasque Ledge** is described on page 40. **Gordon Rock** and **Boden Rock** are described under section 1.

NAHANT BAY.*

The coast from Marblehead Neck to Nahant Bay is irregular both in direction and appearance.

From **Flying Point,** the southwestern extremity of Marblehead Neck, to **Phillips Point,** the northern point at entrance to Nahant Bay, the direction is **WSW.** and the distance 2¾ miles; but the shore between these two points curves northward and then westward, thus forming a wide cove or bay. In this cove, and off its entrance, are a number of rocks, shoals, and ledges (see description under section 1, Sailing Directions, Nahant Bay). **Ram Island** is a rocky islet lying about ½ mile from the shore, and about midway between Flying Point and Phillips Point.

Marblehead Beach extends from Marblehead Neck about **W.** ½ **N.** for ⅝ mile. It is a narrow sand beach, which separates Marblehead Harbor from the sea, and the town is plainly visible over it. At the western end of Marblehead Beach begin the hills, which come abruptly down to the water's edge and are from 50 to 100 feet high. The high land continues in a **WSW.** direction for 1 mile to the eastern end of **Phillips Beach.** This beach has a general course of **SW.** for about ⅞ mile, and for half its length stretches at the foot of a low cliff (about 20 feet high). For the rest of the distance to Phillips Point the land behind the beach is quite low and flat, but high, wooded lands are visible in the distance.

Phillips Point is a high, rocky point, the eastern half of which is from 50 to 60 feet high, mostly cleared, and presents a somewhat precipitous face. The western half is about 80 feet high, and is thickly wooded.

Along the shore from Marblehead to Nahant numerous large cottages will be seen.

Nahant Bay is one of the smaller subdivisions of Massachusetts Bay and is nearly circular in form. It is contained between Phillips Point on the north and the so-called island of Nahant on the south. Between these two points the bay is 2½ miles wide, and about 2 miles long to **Lynn Beach,** which separates it from Lynn Harbor, in Boston Bay. The village of **Swampscott** is situated on the northern shore of the bay, about ¾ mile **W.** from Phillips Point, and the eastern part of the town of Lynn occupies a portion of the northwestern shore of the bay.

Fishing Point, the first headland on the northern shore westward of Phillips Point, is a low but prominent rocky point on which is a large hotel. From it numerous houses dot the beach around to Lynn.

Lynn Beach is a narrow strip of sand separating Nahant Bay from Lynn Harbor. It extends in a **S.** by **W.** direction a little over 1 mile to a high, bluff, rocky head, called **Little Nahant,** the eastern face of which is bold and steep, and is known as **Little Nahant East Point.** On the south, Little Nahant is connected with Nahant by a strip of beach nearly ½ mile long, called **Little Nahant Beach.**

Nahant lies nearly **E.** and **W.**, and is very irregular in shape. It is a high, rocky peninsula, with a precipitous face eastward. It is occupied by a town which is mainly composed of summer cottages. Its eastern extremity is called **East Point.** Nahant is a great summer resort, and steamers ply regularly between it and Boston during the season. The landings are on the south and west sides. The large cove formed by the curve of the southern shore is sometimes called **Nahant Harbor.**

Seven-eighths mile **NNE.** from East Point is a bold, rocky islet, 60 feet high, called **Egg Rock,** on which is **Egg Rock Lighthouse** (see table, page 12).

For **tidal data,** see tides for Boston Lighthouse in table on page 11.

SAILING DIRECTIONS, NAHANT BAY, TO AN ANCHORAGE OFF SWAMPSCOTT.

This anchorage, in 3 to 6 fathoms, is exposed to winds from eastward and southward, and is seldom used except by yachts in summer. No stranger should attempt to pass between the rocks and ledges lying between Tinker Island and Phillips Point.

*Shown on charts **109,** scale $\frac{1}{80,000}$; **337,** scale $\frac{1}{40,000}$, price of each $0.50.

1. ***Approaching and Entering, from Eastward.***—When 4 miles eastward of Egg Rock Lighthouse, bring it to bear **W.** by **S.**, or westward of this bearing, and steer for the lighthouse. When the lighthouse is 2 miles distant ahead, haul northward, course about **WNW.**, and when Egg Rock Lighthouse bears *S.* by *E.*, steer **N.** by **W.** Anchor in about 5 fathoms when Dread Ledge spindle bears about *E.* by *S.*; Fishing Point will then bear about *NE.* distant ⅜ mile.

Vessels of light draft can find good anchorage in 8 to 15 feet of water westward of Fishing Point, giving the northern shore a berth of not less than 400 yards.

Remarks.—On the **W.** by **S.** course the bell buoy near the Outer Breakers will be left about ⅜ mile on the starboard hand, and two red nun buoys southward of Great Pig Rocks will be left well on the starboard hand.

On the **WNW.** course into the bay, Dread Ledge spindle will be made on the starboard bow; the sailing line leads over ¼ mile southward of it.

Dangers.—**Tinker Island, Roaring Bull,** and **Outer Breakers** are described on page 40.

Great Pig Rocks, a group of bare rocks, surrounded by shoal water, lie 1¼ miles **SW.** ¼ **W.** from Tinker Island.

Southern Shoal Rock, a ledge awash at low water and marked by a buoy (nun, red, No. 6), lies 300 yards **SE.** by **S.** from Great Pig Rocks.

Southwest Breakers, a detached shoal with a rock awash at low water, lies about 300 yards **SW.** from Great Pig Rocks. It is marked by a buoy (nun, red, No. 8).

Middle Ground is a sunken ledge with 5 to 17 feet over it, lying ½ mile **NNW.** from Great Pig Rocks and about 400 yards **SSE.** from Ram Island. A buoy (spar, red, No. 4) marks the ledge at its southeastern end.

Eight-Foot Spot, marked by a buoy (spar, red and black horizontal stripes), lies about midway between Great Pig Rocks and Middle Ground.

Sammy Rock, with 3 feet over it, lies nearly ⅜ mile **W.** ½ **N.** from Middle Ground buoy, and is marked by a buoy (spar, red, No. 6).

Dolphin Rock has 6 feet over it, and lies ½ mile **NW.** by **W.** ½ **W.** from Great Pig Rocks. It is marked by a buoy (spar, red, No. 10).

There are a number of **detached rocks** with 12 to 18 feet over them lying eastward of the above-mentioned rocks and ledges.

Dread Ledge is a bare rock which lies nearly ¼ mile off the southwestern side of Phillips Point. It is marked by an iron spindle with a red cask on top.

1 A. ***Approaching and Entering, from Southward.***—Steer for Egg Rock Lighthouse on any bearing westward of **N.** by **W.** ½ **W.**, and pass ¼ to ½ mile eastward of Egg Rock. Then bring the lighthouse to bear *S.* by *E.* and steer **N.** by **W.**, and anchor as directed in section 1.

If coming from westward, give the southeastern shore of Nahant a berth of at least ½ mile. When Egg Rock Lighthouse bears **N.** steer for it; pass 250 yards westward of Egg Rock; continue the **N.** course and come to anchor off Fishing Point in 4 to 6 fathoms of water.

Remarks.—In coming from westward, care should be taken to avoid Flip Rock, in Broad Sound (see page 47). When past East Point of Nahant the course should be shaped so as to lead 250 yards westward of Egg Rock.

Dangers.—**Shag Rocks** are a group of bare rocks lying nearly ⅜ mile **SW.** from East Point and about 300 yards from the southern point of Nahant. There is a rock, nearly bare at low water, about 80 yards southward of the southernmost Shag Rock.

A **19-foot spot** lies 700 yards **S.** ½ **E.** from Egg Rock Lighthouse, and about ⅜ mile **NE.** ¼ **N.** from East Point.

An **8-foot spot** lies nearly ½ mile **WSW.** from Egg Rock Lighthouse, and 400 yards from the shore of Nahant.

BOSTON BAY,*

situated at the western end of Massachusetts Bay, is included between Nahant Head on the north and Strawberry Point, the northern point of Scituate Neck, on the south. Between these limits the distance is about 11½ miles. The northwestern part of the bay is called **Broad Sound.** The principal harbor in the bay is Boston Harbor. It also includes the subordinate harbors of Lynn, Neponset, Weymouth, Hingham, and Cohasset.

* Shown on charts **109**, scale $\frac{1}{80,000}$; **387**, scale $\frac{1}{40,000}$, price of each $0.50. See also footnote on page 9.

The shore of the bay is very irregular, and the western part, Boston Entrance and Harbor, is studded with islands, rocks, and shoals, which are described in connection with that and adjoining harbors.

A table of lighthouses will be found on pages 12–21, which gives the characteristics of the coast and harbor lights from Cape Ann to Point Judith.

Lists of the **life-saving stations** maintained between Cape Ann and Point Judith are given on pages 25–26.

Extracts from the laws of Massachusetts, relating to **pilots** and **pilotage, harbors,** and **quarantine,** are given in Appendix II.

Storm warning displays of the U. S. Weather Bureau are made on the coast at the points named in the list on page 24. An explanation of the use and meaning of these displays is given in Appendix III.

BROAD SOUND,

the northwestern portion of Boston Bay, is about 5 miles wide between Deer Island and Nahant, and nearly 3½ miles long. At the head of the sound is Lynn Harbor, the entrance to which is between **Bass Point** (on Nahant) and Revere Beach. On the east, Broad Sound is separated from Nahant Bay by Lynn Beach, Little Nahant, and Nahant; and its northern shores are occupied by the city of **Lynn,** one of the great manufacturing cities of New England. On the northwest is **Revere Beach,** at the northern extremity of which is a thinly wooded point known as **Point of Pines.**

Deer Island, which separates the entrance to Broad Sound from Boston Harbor, lies **NNW.** and **SSE.,** is nearly 1 mile long, and ¼ mile wide at its widest part. To a vessel approaching from northeastward it will appear as a long, bare island with a gently sloping, green hill, which appears joined to another to the westward, which has a precipitous descent seaward. A large brick building, with a high cupola, is on the western end, and a flagstaff is on the highest part, of the island. On the spit (dry at low water) at the southern end of the island is **Deer Island Lighthouse** (see page 14).

On the north a channel less than 80 yards wide and 9 feet deep separates Deer Island from a low, sandy point of the mainland called **Point Shirley.** This passage is known as **Shirley Gut,** and is used by the steamers plying between Boston and Nahant.

Point Shirley is the southwestern extremity of a very long and narrow peninsula, mostly sand beach, which extends in a **S. ½ W.** direction from the mainland southward of Revere Beach. The point itself forms a sort of flat head to this peninsula.

Winthrop Head, a precipitous headland 100 feet high with many houses on its northern side, is situated ½ mile **NNE.** from Point Shirley and on the western side of the entrance to Broad Sound. From this head a sand beach extends about 1 mile northward to **Grover Cliff,** which shows bare, yellow, precipitous faces, about 80 feet high eastward, and is the most prominent between Point Allerton and Nahant Head.

Broad Sound has good water, the depth ranging from 4½ to 7 fathoms, but from the western shore shoals make off a long distance. Between Winthrop Head and Grover Cliff shoals extend out ½ to ¾ mile, and northward of Grover Cliff the 18-foot curve runs northward for 1⅝ miles and then east to **Bass Point** (the western point of Nahant).

Flip Rock, with 13 feet over it, and surrounded by a depth of 6 to 10 fathoms, is the principal outlying danger. It lies 4 miles **NNE. ⅞ E.** from Deer Island Lighthouse and is marked by a buoy (spar, red and black horizontal stripes).

LYNN HARBOR.*

On the northern side of Broad Sound are situated the harbor and city of **Lynn.** The land is low and marshy from the northern bank of Saugus River across the head of the harbor, and it is also much cut up by coves and slues penetrating the marshes in every direction.

The entrance is between Revere Beach on the west and Bass Point, the western point of Nahant, on the east. It is 2 miles wide, but it is so full of rocks and shoals as to leave only very narrow and shallow channels of approach, which have, however, been improved by dredging.

The city of **Lynn** occupies the northern shore of the harbor. On the south and southwest the city is bounded by extensive salt marshes, which extend from ¼ mile to 1¼ miles back from the shore. On the southwest these marshes extend to **Saugus River,** which empties into Lynn Harbor between Tree Point on the north and Point of Pines on the south. The entrance to this river is ¼ mile wide, but the channel is very narrow and the best water is close to Point of Pines. About 4 feet at mean low water may be carried up to the bridge of the Eastern Railroad.

* See footnote on page 46.

Channel.—A dredged channel 200 feet wide and 10 feet deep leads up to the city wharves at Lynn. Occasional dredging is required to maintain this width and depth. The entrance to this channel is about 1 mile **NW.** from Bass Point, and is marked by a number of buoys and by **White Rocks beacon light**; and the channel is marked by several beacon lights.

Wharves.—A draft of 10 feet can be carried to some of the wharves in Lynn, at mean low water.

Pilots are to be found off Nahant, in Broad Sound, and are generally taken by vessels bound to Lynn. Strangers should never attempt the channel without a pilot. Sailing vessels generally take a towboat. (See Appendix II.)

The **marine hospital**, at Chelsea, is available for mariners entitled to hospital treatment.

Supplies.—Coal, wood, water, and general stores can be obtained at the wharves.

Ice forms in the harbor in severe weather, but it does not endanger vessels.

Tidal data is about the same as for the Navy Yard, Boston (see page 11).

The **tidal currents** set in the general direction of the channel and have considerable velocity during part of the ebb.

SAILING DIRECTIONS, LYNN HARBOR.

These directions lead to the entrance to the dredged channel, above which no stranger should go without a pilot.

1. ***Approaching from Eastward.***—Keep the southeastern end of Nahant bearing westward of *SW.* by *W.* ¾ *W.*, and steer so as to pass about ½ mile southward of Nahant, and when Egg Rock is in range with East Point of Nahant, steer **WNW.** ½ **W.** When Bass Point bears *N.*, distant about ½ mile, steer **NW.** and anchor in 3½ to 4 fathoms, or stand off and on with signal set until boarded by a pilot.

Remarks.—The **WNW.** ½ **W.** course leads ¼ mile south of the red buoy on Joe Beach Ledge, ⅝ mile south of the spindle on Bass Rock, and ¼ mile north of Flip Rock. The steamboat landing at Nahant will be seen northward. The entrance to Nahant Harbor is between Joe Beach Ledge buoy and Bass Rock spindle (see dangers, following); vessels may stand in between the two and anchor southwestward of the landing in 4 to 4½ fathoms of water.

On the **NW.** course the buoys marking the channel to Lynn will be on the starboard bow; the water shoals gradually on the course, and on approaching Revere Beach.

Dangers.—**Shag Rocks** are described on page 46.

Flip Rock is a small, detached ledge, with 13 feet over it, lying nearly 1⅛ miles **SW.** by **W.** ¼ **W.** from East Point of Nahant; it is marked by a buoy (spar, red and black horizontal stripes).

Bass Rock is bare at half tide, with shoal water around it, and lies nearly in the middle of the entrance to Nahant Harbor, about ⅝ mile **SE.** by **E.** ¼ **E.** from Bass Point. It is marked by a spindle (iron, with cage on top, red). A stranger should not pass between Nahant and the spindle.

Joe Beach Ledge, with 2 feet over it, lies nearly ½ mile **E.** ½ **N.** from the spindle on Bass Rock, and 250 to 400 yards from shore. It is marked near its southwestern end by a buoy (spar, red, No. 2).

A spot with 15 feet over it lies about 250 yards **W.** from Bass Point, and a small 18-foot spot lies ⅞ mile **SW.** ½ **W.** from Bass Point.

1 A. ***Approaching from Southward.***—From a position ¾ mile eastward of Minots Ledge Lighthouse steer **NNW.** ¼ **W.** for 7½ miles to a position about ½ mile eastward of the whistling buoy off The Graves. Then steer about **NW.** ¼ **W.** so as to pass about ¼ mile southwestward of Bass Point, the southwestern point of Nahant. Anchor when Bass Point bears *E.*, or stand off and on for a pilot, keeping Bass Point bearing northward of *E.*

Remarks.—On the **NNW.** ¼ **W.** course Egg Rock Lighthouse should be a very little on the starboard bow, and East Point of Nahant a very little on the port bow; and the course if made good leads well clear of all dangers.

On the **NW.** ¼ **W.** course a sharp lookout should be kept for Flip Rock buoy, which can be left 250 yards on either hand (see the dangers under section 1, preceding).

1 B. ***Approaching from Boston Harbor.***—Stand out through the Broad Sound South Channel and when 350 yards northwestward of Commissioner Ledge buoy (can, black, No. 1) steer **N.** by **W.** ½ **W.** and anchor as directed in section 1. See the remarks and dangers in the two preceding sections.

BOSTON ENTRANCE AND HARBOR.*

The entrance to Boston Harbor, between Point Shirley on the north and Point Allerton on the south, is about 4¾ miles wide, but is full of islands and shoals between which several channels (see channels) lead into the harbor.

Point Shirley and Deer Island are described on page 47.

Point Allerton, a conspicuous headland, is a bare hill 115 feet high, presenting a steep, waterworn, cliff-like face eastward. The summit is grassy and many houses will be seen on its slopes, and the base of the sea face is protected by a sea wall of granite.

About 1 mile southward of Point Allerton is quite a prominent hill called **Strawberry Hill,** on the top of which is a dark, round water tower, which shows prominently from all directions and is the most prominent landmark in approaching the main channel entrance.

Nantasket Hill lies nearly 1 mile westward of Point Allerton, and is 100 feet high, with an old earthwork and standpipe on its summit. The town of **Hull** is on the lower hill southwestward of Nantasket Hill. **Storm warning displays** of the U. S. Weather Bureau are made on Nantasket Hill.

Outer Brewster, the easternmost of the group of islands at the entrance to Boston Harbor, and lying about 2 miles **N.** by **E.** from Point Allerton, is prominent when approaching from eastward. It is a bare, rocky island 60 feet high, presents a very rugged appearance, and its shores are comparatively bold.

Middle Brewster, a mass of rock about 50 feet high, lies about 300 yards westward of Outer Brewster, and is somewhat less rugged in appearance. A narrow, dangerous passage, called **Flying Place,** separates the two.

Lighthouse Island, a low, rocky islet of irregular shape, lying about ¼ mile **SSW.** from Middle Brewster, is on the north side of the Main Ship Channel, and on it is **Boston Lighthouse** (see table, page 12), with its accompanying dwelling and fog-signal houses.

Great Brewster, about 800 yards **NNW.** from Lighthouse Island (with which it is connected by a long gravel spit, bare at low water), is about 100 feet high, and presents a precipitous face seaward. Its very remarkable shape renders it a landmark not to be mistaken. The sea face is a precipitous waterworn cliff, the base of which is protected by a sea wall. The summit is smooth and grassy, but bare of trees. From the southwestern end of Great Brewster, a long, dry, sand spit or bar extends westward for 1 mile to The Narrows. This is called **Great Brewster Spit,** and on its end is **Narrows Lighthouse** (see table, page 12).

Calf Island, lying about ¼ mile northward of Great Brewster, is a grassy island about 30 feet high.

Little Calf Island, about 100 yards in diameter, lies about 300 yards northward of Calf Island.

Green Island, a small island of moderate height, with an undulating surface, and faced on its eastern side by whitish-looking rocks, lies about ⅜ mile northeastward of Little Calf Island.

Georges Island, on the southwest side of The Narrows, about ⅜ mile southwestward of Narrows Lighthouse, is entirely covered by **Fort Warren.**

Lovell Island, on the north side of the Main Ship Channel, lies about ¼ mile northward of Georges Island and is about 30 or 40 feet high. The northern and southeastern ends of the island are protected by sea walls which are joined by a stone apron, and on the northern end of the island are the two lighted range beacons for the outer section of the Broad Sound South Channel (see table, page 12). On the south side of the island is the buoy depot wharf of the Light-House Establishment.

Gallup Island, narrow and bare of trees, with a precipitous face on its northern side, is on the western side of the channel, directly opposite Lovell Island, and on it is the **Quarantine Hospital,** under the control of the Board of Health. The cliff and sea face of Gallup Island are protected from the action of the water by a granite sea wall.

Long Island, lying about ¼ mile westward of Gallup Island and on the southern side of the channel, is 1½ miles long in a **NE.** and **SW.** direction, and about 80 feet high at its highest parts. The northern end (and highest part) of this island is called **Long Island Head.** This head shows a steep, waterworn cliff northward, and on its summit is **Long Island Head Lighthouse** (see table, page 14).

Spectacle Island, lying about 1 mile westward of Long Island and on the south side of the channel, is two small islands about 65 feet high, connected by a low gravel pit. Except on the southern side, these islands have

*Shown on charts **109,** scale $\frac{1}{80,000}$; **337,** scale $\frac{1}{40,000}$; **246,** scale $\frac{1}{20,000}$; **248,** scale $\frac{1}{10,000}$; price of each $0.50.

cliff-like faces. There is a group of houses near the southern end of each of the islands, and a factory with iron stack on the north end of the southern island. On the north end of the north island are the lighted range beacons for the inner section of Broad Sound South Channel, and of the Spectacle Island Range.

Thompson Island, about ½ mile westward of Spectacle Island and off the entrance to Neponset River, is about 75 feet high at its highest part, where there is a group of buildings surrounded by ornamental grounds. The island presents a precipitous face northward, but is low facing southward with clumps of trees. There is a wharf on the western side of the island.

Castle Island, covered by **Fort Independence** (granite, surmounted by sod traverses), lies on the south side of the channel about 2½ miles **WNW.** from Long Island Head Lighthouse. It is connected with the mainland by a long bridge.

Governors Island, on the northern side of the channel, a little over ½ mile from Castle Island, is of irregular shape, about ½ mile long, and about 90 feet high at its highest point, where there is a small stone fort. The southeastern part of the island is much lower and has a few small water batteries near the shore. A channel, in which there is a least depth of 17 feet, leads between it and **Apple Island,** which lies about ⅝ mile **ENE.** from it.

From many of the islands above described shoals make out, and are described under the head of "dangers," following the sailing directions.

Boston Harbor proper, or the **Inner Harbor**, begins westward of Castle and Governors islands. Extensive improvements are in progress to increase the depth in the channel and the area available for anchorage for large vessels. In 1902 dredges were at work removing a part of Bird Island Flats to a depth of 30 feet.

The **City of Boston** includes within its limits **East Boston, Charlestown, South Boston, Roxbury, Dorchester,** and **Neponset.** East Boston is on the northeastern side of the harbor, and is separated from the city of Chelsea by Chelsea River. Chelsea is separated from Charlestown, on the western side of the harbor, by the Mystic River, and Charlestown from Boston proper by the Charles River.

The **U. S. Navy Yard** occupies a large part of the deep water front of Charlestown, and is conspicuous on account of its foundries, and other large buildings. South Boston is on the peninsula southeast of the city proper, from which it is separated by South Bay and the narrow channel (Fort Point Channel) leading into it.

Chelsea River is a narrow stream flowing into the northern part of the harbor and separating East Boston from the city of Chelsea. It has a depth of 18 feet in the channel for a distance of 1 mile above its mouth. The draw in the first bridge, crossing the river at Meridian street, has a width of 59 feet, and the second bridge, at Chelsea Street, has a width of 36 feet in the draw.

Mystic River takes its rise at **Medford,** 3½ miles above its mouth, and flows through a narrow and crooked channel, with a general direction about **SE.** into the northern part of Boston Harbor. Near its mouth it is crossed by Chelsea Bridge, connecting Charlestown with Chelsea. A channel not less than 25 feet deep at mean low water, with a least width of 100 feet, leads between the Charlestown district and East Boston to the draw in Chelsea Bridge. Above Chelsea Bridge, for a distance of nearly ½ mile, the channel has been dredged to a width of 125 to 240 feet and a depth of 25 feet. The deepest draft taken to Medford is 9 feet, and to Malden 10 feet. The width of the draw in Chelsea (the first) Bridge is 60 feet and Malden (the second) Bridge is 50 feet.

Charles River empties into the western part of the harbor between Boston proper and Charlestown, and is the approach by water to the city of **Cambridge** and town of **Watertown.** Seven bridges cross the river at points less than 1¼ miles from its mouth. Four of these are railroad bridges, the draws of which are closed except for a short specified time each day. There is a channel with 18 to 23 feet of water in the Charles River for a distance of about 1¼ miles from its mouth, up to Cragie (the seventh) Bridge, but the numerous bridges greatly retard its free navigation. Above Cragie Bridge the channel has a least depth of 7 feet and width of 200 feet to Western Avenue Bridge. There are two hauling buoys placed in mid-channel, about 500 yards below the Charlestown (first) Bridge. Towboats from the harbor take vessels through, if specially engaged for the purpose. The least width in the clear of the draws in the first eight bridges is 36 feet.

At mean low water the depth off the city of Cambridge between Cragie and West Boston bridges is 11 to 19 feet. At high water 9 feet can be carried up to Watertown, which is as far as vessels go. Towboats are employed by sailing vessels going up the river.

Fort Point Channel and **South Bay** separate Boston proper from South Boston. In a distance of 1 mile from its entrance in Boston Harbor, Fort Point Channel is crossed by seven bridges, the least width in the draws of these bridges being 41 feet 5 inches. The upper bridge (Dover Street) has a width of 37 feet in the draw. A dredged channel 175 feet wide and 23 feet deep leads from the entrance through Congress Street Bridge, and it is proposed to continue this channel to near Federal Street Bridge. From the latter bridge to Dover Street Bridge the depth is about 11 feet in the channel, and from thence to the head of South Bay it is 6 to 8 feet.

Sailing vessels employ towboats if bound into Fort Point Channel or South Bay, under a special agreement to tow through the bridges.

Prominent objects.—In approaching and entering Boston Harbor the most conspicuous object is the **State House,** built on the highest part of the city, its large gilded dome being visible for many miles. **Bunker Hill Monument** in Charlestown, the tall chimney of the large brick building on Deer Island, Great Brewster Island, Point Allerton, Nantasket Hill and Strawberry Hill (see descriptions of the last four) should also be easily recognized as the entrance is approached.

At night Boston Light-vessel and the many lights (see table, page 12) of the bay and harbor should make the approach to the entrance easy, but strangers should not attempt to enter at night, as the channels are narrow in many places, and the many lights are apt to be confusing. (To make an anchorage in Nantasket Roads at night, see section 2 A, sailing directions.)

Channels.—There are a number of channels leading into Boston Harbor. The principal ones leading in from deep water are the Main Ship Channel, Broad Sound South Channel, and Broad Sound North Channel.

Main Ship Channel.—The entrance to this channel is between Lighthouse Island (on which is Boston Lighthouse) on the north and Point Allerton on the south, and is 1⅛ miles wide, but shoals and ledges on both sides reduce the navigable width to a little over ½ mile. In The Narrows its width is about 275 yards. The course is first about **W.** for 1⅛ miles, then leads through The Narrows, between Narrows Lighthouse (on Great Brewster Spit) and Georges Island (Fort Warren); then between Lovell Island and Gallup Island until up with Nix Mate beacon; then toward Deer Island, joining the Broad Sound Channels; then through President Roads, passing southward of Deer Island Lighthouse and northward of Long Island Head and Spectacle Island, and then about **NW. ½ N.** up to the city, passing between Governors Island on the north and Castle Island on the south. This channel, 7½ miles in length from the entrance to the anchorage off the Boston wharves, has been improved, and in 1902 had a least width of 450 feet in The Narrows and 500 feet in the Upper Harbor, with a navigable depth of 27 feet throughout its length. Improvements are in progress to deepen the channel in the Upper Harbor to 35 feet with a width of 1,200 feet. This channel is to connect through President Roads with a 35-foot channel 1,500 feet wide through Broad Sound.

Broad Sound South Channel.—This channel has its entrance in Broad Sound northward of The Graves, and leads into President Roads. There are shoals and dangers on both sides, but the channel has been improved, and in 1903 had a least width of 925 feet and a depth of 28 feet, so that at three-quarters flood vessels of the deepest draft should have no trouble in entering by it in clear weather. This channel is marked by two lighted ranges and a number of buoys.

Broad Sound North Channel.—This channel leads from Broad Sound across Great Faun and Little Faun bars into President Roads. Its entrance is just westward of the entrance to Broad Sound South Channel, and its direction is about **WSW.** Although 13 feet at mean low water can be carried across the two bars, the channel with this depth is narrow and it should not be attempted by strangers of over 9 feet draft at low water.

Governors Island Channel.—This channel, which is well buoyed but is only fit for steamers, begins at the eastern end of Governors Island Flats and leads in a **NW.** by **W.** direction, between Governors Island and Apple Island, for a little over 1½ miles. Then, turning abruptly southward, it leads between Bird Island Flats and Governors Island into the Main Ship Channel. It is crooked at its western end and quite narrow; but a steamer can carry 17 feet at mean low water throughout its entire length.

In addition to the channels already mentioned there are several others, sometimes used by those who are well acquainted with their dangers. These are: (1) the **Hypocrite Channel,** which connects Boston Bay with the Broad Sound South Channel; (2) the **Black Rock Channel** connects the Main Ship Channel with the Hypocrite Channel; (3) the **Back or Western Way,** leads southward and westward of the islands that form the southern limits of the Main Ship Channel, leaving that channel at the entrance to Nantasket Roads; the Back or Western Way carries deep water as far as Long Island, but beyond this point only 9 feet can be carried with safety; (4) **Shirley Gut,** a narrow slue with a channel less than 80 yards wide between Deer Island and Point Shirley, carrying about 9 feet of water, connects Broad Sound directly with President Roads; (5) **the dredged channel** between Long Island and Nix Mate has a depth of 14 feet and width of 200 feet.

Anchorages.—**Nantasket Roads** is a good anchorage on the south side of the entrance to the Main Ship Channel, south of Narrows Lighthouse and Georges Island (Fort Warren). The depth here varies from 5 to 11 fathoms; but on the western side of Georges Island the depth ranges from 3¼ to 5 fathoms, and better bottom is found and shelter in easterly winds. This anchorage is frequently used by vessels bound through the Main Ship Channel and headed off by the winds, and vessels seeking shelter in easterly gales.

President Roads, a wide and good anchorage, lies between Governors Island Flats and Deer Island Flats on the north, Deer Island on the east, Long Island and Spectacle Island on the south, and Castle and Governors

islands on the west. It is within these limits, 1¾ miles long and nearly ¾ mile wide, and is entered from the Main Ship and Broad Sound channels at its eastern end.

Inner Harbor.—The anchorage for vessels and yachts in the inner harbor is limited, but good holding ground in 3¾ to 4 fathoms will be found on both sides of the channel above Governors Island within the limits prescribed by the harbor master (see Appendix II).

The **buoyage** of Boston Harbor and its tributaries accords with the system adopted in United States waters (see page 5). The channels leading to Boston are well buoyed; but strangers should not attempt them at night, as they have sudden changes in direction, are narrow in places, and are liable to be confusing to strangers.

The **table of lighthouses**, on page 12, gives the characteristics of the lights in Boston Harbor.

Bearings and distances from certain lighthouses are given on pages 22–24.

Pilots.—There are a number of pilots for the port of Boston who cruise by turns in pilot boats which are designated by the numbers painted in black figures 4 feet in length on the mainsail and jib. Three of the pilot boats are required to cruise in Boston Bay outside of the inner station boat.

Pilotage.—The rates of pilotage for Boston, and extracts from the laws and regulations relating to pilots and pilotage, are given in Appendix II.

Towboats are constantly cruising in Boston Bay and Harbor, and may be obtained by hailing or by signal. They may also be obtained by applying at the various towboat offices. The greater number of these towboats have an established schedule of charges. Towboats do not assume accountability for damage while towing through bridges. Pilotage charges, if incurred, are paid by the vessel being towed.

Fire and wrecking tugs are to be obtained, and will take tows to or from any point on the Atlantic coast between Nova Scotia and the Gulf of Mexico. Steam lighters can be obtained.

Harbor regulations are given in Appendix II.

Quarantine regulations for the port of Boston are issued from time to time by the board of health for the guidance of the port physician, harbor master, pilots, and all vessels (see Appendix II). The quarantine station is on Gallup Island, where vessels are boarded by the visiting health officer. Vessels undergoing quarantine are anchored either at the anchorage south of Gallup Island or in President Roads, as directed by the port physician.

Marine Hospital.—There is a marine hospital of the United States Public Health and Marine-Hospital Service at Chelsea. The service has an office and dispensary in the customhouse, Boston, where out-patients are treated by an officer of the service, who is also the proper person to whom to apply for admission to the hospital. Extracts from the regulations for the government of the United States Public Health and Marine-Hospital Service are given in Appendix IV.

Docking facilities.—There are a number of Simpson dry docks and marine railways. The dimensions of the largest dock, not owned by the Government, are: length 465 feet, width 66 feet, depth over sill 18 feet 8 inches; of the largest marine railway: length 250 feet, draft forward 12 feet, draft aft 15 feet, capacity 2,000 tons.

Repairs.—There are excellent facilities for repairing hulls of iron and wooden vessels and the machinery of steamers at Boston and Quincy Point.

Storm warning displays of the United States Weather Bureau are shown from the post office building, and on Nantasket Hill at the entrance to the harbor. An explanation of the use and meaning of these signals is given in Appendix III.

A **United States Branch Hydrographic Office** is established at the customhouse, Boston. Bulletins are posted here giving information of value to seamen, who are also enabled to avail themselves of publications pertaining to navigation, to take barometer comparisons, and to correct their charts from standards. No charge is made for this service.

A **time ball** is dropped daily, Sunday excepted, on a staff on the Ames Building, corner of State and Washington streets, at 12 h. 00 m. 00 s. of 75th meridian time, 5 h. 00 m. 00 s. Greenwich mean time. This time signal can be seen by shipping anchored in the harbor.

Ice.—The Main Ship Channel into Boston Harbor is kept open by the constant employment of towboats, which break the ice in towing vessels up and down. In the minor passages, navigation is sometimes suspended during severe weather. Communication with Boston being, as a rule, carried on through the Main Ship Channel, the ice boats do not enter the other channels to break the ice. The Charles, Mystic, and Chelsea rivers are, as a rule, closed to navigation during a part of the winter. During very severe weather the ice sometimes forms as far out as the edges of the Main Ship Channel.

From the middle of January to the middle of February sailing vessels should not attempt to pass in or out of the harbor without the assistance of a towboat, as navigation is rendered hazardous on account of quantities

of drift ice in the channel. Vessels entering the harbor during the winter should not depend too much upon the buoys, as these are apt to be forced from their proper positions and even carried away by the drift ice. As accidents of this sort are liable to occur every winter, no stranger should attempt to enter the harbor during these months without a pilot.

Tidal data for Boston Harbor is given on page 11.

CURRENT TABLE FOR MAIN SHIP CHANNEL FROM BOSTON LIGHTHOUSE TO THE NAVY YARD.

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 Boston Harbor, referred to time of tide at Boston (Navy Yard).													
(1) Five-tenths Mile S. 8° E. from Boston Lighthouse.													
S 78° W	S 78° W	S 76° W	S 76° W	N 88° E	N 82° E	N 80° E	N 80° E	N 82° E	N 89° E	SE	S 75° W	S 77° W	S 78° W
1.8	1.7	1.2	0.1	0.6	1.4	2.0	2.0	1.8	0.9	0.1	0.9	1.6	1.8
(2) Three-tenths Mile S. 50° E. from Narrows Lighthouse.													
S 68° W	S 74° W	S 83° W	S 84° W	N 65° E	N 57° E	N 54° E	N 53° E	N 51° E	N 51° E	N 69° E	S 79° W	S 70° W	S 68° W
1.6	1.4	0.9	0.3	0.6	1.2	1.4	1.4	1.1	0.7	0.1	0.8	1.2	1.6
(3) Four-tenths Mile N. 80° W. from Narrows Lighthouse.													
S 88° W	S 85° W	S 72° W	N 75° E	N 85° E	N 89° E	E	S 88° E	S 85° E	S 86° E	S 85° E	N 85° W	N 88° W	S 89° W
1.6	1.2	0.5	0.4	0.9	1.3	1.5	1.5	1.5	1.1	0.3	0.9	1.6	1.6
(4) Eight-tenths Mile N. 68° W. from Narrows Lighthouse.													
N 43° W	N 42° W	N 42° W	N 42° W	N 41° W	N 37° W	N 30° W	N 28° W	N 20° W	N 11° W	S 44° E	S 44° E	S 48° E	N 43° W
0.5	0.6	0.4	0.2	0.3	0.6	0.8	0.8	0.6	0.1	0.2	0.4	0.2	0.4
(5) At the Bell Buoy off Nix Mate.													
S 10° W	----------	N 42° E	N 82° E	N 82° E	N 20° E	N 17° W	N 17° W	----------	S 30° W	S 75° W	S 63° W	S 21° W	S 11° W
0.2	0.0	0.3	0.5	0.5	0.4	0.2	0.2	0.0	0.2	0.3	0.4	0.4	0.3
(6) Broad Sound South Channel, 1.2 Miles N. 85° E. from Deer Island Lighthouse.													
S 75° W	S 76° W	S 76° W	S 77° W	N 59° E	N 61° E	N 63° E	N 63° E	N 64° E	N 64° E	N 65° E	S 70° W	S 75° W	S 75° W
1.5	1.3	0.9	0.1	0.8	1.5	1.8	1.8	1.8	1.4	0.1	0.9	1.4	1.5
(7) Two-tenths Mile S. from Deer Island Lighthouse.													
S 86° W	S 83° W	S 87° W	N 84° W	N 86° E	N 87° E	N 86° E	N 86° E	N 81° E	N 74° E	N 58° E	N 78° W	N 85° W	S 87° W
2.1	2.3	1.5	0.1	1.1	2.0	2.9	2.8	3.0	2.1	0.3	0.8	1.4	2.0
(8) Three-tenths Mile N. 10° W. from Spectacle Island Range Beacon (Front).													
N 80° W	N 81° W	N 87° W	S 88° W	N 68° E	N 71° E	N 74° E	N 75° E	N 81° E	N 87° E	S 85° W	N 89° W	N 83° W	N 80° W
1.0	0.8	0.5	0.2	0.1	0.7	0.9	0.9	0.7	0.1	0.2	0.5	0.8	1.0

CURRENT TABLE FOR MAIN SHIP CHANNEL FROM BOSTON LIGHTHOUSE TO THE NAVY YARD—Continued.

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 Boston Harbor, referred to time of tide at Boston (Navy Yard)—Continued.													
(9) Three-tenths Mile N. from Castle Island Wharf.													
N 39° W	N 40° W	N 41° W	----------	S 47° E	S 44° E	S 42° E	S 42° E	S 42° E	S 43° E	----------	N 35° W	N 37° W	N 30° W
1.5	1.4	0.9	0.0	0.7	1.1	1.3	1.4	1.3	0.8	0.0	0.9	1.3	1.5
(10) Four-tenths Mile S. of Bird Island Flats Spindle.													
N 63° W	N 60° W	N 58° W	N 56° W	S 57° E	S 57° E	S 59° E	S 60° E	S 66° E	S 75° E	S 85° E	N 75° W	N 68° W	N 63° W
1.2	1.0	0.5	0.1	0.1	0.6	0.9	1.0	1.1	0.9	0.2	0.6	1.1	1.2
(11) Three-tenths Mile S. 25° W. from Cunard Wharf at East Boston.													
N 15° W	N 28° W	N 41° W	N 50° W	S 65° E	S 59° E	S 53° E	S 51° E	S 47° E	S 40° E	S 35° E	N 20° W	N 11° W	N 12° W
1.0	1.0	0.7	0.1	0.4	0.7	0.9	1.0	1.0	0.8	0.2	0.5	0.8	1.0
(12) Mid-channel off Navy Yard, 0.5 Mile N. 65° E. from Draw of Charles River Bridge.													
N 26° W	N 30° W	N 32° W	N 26° W	S 40° E	S 44° E	S 49° E	S 50° E	S 56° E	S 65° E	S 72° E	N 21° W	N 22° W	N 25° W
0.6	0.6	0.5	0.2	0.3	0.5	0.6	0.6	0.5	0.4	0.1	0.2	0.5	0.6

Between Boston Lighthouse and Point Allerton the ebb current begins about 10 minutes after high water, and the flood current about 10 minutes after low water, at the Navy Yard. The flood sets up channel, but the ebb coming from Nantasket Gut sets somewhat across the channel toward the Spit. Care must be taken accordingly.

Vessels bound up through The Narrows must be careful, after passing False Spit beacon, not to be set on to Georges Island rocks on the flood tide, as the current of the flood sets through the Black Rock Channel on to Georges Island. The ebb sets through the same channel, and *vessels coming down from The Narrows*, between Lovell and Gallup islands, are in danger of being carried by it on to Whiting Ledge or into the Black Rock Channel.

The flood, setting *between Gallup and Georges islands*, may, in light winds, carry a vessel through when going up; but here the channelway and anchorage are good.

In the northern part of The Narrows the flood during part of its period sets southward, but is not strong. The ebb, which is stronger, sets northward, and it requires a quick-working vessel to beat down The Narrows against an ebb current.

Near Nix Mate the ebb will, in light winds, carry vessels out through the Broad Sound Channel.

Between Long Island Head and Deer Island Lighthouse the ebb begins about 20 minutes after high water, and the flood about 20 minutes after low water, at the Navy Yard.

Along the northwestern side of Long Island the flood sets southwestward for about two hours; the current then turns and sets northward and eastward during the remaining period of flood, and so continues throughout the period of ebb. While setting thus during this period of flood it meets the current coming in through the Broad Sound Channel, and this causes a rip at times near Long Island Head.

The **variation of the compass** for various points between Cape Ann and Point Judith is given on page 11.

GENERAL REMARKS ON APPROACHING BOSTON HARBOR.

General remarks on approaching and standing along the coast are given on pages 26–28.

Approaching the entrance from the vicinity of Cape Ann.—The soundings in the vicinity of Cape Ann are very irregular and can not be depended on to locate even approximately the vessel's position. The southern end of *Jeffrey Ledge*, with depths of 19 to 30 fathoms, extends 15 miles eastward from Cape Ann, and depths of over 50 fathoms are found a few miles eastward and a short distance southward from the edge of the bank. A SW. by W. ½ W. line drawn from the spindle on The Londoner just clears the offshore dangers between Cape Ann and Nahant.

At night, if the weather is clear Cape Ann Lighthouses will be seen nearly 20 miles and will be visible until nearly up to Boston Light-vessel; as the entrance to the harbor is approached a number of lights will be visible, and they are sufficiently numerous to locate the position readily by cross bearings.

Approaching the entrance from the vicinity of Cape Cod.—Approaching the eastern side of the cape, soundings of 20 fathoms indicate a distance of 2 to 3½ miles from the shore, but off the north side of the cape the 20-fathom curve draws closer inshore and the soundings are not so regular. Vessels standing for Boston Light-vessel will cross the southwestern end of *Stellwagen Bank* in depths of 12 to 15 fathoms; this bank, with depths of less than 20 fathoms on it, begins 5 miles north of the north end of Cape Cod and extends in a general N. direction for 17½ miles, its width varying from 8 miles at its southern end to about 2 miles near its northern end. Soundings on Stellwagen Bank can not be depended on to locate a position on the bank except in the case of soundings in a depth of 9½ fathoms, the shoalest water, which is found near its extreme southwestern end and about 6½ miles N. by W. ½ W. from Race Point Lighthouse. The prevailing depths over the shoaler parts of the bank are 12 to 15 fathoms.

As the entrance to Boston Harbor is approached, after crossing Stellwagen Bank, soundings of 20 fathoms or more (at low water) insure a distance of 5 miles or more from the shore and well outside of outlying rocks. Inside the depth of 20 fathoms the soundings are very irregular and they can not, as a rule, be depended on to keep a vessel out of danger; but the use of the lead, on this account, should not be neglected.

At night, in clear weather, Minots Ledge Light will be sighted as soon or shortly after the Lights on Cape Cod (Cape Cod and Race Point lights) are dropped. Boston Light-vessel should be steered for to avoid the rocks and shoal spots lying eastward and northward of Minots Ledge, and on which the sea breaks in heavy gales.

Tidal currents.—For some distance northwestward of Cape Cod the tidal currents have a slight set southward into Cape Cod Bay on the flood and eastward out of the bay on the ebb. Along the north shore of Massachusetts Bay the flood sets in a general westerly or northwesterly direction, and the ebb in a southerly or southeasterly direction. The velocity of the currents is influenced greatly by the force and direction of the wind. Off the entrance to Boston Harbor the flood sets westward and ebb eastward, increasing slightly in velocity as the entrance is approached.

Fogs.—In thick weather Boston Light-vessel should be steered for when approaching from either Cape Ann or Cape Cod, and the water should not be shoaled to less than 20 fathoms unless the fog signal of the light-vessel is heard and the vessel located. From the light-vessel a course may be laid for Boston Lighthouse, and the fog signal of the latter with a frequent use of the lead will enable a vessel to reach an anchorage inside of Point Allerton. Unless the light-vessel is located no attempt should be made to enter the harbor, and the water should not be shoaled to less than 20 fathoms.

Vessels when in the vicinity of Cape Cod, if overtaken by fog or thick easterly weather, may find it convenient to anchor in Providence Harbor, or on the west side of the cape south of Providence, where there is a good lee and holding ground in 7 to 11 fathoms water.

SAILING DIRECTIONS, BOSTON HARBOR.

In following the sailing directions sufficient allowance should be made for tidal currents, the set and drift of which are given on pages 53–54, and it is advisable and generally easy to pick up a range ahead when entering.

The directions for Boston Harbor are arranged in sections, as follows:

1. Approaching Main Ship Channel Entrance, from Northward or Northeastward.

1 A. Approaching Main Ship Channel Entrance, from Eastward or Southward.

2. From Boston Lighthouse through the Main Ship Channel to President Roads.

3. From President Roads to the city of Boston by the Main Ship Channel.

1 B. Approaching and Entering through Broad Sound South Channel to President Roads.

1 C. Approaching and Entering through Broad Sound North Channel to President Roads.

2 A. From the Main Ship Channel Entrance to an Anchorage in Nantasket Roads.

3 A. From an Anchorage in Nantasket Roads or Westward of Georges Island to President Roads.

3 B. From President Roads through Governors Island Channel to the city of Boston.

1. ***Approaching Main Ship Channel Entrance, from Northward or Northeastward.***—Vessels from Cape Ann should follow the directions in paragraph II, under section 1, page 29.

As the entrance is approached keep eastward of a line joining Egg Rock and Minots Ledge lighthouses, bearing *N.* by *W.* ¾ *W.* and *S.* by *E.* ¾ *E.*, until Point Allerton (see description, page 49) bears **SW.** ¾ **W.**, when steer for it until Narrows Lighthouse is just open south of Boston Lighthouse, bearing *W.* Then steer **WSW.** ¾ **W.** so as to pass nearly ½ mile south of Boston Lighthouse and follow the directions in section 2.

If bound to an anchorage in Nantasket Roads, follow the directions in section 2 A.

At night.—Keep eastward of a line joining Egg Rock and Minots Ledge lights until Narrows Light is just open south of Boston Light, bearing **W.**; then steer this course, keeping the range ahead. When Minots Ledge Light bears *SSE.* ¾ *E.*, steer **W.** by **S.**, so as to pass nearly ½ mile south of Boston Light. When Boston Light bears *N.*, distant nearly ½ mile, Narrows Light should bear *WNW.* ¼ *W.*

From Boston Light-vessel.—Steer **W.** ½ **N.** for Boston Lighthouse, and, having stood on this course about 3¾ miles and Minots Ledge Lighthouse bears *SSE.* ¾ *E.*, steer **W.** ½ **S.** so as to pass nearly ½ mile south of Boston Lighthouse. When Boston Light bears *N.*, distant nearly ½ mile, Narrows Light should bear *WNW.* ¼ *W.*

Remarks.—In approaching the entrance, Point Allerton and Great Brewster (see description, page 49), and Boston Lighthouse and Boston Light-vessel (see table, page 12), should be easily recognized. Coming from northeastward a lookout should be kept for the three red nun buoys marking the outlying ledges northeastward of Boston Lighthouse.

The **SW.** ¾ **W.** course for Point Allerton leads ⅝ mile or more southeastward of the nun buoys marking Three and one-half Fathom Ledge, Martin Ledge, and Boston Ledge, and 1 mile southeastward of Outer Brewster.

The **W.** and **W.** ½ **N.** courses for Boston Lighthouse lead ⅜ and ⅝ mile, respectively, north of Thieves Ledge whistling buoy.

Dangers.—**The Graves** are a dangerous group of bare rocks and ledges, extending about ¼ mile in a general **NE.** ½ **N.** and **SW.** ½ **S.** direction. The middle of this ledge lies about 2½ miles **NE.** by **N.** from Boston Lighthouse and 4¼ miles **S.** ½ **E.** from Egg Rock Lighthouse. Near the northeast end of the ledge and about 450 yards **NE.** from the northernmost bare rock, is a small rock, bare at low water, called the **Northeast Grave**; and ⅝ mile northeastward of the latter is the mammoth whistling buoy, which is the principal thick-weather aid for vessels approaching the Broad Sound Channels from northward.

Three and one-half fathom Ledge is a small, detached spot with a depth of 3¼ fathoms. It lies about 2¼ miles **NE.** by **E.** ¾ **E.** from Boston Lighthouse and about 1½ miles **S.** by **E.** ½ **E.** from the whistling buoy off The Graves, and is marked by a buoy (nun, red, No. 2) placed southeastward of its shoalest part.

Martin Ledge is a small, detached spot with 17 feet over it, lying 1¾ miles **NE.** by **E.** ¾ **E.** from Boston Lighthouse, and about ¾ mile **E.** from the eastern end of Outer Brewster Island. It is marked by a buoy (nun, red, No. 4) placed eastward of the ledge.

Boston Ledge has 18 feet over it and lies a little over 1½ miles **E.** ⅞ **N.** from Boston Lighthouse; it is marked by a buoy (nun, red, No. 6). There are spots with 14 and 15 feet over them westward of the ledge.

Thieves Ledge has depths of 4½ to 6 fathoms over it and is about ¾ mile long **ESE.** and **WNW.** and about ¼ mile wide; the middle of the ledge lies about 2½ miles **ESE.** ½ **E.** from Boston Lighthouse. It is dangerous in heavy easterly gales, when the sea breaks on it. At low water it should be avoided by vessels of over 24 feet draft even in a smooth sea. The ledge is marked north of its shoalest part by a whistling buoy. There is a spot with 5¾ fathoms over it lying nearly 1¼ miles **SE.** ¾ **E.** from the whistling buoy, and another 5¾-fathom spot a little over ½ mile **E.** ½ **S.** from this buoy upon which the sea sometimes breaks in heavy easterly gales.

Harding Ledge and the dangers between it and Minots Ledge are described under section 1 A, following.

Shag Rocks or **Egg Rocks** are a cluster of bare, dark rocks lying eastward of Boston Lighthouse, and should not be approached from southward closer than ¼ mile.

A 14-foot spot lies about 400 yards **S.** by **E.** from the lighthouse.

Point Allerton Bar makes off a little more than ⅜ mile eastward and northward from Point Allerton. At its northern side is a buoy (can, black, No. 3) and near the end of the dry part of the bar is a beacon (pyramidal stone structure, with shaft and black cone on top). **Ultonia Ledge** with a least depth of 3½ fathoms lies over 1 mile **E.** by **N.** from the beacon.

A spot with 3¾ fathoms over it lies nearly ⅜ mile **S.** ⅞ **W.** from Boston Lighthouse.

1 A. ***Approaching Main Ship Channel Entrance, from Eastward or Southward.***—***I. Deep-draft vessels.***—With the standpipe in Provincetown bearing *SW.* by *W.*, distant 4½ miles, and the whistling buoy off Peaked Hill Bar 1 mile distant and nearly in range with the standpipe, steer **NW.** ½ **W.** for 31 miles to Boston Light-vessel.

Or, bring Race Point Lighthouse to bear *SE.* ⅜ *S.* over the stern and steer **NW.** ⅜ **N.** for Boston Light-vessel.

From Boston Light-vessel steer **W.** ½ **N.** for Boston Lighthouse, and having stood on this course about 3¾ miles and Minots Ledge Lighthouse bears *SSE.* ¾ *E.*, steer **W.** ½ **S.** so as to pass nearly ½ mile south of Boston Lighthouse. When Boston Lighthouse bears *N.*, distant nearly ½ mile, Narrows Lighthouse should bear *WNW.* ¼ *W.*; then follow the directions in section 2.

If bound to an anchorage in Nantasket Roads follow the directions in section 2 A.

Remarks.—On the above courses for Boston Light-vessel a high, dark-gray tower with pointed top, on the high land about 1¼ miles inland and 4 miles **S.** by **W.** ⅛ **W.** from Minots Ledge Lighthouse, will be the first object sighted, and should be well on the port bow. The courses lead about 3½ miles northeastward of Minots Ledge Lighthouse and clear the shoal spots eastward of it. A white nun marking buoy is placed about ¼ mile northeastward of the light-vessel.

On the **W.** ½ **N.** course when heading for Boston Lighthouse, Narrows Lighthouse will be open southward of Boston Lighthouse, and having stood on the course 3¾ miles the whistling buoy on Thieves Ledge should be a little over ½ mile distant and about in range with Minots Ledge Lighthouse, bearing **SSE.** ¾ **E.**

The **W.** ½ **S.** course leads fair for the entrance and leaves the black can buoy, on Point Allerton Bar, about 500 yards on the port hand.

See the dangers under paragraph II, following.

II. Vessels of 18 feet or less draft with a smooth sea.—When Boston Lighthouse is made, it may be steered for on any bearing between **W.** and **NW.** by **W.** ¼ **W.** until about 1¼ miles from it, when the course should be changed so as to pass nearly ½ mile southward of it. Then follow the directions in section 2.

In coming from southeastward or southward, when Minots Ledge Lighthouse is made, steer so as to pass ¾ mile northeastward of it on any course westward of **NNW.** ½ **W.** When this lighthouse bears *SW.*, distant ¾ mile, steer **NW.** ¾ **W.**; Boston Lighthouse, if not then visible, should be made right ahead, and should be kept on the bearing until within about 1 mile of it and Narrows Lighthouse bears **WNW.** ½ **W.**, when the course should be changed to head for Narrows Lighthouse and so as to pass nearly ½ mile southward of Boston Lighthouse. Then follow the directions in section 2, following.

If bound to an anchorage in Nantasket Roads, follow the directions in section 2 A.

Remarks.—For prominent objects in approaching see page 51. On a clear day Boston Lighthouse should be made when abreast of Minots Ledge Lighthouse, if not before.

The **NW. ¾ W.** course (on a bearing for Boston Lighthouse) leads between Harding Ledge and Thieves Ledge, and to clear both of these ledges the bell buoy off Harding Ledge should be left about 400 yards on the port hand. Point Allerton beacon and Narrows Lighthouse will show on the port bow, and when approaching the entrance and hauling westward the latter should be ahead, bearing about **WNW. ½ W.**

Dangers.—**Stellwagen Ledges** is the name applied to the large number of rocks and sunken ledges which fringe the coast from Minots Ledge to Scituate Harbor. Some of these sunken ledges lie over 1 mile from shore, and have from 7 to 14 feet over them in surrounding depths of 4 to 9 fathoms. When in this vicinity strangers should keep over 1¼ miles from the shore while the old light-tower at Scituate bears southward of **SW.** A buoy (can, black, No. 1) is placed a little over ⅜ mile **E.** by **S.** from Minots Ledge Lighthouse, eastward of the ledges near it.

A small, rocky patch with 3½ fathoms over and 9 to 13 fathoms around it, lies 2⅜ miles **E. ½ S.** from Minots Ledge Lighthouse.

Jason Shoal is a small, detached shoal with 5½ fathoms over it, lying 1¼ miles **NE.** by **E. ½ E.** from Minots Ledge Lighthouse. The sea breaks on this ledge during heavy gales and also over a small 4½-fathom spot (**Sylveter Rocks**) lying ½ mile **NE.** from the lighthouse.

Davis Ledge, with a least depth of 13 feet, lies over ⅜ mile **ESE. ¾ E.** from Minots Ledge Lighthouse; it is marked by a buoy (can, black, No. 1). Vessels should pass well eastward of this buoy.

Harding Ledge shows bare at half tide and is marked by a spindle; it is a little southward of a line from Minots Ledge Lighthouse to Boston Lighthouse and lies 1⅜ miles **SE.** by **E. ½ E.** from Point Allerton beacon. A black bell buoy and a gas-lighted buoy are placed about ⅜ mile **NE.** from the spindle on the ledge.

Westward of Harding Ledge are **a number of spots** with 15 to 18 feet over them, and a small rock, showing bare at low water, lies about ¼ mile **SW.** from the spindle.

Ultonia Ledge, with 3½ to 5 fathoms over it, is the eastern end of the rocky, broken ground which extends 1⅜ mile **E.** by **N.** from Point Allerton. It is a danger to deep-draft vessels.

See also dangers under section 1, foregoing.

2. ***From Boston Lighthouse through the Main Ship Channel to President Roads.***—From a position nearly ½ mile south of Boston Lighthouse steer **W.** by **N.**, pass about 225 yards south of Nash Rock buoy (spar, red, No. 8), and about 80 yards south of Kellys Rock buoy (spar, red, No. 8½); then haul a little northward so as to pass 200 yards southward of Narrows Lighthouse.

With Narrows Lighthouse bearing *N.* distant about 200 yards steer **NW. ½ W.** for Nix Mate beacon until the southern end of Lovell Island bears *E.* Then steer **NW. ¾ N.** and leave red nun buoy, No. 10, about 200 yards on the starboard hand and Nix Mate bell buoy about 50 yards on the port hand. When past the bell buoy, haul westward, course **W.** by **N.**, so that Long Island Head Lighthouse will be ¼ mile distant when it bears *S.*, then follow the directions in section 3, following.

Desiring to anchor in President Roads.—When 100 yards northward of Nix Mate bell buoy steer about **WNW.** and anchor before Deer Island Lighthouse bears *E.* by *S.* distant ¼ to 1¼ miles.

Remarks.—The sailing line carries a least depth of 27 feet of water.

The **W.** by **N.** course heads nearly for the middle of Georges Island. After passing Nash Rock buoy, Kellys Rock buoy will be made a little on the starboard bow and a black gas-lighted buoy should be nearly ahead. When past Kellys Rock buoy the course is changed so as to lead about midway between this gas-lighted buoy and Narrows Lighthouse. Two stone beacons will be seen, one **N.** of Kellys Rock buoy, and the other a short distance southeastward of Narrows Lighthouse.

On the **NW. ½ W.** course for Nix Mate beacon, the southern end of Lovell Island is given a berth of about 200 yards, and during the strength of the current care must be taken not to be set off the course (see page 54).

On the **NW. ¾ N.** course the bell buoy off Nix Mate beacon will be a little on the port bow and Deer Island Lighthouse will show a little westward of it. The highest point of Deer Island with the flagstaff will be a little on the starboard bow, and the course leads about 150 yards from the westernmost end of Lovell Island. The red nun buoy on Seventy-four Bar will be left about 200 yards on the starboard hand.

Dangers.—**Nash Rock Shoal** has 20 feet over it and lies ⅜ mile **SW.** from Boston Lighthouse; it is marked near its shoalest part by a buoy (spar, red, No. 8).

A spot with 3¾ fathoms over it lies nearly ⅜ mile **S. ½ W.** from Boston Lighthouse.

Hunt Ledge, a detached spot with a least depth of 10 feet over it, lies nearly ¾ mile **SE. ¾ S.** from Narrows Lighthouse; it is marked by a buoy (nun, red and black horizontal stripes). This buoy should not be approached from northward closer than 300 yards. There is a depth of 21 feet between this buoy and the black buoy southward of it.

Great Brewster Spit and Kelp Ledges extend from Narrows Lighthouse to Boston Lighthouse on the north side of the channel. At low water the whole of the bar shows bare; near its western end is **Narrows Lighthouse,** eastward of which are two stone beacons placed on the dry part of the spit. The easternmost is known as **False Spit beacon** and the one near the lighthouse as **Spit beacon.**

Kellys Rock, with 3¾ fathoms over it, lies 325 yards **S.** by **E. ½ E.** from False Spit beacon; it is marked on its southern side by a buoy (spar, red, No. 8½).

A small 3¾ fathom spot lies about 300 yards **SSE.** from the buoy on Kellys Rock.

Georges Island Rocks make off for a distance of 600 yards eastward from Georges Island; they are marked by a buoy (black, gas-lighted) at their northeastern end. A large part of the shoal on the east side of Georges Island is dry at low water.

A shoal extends along the west side of The Narrows from the east end of Gallup Island to the gas-lighted buoy off Nix Mate.

Nix Mate is a large, rocky shoal, partly bare at low water, lying northward of Gallup Island. Near the middle of its dry part is a large beacon with a square granite base and wooden octagonal pyramid on top. The northeastern end of this shoal is marked by a black gas-lighted buoy, and about 30 yards northeastward from this buoy is a black bell buoy; on the northernmost end of the shoal is a black spar buoy.

Seventy-four Bar makes westward from the northern end of Lovell Island; it is partly bare at low water and is marked off its western side by a buoy (nun, red, No. 10).

3. ***From President Roads to the City of Boston by the Main Ship Channel.***—With Long Island Head Lighthouse bearing *S.*, distant ¼ mile, steer **W. ¾ N.** and pass ¼ mile north of Spectacle Island. Then bring the two range beacons on the northeast end of Spectacle Island in line, bearing *SE. ½ S.*, and steer **NW. ½ N.** until the northern edge of Governors Island is in range with the northern edge of Apple Island, bearing about *E. ¾ N.* Then steer **NW.** up to the city, and anchor within the limits (see Appendix II) prescribed by the harbor master.

Bound up the Charles River.—Continue the **NW.** course until nearly on a line between the elevators in South Boston and East Boston, and then haul northward heading for the tall chimney in the Navy Yard (course about **N.** by **W. ½ W.**). When nearly up to the Navy Yard, follow the turn in the port-hand shore and anchor below the bridge as close as practicable to the wharves on the south side (see page 50).

Bound to Chelsea or up the Mystic River.—Continue the **NW.** course and when nearly on a line between the elevators in South Boston and East Boston haul northward; follow the wharves on the starboard hand, giving them a berth of about 150 yards. A stranger should take a towboat to pass through the bridges of Chelsea or Mystic rivers.

Remarks.—The sailing line if closely followed carries a least depth of 27 feet of water to the city of Boston.

The **W. ¾ N.** course leads ¼ mile **N.** of Spectacle Island, and nearly on the South Boston Range (this range is difficult for a stranger to pick up either in the daytime or at night). **Fort Independence,** a granite structure on Castle Island, will be on the starboard bow and the gilded dome of the State House will be seen northward of it. The range beacons on the northeast end of Spectacle Island will be seen and be left ¼ mile on the port hand.

On the **NW. ½ N.** course the black can buoy and black bell buoy, lying close together and southeastward of Fort Independence, will be left about 325 yards on the port hand. Three red spar buoys on the western edge of the Lower Middle and Governors Island Flats will be left about 150 yards on the starboard hand. After passing red spar buoy No. 12, a black gas-lighted buoy and its marker, and black spar buoy No. C1 will be left 150 yards on the port hand, and when about ¼ mile above the latter the northern edges of Governors and Apple islands will be in range. (Note: While the channel is being improved these buoys may not always be in the positions indicated).

The **NW.** and **N. by W. ½ W.** courses lead in mid-channel. In 1903 dredges are at work on the southwestern side of Bird Island Flats, which are to be partly dredged to a depth of 30 feet. When abreast the elevators in South Boston, Fort Point Channel, leading into South Bay, will be opened southwestward. It is advisable for

vessels going alongside the wharves to take a towboat. No vessel propelled by steam is permitted to pass within 100 yards of the wharves at a greater speed than 5 miles.

Dangers.—**Shoals** extend 225 yards northward from Long and Spectacle islands.

Lower Middle is a shoal partly bare at extreme low water, nearly 1 mile long in a **SE.** by **E.** ½ **E.** and **NW.** by **W.** ½ **W.** direction, lying eastward of Fort Independence and on the northern side of the Main Ship Channel. Its eastern extremity is marked by a buoy (nun, red, No. 6) and its channel side is marked by two buoys (spars, red, Nos. 8 and 10).

Governors Island Flats are described under section 3 B.

Castle Rocks extend eastward from Castle Island and show partly bare at low water; near their eastern end they are marked by two buoys (a black can and a black bell). The northeastern end of Castle Island, near the wharf, is comparatively bold-to.

A shoal extends nearly ¼ mile southward from the southern end of Governors Island, and is marked at its southern end by a buoy (spar, red, No. 12). From this buoy the edge of the shoal, extending southwestward from Governors Island, runs about ¾ mile **NW.** ½ **N.** along the channel. The black spar buoy at the western extremity of the shoal marks the channel between it and Bird Island Flats, and should be left well on the starboard hand by vessels in the Main Ship Channel.

South Boston or **Dorchester Flats** make out northward and eastward from South Boston; the channel edge of these flats extends from the northern end of Castle Island nearly ⅞ mile in a **NW.** ¾ **N.** direction, and thence to the wharves east of Fort Point Channel. **Upper Middle,** nearly ½ mile **NNW.** from Fort Independence, has been partly removed and is marked at its eastern edge by a buoy (black, gas-lighted).

Slate Ledge, with about 4 feet over it, is on the northern edge of South Boston Flats and just eastward of the line of the wharves south of the entrance to Fort Point Channel. Its northern edge is marked by black spar buoy No. 11.

Bird Island Flats, a large area of which is dry at low water, lie between the wharves of East Boston and Governors Island, and extend to the edge of the channel. Near their southeastern end, where there is a channel to pass north of Governors Island, is a buoy (spar, red, No. 12) and 150 yards **N.** of the buoy a spindle (iron, red, with cage on top). The southwestern part of these flats are being dredged to a depth of 30 feet.

1 B. ***Approaching and Entering, through Broad Sound South Channel to President Roads.***—While Egg Rock Lighthouse bears westward of *N.* by *W.* ¾ *W.* bring Long Island Head Lighthouse to bear **SW.** by **W.** ¾ **W.** and steer for it on this bearing; the whistling buoy northeastward of The Graves should be left ½ mile on the port hand. Continue the course until the eastern end of Outer Brewster Island (the easternmost large island) bears *SSE.* ¾ *E.* The two white conical range beacons on the north end of Lovell Island should then be in line; steer on the range, keeping it close, course **SW.** ¼ **W.,** leaving red nun buoy No. 2 on the starboard hand and the three black can buoys Nos. 1, 3, and 5 about 150 yards on the port hand. When the latter buoy is a little abaft the beam steer **W.** ¾ **S.,** keeping the two red conical towers of the Spectacle Island Range in line ahead; pass 200 yards northward of Ram Head buoy (black, gas-lighted) and black spar buoy No. 9, leaving red nun buoys Nos. 4 and 6 on the starboard hand. Continue the **W.** ¾ **S.** course on the range and pass ¼ mile north of Long Island Head Lighthouse. When the lighthouse bears *S.* steer **W.** ¾ **N.,** and follow the directions under section 3, page 59.

To anchor in President Roads.—When Deer Island Lighthouse bears *N.,* steer **WNW.** and anchor anywhere from ½ to 1¼ miles westward of the lighthouse before it bears *E.* by *S.*

Remarks.—The sailing line if closely followed carries a least depth of 28 feet of water.

On the **SW.** by **W.** ¾ **W.** course standing for Long Island Head Lighthouse, Deer Island Lighthouse will be a little on the starboard bow. Narrows Lighthouse (see table, page 12) will be made on the port bow; Lovell Island (see page 49) is just northward of this lighthouse, and the range beacons on the northern end of the island should be watched, and as soon as they are in line should be steered for.

When standing on the Lovell Island range, the two red conical range towers on Spectacle Island (the island westward of Long Island Head) should be looked for. When black can buoy No. 5 is a little abaft the beam, the high, bluff, northern end of Great Brewster Island will be on the port beam and the course is then changed to **W.** ¾ **S.**

On the **W.** ¾ **S.** course Ram Head lighted buoy (black) will be left 200 yards on the port hand, and Deer Island Lighthouse will be distant ¼ mile when abeam. There are two white pyramidal towers on the north end of Spectacle Island which form the range for standing up the harbor above the Lower Middle. Nix Mate beacon will be broad off the port bow, and a little over ⅜ mile distant when abeam.

The northern edge of the Broad Sound South Channel is marked by three red nun buoys, Nos. 2, 4, and 6. No. 2 is at the northern end, No. 4 at the point where the vessel changes to the Spectacle Island range beacons, and No. 6 at its western end.

Dangers.—**The Graves** are described on page 56.

Mafflitt Ledge, a small, detached spot with 16 feet over it, lies about ¼ mile **NNW.** ¾ **W.** from Green Island.

Roaring Bulls are a number of detached rocks extending about 700 yards in an **ENE.** and **WSW.** direction, and several of them show bare at low water and are usually marked by breakers. Their southwestern end lies ⅝ mile **E.** from Green Island, and their northeastern end about ½ mile **SW.** ¾ **W.** from The Graves.

Commissioners Ledge, two small, detached spots with 13 and 16 feet over them, lies ½ mile **NW.** ½ **W.** from Green Island. To avoid this ledge, Long Island Head Lighthouse should be kept bearing a little southward of **WSW.** until the northern end of Green Island bears **SE.** by **E.** ½ **E.** The ledge is marked off its western side by a buoy (can, black, No. 1).

Great Faun and **Little Faun** bars are described under section 1 C, following. A 9-foot spot lies near the eastern extremity of Little Faun Bar, 1¼ miles **E.** ⅝ **N.** from Deer Island Lighthouse; it is marked by a buoy (can, red and black horizontal stripes).

There are **a number of detached spots** with 14 to 18 feet over them, lying eastward and southward of these bars and on the northern edge of the Broad Sound South Channel.

Devils Back, between 300 and 400 yards long, is occasionally bare in places at low water; it lies ⅝ mile **W.** from Green Island, and is marked off its north end by a buoy (can, black, No. 3).

Aldridge Ledge has 8 feet over it at its western part, and lies 1⅝ miles **NNE.** from Narrows Lighthouse and 1⅞ miles **E.** from Deer Island Lighthouse. Near the western side is a buoy (can, black, No. 5).

Ram Head is the extensive shoal making off northeastward from Lovell Island; a large part of this shoal is bare at low water, and only 6 feet of water is found ½ mile from the island. On its northern side the shoal is marked by a buoy (black, gas-lighted). The **northern edge of the shoal** making northward from Lovell Island, and westward of Ram Head, is marked by a buoy (spar, black, No. 9).

Deer Island Point, near the southern end of which is Deer Island Lighthouse, is described under section 1 C.

Nix Mate is described under section 2, page 59.

1 C. ***Approaching and entering, through Broad Sound North Channel to President Roads.—I. From Lynn Harbor or Nahant.***—Stand southward, keeping well off the entrance until Deer Island Lighthouse bears **WSW.** ¼ **W.**, when steer for it on that bearing, leaving the bell buoy and red nun buoy, No. 4, about 75 yards on the starboard hand. When red buoy No. 4 is abeam steer **SW.** by **W.** ¼ **W.** so as to pass ¼ mile south of Deer Island Lighthouse, and when the lighthouse bears *N.* steer **W.** ¾ **N.** until the Spectacle Island Range bears *SE.* ½ *S.* Then steer **NW.** ½ **N.**, and follow the directions under section 3, page 59.

Or, when Deer Island Lighthouse bears *N.* steer about **WNW.** ¼ **W.** and anchor anywhere from ½ to 1¼ miles westward of it.

Remarks.—The directions are good for a draft of 9 feet at low water with a smooth sea.

When approaching Great Faun Bar bell buoy, the beacon on Great Faun Bar will be seen well westward of the buoy. The red buoys and black buoys, marking the edges of Broad Sound South Channel, and the can buoy (red and black horizontal stripes), marking the 9-foot shoal near the eastern part of Little Faun Bar, will be seen southward. As Deer Island and Long Island Head lighthouses are approached, Nix Mate beacon and the buoys at the northwestern end of the Main Ship Channel will be seen southward.

Vessels of 15 feet or less draft can, at high water with a smooth sea, stand directly in for Long Island Head Lighthouse bearing **SW.** by **W.** ¼ **W.**

Dangers.—**Great Faun Bar** extends eastward from the middle of Deer Island for a distance of nearly ¾ mile, where it is marked by a beacon (square stone base and cone, with red iron spindle and cage on top); the bar is dry at low water. The shoal water extends a distance of 1 mile eastward of the beacon and a red bell buoy is placed ¾ mile eastward of the beacon as a guide over the bar, where the least depth is 12 feet.

Little Faun Bar makes eastward from near the southern end of Deer Island. A buoy (nun, red, No. 4) is placed on a part of the bar having about 15 feet over it and about ½ mile eastward of the island. The bar is partly dry between the buoy and the shore, and with exception of the 9-foot spot (8-foot spot) marked by a buoy, has least depths of 11 feet eastward of buoy No. 4.

Deer Island Point is a long spit, dry at low water, extending ¼ mile southward from the southern end of Deer Island. Near its southern end it is marked by Deer Island Lighthouse (see table, page 14). Shoals extend 300 yards eastward and 150 yards southward from the lighthouse, and northeastward to Little Faun Bar.

II. From northeastward.—When Long Island Head Lighthouse is made, bring it (while still well off the entrance) to bear **SW.** by **W.** ¼ **W.** and steer for it until Deer Island Lighthouse bears **WSW.** ¼ **W.** Then steer for Deer Island Lighthouse, keeping it bearing **WSW.** ¼ **W.** until up to Great Faun Bar bell buoy, from which follow the directions given in paragraph 1, foregoing.

Or, from the whistling buoy off The Graves bring Deer Island Lighthouse to bear **WSW.** ½ **W.** and steer for it on this bearing, and follow the directions in paragraph 1, preceding.

Remarks.—Standing on the **SW.** by **W.** ¼ **W.** course for Long Island Head Lighthouse, a black whistling buoy northeastward of The Graves will be left nearly 1 mile on the port hand.

See also the remarks and dangers under paragraph 1, foregoing.

The Graves are described under section 1, page 56.

2 A. ***From the Main Channel Entrance to an Anchorage in Nantasket Roads.***—Having followed the directions in section 1 or 1 A, pages 56–57, and when nearly ½ mile south of Boston Lighthouse, steer **W.** ¼ **N.** until the range beacon southward of Boston Lighthouse is in range with the lighthouse and Deer Island Lighthouse is seen on the high-water mark of the southwest end of Lovell Island; then steer **WSW.**, keeping Boston Lighthouse and beacon in range over the stern. When the eastern end of Georges Island closes on the west end of Lovell Island, haul westward and anchor south of Georges Island, keeping Narrows Lighthouse open southward of the island.

If of less than 18-feet draft, when following the above directions, Long Island Head Lighthouse bears **NW.** ½ **N.** steer for it and anchor anywhere ¼ mile southwestward of Georges Island. The best anchorage is in 3½ to 5 fathoms, ¼ mile westward of Georges Island.

At night.—When nearly ½ mile south of Boston Lighthouse steer **W.** ¼ **N.** until the first red sector of Boston Light (auxiliary light) is crossed; then stand **WSW.** ¼ **W.**, keeping in the white rays of the auxiliary light until Long Island Head Light bears **NW.** ½ **N.**, when steer for it and anchor southwestward of Georges Island.

Remarks.—The **W.** ¼ **N.** course leads about 300 yards northward of Hunt Ledge buoy (nun, red and black horizontal stripes), and when the buoy is abaft the beam the course is changed to **WSW.**

On the **WSW.** course the northwestern end of Peddock Island will be a little on the port bow; two red spar buoys (Nos. 2 and 4) will be left on the starboard hand, and Hunt Ledge buoy and a black can buoy on the port hand. When past these buoys Nantasket Gut will be opened out between Peddock Island and Windmill Point. The white rays of the auxiliary light can be seen only when in the channel for Nantasket Roads.

Dangers.—**Nash Rock Shoal** and **Hunt Ledge** are described on pages 58–59.

A spot, with 16 feet over it and marked by red spar buoy No. 2, lies nearly ½ mile **S.** from Narrows Lighthouse, and a 14-foot spot, marked by red spar buoy No. 4, lies 350 yards westward of it.

Hospital Shoal, with a least depth of 7 feet on it, lies ½ mile **WSW.** ½ **W.** from Georges Island, and is marked on its eastern side by a buoy (can, black, No. 1).

3 A. ***From an Anchorage in Nantasket Roads or Westward of Georges Island to President Roads.***—*I. To pass between Georges and Gallup islands.*—The turn around the eastern end of Gallup Island is too sharp and the channel too narrow for any but a quick-working vessel to attempt to enter The Narrows between Georges and Gallup islands.

Stand northward or northeastward, giving the western shore of Georges Island a berth of 200 yards on the starboard hand, and stand into The Narrows, giving the eastern point of Gallup Island a berth of 200 yards. When Nix Mate beacon shows open eastward of the end of Gallup Island, haul sharply northward and westward, and steer about **NW.** ¾ **N.** with Deer Island Lighthouse a little on the port bow. Leave the bell buoy and Nix Mate

beacon on the port hand, and when well past them steer **W.** ¾ **N.** into President Roads, and if bound up to the city follow the directions in section 3, page 59.

II. To pass through the dredged channel between Long Island and Nix Mate.—Steer for Long Island Head Lighthouse bearing **NW.** ½ **N.** until Deer Island Lighthouse bears **N.** ¾ **W.**, and then steer for the latter on the bearing until up to red spar buoy No. 2. When up to this buoy leave it 30 yards on the starboard hand and steer **NNW.**, leaving black can buoys Nos. 1 and 3 on the port hand, and red spar buoy No. 4 on the starboard hand. When well past these buoys haul westward so as to pass about ¼ mile northward of Long Island Head; then if bound to the city follow the directions in section 3, page 59.

Remarks.—The channel between Long Island Head and Nix Mate is only about 200 feet wide and 14 feet deep.

3 B. ***From President Roads through Governors Island Channel to the City of Boston.***—This channel is narrow and tortuous near its western end and is little used by strangers; 17 feet can be carried through if the buoys are closely followed.

With Long Island Head Lighthouse bearing *S.*, distant ¼ mile, steer **NW.** ¾ **W.** for ⅞ mile, until red spar buoy No. 2 is about 300 yards distant on the starboard beam. Then steer **N.** by **W.** ¾ **W.** for the highest part of Apple Island, and pass about 100 yards westward of red spar buoy No 4, on the Middle Ground, and about 100 yards northeast of black spar buoy No. 1. Then steer **NW.** ¾ **W.** and pass close southward of red spar buoy, No. 8, marking Apple Island Flats.

When past red spar buoy No. 8, haul a little northward and leave black spar buoy No. 3 on the port hand. When Glade Flats beacon bears *SW.* by *S.*, haul sharply southward, course about **SW.** by **S.**, and leave the beacon and black spar buoy, No. 5, on the port hand and Bird Island Flats spindle and red spar buoy, No. 12, about 125 yards on the starboard hand. When buoy No. 5 is abaft the port beam, steer **W.** ¼ **N.** about ⅜ mile until in the middle of the Main Ship Channel, and then haul northward (course about **NW.**) and stand up the harbor; anchor within the limits prescribed in the harbor regulations (see Appendix II).

Remarks.—Vessels of less than 15 feet draft may bring Deer Island Lighthouse to bear **SE.** by **E.** and steer **NW.** by **W.**, passing about 300 yards northward of red spar buoys Nos. 2 and 4. The channel is well buoyed, and the buoys should be closely followed.

On the **NW.** ¾ **W.** course Bunker Hill Monument will be a little on the starboard bow, and will be brought a little on the port bow after passing red spar buoy No. 8.

Dangers.—Middle Ground, with 7 to 17 feet over it, lies ⅝ mile **WNW.** from Deer Island Lighthouse; it is ⅞ mile long in a **WNW.** ½ **W.** and **ESE.** ½ **E.** direction and has a greatest width of about 300 yards, near its eastern end. A buoy (spar, red, No. 2) marks the shoal near the middle at its southern side, and a buoy (spar, red, No. 4) marks its western extremity. Eastward of buoy No. 2 the depth on the shoal ranges from 15 to 17 feet. Between buoy No. 4 and Governors Island Flats a channel 250 yards wide leads from President Roads into Governors Island Channel.

Governors Island Flats, partly dry at low water, extend 1⅛ miles in a **SE.** by **E.** direction from the eastern shore of Governors Island. A buoy (spar, red, No. 2) marks the flats at their southern edge and a buoy (spar, black, No. 1) at their northeastern extremity.

Deer Island Flats make out from the western shore of Deer Island. They have a depth of 3 to 10 feet over them and extend a little over ½ mile **WSW.** ½ **W.** from the northwestern point of Deer Island; a depth of 5 feet is found near the western extremity of these flats.

Apple Island Flats is the name given to the mud flats surrounding Apple Island. The greater part is dry at low water, and the southern edge rises abruptly from the deep water of Governors Island Channel. A buoy (spar, red, No. 8) marks their southern edge nearly ½ mile **WSW.** from Apple Island, and from here the edge of the flats makes ⅞ mile in an **ESE.** direction to red spar buoy No. 6, which marks their southeastern point, ⅞ mile **SSE.** ¾ **E.** from Apple Island. A channel about 200 yards wide, leading to Shirley Gut and north of Apple Island, makes between this buoy and Deer Island Flats. A shoal, with 4 feet near its outer point, extends nearly ¾ mile **WNW.** ¾ **W.** from Apple Island.

Noddle Island Flats, partly dry at low water, make out from the southeastern point of East Boston in an **ESE.** direction to a point about 400 yards north of Apple Island. A buoy (spar, red, No. 10) marks the southernmost point of this shoal.

A narrow channel leads from Governors Island Channel north of Apple Island along the southeastern edge of Noddle Island Flats.

Shoals make out about ¼ mile northward and westward from the western end of Governors Island. They are marked at the northern end by a buoy (spar, black, No. 3), at the northwestern side by Glade Flats beacon, and near the western point by a buoy (spar, black, No. 5). These buoys and the beacon will be left close to on the port hand. That part of the shoals which is dry at low water is known as **Glade Flats.**

NEPONSET RIVER*

is the first river emptying into Boston Harbor southward of South Boston, and leads to **Neponset** and Milton. The approach to the river from the Main Ship Channel in Boston Harbor leads along the northwestern side of Thompson Island between extensive mud flats, which rise abruptly from the edge of the channel and are bare or nearly bare at low water. The river is ¼ mile wide at its mouth, but grows gradually narrower until, at Milton, it is only 100 yards in width. **Milton** is 2½ miles above the mouth of the river in a straight line, but nearly 3½ miles by the windings of the river. The southern boundary of the city of Boston extends to the north bank of the Neponset River. At mean low water the least depth in the channel, as far up as **Commercial Point,** at the mouth of the river, is 12 feet; as far as Neponset, 7 feet; and to Milton, the head of navigation, 4 feet. The deepest draft that can be taken into the river is 20 feet; the greatest draft taken up to Milton is 12 feet.

The channel below Neponset is buoyed. At Neponset, where the first bridge crosses the river, there are shifting, middle grounds, and above the third or granite bridge there are rocks along the edge of the channel.

Pilots are generally taken by strangers, and may be had by making signal off Thompson Island, at the mouth of the river, anchoring there if necessary; they are not always taken by light-draft vessels bound to Neponset. Pilotage is not compulsory; the rates for the lower part of the river are given in Appendix II.

Towboats are taken by most vessels in going up and down the river, the master of the tug doing the piloting below Neponset bridge, where, if bound for Milton, a special pilot is taken and the vessel being towed pays his pilotage.

The **harbor regulations,** etc., are the same as for Boston Harbor (see page 52 and Appendix II).

Ice forms over the river in winter, extending to its mouth and beyond.

The **tidal currents** set fair with the direction of the channel as a rule, below Neponset; above this the currents are irregular.

SAILING DIRECTIONS, NEPONSET RIVER.

The following directions will lead to an anchorage westward of Thompson Island with a least depth of 12 feet at low water. Here a pilot or towboat should be taken by strangers bound up the river.

From President Roads to the Anchorage.—Having entered Boston Harbor as directed in the sailing directions under that heading to a position ¼ mile north of Long Island Head Lighthouse, steer **W. ¾ N.** through President Roads until the western end of Spectacle Island bears *S.* by *W.* ¼ *W.* Then steer **WSW.**; leave Old Harbor Shoals buoy (spar, red, No. 2) about 100 yards on the starboard hand, and continue the course so as to pass about midway between Old Harbor buoy (spar, red, No. 4) and Thompson Island Flats buoy (spar, black, No. 3). When abreast these buoys steer about **SW. ½ W.** and anchor in 14 to 17 feet water northeastward of Cow Pasture Flats buoy (spar, red, No. 6).

Remarks.—The channel leads between shoals with 2 and 3 feet over them in places at low water. The only guides easily recognized by a stranger are the buoys. On the **WSW.** course red buoy No. 2 should be made a little on the starboard bow and Spectacle Island will be left ¼ mile on the port hand; Commercial Point will be a little on the port bow, and a tall smokestack will be a very little on the starboard bow; the northern shore of Thompson Island will be left well on the port hand. On the **SW. ½ W.** course red spar buoy No. 6 will be a little on the starboard bow.

QUINCY BAY.*

This large but shallow bay indents the southern shore of Boston Harbor eastward of Neponset River. On the west it is separated from that river by the peninsula of Squantum, and on the east Hough Neck separates it from Weymouth Fore River. Its shores are mostly low and gently sloping toward the water, but

* See footnote on page 49.

high, steep hills will appear behind and over the low lands; the highest summits are those of Mount Hope, Forbes Hill, and Presidents Hill. The town of **Quincy** is situated about 1 mile inland from the shores of the bay, near its eastern end. It has no communication by water with the bay, but there is a small frontage on a narrow stream emptying into Town River Bay.

The peninsula of **Squantum** extends from the mainland about 1 mile in a **ENE.** direction and has a general width of about ⅜ mile. It is bare of trees and hilly with the exception of its western end, where it joins the mainland, which is almost entirely composed of salt meadows.

Eastward of Squantum and connected with the peninsula by a causeway lies **Moon Head.** It is a narrow island, easily recognized by the precipitous head on its eastern end.

Eastward of Moon Head, and between it and the southwestern end of Long Island, lies the entrance to Quincy Bay from westward. From here the Back or Western Way leads in a **NNW.** direction between Spectacle Island and Thompson Island into the Main Ship Channel, and the **Sculpin Ledge Channel** in a **NE.** direction following closely the western shore of Long Island into President Roads.

Hough Neck extends from the mainland about 1¼ miles in a general **NNE.** direction. It is of irregular shape and moderate height, has a smooth surface, and its eastern slope is covered with houses. At its northeastern end it terminates in a smooth, green hill 100 feet high, with steep faces, called **Quincy Great Hill.**

About 200 yards northward of Hough Neck and connected with it by a causeway lies **Nut Island,** a small islet. The channel into Weymouth passes between this island and Peddock Island. **Hangmans Island** is a small, rocky islet lying in the bay nearly midway between Moon Island and Nut Island; on it are several fishing huts.

HINGHAM BAY AND TRIBUTARIES.*

HINGHAM BAY

is that part of Boston Harbor lying southeastward of Peddock Island and southward of the shore running west from Point Allerton to Windmill Point; on the east it is separated from Boston Bay by Nantasket Beach. It is the approach to Weymouth Fore River, Weymouth Back River, Hingham Harbor, and Weir River. The eastern part of the bay is shoal, and extensive shoals, between which the narrow channels of the tributaries of the bay lead, make out from the southern shore and surround the islands in the southern part of the bay.

Sheep Island is a small, low, bare islet with a hut on top of it, and lies near the middle of the bay about 1⅝ miles **S.** by **W.** ¾ **W.** from Windmill Point; it is surrounded by a nearly circular shoal about ½ mile in diameter.

Grape Island lies near the southern shore of the bay, ¼ mile from Lower Neck, the northern point of the peninsula between Weymouth Back River and Weymouth Fore River. The island is about ½ mile long **E.** and **W.** and has a saddle-shaped appearance from northward, with a house standing in the hollow near the middle.

Slate Island is a small island which lies nearly 300 yards eastward of Grape Island.

Bumkin Island lies ⅞ mile **ENE.** from Grape Island. It is ⅝ mile long in a **ESE.** and **WNW.** direction, is about 80 feet high and bare of trees. There is a large yellow building on the island, and a wharf on the south side.

Little Hog Island is a small island in the northeastern part of the bay. The bight northeastward of it is very shoal, and shoals with 1 to 10 feet extend in a **SE.** and **NW.** direction from the island to the shore.

The principal entrance, **Nantasket Gut,** is a narrow but deep channel between the northeastern end of Peddock Island and **Windmill Point** and leads directly from Nantasket Roads into the bay. Windmill Point Post Light (see table, page 12) is on the southern end of the point. Prominent on Windmill Point is a large hotel, with steamboat landing southward of it. This is the terminus of the Nantasket Beach Railroad. Eastward, on the slopes of the hills, is the town of **Hull** and the clubhouses of the **Hull yacht clubs.** The usual and **best anchorage** is off the steamboat landings at Hull. There is also an entrance southward of Peddock Island; this is sometimes used by vessels bound into Weymouth Fore or Weymouth Back rivers.

The **tidal currents** in Nantasket Gut have considerable velocity, but generally follow the direction of the channel. The flood sets southward and the ebb northward.

Sailing directions for entering the bay are given in connection with its tributaries.

WEYMOUTH FORE RIVER

empties into Hingham Bay eastward of Hough Neck, Quincy Great Hill being on the western side of the entrance and Grape Island on the eastern. It is quite wide at its mouth, but above is very variable in width and is somewhat crooked, but extends in a general **SW.** direction for about 4 miles to **Weymouth** and **East**

* See footnote on page 49.

Braintree, near the head of navigation. About 2¼ miles above its mouth it is crossed by Quincy bridge (width of draw 100 feet), and at East Braintree by another bridge (width of draw 35 feet).

It is the approach by water to **Quincy Point, Weymouth,** and **East Braintree,** and to a number of landings on its banks.

The channel is narrow and crooked, but at high water a draft of 25 feet can be taken a little above Quincy bridge to the Fore River Ship and Engine Company's shipyard at Quincy Point, and 5 feet thence to East Braintree at low water.

Town River Bay makes in on the northwestern shore of Weymouth Fore River north of Quincy Point. It is full of shoals, but has a narrow channel with some deep holes; it is not safe for strangers. On its northern side near the entrance is **Sailors' Snug Harbor. Town River** empties into the bay nearly 1 mile above Quincy Point. It is a small creek, very crooked and shoal. The channel through the bay and river has been dredged, so that 4 feet may be taken at low water to the landings at Quincy.

Pilots are always taken by vessels going up Weymouth Fore River above Quincy bridge, and are obtained either at Nantasket Gut or at Quincy Point; in the former case, after making signal, vessels anchor between Nantasket Gut and Sheep Island, if it is necessary to wait for a pilot.

Towboats are employed by all large vessels entering the river, being generally taken from Boston; light-draft vessels sometimes sail up if the wind is fair.

Repairs.—The shipyard at Quincy Point has facilities for the construction and repair of the largest ships and engines of steamers.

Supplies.—Provisions can be obtained at Quincy, Weymouth, and East Braintree. Fresh water can be had at Quincy Point and at Weymouth Landing, alongside of wharves.

Ice.—The river freezes over down to Quincy Point, and in extremely cold winters the ice extends as far as Hull.

Tides.—The mean rise and fall of tides is about 9 feet.

WEYMOUTH BACK RIVER

empties into Hingham Bay just eastward of Weymouth Fore River, from which it is separated by Lower and Eastern necks; it is narrow, crooked, and its upper part shallow, about 3 miles in length, and of some importance. Directly across its mouth lie Grape and Slate islands, which are nearly connected at low water.

Two channels lead into the river, one narrow and crooked, with a depth of 10 feet, from eastward leading southward of **Slate Island**; the other, with a depth of 18 feet, from westward leading southward of **Grape Island**; the latter channel is buoyed, and is the one used. The channel is very narrow, but about 10 feet at low water can be carried up to Bradley Fertilizer Company's wharves.

Vessels entering this river, unless well acquainted, should take a pilot.

For directions in approaching see the sailing for Weymouth Fore River.

HINGHAM HARBOR AND WEIR RIVER

are shallow, irregular bodies of water making into the mainland in the southeastern corner of Hingham Bay. Their common entrance from the bay lies westward and leads close to **Bumkin Island.** The channel, 250 yards wide, and having a depth of over 3 fathoms, leads for ½ mile in a southeast direction from the western end of Bumkin Island to East Crow Point Flats buoy (spar, red, No. 2), where the channel shoals and branches. The branch leading eastward takes the name of **Weir River.** The channel leading to Hingham Harbor follows a general south direction, is narrow, and has a depth of 18 feet up to Crow Point (Downer Landing), the entrance of the harbor.

Hingham Harbor is a cove 1 mile long, with an average width of about ⅛ mile. At low water it is a dry flat, through which a narrow and tortuous channel winds, leading up to the long wharf built out from the southeastern shore at the town of Hingham. The depth in the channel at low water is 10 feet at the outer wharf.

Crow Point (Downer Landing), the western point, at entrance to the harbor, is a high, bare hill with a steep face northward. A steamboat landing is built out from its eastern end to the edge of the channel.

Planters Hill, the eastern point at the entrance to the harbor and lying ⅛ mile E. from Crow Point, is a high, smooth, grassy hill, with a few trees and a bluff face on its western side.

Three small islands lie just inside of the entrance of the harbor; the northern or outer one is **Langlee Island,** and the channel leads between it and **Ragged Island** and **Sailor Island,** which lie just southward.

Weir River leads between **World End**, a high peninsula northward of Planters Hill, and a narrow spit of land making out about 1 mile westward from the south central part of Nantasket Beach, and then extends in a southeasterly direction for about 1½ miles. It is more of an inlet than a river, and is composed mostly of extensive flats bare at low water, through which a narrow channel leads to **Nantasket Pier**, on the western side and near the southern end of Nantasket Beach. This channel has a least width of 100 feet and least depth of 10½ feet from the entrance to Nantasket Pier.

The channel is used by the steamers running from Boston to Nantasket Beach, and it is marked by piles or stakes, but it is so narrow that a stranger should not attempt it.

Directions for approaching the entrance are given in "Sailing Directions, Hingham Harbor." The tidal data for Hingham Harbor and Weir River is about the same as for Boston Lighthouse (see table, page 11).

SAILING DIRECTIONS, HINGHAM BAY AND TRIBUTARIES.

A depth of 4¼ fathoms can be taken through Nantasket Gut, and about 3½ fathoms South of Peddock Island into Hingham Bay. The directions are good for vessels of 16 feet draft at about half tide; deeper-draft vessels should take a pilot.

1. ***From Nantasket Roads to an anchorage in Hingham Bay.***—Follow the directions in section 2 A, page 62, until Nantasket Gut is opened, then haul southward and pass through it on a course about **S.** by **E.**, giving the high-water mark of Windmill Point a berth of 150 yards. When through Nantasket Gut good anchorage will be found southward of and close under Windmill Point, or in 4½ to 7½ fathoms ¼ mile *S.* by *W.* from the hotel on the point.

If bound into any of the tributaries of the bay, anchor and signal for a pilot or proceed, according to destination, as directed in paragraphs I or II, following.

Dangers.—**Shoals** make off 200 yards northward and northeastward from Peddock Island.

A small **16-foot spot** lies nearly in the middle of the channel of Nantasket Gut and about 120 yards from the west end of Windmill Point.

I. From Hingham Bay into Weymouth Fore or Weymouth Back rivers.—When through Nantasket Gut, bring the large hotel on Windmill Point to bear *NE.* by *N.* and steer **SW.** by **S.** until Sheep Island bears *E.* ¾ *S.*, distant about 600 yards, and the beacon on Pig Rocks is the same distance forward of the starboard beam. Then change the course to **S.** by **E.** for the western end of Grape Island, leaving Sheep Island a little over ¼ mile on the port hand, and when the western end of Sheep Island bears *NE.* ½ *N.* steer **SW.** ½ **S.** This course made good for a little over 1¼ miles will lead 100 yards westward of black spar buoy No. 1 and about 100 yards eastward of red spar buoy No. 2. When the latter buoy is abeam haul a little more westward so as to pass 100 yards southward of the red and black horizontally striped buoy marking Channel Rock off the eastern edge of the shoal making out from Gull Point. Leave the last-mentioned buoy 100 yards on the starboard hand, steer **W.** ¾ **N.** and anchor in the channel 250 yards west of the buoy in 4½ fathoms. The least depth on the sailing lines to this point is 17 feet; farther up, the channel is very crooked and local knowledge is necessary.

If bound into Weymouth Back River follow the directions above until nearly ⅜ mile west of Grape Island, and abreast the entrance, when take a pilot.

Remarks and dangers.—On the **SW.** by **S.** course with the large hotel on Windmill Point astern, Pig Rock beacon will be on the starboard bow. Sheep Island, which is surrounded at low water by a large, bare shoal with bowlders, will be on the port bow. The course leads 300 yards eastward of **Harrys Rock**, a cluster of bowlders showing at low water, extending 500 yards southeastward near the middle of Peddock Island. The western end of Sheep Island should be given a berth of about 450 yards.

Prince Head is a small island nearly ⅝ mile **NW.** ¼ **W.** from Sheep Island, and is off the south side of, and connected at low water with Peddock Island. A shoal extends nearly 500 yards eastward from Prince Head.

Sheep Island is surrounded by a shoal, with 6 to 8 feet over it, which extends about ⅝ mile in a northeasterly and northerly direction from the island, and rises abruptly from depths of 3½ and 4½ fathoms. On the western side of **Sheep Island** 18 feet can be carried as close as 400 yards from it.

On the **S.** by **E.** course the western end of Grape Island, which is a bluff about 20 feet high, rising to a round, smooth, grassy hill 80 feet high, will be ahead. The course leads between the shoals surrounding Sheep Island and those making eastward from Hough Neck. A red spar buoy will be seen broad off the port bow.

Extensive shoals make northeastward and eastward from Hough Neck, a depth of only 6 feet being found ¾ mile eastward from **Quincy Great Hill.** A little over ½ mile **ENE.** ½ **E.** from this hill, and near the northern edge of the shoal is **Pig Rock,** marked by an openwork beacon with granite base, surmounted by a black staff and cage.

The channel southward of Sheep Island leads between shoals on both sides, but a useful description of them can not be given.

On the **SW.** ½ **S.** course, with the high-water mark on the west end of Sheep Island astern, the highest point of the hill at Hull will show over Sheep Island; the standpipe on Nantasket Hill will be seen eastward of Hull. The course leads nearly 300 yards westward of the red spar buoy at the entrance to Weymouth Back River, and Jackknife Ledge buoy (spar, black, No. 1) will be made a little on the port bow. After passing this buoy and red spar buoy No. 2, Channel Rock buoy should be seen on the starboard bow; the channel is quite narrow southward of this buoy and the buoy should be given a berth of 100 yards. The anchorage westward of the buoy is about 225 yards wide between the shoals.

II. Through Hingham Bay to Hingham Harbor and Weir River entrance.—Entering Hingham Bay as directed is section 1, preceding, continue the **S.** by **E.** course, leaving Bumkin Island Shoal buoy (can, black, No. 1) about 200 yards on the port hand, and when the north end of Sheep Island is abeam bearing *W.* by *S.*, steer **SE.** ¾ **S.** Pass 200 yards westward of Bumkin Island, and leave Bumkin Island buoy (can, black, No. 3) about 100 yards on the port hand; continue the course nearly ½ mile past this buoy, and anchor 200 yards *NNE.* from red spar buoy No. 2, marking the entrance to Hingham Harbor.

If bound to Hingham or to Weir River take a pilot.

Dangers.—Bumkin Island Shoal makes off nearly ¾ mile in a northwesterly direction from Bumkin Island and is marked at its northern extremity by a buoy (can, black, No. 1).

Crow Point Flats are very shoal and extend 1¼ miles in a northerly direction from Crow Point, their eastern edge forming the western edge of the channel into Hingham Harbor; the eastern edge of the channel is formed by the extensive flats making westward for ½ mile from World End and Planter Hill. These shoals rise abruptly from the channel which leads between them.

1 A. ***Approaching and Entering Hingham Bay or Weymouth Fore River, from Northwestward, Passing South of Peddock Island.—I. From Boston by the Back or Western Way.***—The following directions are good for about 8 feet at low water:

Pass 200 yards eastward of Castle Rocks buoys (a black bell and black can close together) and steer about **S.** ½ **E.** for the eastern end of Moon Head. When about midway between the north ends of Spectacle and Thompson islands and the middle of Fort Independence (on Castle Island) bears *NNW.* ⅜ *W.* steer **SSE.** ⅜ **E.**, keeping the fort on the bearing astern and heading so as to pass 300 yards from the southwestern end of Long Island. Leave red spar buoy No. 4 off the end of Long Island about 100 yards on the port hand, and continue the course so as to leave Sunken Ledge beacon at least 300 yards on the port hand. Having stood on the course ½ mile after passing the beacon, red spar buoy No. 4 should be left 300 yards on the starboard hand, and when the north end of *Nut Island* (small island with causeway to Quincy Great Hill) is on the starboard beam, steer **ESE.** ¼ **E.** for Sheep Island and pass 300 yards north of Pig Rock beacon. Then—

If bound into Weymouth Fore or Weymouth Back rivers continue the **ESE.** ¼ **E.** course for Sheep Island until the western end of Grape Island bears **S.** by **E.**, when steer for it and follow the directions in paragraph I, page 67.

If bound into Hingham Bay, when Pig Rock beacon bears *SW.* by *W.* ¼ *W.* steer **NE.** by **E.** ¼ **E.**, keeping the beacon on the bearing astern. Then, if bound into Hingham Harbor or Weir River, steer for Bumkin Island Shoal buoy (can, black, No. 1) when it bears **E.**, and when 300 yards from it steer **S.** by **E.** until the north end of Sheep Island is abeam; then follow the directions in paragraph II, under section 1, preceding.

II. From President Roads by the Sculpin Ledge Channel.—With the wharf on the western side of Long Island, ¼ mile from its northern end, bearing between **S.** by **W.** ½ **W.** and

SE. ½ S. steer for it; as it is approached change the course so as to pass about 400 yards westward of it and then steer **SW.** by **S.** for Sculpin Ledge buoy (spar, red, No. 2). Leave this buoy close-to on the starboard hand and steer **SW. ¾ W.**; round the southwestern end of Long Island at a distance of 300 yards and when the end of the island bears *E.* steer **SSE. ⅝ E.** and follow the directions in paragraph I, foregoing.

Dangers.—The directions above (paragraphs I and II) are intended only for vessels of 8 feet or less draft, and a detailed description of all the shoals would be of no particular value.

Sculpin Ledge, a long reef with 1 to 10 feet over it, lies about midway between the southwestern end of Long Island and Spectacle Island. Its eastern end is marked by Sculpin Ledge buoy (spar, red, No. 2).

Sunken Ledge, dry at low water, and lying over ½ mile **NW.** from the western end of Peddock Island, is marked by an openwork beacon, with granite base, surmounted by a black staff and cage.

About ½ mile **WSW.** from Sunken Ledge beacon is **Hangmans Island,** low, with several huts on it and bare rocks and shoals around it.

Wreck Rock, a sunken rock with 6 feet over it, near the end of the shoal making out about ½ mile in a **N.** by **W. ½ W.** direction from Nut Island, is marked off its eastern side by a buoy (spar, red, No. 4).

COHASSET HARBOR.*

The coast from Point Allerton extends in a general **S.** by **E. ¾ E.** direction for 3 miles and is known as **Nantasket Beach.** It is a low and narrow strip of land separating Boston Bay from Hingham Bay. There are three smooth and grassy hills on this beach, the most prominent of which is **Strawberry Hill** (about 1 mile southward of Point Allerton), which can be easily recognized by the tall, dark, round water tower on its top; the other two hills to the southward are **White Head** and **Sagamore Head.** Houses show scattered along the entire length of the beach. From Nantasket Beach the coast, presenting a general hilly appearance, although intersected by creeks and marshes, extends 3 miles in a general **ESE.** direction to Cohasset Harbor. Rocks and sunken ledges are found ½ mile off the shore along the coast between Nantasket Beach and Cohasset Harbor.

Cohasset Harbor is formed by a large but shallow cove of irregular shape which makes into the shore on the western side of Strawberry Point, the entrance lying 5 miles **SE.** from Point Allerton. The harbor is of little commercial importance, but is the resort of a number of small yachts.

Anchorage in 8 to 10 feet can be found in the so-called outer harbor, but the inner harbor is almost entirely composed of flats through which a narrow channel, with 3 feet at mean low water, but only 1 foot over the bar, leads from the outer harbor to the wharves of **Cohasset,** situated on the southwestern shores of the harbor.

The most conspicuous object approaching this harbor is **Minots Ledge Lighthouse** (see table, page 12), built on the **Outer Minot,** the most northerly of the Cohasset Rocks.

Strawberry Point, the point on the eastern side of the harbor, is a low cleared point with houses scattered over its surface, and is a summer resort. Numerous bare and sunken ledges with a few bare islets surround this point and render a close approach to it hazardous.

Channels.—There are three channels, the entrances to which are marked by buoys; the Western or **Brush Island Channel** enters between Brush Island Ledge and Chittenden Rock; **Gangway Passage,** leading between West Hogshead Rock and The Grampuses; and **Eastern Channel,** which leads between Enos and West Willies ledges.

A pilot should always be taken by strangers desiring to enter this harbor, as the numerous bare and sunken ledges (extending out to Minots Ledge Lighthouse) at its entrance make it difficult even for those acquainted with the locality to pass through safely.

No sailing directions of value can be given; if obliged to enter without a pilot, the chart and buoys must be the guides.

SCITUATE HARBOR.†

The coast from Strawberry Point, on the eastern side of Cohasset Harbor, extends in a general **SSE.** direction for a distance of 3¼ miles to Cedar Point, the northern point at entrance to Scituate Harbor. Seen from eastward it appears as undulating land of moderate height, thickly settled, dotted here and there with woods, but for the most part grassy and bare of trees. On the high land about 1¼ miles inland and 4 miles **S.** by **W. ½ W.** from Minots Ledge Lighthouse is a high, dark-gray tower with pointed top. This is a prominent landmark for this vicinity and for vessels approaching Boston Harbor from the direction of Cape Cod.

*Shown on charts **109,** scale $\frac{1}{80,000}$; **337,** scale $\frac{1}{40,000}$, price of each $0.50.

†Shown on chart **109,** scale $\frac{1}{80,000}$, price $0.50.

The entire coast from abreast of Minots Ledge Lighthouse to Scituate Harbor is rendered extremely hazardous to navigation by the large number of rocks and detached ledges lying off it, and known under the general name of **Stellwagen Ledges**. Some of these sunken ledges lie 1 mile from shore and have from 7 to 14 feet over them in surrounding depths of 4 to 9 fathoms. While in this vicinity, strangers should keep over 1¼ miles from the shore while the old light-tower at Scituate bears southward of **SW.**

Scituate Harbor is about 4½ miles southward of Cohasset Harbor and 12¾ miles northward of Plymouth Harbor. It is easy of access, but shallow, and affords limited anchorage. The greater part of the harbor is bare at low water.

The town of **Scituate** is at the southwestern end of the harbor; it has several wharves, which are dry at low water. Two breakwaters have been built, the northern extending about 250 yards in a **SE.** by **S.** direction from the southern end of Cedar Point, and the southern about 150 yards in a southeasterly direction from **First Cliff**, on the south side of the entrance. A channel 100 feet wide and 7 feet deep has been dredged across the bar between the breakwaters at the entrance to the anchorage basin, which is 350 by 400 feet, and has a depth of 7 feet. A dredged channel about 100 feet wide and 1½ feet deep leads from the basin to the wharves of the town.

On the north point, at the entrance, is an old, unused, white light tower 44 feet high, which serves as a daymark for vessels approaching the harbor or standing along the coast, but as it is approached the white houses on the southern side of the entrance will show more prominently. The ends of the breakwaters are readily distinguished when standing in for the entrance; **Scituate Breakwater Post Light** (see table, page 14) is on the southern end of the north breakwater. Inside the harbor are two spar beacons, which mark the channel to the wharves of the town.

Pilots may be obtained by lying-to off the entrance and making signal.

Provisions and water may be obtained at Scituate, which has railway communication with Boston.

Ice.—There is no danger from ice, the harbor being kept clear by the current. The tidal currents take the general course of the channel.

Tides.—The mean rise and fall of tides is about 9.4 feet.

GENERAL DIRECTIONS, SCITUATE HARBOR.

The following directions carry a depth of about 6 feet over the bar at low water. The best time to enter is just before high water.

If northward of the entrance, keep more than 1¼ miles from the shore while the old light-tower at Scituate bears southward of *SW.* Steer for the tower on any bearing between **SW. ½ W.** through *W.* to **NNW.**

When ½ mile from the shore bring the end of the north breakwater to bear **W.** by **N.**; steer for it on this bearing and leave it 35 yards on the starboard hand. Leave the end of the south breakwater about 35 yards on the port hand, and when a short distance inside the breakwaters steer for the two beacons, which will be seen westward. Anchor well eastward of them, or, if bound to the town, take a pilot.

COAST FROM SCITUATE TO PLYMOUTH.*

The coast from Scituate Harbor to **Gurnet Point** (the northern point at the entrance to Plymouth Harbor) trends in a general **S.** by **E.** direction for about 13 miles.

From Scituate Harbor entrance to Green Harbor Point (Brant point) the distance is 7¾ miles. Four conspicuous, yellow bluffs with low beaches between them extend 2¼ miles southward from Scituate entrance.

From abreast of Green Harbor Point **Duxbury Beach** extends a distance of about 5¼ miles to Gurnet Point. For the most of this distance it is a mere strip of low, sandy beach separating Duxbury Bay from the sea.

Green Harbor Point is a low and flat headland with several higher patches of ground on which houses are built. There is quite a village here—the point having become a summer resort. **Green Harbor River** has its entrance west of the point. It makes in a general **NW.** direction, is narrow and crooked and very shoal—being closed by a bar with less than 6 feet upon it.

North River (or Marshfield Harbor, as it is sometimes called, from the village on its bank) and **South River** have their common entrance 3 miles northward from Green Harbor Point. The northern entrance to North

*Shown on charts 7, scale $\frac{1}{400,000}$; 109, 110, scale $\frac{1}{80,000}$, price of each $0.50.

River is through **New Inlet**, which is shoal and lies 2 miles southward of Scituate entrance and just northward of Fourth Cliff.

North River is a shallow stream, very narrow at its entrance, leading in a **NNW.** direction, and is separated from the ocean by a narrow beach. The river widens about two miles from its entrance near the steep, bare hill called **Fourth Cliff**, which is the southernmost of four yellow bluffs south of Scituate. The river is of no importance, and is only used by vessels of extremely light draft whose masters are well acquainted with the locality. **South River** is a very small, narrow, and crooked stream making southward from just inside the south entrance to North River. It is not navigable.

The coast is fairly bold-to, and 4 fathoms can be taken as close as ½ mile (and much closer in places) to the shore; but about 2 miles northward of Green Harbor Point shoals extend ⅜ mile from the shore, and off Green Harbor Point and between it and Gurnet Point are three outlying ledges, and the shore should be given a berth of 1¾ miles (see dangers under section 1, page 73).

CAPE COD BAY,*

is a large, nearly circular bay contained between the peninsula of Cape Cod on the east and south and the mainland of Massachusetts on the west. Between these limits it is about 20 miles in diameter with deep water, the soundings varying from 10 to 27 fathoms except close to the shore and in its southeastern part. **Race Point**, the northwestern extremity of Cape Cod, is the eastern, and Gurnet Point the western point at the entrance. From Race Point to Gurnet Point the distance is 16¼ miles and the bearing **W.** Within the limits of Cape Cod Bay are embraced several harbors—those of Plymouth and Duxbury on the western shore, Barnstable and Yarmouth on the southern, and Wellfleet and Provincetown on the eastern shore, all of which are treated under special headings.

Cape Cod is a long peninsula, forming the eastern extremity of Massachusetts. It makes out from the mainland, first in an easterly direction for 31 miles, and then nearly due **N.** for a little over 20 miles—this latter portion forming what is usually termed the Hook of the Cape. It is composed almost entirely of sandy lands, with high, bare sand hills, and low, nearly level plains, and is well settled. Cape Cod Bay is on its northern side, and Nantucket Sound on its southern. The name Cape Cod is also generally applied to the south coast of Massachusetts between Monomoy and Falmouth.

A **table of lighthouses** will be found on page 14, which gives the characteristics of the coast and harbor lights and their geographical positions.

Lists of the **life-saving stations** maintained between Cape Ann and Point Judith are given on pages 25-26.

Extracts from the laws of Massachusetts relating to Pilots and Pilotage, Harbor Control, and Quarantine are given in Appendix II.

Ice, and its effects in Cape Cod Bay.—As a rule parts of this bay are unsafe during the winter, owing to quantities of drift ice which, being driven out of the rivers and harbors of Massachusetts Bay, mass into heavy floes and drive down upon the southern and eastern shores of Cape Cod Bay. During very severe winters the ice "packs," and in some cases extends as far from the southern shore as a line from Wood End to Sandwich, thus closing Barnstable, Wellfleet, and Provincetown harbors, and attains the extraordinary thickness of 18 feet. This impassable barrier may remain until the return of spring, and navigation of all kinds is of course suspended. In these extreme cases, which are rare, vessels caught in the floes have been known to drift helplessly about with the pack until released by the warmer weather and consequent breaking up of the ice at the commencement of spring.

The prevailing **NW.** winds are the cause of the presence of most of the "drift" and "pack" ice, as they bring it from Boston and other harbors west of Cape Ann, and there being no southern outlet to Cape Cod Bay, the ice masses together and increases in thickness and extent. Northeasterly winds, on the contrary, tend to break up the pack, while those from **E.** to **SW.** prevent formations and remove any that may have taken place.

The **tidal current**, so far as ascertained, seems to have little or no effect upon the movements of the ice.

*Shown on charts **7**, scale $\frac{1}{400,000}$; **110**, scale $\frac{1}{80,000}$; price of each $0.50.

PLYMOUTH HARBOR,*

the most northern and western harbor in Cape Cod Bay, affords excellent and safe anchorage, and is composed of three different harbors—Duxbury Bay, Kingston Bay, and Plymouth Harbor proper. The common entrance is just southward of Gurnet Point, and is 17 miles **S.** by **E.** from Minots Ledge Lighthouse and 16¼ miles **W.** from Race Point Lighthouse.

Duxbury Bay is contained between Duxbury Beach on the east, Saquish Neck on the south, and the mainland on the west. It is of irregular shape and about 3 miles long, with an average width of 2 miles; but is full of flats, mostly dry at low water, intersected by numerous narrow channels, which are not navigable without a pilot. In the lower part of the bay there is deep water (from 3 to 6 fathoms) with good anchorage in what is called the **Cowyard.** A narrow channel, 40 to 80 feet wide, through which 5 feet may be taken, leads up to the wharf at Duxbury. Another channel leads along the western shore of Clark Island, and thence gradually approaches Duxbury Beach, which it skirts for some distance, and enters a narrow and shoal stream called **Back River.** About 7 feet at low water may be taken up to **Powder Point** (the western point at entrance to this river), but not more than 4 feet above that point. The channel is narrow and intricate and is not fit for strangers.

Kingston Bay, contained between the mainland and the western point of Duxbury Bay, has a diameter of about 1½ miles, but is so full of flats as to render it unfit for navigation except with a pilot and at high water. The village of **Kingston** is built upon its western shore (about ¾ mile back from the water) on a small stream called **Jones River.** The bay is of little importance as a harbor or port.

Several channels lead between the flats of this bay, but they are narrow and crooked. The northernmost and deepest is **Miles** or **South Channel,** and by it about 8 feet at low water can be taken to the wharf on the western side of the peninsula between Duxbury and Kingston bays.

Plymouth Inner Harbor is about 1 mile wide at its northern end, gradually narrowing for 2¼ miles to its southern end. The larger part of the harbor is dry at low water, and its narrow channels are unfit for navigation except for steamers, or at high water for vessels having pilots.

The channel, which is very narrow, first leads southward along the western side of Long Beach for nearly 1 mile, then turns abruptly at right angles westward toward the town of **Plymouth** for nearly ½ mile, and then southeastward toward the head of the harbor for about the same distance.

In front of the city wharves a basin 866 feet long, 150 feet wide, and 9 feet deep has been dredged; and a channel 150 feet wide and 9 feet deep at mean low water has been dredged from the main channel to the north side of the basin and to the wharves at Plymouth. A draft of 7 feet can now (1902) be taken to the wharves at low water. There are none but local guides through the dredged channel.

Gurnet Point, on the southern end of Duxbury Beach and east of **Saquish Neck,** is about 80 feet in height, bare of trees, and marks the northern side of the entrance to Plymouth Harbor. On this point is **Gurnet Lighthouse** and **beacon** (see table, page 14.)

Captains Hill, on the peninsula between Duxbury and Kingston bays, is about 200 feet high and on its top is Standish monument, which shows prominently from all directions when approaching the harbor. **Manomet Hill,** about 5 miles southward of Gurnet Point, is over 380 feet in height, heavily wooded, and is a conspicuous landmark in approaching the entrance.

Channel.—The channel leads from the deep water southward of Gurnet Point in a westerly direction to the Cowyard, and is about ¼ mile wide until southward of Saquish Head, where it narrows to 300 yards between the 18-foot curves, and continues with this width until past Duxbury Pier Lighthouse. The aids in entering are described in connection with the sailing directions.

The deepest draft of vessels going to Plymouth is about 13 feet, which is taken in near high water. The deepest draft of those entering the Cowyard is about 13 feet; of those going to Duxbury 8 feet; into Kingston bay 8 feet. About 7 feet at mean low water can be found at the principal wharves of Plymouth.

Anchorage.—The best anchorage is in the Cowyard, but small light-draft vessels often find good anchorage under the lee of **Long Beach,** just southward of Pier Head beacon, in 3 to 4 fathoms, hard bottom.

Pilots.—There are regular pilots and one can be had by making signal when off Gurnet Point.

Towboats may be had by telegraphing to Boston and are sometimes used, if going beyond the Cowyard.

There are no special harbor regulations.

Supplies.—General supplies can be had from Boston by rail. Anthracite coal in limited quantity, water, and cordage can be obtained at Plymouth; in case of necessity, bituminous coal may be obtained from one of the factories.

Tides, see table, page 11.

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* Shown on charts **110,** scale $\frac{1}{80,000}$, price $0.50; **338,** scale $\frac{1}{40,000}$, price $0.25.

The **tidal currents** have considerable velocity, the greatest velocity being between Gurnet Point and Duxbury Pier and at the entrance to the Cowyard. The set is generally in the direction of the channel; but the ebb sets southward and eastward across Browns Bank, while the flood sets northward and westward above Saquish Head and sweeps strong around Duxbury Pier northward into the Cowyard.

Ice.—This harbor is usually obstructed every winter for a few weeks by local ice, and in January and February large masses of drift ice may be encountered, which render the approaches hazardous and makes the Outer Harbor unsafe as an anchorage. In severe winters the harbor is closed to all navigation from December to March. Westerly winds have a tendency to carry the ice out in fields (see ice, Cape Cod Bay, page 71).

SAILING DIRECTIONS, PLYMOUTH HARBOR.

These directions lead to an anchorage in the Cowyard with a least depth of about 21 feet.

Directions for approaching from Cape Ann are given on page 29. Bearings and distances from lighthouses are given on page 22, and will assist in shaping the course for Plymouth Harbor. In approaching, Gurnet Lighthouse may be steered for on any bearing between **S.** by **W.** ½ **W.** through *W.* to **NW.** until within 1 mile of it.

1. ***Approaching from Northward.***—When eastward or southeastward of Minots Ledge Lighthouse, stand southward, giving the shore a berth of at least 1½ miles until Gurnet Lighthouse is made. When this lighthouse is made keep it bearing westward of **S.** by **W.** ½ **W.** and steer so as to pass about ½ mile eastward of it. When the whistling buoy at the entrance is made, steer so as to pass it close-to on either side, and follow the directions in section 2.

Remarks.—The coast northward of Plymouth Harbor is described on page 70. Gurnet Point, marked by Gurnet Lighthouse, is described on page 72.

Dangers.—**Howland Ledge** has 7 feet over it, and lies 1⅛ miles from the nearest shore and 4½ miles **N.** ⅝ **E.** from Gurnet Lighthouse. It is marked off its eastern side by a buoy (spar, red, No. 4), and by a red bell buoy in summer. Strangers should not attempt to pass inshore of Howland Ledge.

Bartlett Rock is a small rock, bare at low water, with depths around it ranging from 7 to 18 feet; it lies about ⅝ mile westward of Howland Ledge and is marked by a buoy (spar, red, No. 2) placed eastward of the bare rock.

High Pine Ledge has a least depth of 2 feet and shows bare at low water of spring tides; its eastern end lies 2 miles **N.** ½ **E.** from Gurnet Lighthouse and is marked by a buoy (spar, red, No. 6). The ledge extends from the buoy nearly to the shore and vessels should not attempt to pass westward of the buoy.

Gurnet Rock is a detached ledge near the end of the shoals making 600 yards eastward and southeastward from Gurnet Point; it has 4 feet over it and is marked by a buoy (spar, red, No. 2), which should be left on the starboard hand by vessels entering.

1A. ***Approaching from Southward.***—Give the shore a berth of at least 1 mile, although it may be approached closer in places. Keep Gurnet Lighthouse bearing westward of **NW.** and steer for it, and when up to the whistling buoy at the entrance proceed as directed in section 2, following:

Remarks.—**Manomet Point** is 5¼ miles **S.** by **E.** ⅝ **E.** from Gurnet Point, and **Rocky Point** is nearly 2½ miles northwestward of Manomet Point. A little southward of Rocky Point is a high hill (Manomet Hill, see description, page 72) which will show prominently and be seen before either of the points can be distinguished.

When northward of Rocky Point the town of **Plymouth** will be seen over Long Beach and the entrance buoys near Gurnet Point should be seen.

Dangers.—**Stellwagen Rock,** a small, detached rock with 6 feet over it, lies about ¾ mile from the shore and 2 miles **S.** by **E.** ⅝ **E.** from Manomet Point.

Mary Ann Rocks are two detached rocks, bare at low water, the easternmost lying ⅞ mile **SE.** ¼ **E.** from the northeastern end of Manomet Point. The inner rock lies about 300 yards **NW.** from the easternmost.

Stone Horse Rocks are bare at low water and lie between Mary Ann Rocks and the southeastern extremity of Manomet Point.

There are **several outlying rocks** between Manomet Point and Rocky Point, but these are avoided by giving the shore a berth of at least ½ mile, and the sailing line passes well eastward of them.

Gurnet Lighthouse and beacon in range clears the dangers in approaching from southeastward.

2. ***Entering and to an Anchorage.***—Having followed the directions in section 1 or 1 A until near the whistling buoy off the entrance, bring Duxbury Pier Lighthouse to bear **W.** ¼ **S.** and in range with the right-hand tall smokestack (there are two tall smokestacks on the large red-brick factory). Steer for Duxbury Pier Lighthouse on this range and pass 50 to 75 yards north of black spar buoy No. 3. When abreast of this buoy, Pierhead beacon (granite openwork pyramid with staff and cage on top) will bear **W.** by **S.**, and black spar buoy No. 5 should be seen just southward of and nearly in range with the beacon.

Steer **W.** by **S.** for Pierhead beacon and leave black spar buoy No. 5 about 50 yards on the port hand, and when this buoy is abeam change the course to **WNW.** ¼ **W.** so as to pass about 120 yards southward of Duxbury Pier Lighthouse. When the lighthouse is abeam haul northward gradually so as to leave Duxbury beacon at least 100 yards on the starboard hand. Anchor about 400 yards westward of the beacon in 5 to 8 fathoms water.

Desiring to anchor in the Cowyard.—Leave Duxbury beacon about 150 yards on the starboard hand and steer about **N.** so as to leave red spar buoy No. 6, marking the western side of the Muscle Bank, 50 yards on the starboard hand. Then steer **NNE.** ¼ **E.** and anchor in the Cowyard with the south end of Clark Island bearing about *ESE.*, distant 650 yards.

Bound to Duxbury.—A pilot must be taken; it is not safe to attempt to go beyond the Cowyard without one.

Bound to Kingston Bay.—There is a channel into Kingston Bay as far as the wharf at Captain Hill. No sailing directions can be given for this channel, however. Strangers should anchor westward of Duxbury beacon and take a pilot.

Bound to Plymouth Inner Harbor.—Small vessels may round black spar buoy No. 7, on Dicks Flats, passing northward of it, and steer about **SW.** ½ **S.**, heading from buoy to buoy and leaving them on the side indicated by their color, and carrying not less than 12 feet water in the channel, until Pierhead beacon bears *E.* ½ *N.*, distant about 200 yards. Here anchor and take a pilot.

Remarks.—The range of Duxbury Pier Lighthouse and the right-hand one of the two tall smokestacks of the large red-brick factory on the west shore, leads fair into the entrance and passes well southward of Bass Rock buoy.

On the **W.** by **S.** course for Pierhead beacon care must be taken not to be set off the sailing line by the currents; at low water parts of Browns Bank will show bare, and when the shoal is covered it is often marked by rips or breakers.

On the **WNW.** ¼ **W.** course black spar buoy No. 7, on Dicks Flats, will be on the port bow. At half ebb there will be a current with considerable velocity setting southeastward south of Duxbury Pier Lighthouse and the beacon northwestward of it.

The **NNE.** ¼ **E.** course leads through the Cowyard in good water, but on both sides of the channel, which has a width of 175 yards at its narrowest part, flats rise abruptly with from 3 to 12 feet of water over them near their channel edges. At low water the edges of the shoals on both sides of the channel can be distinguished by the discolored water. The width of the channel at the anchorage is about 350 yards.

Vessels desiring a pilot are advised to get one while off the entrance, or they may anchor westward of Duxbury beacon and take one from the anchorage.

Dangers.—**Bass Rock** has 4 feet over it and lies about 500 yards **S.** ¼ **W.** from Gurnet Lighthouse; it is marked by a buoy (spar, red, No. 4).

Browns Bank is the extensive shoal, showing bare in places at low water, which extends eastward 2¼ miles from Pierhead and forms the southern side of the channel westward of Gurnet Point. The northern edge of this shoal rises abruptly from the deep water of the channel and is marked by several buoys. East end of Browns Bank buoy (can, black, No. 1) marks the eastern end of the shoal and lies ¾ mile **SSE.** ¼ **E.** from Gurnet Lighthouse. Browns Bank buoy (spar, black, No. 3) is on the edge of the shoal about ⅛ mile westward of black

buoy No. 1. West Browns Bank buoy (spar, black, No. 5) is on the edge of the shoal nearly ⅝ mile eastward of Duxbury Pier Lighthouse.

Saquish Point Shoal makes southward nearly ¼ mile from the point about 1½ miles westward of Gurnet Point. **Saquish Head Rock**, a detached rock with 6 feet of water over it, lies 350 yards southward of **Saquish Head**, the bluff, sandy head on Saquish Point. The bight between Saquish Head and Gurnet Point is full of shoals, and shoals extend from Saquish Head to Duxbury Pier Lighthouse.

Dicks Flats, showing bare at low water, lie northward of Pierhead and join the western end of Browns Bank. The channel into Plymouth Harbor leads along the western edge of these flats. A buoy (spar, black, No. 7) is placed on the northern point of the shoal.

Muscle Bank is the extensive shoal making southwestward from Clark Island, and is marked at its southern end by Duxbury Pier Lighthouse (see table, page 14). Near the western edge of the bank northwestward of the lighthouse are Duxbury beacon (square, granite structure, surmounted by a granite post) and a buoy (spar, red, No. 6).

Captain Flat is the large shoal lying on the western side of the Cowyard and extending to Duxbury Point. Along the edge of the channel the depths on the flat range from 4 to 11 feet, but the greater part of it, lying nearest the shore, is dry at low water. The southeastern point is marked by a buoy (spar, black, No. 9), which marks the western side of the entrance to the Cowyard. The channel to Captain Hill wharf is not marked.

COAST FROM PLYMOUTH TO BARNSTABLE.*

Nearly 3¼ miles **S.** from Gurnet Point is Rocky Point. Between these two points a deep indentation makes into the shore, to which is often given the name of **Plymouth Bay.** This bay is separated from Plymouth Harbor by Long Beach, which leads **S.** by **E.** ½ **E.** for 2¼ miles from Pierhead, its northern point. At its southern end the shore turns abruptly eastward for two miles to Rocky Point, thus forming a large cove—**Warren Cove;** this cove affords anchorage in southerly winds in 3 to 5 fathoms, sandy bottom.

From Rocky Point the general course of the shore is **SE.** for nearly 2½ miles to Manomet Point. The shore between these two points varies in height and character, and is backed by high, wooded hills, the most conspicuous of which is **Manomet Hill,** 390 feet high. Manomet Point is almost bare of trees and has several houses upon it.

From Manomet Point the general trend of the shore is **S.** for 4 miles to Center Hill Point. The shore between these points is wooded and of moderate height, except at **Indian Hill,** 2¼ miles below Manomet Point. This hill is high, thickly wooded, and shows precipitous faces seaward. **Center Hill Point** is a low point, cleared near its eastern extremity, but backed by wooded higher lands.

From Center Hill Point the shore has a **SW.** by **S.** direction for 1½ miles, then turns westward for ½ mile, and then sweeps with a regular curve from **SW.** to **SE.** by **S.** around to the entrance of Sandwich, 6¼ miles below. The shore is for the most part thickly wooded, and faced by a sand beach called **Scusset Beach** to abreast of West Sandwich, about 5 miles below Center Hill Point. From here to the entrance of **Sandwich Harbor** the shore is low and composed of marsh lands faced by a sand beach known by the name of **Town Beach.** Back of the beach are higher lands, partly wooded and partly cleared and settled.

The entrance to the harbor of Sandwich is extremely narrow, passing between two stone piers or breakwaters; it can only be entered at high water, and then a pilot is necessary. Pilots may always be obtained off the bar at the entrance of the harbor. The village of **Sandwich** is westward of the harbor, ½ mile back from the beach.

From Sandwich Harbor entrance **Spring Hill Beach** extends in a **SE.** ¾ **E.** direction for 2¾ miles; it is backed by low lands, cultivated and settled. Thence the trend is **ESE.** ½ **E.** for 6 miles to Barnstable entrance, and the shore is for the most part composed of sand hillocks backed by marshes. The highest part of this shore with some houses and trees upon it, and lying just eastward of Spring Hill Beach, is known as **Scorton Neck.** From here **Sandy Neck,** composed entirely of sand and dotted with occasional clumps of trees, extends to Barnstable entrance. At its eastern end it turns more southward and terminates in **Beach Point,** on which is Sandy Neck Lighthouse (see table, page 14).

The coast from Rocky Point to 1½ miles south of Center Hill Point should be given a berth of 1 mile, as there are a number of outlying rocks and ledges. When beyond this limit the shore is generally bold-to and can be approached as close as ⅜ mile until 2 miles westward of the entrance to Barnstable Harbor (see sailing directions for this harbor).

*See footnote on page 71.

BARNSTABLE HARBOR.*

This harbor lies on the southern shore of Cape Cod Bay; the entrance, about 38 miles **SSE.** from Minots Ledge Lighthouse, is obstructed by a shifting bar with 7 feet over it at low water, and is marked by **Sandy Neck Lighthouse** (see table, page 14), which is on the western point. The harbor is formed by an arm of the bay extending in a general **E.** and **W.** direction about 3 miles between Sandy Neck and the main shore; flats and shoals occupy nearly the whole harbor, leaving only narrow channels, which are difficult for a stranger to follow. Vessels entering usually await a favorable stage of the tide to cross the bar. Few vessels enter the harbor, the greatest draft being 12 feet. Strangers should make signal and remain well outside the bar until a pilot comes out. Towboats are seldom used.

The town of **Barnstable** and village of **Yarmouth Port** are on the southern shore of the harbor, the latter being of no commercial importance. The approach to Yarmouth Port is by a narrow, shallow slue making through the flats, which are bare at low water, and lie on the eastern side of Barnstable Harbor proper.

Marine Hospital.—Emergency relief is furnished at Barnstable by the U. S. Public Health and Marine Hospital Service as for stations of Class IV (see Appendix IV).

Ice obstructs the harbor during the winter. Note the remarks on page 71.

Tides.—See table, page 11.

The **tidal currents** generally set fair with the direction of the channel.

For **variation of the compass** see page 11.

GENERAL DIRECTIONS, BARNSTABLE HARBOR.

The following directions lead to the entrance, where a pilot should be taken.

From a position ¾ mile eastward of Minots Ledge Lighthouse, steer **SSE.** about 36½ miles.

Or, from a position 1 mile westward of Race Point Lighthouse, steer **S.** by **W.** about 17½ miles.

Make the signal for a pilot and stand off and on, or anchor in about 6 fathoms water with Sandy Neck Lighthouse bearing about *SSW. ½ W.*

Remarks.—Sandy Neck Lighthouse should be made on the starboard bow. The entrance is full of flats and shoals which extend 2 miles from the shore eastward of the lighthouse, and vessels should not shoal the water to less than 6 fathoms. In strong northerly winds a heavy sea makes on the bar and vessels bound to Barnstable should anchor in Plymouth or Provincetown until the weather moderates.

COAST FROM BARNSTABLE TO WELLFLEET.

From the entrance to Barnstable Harbor the shore has a general direction of about **E. ¼ N.** for 9 miles, when it curves sharply northward and has a general direction of **N. ½ E.** for about 6 miles to Wellfleet Harbor. The shore is broken in a few places by small creeks, none of which are of importance; and there are several small villages a little back from the beach, plainly visible from offshore.

The coast is comparatively low, and for the most part cleared and settled, and backed by thickly wooded hills. The shore may be approached a little eastward of Barnstable entrance in 3¾ fathoms to within ¼ mile, but farther eastward the 18-foot curve is from ½ to 1½ miles from the shore.

WELLFLEET HARBOR.†

is situated on the western side of the hook of Cape Cod, near its southern end, and about 11 miles southward of Provincetown Harbor. Extensive shoals lie in the entrance and extend about 5½ miles westward from **Billingsgate Island Lighthouse** (see table, page 14), which marks the western side of the entrance to the harbor. **Mayo Beach Lighthouse** is at the head of the harbor and is the guide to the anchorage in the inner harbor. The channel into the harbor leads between the shoals and is comparatively narrow, but is marked by buoys so as to be easily followed in the daytime in clear weather; it has a least depth of 14 feet until above Smalley Bar.

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* Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **339**, scale $\frac{1}{20,000}$, price $0.20.

† Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **340**, scale $\frac{1}{50,000}$, price $0.20.

The town of **Wellfleet** is at the head of the harbor, but can only be reached by vessels at high water. It is of no commercial importance, but has railroad communication with Provincetown and Boston.

Strangers intending to enter Wellfleet Harbor generally take a pilot, and should always do so. It is usual to go into Provincetown Harbor first and telegraph to Wellfleet for a pilot, who then joins the vessel at Provincetown. In going directly to Wellfleet entrance, if signal is made when off Billingsgate Island, a pilot will come out from the town, the vessel anchoring meanwhile, if desirable, in the channel off the shoals.

The greatest draft of vessels entering Wellfleet Harbor is about 12 feet; the usual draft averages about 8 feet. Vessels do not enter this harbor in winter. Towboats can be had from Boston.

Anchorages.—The best anchorage is in the inner harbor, where the depth ranges from 10 to 15 feet. The anchorage in the outer harbor is somewhat exposed in westerly winds; the depth ranges from 14 to 31 feet between Billingsgate Island and Smalley Bar, and from 14 to 18 feet between Stony Bar and Billingsgate Island. In strong northerly gales vessels that have fallen to leeward of Provincetown sometimes anchor on the lee side of Billingsgate Shoal in 3 to 8 fathoms water, the shoal breaking the sea so that vessels with good ground tackle can ride out a heavy gale from northward.

There are no special harbor regulations.

Tides.—The tides are about the same as at Plymouth (see table, page 11).

The tidal currents are weak.

SAILING DIRECTIONS, WELLFLEET HARBOR.

The directions in sections 1 and 2 are good for vessels of 8 feet draft, in daylight, with a favorable wind and clear weather, and lead to an anchorage in 14 to 19 feet of water just northward of Smalley Bar buoy. Strangers of over 8 feet draft should take a pilot at Provincetown or after coming to anchor south of Billingsgate Shoal. The directions in section 1 A are for vessels of over 8 feet draft, or those that, having fallen to leeward of Provincetown, desire to anchor under the lee of Billingsgate Shoal.

1. ***Approaching and Entering.***—From a position ¾ mile west of Race Point Lighthouse steer **S.** nearly 15 miles; or, from the whistling buoy off Plymouth entrance, steer **SE.** about 21½ miles; or, from a position 1½ miles eastward of Minots Ledge Lighthouse steer **SSE.** ½ **E.** nearly 36½ miles. Billingsgate Island Lighthouse should then bear **ENE.** distant nearly 6½ miles, and the black can buoy marking the end of Billingsgate Shoal should be ½ mile distant and in line with the lighthouse. Pass ¼ mile south of this buoy and steer **E.** nearly 4¼ miles until Billingsgate Island Lighthouse bears *NNE.*, then steer **NE.** by **E.** so as to pass close southward of black spar buoy No. 3. Leave this buoy about 50 yards on the port hand and follow the directions in section 2.

Remarks.—Vessels finding themselves too far westward to see the buoy on the end of Billingsgate Shoal, should bring Billingsgate Island Lighthouse to bear **ENE.** and steer for it on this bearing until up to the buoy. On the **E.** course when Billingsgate Island Lighthouse bears **NNE.** Bibb Rock buoy should be nearly 1¼ miles distant on the starboard bow, and the course should then be changed to **NE.** by **E.** for Billingsgate Flat buoy, which should be made a little on the port bow.

Dangers.—**Billingsgate Shoal** commences about 4¼ miles northward of Billingsgate Island Lighthouse and extends 8¼ miles in a general **SW.** direction from the shore of Cape Cod and about 5¼ miles in a general **WSW.** direction from the lighthouse. It is marked at its western end by a buoy (can, black, No. 1). The water shoals gradually on the northern side of the shoal, but on its southern side the shoaling is abrupt.

Bibb Rock, a detached rock with 8 feet over it, lies 2⅝ miles **S.** ⅛ **E.** from Billingsgate Island Lighthouse; it is marked by a buoy (spar, red and black horizontal stripes).

Billingsgate Flat has 8 to 9 feet of water over it, and a part nearest the island is bare at low water; it extends about 1⅝ miles southward from Billingsgate Island; it is marked at its southeastern point by a buoy (spar, black, No. 3).

1 A. ***Approaching and to an Anchorage Southward of Billingsgate Shoal.***—Follow the directions in section 1, until Billingsgate Island Lighthouse bears *ENE.*, taking care to pass westward of Billingsgate Shoal buoy.

When ¼ mile southward of the buoy, steer **E.** by **N.**, and when the water shoals to 4 fathoms anchor with Billingsgate Island Lighthouse bearing about *NE.* ½ *E.*

At night.—To avoid the end of Billingsgate Shoal, keep Wood End Light bearing a little eastward of *N.* ⅛ *E.* until Billingsgate Island Light bears northward of **ENE.** Steer for Billingsgate Island Light when it bears **NE.** by **E.** ½ **E.**, and anchor when the water shoals to 4 fathoms with the light distant about 2¾ miles.

Remarks.—A stranger approaching Wellfleet from northward and being uncertain of his distance westward of Billingsgate Island can tell when the shoals are cleared by using the lead. The water shoals gradually on the north side of Billingsgate Shoal, and when the depth is about 4½ fathoms it is advisable to stand westward until the buoy on the end of the shoal is made. *At night* the lights on Race Point, Wood End, Long Point, Sandy Neck, and Billingsgate Island may all be seen at one time. If on a line between Sandy Neck and Billingsgate Island lights, a course for the latter passes about ¼ mile southward of Billingsgate Shoal buoy. In approaching the light care should be taken to avoid the southern edge of the shoal, which rises abruptly from deep water.

For dangers, see section 1, preceding.

2. ***From Billingsgate Flat Buoy to the Anchorage above Smalley Bar.***—Leaving Billingsgate Flat buoy about 50 yards on the port hand, steer **N.** by **E.** about ¾ mile, then change course to about **NW.** ½ **N.**, keeping red spar buoy No. 2 a little on the starboard bow. Leave this buoy about 25 yards on the starboard hand and steer about **N.**, so as to leave red spar buoy No. 4 about 30 yards on the starboard hand. When this buoy is abeam steer about **NE.** nearly 1½ miles; leave black spar buoy No. 5 about 30 yards on the port hand and steer about **N.** by **E.** Anchor in 16 to 20 feet of water, about 400 yards northward of this buoy, and if bound to the wharves await high water and a pilot.

Remarks.—The **N.** by **E.** course from black spar buoy No. 3 will clear the eastern edge of Billingsgate Flats. When the course is changed to **NW.** ½ **N.** two red spar buoys should be on the starboard bow. The channel leads westward of these buoys and is very narrow; on the ebb tide the current has a tendency to set a vessel southeastward.

On the **NE.** course black buoy No. 1 should be made and kept a little on the port bow. After this buoy is passed a stranger should not go farther toward the head of the harbor without a pilot.

Dangers.—**Lieutenant Island Bar** extends from the eastern shore toward Billingsgate Island, leaving a channel 100 yards wide with a least depth of 14 feet between its western end and the shoals that make eastward from Billingsgate Island. The eastern edge of this channel is marked by two buoys (spars, red, Nos. 2 and 4).

Smalley Bar makes eastward from the west shore about 1⅝ miles northward of Billingsgate Island. It is marked at its eastern end by a buoy (spar, black, No. 5), eastward of which the channel is about 200 yards wide.

A large area of the **flats** which extend from the eastern shore toward the channel is uncovered at low water.

PROVINCETOWN HARBOR*

is formed by a turn in the northern end of the Hook of Cape Cod, and has a diameter of about 2 miles. Its entrance is about 11 miles above Billingsgate Island Lighthouse and lies between the western shore of the Hook and Long Point, the southeastern extremity of the point of the Hook. This harbor is one of the best on the Atlantic coast, being of sufficient capacity for large fleets and having anchorage in from 3 to 10 fathoms, with excellent holding ground. Coasters and fishermen seek shelter here from gales from any direction.

The approach and entrance are free from danger and are marked by three lighthouses: **Race Point Lighthouse**, on the northwestern point of Cape Cod; **Wood End Lighthouse**, on the southern end of the Hook, where it turns eastward; and **Long Point Lighthouse**, on the western point at the entrance to the harbor. At night Cape Cod Lighthouse will show over the land westward of it when approaching the entrance on certain bearings. (See table on page 14, for description of these lighthouses).

Herring Cove, about ¾ mile southward of Race Point Lighthouse, affords a lee from easterly winds; small vessels sometimes anchor well inshore in from 10 feet to 4 fathoms, according to draft. The **Naval Trial Course** (1 mile long) is between Race Point and Wood End lighthouses, and is marked by a black spar buoy at each end of the course; these buoys lie ¾ mile and 1 mile from the shore.

* Shown on charts **110**, scale $\frac{1}{80,000}$, price $0.50; **341**, scale $\frac{1}{50,000}$, price $0.20.

Provincetown occupies the northwestern shore of the harbor, being situated at the base and on the slopes of the high, steep hills which form this shore. It is the home port of many vessels engaged mainly in the cod, mackerel, and whale fisheries, and to a limited extent in the coasting and foreign trade. Such portion of the carrying trade of the port as is done by strangers is confined mostly to the transportation of coal, salt, lumber, and wood.

Prominent objects.—In making the northern part of Cape Cod in clear weather, the first objects seen are the tall standpipe and several high church spires in Provincetown. It is frequently difficult to recognize natural landmarks on Cape Cod when approaching from seaward owing to a lack of distinctive features. The life-saving stations (see pages 25–26) and the lighthouses are about the only well-defined marks; of the latter, Cape Cod Lighthouse is the most important, being the chief guide for this part of the coast.

The depth of water at the entrance and in Provincetown Harbor is ample for vessels of deep draft. There are practically no dangers, if the shores be given a berth.

There are a number of wharves, but their use is confined to vessels of less than 13 feet draft. The principal ones are the steamboat wharf and the one belonging to the railroad. At mean low water the depth at the outer ends of these two is 8 feet for the former and 7 feet for the latter. The other wharves run dry or nearly dry at low water.

Pilots are not necessary and are rarely taken by strangers in entering. Extracts from the pilotage laws of the State are given in Appendix II.

Towboats are not much used. During the stormy season towboats from Boston are generally to be found here; by telegraphing one can be called from there in 6 hours.

There are no special harbor regulations. The custom-house is near the head of the steamboat wharf.

The **U. S. Marine Hospital** at Chelsea, Mass., is the one to which mariners entitled to hospital treatment are sent from Provincetown. Under the Public Health and Marine-Hospital Service and subject to its regulations (see Appendix IV), mariners entitled to treatment receive relief as provided for at stations of Class IV.

Supplies, provisions, and some ship-chandler's stores can always be obtained. Coal can not, as a rule, be had for steamers; only a limited quantity is kept on hand. Fresh water is furnished by a water boat; it can also be obtained at the railroad wharf.

Storm warning displays of the U. S. Weather Bureau are made at Provincetown from High Pole Hill or Town Hill. The signals hoist 130 feet above the sea and are visible from all directions in approaching the coast. They are also made at Race Point and Cape Cod Lighthouse. An explanation of the use and meaning of these signals is given in Appendix III, and a list of stations is given on page 24.

Communication.—Steamers run daily during the summer, and make two or three trips a week during the rest of the year, to Boston, with which place Provincetown has railroad communication.

Ice.—This harbor is closed by ice only in extremely severe winters. When the pack ice extends across Cape Cod Bay, it may be forced across the harbor entrance, and thus favor the formation of local ice inside. When the pack at the entrance is broken up, the harbor ice quickly follows it. As a rule, when ice packs across the entrance to Provincetown Harbor it requires for its removal winds from **NE.** around by northward to **NW.**, unless, as stated above, the pack extends over the whole bay and is heavy enough to resist the sea caused by such winds. In such cases the pack must first be broken up along the southern shores of the bay by southerly or southeasterly winds; and then, if these be followed by strong northerly or northeasterly winds, the harbor will soon be cleared. Winds from **S.** to **SW.** have a tendency to force the drift ice from the bay into the harbor; but these winds are of rare occurrence during the winter months.

For **tidal data**, see table, page 11.

Currents.—Off Race Point the tidal currents have considerable velocity; the flood sets southwestward and the ebb in the opposite direction. Westward of the stretch of coast forming the western side of the harbor the currents are nearly as strong; here the flood sets in a southeasterly direction, the ebb sets northwesterly. At the entrance and in the harbor the tidal currents have little velocity. With spring tides, at half flood the current has somewhat greater velocity at the entrance and then sets westward, inside Long Point, and toward the western side of the harbor.

SAILING DIRECTIONS, PROVINCETOWN HARBOR.

These directions are good for vessels of the largest size and deepest draft either in the daytime or at night. In thick weather great caution is required, as the lead can not always be depended on to give warning of too close an approach to the end of Cape Cod from westward on account of the abrupt shoaling of the water from 20 fathoms to 3 fathoms.

1. ***Approaching and Entering from Eastward, around Cape Cod.***—Passing Cape Cod Lighthouse steer northwestward, following the trend of the shore and giving it a berth of 1½ miles or more. When Race Point Lighthouse bears southward of *SW.*, steer so as to give the shore a berth of ¾ mile or more and round Race Point Lighthouse at this distance, and when it bears *ENE.* steer **SSE.** until Wood End Lighthouse is abeam. Now steer about **E.**, giving the shore eastward of the lighthouse a berth of at least ¼ mile. Follow the trend of the shore, giving it a berth of ⅜ mile while southward and southeastward of Long Point Lighthouse, and pass southward of black spar buoy No. 3 marking Long Point Bar.

Round Long Point Lighthouse, giving it a berth at least ⅜ mile, and when it bears *W.* steer about **NW.** ½ **W.**, and anchor according to draft with the lighthouse bearing eastward of *S.*; do not approach the eastern or northeastern shores of the harbor nearer than ¾ mile on account of extensive flats which make out. Toward the northern shore the shoaling is gradual; toward the western shore it is abrupt from 9 to 2 fathoms.

At night.—With Cape Cod Light bearing *W.* distant 2 miles, steer **NW.** ¼ **N.** for 6 miles. Then steer **WNW.** ½ **W.**, and when Race Point Light bears southward of *SW.* steer about **WSW.** until Race Point Light bears *S.*; then steer so as to pass ¾ mile westward of the light, when the directions above should be followed.

In thick weather.—Lay courses that will lead farther offshore than the preceding, and pay particular attention to the fog signal at Race Point. After rounding Race Point care must be taken to stand far enough southward to clear Wood End; if the fog signal at Wood End Lighthouse is not heard, and it is known that the vessel is southward of it, stand eastward, using the lead, until the vessel is in 11 fathoms. Then haul northward and northwestward, keeping in this depth, until Long Point fog signal is heard. Anchor north of this fog signal in 8 fathoms.

Or, if the wind is easterly, a good lee will be found in 6 to 10 fathoms on the western side of Cap Cod for a distance of 5 miles south of Provincetown Harbor.

Remarks.—See the remarks on currents in the general description preceding. The eastern shore of Cape Cod northward of Cape Cod Lighthouse should be given a berth of 1½ miles to avoid Peaked Hill Bar.

When Race Point Lighthouse bears southward of **SW.** the shore may be approached as close as ½ mile and in some places ¼ mile, but the former distance is the safe one. The shore between Race Point and Wood End Lighthouse should be given a berth of 1 mile to avoid Shank Painter Bar, and the black spar buoys of the Naval Trial Course. When standing in for the harbor, Cape Cod Light at night will be seen across the intervening land and will show brighter than the other lights.

Dangers.—**Peaked Hill Bar** commences about 3 miles northwestward of Cape Cod Lighthouse and extends along the shore 2¾ miles, its distance from the beach being about ¾ mile. The depth over the shoal ranges from 14 to 18 feet and in heavy weather it is marked by breakers. A whistling buoy (red, "P. H. B." in white letters) is placed about 1¼ miles from the shore and 4¾ miles **NW.** by **N.** from Cape Cod Lighthouse, as a guide to keep vessels from approaching the bar too closely in thick weather.

Shank Painter Bar makes off ⅜ mile from the shore about midway between Race Point and Wood End lighthouses. The bar rises abruptly from a depth of 20 fathoms and the depth near its edge is 11 to 15 feet. At its western edge it is marked by a buoy (spar, black, No. 1), and fish stakes usually extend out on it some distance from the shore.

Long Point Bar makes out from Long Point, its eastern end being ¼ mile **E.** by **S.** from the lighthouse, and is marked by a buoy (spar, black, No. 3). The depth on its end is 7 to 16 feet.

1 A. ***Approaching from Northward or Westward.***—Stand for either Race Point Lighthouse or for Wood End Lighthouse on any course until within about 1 mile of either, then follow the directions given in section 1, preceding.

COAST OF CAPE COD FROM RACE POINT TO MONOMOY.*

At Race Point the shore curves northward and then eastward, direction about **E.** ½ **N.**, when it again turns and takes a course about **SE.** by **E.**, and to the Highlands the trend is about **SE.** and the total distance about 9 miles. All of the east coast from Race Point to the Highlands is composed of bare, sand hillocks of

* Shown on charts 7, scale $\frac{1}{400,000}$; 110, 111, scale $\frac{1}{80,000}$, price of each $0.50.

various heights. On approaching the Highlands the sand hills begin to be covered with a brownish-looking growth of grass and the land is higher. The pitch of the cape at this point shows a high, sand bluff, with steep, almost perpendicular faces, on which stands Cape Cod Lighthouse. In coasting several life-saving stations are seen, and just northward of the lighthouse is the signal station. Vessels passing this station can communicate with Boston by using the international code signals. At the Highlands the shore may be safely approached as close as ½ mile, but the water shoals somewhat abruptly and care must be taken not to go inside of 5 fathoms. About 3 miles northwestward of Cape Cod Lighthouse, and nearly ¾ mile offshore, is the eastern end of Peaked Hill Bar, described above.

From the Highlands to Nauset Beach Lighthouses, about 12 miles southward, the shore has a slight curve and a general **S.** by **E.** direction; it is steep, almost perpendicular, sand bluffs of various heights, with narrow valleys at intervals. On a bluff 3¼ miles northward of Nauset Beach Lighthouses and close to the shore are four, high, wireless-telegraph, skeleton towers, which are the most prominent marks on Cape Cod.

Nauset Beach Lighthouses will appear, when seen from northward, as three low, white towers upon the summit of a steep, sand bluff. Southward of the lighthouses the coast turns very gradually southward—direction about **S.** ¼ **W.** to Chatham, 10½ miles below. It gradually becomes lower, less steep, slopes gently back from the beach, and is covered with a scanty growth of grass. A few houses appear at long intervals. About 3¾ miles below Nauset Beach Lighthouses is the entrance to **Nauset Harbor**. Hence to Chatham the coast shows a low, sandy shore covered with small hillocks and backed by higher lands.

Chatham Bar, the northern entrance to Chatham, is about 10¼ miles southward of Nauset Beach Lighthouses, and 1¼ miles northward of Chatham Lighthouses. This bar is a shifting one, and the depths over it are liable to change. It extends ¾ mile from the shore, and is marked off its eastern end by a red nun buoy, and about ½ mile eastward of the latter is a red whistling buoy ("Chatham Bar"). This bar is dangerous in thick weather, and when in its vicinity the shore should not be approached closer than in 8 fathoms. Nauset Beach extends 4½ miles in a **SW.** by **S.** direction from Chatham Bar.

From Cape Cod Lighthouse to near Chatham entrance the coast should not be approached closer than ½ mile. Nauset Harbor entrance may be known by the thickly clustered houses in the villages, which appear on the summit of **The Ridge,** a rising ground somewhat higher than the land northward. In passing along Nauset Beach the town of **Chatham** and **Chatham Lighthouses** (see table, page 14) can be seen over it.

A short distance southwestward of the southern end of Nauset Beach, and nearly joined to it at low water, is a narrow spit called **Monomoy Island,** which extends southward 5½ miles and forms the northern side of the entrance to Nantucket Sound. It is low, barren, and sandy, covered with innumerable sand hillocks, and lies about **SSW.** and **NNE.** Its eastern shore is foul, having many sand shoals off it. Vessels sometimes anchor off this shore in from 4 to 6 fathoms and wait for a fair tide to beat through the sounds. As a general rule the shore should not be approached nearer than 1 mile for a distance of 4 miles southward of Chatham Lighthouses. The southern end of Monomoy Island is called **Monomoy Point,** and nearly 1¼ miles above its southern extremity stands **Monomoy Point Lighthouse,** which marks the northern point at the entrance to Nantucket Sound. From this lighthouse, Nantucket (Great Point) Lighthouse, bears **SSW.** ¼ **W.,** distant 10⅝ miles, and the light on Bishop and Clerks Shoal **WNW.** ½ **W.,** distant about 11½ miles. Shoals make off nearly 5 miles in a general **ENE.** direction from the end of Monomoy Point (see sailing directions for Nantucket and Vineyard sounds).

The life-saving stations, with their location, will be found on pages 25-26.

Currents.—The currents are tidal along the eastern coast of Cape Cod, but flood and ebb are usually of unequal velocity and duration. The flood (northerly current) predominates at zero, or very low, declinations, and the ebb (southerly current) at very high declinations of the moon. The strength of the ebb current is usually reached at the southing (transit) of the moon and the strength of the flood 6 hours later.

Off Chatham Lighthouses 2 miles per hour, and off Cape Cod Lighthouse 1 mile per hour may be expected at strength.

MONOMOY AND NANTUCKET SHOALS.*

Eastward and southeastward of the eastern entrance to Nantucket Sound are numerous and extensive shoals, known as Monomoy and Nantucket shoals. Owing to the great extent and distance of some parts of these shoals from the land, and to the strong and baffling tidal currents which set over them, their navigation

* Shown on charts **7**, scale $\frac{1}{400,000}$; **51**, Mercator projection, degree of latitude=21.4 inches; **111**, scale $\frac{1}{80,000}$, price of each $0.50; and in part on charts **213**, scale $\frac{1}{80,000}$, price $0.50; **250**, scale $\frac{1}{40,000}$, price $0.20.

in thick or foggy weather is very hazardous. In clear weather the lighthouses, light-vessels, and buoys render the navigation of the two principal channels comparatively easy, but care must be taken not to be set out of the channels by the currents. The principal (south) channel leads through these shoals in a nearly due E. direction from Nantucket (Great Point) Lighthouse, and for the purpose of description will be considered as the dividing line between Nantucket and Monomoy shoals, which are briefly described under separate headings.

MONOMOY SHOALS

consist of numerous detached shoals of a shifting character with 3 to 18 feet over them, extending about 5½ miles in an easterly and 9½ miles in a southeasterly and south-southeasterly direction from Monomoy Point. Many parts of these shoals, separated from others by narrow slues, have special names and are briefly described below.

Bearse Shoal is the western, and **Pollock Rip** the eastern, part of the shoal extending from ⅝ mile to 3¾ miles eastward of Monomoy Point Lighthouse. These shoals consist of a series of sand shoals and sand ridges, with 4 to 18 feet over them and deep water between them. The northeastern and southeastern extremities of these shoals lie 4 miles and 3¾ miles **ENE.** ⅝ **E.** and **SE.** by **E.** ⅝ **E.**, respectively, from Monomoy Point Lighthouse.

Broken Part of Pollock Rip, with depths of 15 to 18 feet over it, lies eastward of Pollock Rip, and is separated from it by Pollock Rip Slue, which has a width of about ½ mile and a depth of 3½ to 6 fathoms.

Twelve-foot Shoal, southward of the Broken Part of Pollock Rip, has 14 to 18 feet over it and lies 5¼ miles **SE.** ½ **E.** from Monomoy Point Lighthouse.

Broken Rip, with depths of 7 to 18 feet over it, lies just southward of Twelve-foot Shoal.

Stone Horse Shoal, Little Round Shoal, and **Great Round Shoal** are portions of a continuous series of sand shoals and sand ridges, with depths of 5 to 18 feet over them, lying directly eastward of the entrance of Nantucket Sound and between the two main channels. Stone Horse Shoal and Little Round Shoal lie on the south side of the deep-water channel between them and Pollock Rip. Great Round Shoal lies from 6 to 9½ miles in a **SSE.** direction from Monomoy Point Lighthouse; southward and eastward of this shoal for a distance of about 2½ miles there are numerous shoal spots with depths varying from 17 to 18 feet over them.

Orion Shoal is a small, shoal spot with 17 feet over it, lying 9¾ miles **SE.** ⅝ **S.** from Monomoy Point Lighthouse and 11 miles nearly **E.** by **N.** from Nantucket (Great Point) Lighthouse. About ⅝ mile **SE.** ½ **E.** from the shoal is a red bell buoy.

An **18-foot spot** lies 2¼ miles **SE.** from Orion Shoal, and the depth between them ranges from 3½ to 8 fathoms. About ¼ mile **S.** from the 18-foot spot is a buoy (nun, red, No. 4), which is one of the buoys marking the South Channel.

Shovelful Shoal, extending ¾ mile southward from Monomoy Point, is bare in places and rises abruptly from the deep waters of Butlers Hole.

Handkerchief Shoal, southwestward of Monomoy Point, is described on page 88.

NANTUCKET SHOALS

consist of numerous sand shoals and ridges lying eastward, southeastward, and southward of the eastern end of Nantucket Island, and at distances varying from 1 to 39 miles from the shores of that island. The common features of the sand ridges are that their greatest length is generally in a northerly and southerly direction and that they rise abruptly from deep water. Many of the shoals are separated by deep-water slues, but they are too crooked and the currents too strong and variable to permit of navigation by strangers. Portions of these shoals have special names and are briefly described as follows:

McBlair Shoal, the most northern of the Nantucket Shoals, lies 9¼ to 12¼ miles **E.** ½ **S.** from Nantucket Lighthouse, and consists of numerous sand spots with depths over them ranging from 15 to 22 feet. Near the northeastern extremity of the shoal is black can buoy No. 5, and near its northwestern extremity is black can buoy No. 7, both on the southern side of the channel leading between Monomoy and Nantucket Shoals.

Rose and Crown, a number of detached shoals with depths of 4 to 18 feet over them, lie about 10 miles eastward of Sankaty Head Lighthouse. They form a part of the shoals which extend in a broken line for a distance of over 15 miles south from McBlair Shoal, and are not more than 2 miles wide in an easterly and westerly direction. **Great Rip** is a part of these shoals, and lies southward of Rose and Crown; it has depths of 12 to 18 feet over it.

Bass Rip, lying about 2½ miles eastward of the southeastern end of Nantucket Island, has 3 to 18 feet of water over it, is nearly 4 miles long in a **N.** by **E.** and **S.** by **W.** direction, and not over ¼ mile wide at any part.

Old Man Shoal consists of a long, narrow shoal, with several spots off its southwestern end, extending from a point about 1 mile off the southeastern end of Nantucket Island, in a general southwesterly direction for about 5 miles. The depths on this shoal range from 7 to 18 feet.

Old South Shoal is a number of shoal spots with 7 to 18 feet over them, extending nearly 4 miles in a general **NE.** and **SW.** direction, about 12 miles southeastward from Nantucket Island; its shoalest part lies 13½ miles **S.** by **E.** from Sankaty Head Lighthouse.

Davis South Shoal is 3 miles long **E.** and **W.**, and about 1 mile wide, with depths of less than 5 fathoms, and has a number of spots with 15 to 18 feet over them; the middle of the shoal lies 20 miles **S.** ⅛ **E.** from Sankaty Head Lighthouse. Depths of 5¾ to 7 fathoms extend 8 miles southwestward of this shoal, and 24 miles about **S.** by **E.** ½ **E.** from the shoal is Nantucket Shoals Light-vessel (see table, page 16).

Davis Bank, lying 18 miles in a general southeasterly direction from Nantucket Island, is about 15 miles long in a **N.** and **S.** direction, and has a general depth of about 5 fathoms; it lies 3 to 4 miles eastward of Rose and Crown and Great Rip, with 10 to 18 fathoms between. Near its northern end, 15½ miles **E.** ⅜ **S.** from Sankaty Head Lighthouse, there is a spot with only 16 feet of water over it. For a distance of 3 miles northward of this spot are places with 4 fathoms.

Fishing Rip is a narrow bank with depths over it ranging from 4 to 10 fathoms, the ruling depth being about 6 fathoms; the depth around it ranges from 16 to 21 fathoms. Its southern end lies 29½ miles **SE.** ½ **S.** from Sankaty Head Lighthouse, and the bank extends about 6 miles in a **NNE.** direction. Detached spots with 4½ to 7 fathoms over them extend 10 miles north from the rip.

Phelps Bank is not a danger to navigation, nor can it be considered as a part of Nantucket Shoals, but soundings on it might be a warning to vessels approaching those shoals from a southeasterly direction. **Asia Rip** has a depth of 10 fathoms over it and is on the southern end of the bank in about latitude 40° 47′ N. longitude 69° 23′ W. and is about 14¼ miles **NE.** by **E.** from Nantucket Shoals Light-vessel (see table, page 16). From Asia Rip, Phelps Bank, with a depth of 15 fathoms or less, extends about 7½ miles in a general northeasterly, and 3 miles in a southwesterly, direction; it is about 2½ miles wide at its widest part.

Numerous shoal spots with 10 to 18 feet over them lie between the shoals inside of a distance of 15 miles from the shore of Nantucket Island. These are not named and too numerous for description.

Channels.—There are two principal channels leading from eastward into Nantucket Sound, known as Monomoy Passage and Main or South Channel.

Monomoy Passage is a general name for the passage through Pollock Rip Slue, Butlers Hole, and the deep water channel joining the two. **Pollock Rip Slue** leads between Pollock Rip on the west and Broken Part of Pollock Rip on the east, is about ¼ mile wide, and has a depth of 3¾ to 6 fathoms. It is well marked by buoys, and its entrance is 4 miles **ENE.** ½ **E.** from Monomoy Point Lighthouse and is marked by Pollock Rip Shoals Light-vessel. The passage from the southern end of Pollock Rip Slue to the northeastern entrance to Butlers Hole has a length of about 3 miles and a width of about 1⅝ miles except at its western end, where it is ½ mile wide; the eastern end of the passage is marked by Pollock Rip Light-vessel, the western by Shovelful Shoal Light-vessel. **Butlers Hole,** the passage between Shovelful Shoal and Stone Horse Shoal, is ½ to 1 mile wide and extends about 2 miles in a **SW.** direction from the light-vessel; its general depth varies from 8 to 28 fathoms. In clear weather when the aids can be seen 3¾ fathoms can be carried into Nantucket Sound through Monomoy Passage. There is a narrow passage with a least depth of 3¼ fathoms leading between the southern part of Broken Part of Pollock Rip and Twelve-foot Shoal, and although buoyed it is not much used.

South or Main Channel leads into Nantucket Sound between Monomoy and Nantucket Shoals. A number of buoys and Great Round Shoal Light-vessel indicate the best water of this channel; the entrance is marked by a whistling buoy which lies 15½ miles **E.** ⅛ **S.** from Nantucket Lighthouse, and 9¾ miles **E.** from Great Round Shoal Light-vessel. By this channel a least depth of 5 fathoms can be carried into Nantucket Sound.

Tidal Currents.—Northward of Pollock Rip the general set of the flood is eastward of **NE.** and of the ebb a little westward of **SW.** Southward of McBlair Shoal the flood sets northward of **NE.** and the ebb southward of **SW.** The current sets in all directions of the compass during the twelve lunar hours, without ever being at rest; turning from **N.** to **E.** and **S.** to **W.** (with the hands of a watch). About 4 miles is the greatest velocity observed; this was on the rips eastward of Nantucket Island. About 3 hours after the currents turn they acquire their greatest velocity.

NANTUCKET AND VINEYARD SOUNDS*

lie between the south coast of Cape Cod and the Elizabeth Islands on the north, and Nantucket Island and Marthas Vineyard on the south; their combined length from Monomoy Point to Cuttyhunk is about 43 miles. At the eastern entrance of Nantucket Sound are the Monomoy and Nantucket shoals, and in the sounds are numerous shoals, but well-marked channels lead between them, making the navigation of these waters, in

*Shown on charts **111, 112,** scale $\frac{1}{80,000}$, price of each $0.50. See also footnote on page 81.

clear weather and with a fair wind, comparatively easy westward of Monomoy Shoals. The most important of the shoals are described in connection with the sailing directions through the sounds or for the harbors. The sounds are a thorofare for coasting vessels bound to ports east of Cape Cod and returning bound southward, many thousands of vessels passing through both ways each year. The depth of water in the channel westward of Cross Rip is sufficient for the largest vessels, but at Cross Rip and eastward of it a draft of 27 feet requires very careful piloting to prevent grounding at low water. This route is more direct, for vessels bound along the coast, than outside of Nantucket Shoals. Pilots or towboats, and sometimes both, are often employed by large, square-rigged vessels bound along the coast through the sounds in ballast.

NANTUCKET SOUND

is the body of water lying between the south shore of Cape Cod and Nantucket Island. Its eastern entrance is between Monomoy Point and Great Point, and it extends westward about 26½ miles, joining Vineyard Sound northward of West Chop. Between Monomoy Point and Great Point it is 9¼ miles wide, but a little farther westward it is 20 miles wide; at Cape Poge it is 8 miles and northward of West Chop about 3½ miles wide.

The north shore of Nantucket Sound, between Chatham and Succonnesset Point, is generally low and sandy, backed by low, wooded hills; it is well settled and the church spires some distance back from the beach form conspicuous landmarks when standing along the shore. The principal towns and villages west of Chatham and near the coast are: Harwichport, Dennisport, West Dennis, West Yarmouth, Hyannisport, Centerville, Osterville, Cotuit, and Falmouth. These have small vessels engaged in fishing and but little commerce, except Hyannis, which employs a number of vessels in carrying coal and general merchandise. Shoals extend out in some cases for a distance of 2 miles from the shore. Surrounding Bishop and Clerks Lighthouse are a number of shoal spots with 13 to 18 feet over them with channels between through which 3¼ to 7 fathoms can be taken, but a vessel of over 14 feet draft should not attempt to pass northward of Bishop and Clerks Lighthouse unless well acquainted with the locality.

Nantucket Island, forming the southern shore of Nantucket Sound, is of irregular shape, lies nearly **E.** and **W.**, and is about 15 miles long. It is widest at its eastern end, where, from Great Point to the southeastern point of the island, the distance is about 9½ miles; but it gradually diminishes in width from this westward until it terminates in a narrow strip of sand abreast of Tuckernuck Island. **Great Point**, marked by **Nantuckt Lighthouses**, (see table, page 16) is the northern point of a long, narrow, sand beach lying north of the main body of the island, and is separated from the latter by Nantucket Harbor. The surface of the island is hilly (none of the hills being over 100 feet in height, however) and partly wooded, with steep sand bluffs on its northern and eastern sides. The highest part of the island is near the eastern end. About 5 miles **S.** by **E.** ¾ **E.** from Nantucket Lighthouse is **Squam Head**, a bluff about 40 feet rising nearly vertically from the water's edge; on the bluff is a large house with a cupola. About 2½ miles **S.** by **E.** ¾ **E.** from the cupola is a steep hill 90 feet high, on which is **Sankaty Head Lighthouse** (see table, page 16). On the northern side of the island, the land is generally low, sandy, and for the most part bare of trees. Vessels coming in through Butlers Hole see nothing of Nantucket Island but Great Point and Sankaty Head, the latter only in very clear weather; those coming in by the main channel will on clear days see Sankaty Head, the House on Squam Head, Great Point, the life-saving station southward of Nantucket Lighthouse, and broken, abrupt bluffs of moderate height.

Westward of Nantucket Island, and separated from each other only by sand bars, are **Tuckernuck, Gravel,** and **Muskeget islands**.

Nantucket Island is almost surrounded by shoals; those which lie eastward and southeastward of it (described on pages 82–83) make it one of the most dreaded parts of the coast. The shoals in the sound are sufficiently described in connection with the sailing directions.

The only harbor on the shore of Nantucket Island is Nantucket Harbor (see heading).

Channels.—The shoals extending 4 miles southwestward from Monomoy Point and the shoal making off 3 miles northeastward from Great Point contract the entrance of Nantucket Sound to a width of 5¼ miles. Extending across the sound westward of Nantucket Island is an irregular line of shoals, between which are two well-marked channels with good water.

The *North Channel* leads near Bishop and Clerks Lighthouse and follows the south shore of Cape Cod northward of the principal shoals in the sound. It is mostly used in northerly winds and in winter, when the prevailing northerly winds keep the south shore of Cape Cod free from drift ice. The least depth in this channel, near Bishop and Clerks Lighthouse, is about 16 feet.

The *Main Channel* leads through an opening in the shoals near the middle of the sound and is marked by Cross Rip Light-vessel. With care a least depth of 5 fathoms can be carried from Handkerchief Light-vessel through this channel.

Just westward of Monomoy Point is a **narrow, buoyed channel** with a depth of about 18 feet; it leads northward between Shovelful and Handkerchief shoals and is an approach to Chatham Roads and to the North Channel through the sound. This channel should not be used by a stranger.

Between Muskeget Island and Chappaquiddick Island there is an opening nearly 6 miles wide, known as *Muskeget Channel*. It is full of shifting shoals, the best water being close eastward of Wasque Shoal, and a little eastward of the eastern shore of Chappaquiddick Island. This channel is partly buoyed, but should never be attempted by strangers, as the currents are very strong and variable in direction and make the navigation of it extremely dangerous. **Wasque Shoal** lies southward of **Wasque Point** (the southeastern point of Chappaquiddick Island) and rises abruptly on its southern and eastern sides from a depth of 3 and 8 fathoms to 2 and 4 feet. On its eastern edge is a small, sand island, called **Skiffs Island,** which almost disappears at times.

Near the western end of the sound are three shoals extending in a general **WNW.** and **ESE.** direction, between which are four good channels which unite at the entrance to Vineyard Sound and may be used by vessels passing through.

VINEYARD SOUND

joins Nantucket Sound northward of West Chop and extends southwestward between the south shore of Cape Cod and the Elizabeth Islands on the north and Marthas Vineyard on the south, its western limit being a line from Gay Head to Cuttyhunk. The sound is about 17 miles long and the width varies from 7 miles to a little less than 3 miles abreast Nobska Point Lighthouse, its narrowest part.

Marthas Vineyard is a large, irregular-shaped island about 15 miles long **E.** and **W.** and 8 miles wide at its widest part. It is well settled, especially along its northern shore, and has submarine cable connection with the mainland at Woods Hole. The principal towns are Edgartown, Vineyard Haven, and Cottage City, the last being an important summer resort. **Cape Poge,** generally spoken of as the northeastern point of Marthas Vineyard, is really the northern point of **Chappaquiddick Island,** which is separated from Marthas Vineyard by Edgartown Harbor and **Katama Bay,** and the narrow slue connecting them. The opening from the sea into Katama Bay has sometimes been closed, but now there is a shallow opening through which fishing boats pass in smooth water at high tide. **Lake Anthony,** which is at Cottage City, and has a depth of 4 to 9 feet, now has an entrance about midway between the two large landing piers on the east side of East Chop. Two jetties with a channel 5 feet deep leading between them connect with the lake which affords an anchorage for small vessels. **East Chop** and **West Chop,** at the entrance to Vineyard Haven, are the two northernmost points on the island, and each is marked by a lighthouse. **Gay Head,** the northwestern point of the island, and one of the most remarkable headlands along the Atlantic coast, is marked by a lighthouse, and is a prominent landmark for entering Vineyard Sound from westward. Seen from this direction the light-colored bare bluff shows clearly between the darker land on either side. There is a telegraph cable across Vineyard Sound from near the western end of Pasque Island to Gay Head; and a telephone cable across the sound from Nobska Point to a point about ⅝ mile northeastward of Norton Point.

About 5 miles **S.** from Gay Head is **No Mans Land,** a high, rocky, barren island, which is a prominent landmark from seaward. A couple of buoyed ledges lie between No Mans Land and the southwestern end of Marthas Vineyard. The south shore of Marthas Vineyard is unimportant and seldom approached by vessels, as it is out of the track of navigation.

The **Elizabeth Islands** extend in a general **WSW.** ½ **W.** direction nearly 15 miles from Woods Hole, the southwestern end of Cape Cod. They are known separately as **Nonamesset, Uncatena, Naushon, Pasque, Nashawena,** and **Cuttyhunk** islands, and separate Vineyard Sound from Buzzards Bay. The southern shores of these islands are comparatively bold-to, and in Naushon, the largest, is **Tarpaulin Cove,** a small anchorage used in northerly winds and as an anchorage for the night. Near the western end of Cuttyhunk Island is a lighthouse which serves as a guide for the entrances to Buzzards Bay and Vineyard Sound. The channels leading between the islands are treated separately.

Channels.—Westward of West Chop the channel follows the shores of the Elizabeth Islands; shoals lie off the shore of Marthas Vineyard westward of West Chop. There are three passages from Vineyard Sound into Buzzards Bay between the Elizabeth Islands; these are known as Woods Hole, Robinsons Hole, and Quicks Hole.

GENERAL INFORMATION.

Anchorages in Nantucket and Vineyard sounds.—Vessels working through the sounds against a head wind usually anchor during the night, or if becalmed and drifting toward the shoals, it is best to anchor and wait for a favorable tide or change of wind. There are no anchorages for vessels of over 10 feet draft that afford shelter from all winds, except the inner harbor of Edgartown and Woods Hole. Vineyard Haven, the anchorage

most used by coasters, is exposed to northeasterly winds. *In northerly winds* the best anchorages are off Dennisport, Hyannisport, along the north shore, and in Tarpaulin Cove. The anchorage off Falmouth is used in all winds by large vessels with good ground tackle. *In easterly winds* vessels sometimes anchor in smooth water westward of Handkerchief Shoal or inside Great Point; good shelter is then also found in Chatham Roads and Edgartown outer harbor. *In southerly winds* Edgartown Harbor and Vineyard Haven are the best anchorages; **Menemsha Bight** affords shelter and is sometimes used by vessels in the western end of Vineyard Sound. *In westerly winds* Edgartown, Vineyard Haven, and Tarpaulin Cove are good anchorages. These harbors can be entered by a stranger assisted by the chart or following the directions under the different headings. Nantucket Harbor can only be entered by light-draft vessels with comparatively smooth water.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced in entering and passing through the sounds. The lights are numerous and readily distinguished (see table, pages 14-18). The buoyage accords with the system adopted for United States waters, and the aids are colored and numbered for passing through the sounds from eastward (see page 5).

Pilots and pilotage.—Pilotage is not compulsory for vessels passing through the sounds; it is only compulsory for certain vessels entering or clearing from the ports (see laws relating to "Pilots and Pilotage" in Appendix II). Pilots for the sounds or Monomoy and Nantucket shoals can be found at Provincetown or Boston by vessels coming from northward, or at Tarpaulin Cove, or Vineyard Haven, coming from westward.

Towboats.—Vessels towing usually take a towboat from the port of their departure. A powerful tug may generally be found at Woods Hole or Vineyard Haven during the winter to assist vessels that may be aground or in trouble.

Repairs.—There is a marine railway at Vineyard Haven capable of hauling out vessels of about 200 tons. The nearest place at which light repairs to the machinery of steamers can be made is at New Bedford.

Supplies.—Coal, in limited quantity, can be obtained at Nantucket, Hyannis, Edgartown, and Vineyard Haven. Provisions and some ship-chandler's stores can be had at these places.

Storm warning displays.—A list of the display stations of the U. S. Weather Bureau from which storm warning displays are made is given on page 24.

Fogs are liable to occur at any time, but are more frequent from April to October than during the remainder of the year. They come more frequently with easterly and southerly winds; northerly winds clear them away.

Ice.—In mild winters ice interferes but little with the movements of vessels in Nantucket and Vineyard sounds. In severe winters drift ice accumulates and renders the movements of sailing vessels extremely hazardous, and sometimes almost completely obstructs their progress for periods of as much as six weeks. During northerly winds, which prevail in winter, the passage along the north shore through Nantucket Sound will be clear when other parts of the sound are unsafe. Steamers force their way through the ice. Sailing vessels, if caught in a floe while entering by Monomoy Passage, are almost certain to be carried on the shoals.

It should be borne in mind that the buoys and even light-vessels are liable to be moved out of their positions by drift ice.

GENERAL REMARKS ON ENTERING AND PASSING THROUGH NANTUCKET AND VINEYARD SOUNDS.

The numerous shoals, strong tidal currents, at certain seasons thick fog, and the large number of sailing vessels which are often encountered beating through the narrower parts of the channels, call for more than the ordinary attention of the navigator. In clear weather, in the daytime or in the night, the aids are readily distinguished and sufficiently numerous to enable a stranger to follow the channel without difficulty.

In clear weather sailing vessels with a favorable current, and with some local knowledge, beat through the sounds against a head wind, and when they find they are losing ground, come to anchor on either side of the sailing line or under the lee of one of the shoals or in one of the harbors, until the wind or current changes. The strongest currents will be encountered in Pollock Rip Slue, between Pollock Rip and Handkerchief light-vessels, off East and West Chop and in Vineyard Sound (see the current diagram in Appendix I); in some places the current sets directly on the shoals and in a calm sailing vessels are sometimes obliged to anchor to prevent getting aground. Most of the shoals rise abruptly from deep water, and the soundings are very irregular in depth and can not everywhere be depended on alone for warning of too close an approach to danger.

In thick weather or fog when the aids can not be seen, sailing vessels and steamers in the vicinity of Pollock Rip Slue desiring to anchor are cautioned against anchoring in the channel or near the buoys or light-vessel. The large number of steamers and tows passing through the slue in thick weather, depending entirely on the sound signals of the aids (making it necessary for them to pass close to the latter), increases the probability of collision for vessels at anchor close to them, and as there is seldom a necessity for such action, sailing vessels should avoid doing so; there is no excuse for a steamer anchoring near the aids.

Vessels when in the vicinity of Pollock Rip Shoals Light-vessel, or when between the light-vessel and the bell buoy on the Broken Part of Pollock Rip, and desiring to anchor (wind and sea permitting), should first be sure of their position, and then stand westward and anchor about 1¼ miles westward of Pollock Rip Shoals Light-vessel in 5 to 6 fathoms water.

A vessel in the vicinity of Pollock Rip Light-vessel should anchor about ¾ mile southward or southwestward from the light-vessel in 4½ to 6 fathoms water. The tidal currents here have considerable velocity and the bottom is generally sand or gravel.

When in the vicinity of Shovelful Shoal Light-vessel, steer **SE.** for 1½ miles from the light-vessel and anchor in 3½ to 4½ fathoms and about ¾ mile southward of the sailing line. The water is too deep and currents are strong in Butlers Hole, and a vessel should not anchor here except in case of necessity.

Vessels when between Butlers Hole and Handkerchief Light-vessel, or when in the vicinity of the latter, can anchor anywhere southwestward of Stone Horse Shoal in 4¼ to 6½ fathoms, taking care to be 1 to 1¼ miles southward of the sailing line. Or, they may anchor northwestward of Handkerchief Light-vessel and on the west side of the shoal.

See also anchorages, pages 85–86.

The South or Main Channel is used mostly by the very deep draft vessels passing through the sounds, and sometimes by sailing vessels that are headed by the wind so as to prevent their working through the Monomoy Passage. In thick weather a vessel may anchor (wind and sea permitting) anywhere in this channel and wait for clear weather; the bottom is generally sand, gravel, pebbles, or a combination of these. The tidal currents are not as strong as in Pollock Rip Slue or Butlers Hole, nor is the danger from collision as great as in the former. The sound signals are not as numerous as in the Monomoy Passage.

Note.—Easterly winds make high tides and strong westerly currents. Westerly winds make low tides and strong easterly currents.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS FROM EASTWARD.

Directions for passing through the sounds from westward are given on pages 91–93, and for passing through the sounds along the north shore by the North Channel from eastward on pages 93–95. Monomoy and Nantucket shoals are described on pages 81–83, and the channels through them on page 84. The directions in section 1 are good for a draft of 18 feet, and in section 1 A for a draft of 25 feet at low water.

1. ***Entering Nantucket Sound, through Pollock Rip Slue and Butlers Hole to Cross Rip Light-vessel.***—Give the eastern shore of Cape Cod a berth of about 2 miles, and when Cape Cod Lighthouse bears *W.* steer **S.** by **E.** This course made good for about 13 miles should lead about 2 miles eastward of Nauset Beach Lighthouses, and to a position with the lighthouses bearing *NW.* by *W.*, distant about 2½ miles. Then make good a **S.** by **W.** course for 14 miles, which should lead ¼ mile eastward of the whistling buoy off Chatham Bar, and close to Pollock Rip Shoals Light-vessel.

Leaving this light-vessel close-to on either hand, steer **S.** by **W.** ¾ **W.**, heading for Pollock Rip Light-vessel. Pass nearly ½ mile westward of the whistling buoy northeastward of Pollock Rip Slue, and leave a black bell buoy 200 to 300 yards on the port hand, and a red gas-lighted buoy and red nun buoy on the starboard hand.

Pass Pollock Rip Light-vessel on either hand and with it over the stern steer **WNW.** ¼ **W.** for Shovelful Shoal Light-vessel. Pass close to Shovelful Shoal Light-vessel, haul sharply southward, and with it over the stern steer **SW.** by **W.** ⅛ **W.** for Handkerchief Light-vessel. Pass southward of this light-vessel and with it over the stern, bearing *E.* ½ *N.*, steer **W.** ½ **S.** nearly 8 miles; red nun buoy No. 12 should then bear *N.* and be distant ½ mile. Then steer **WNW.** ¾ **W.** so as to pass about 300 yards north of Cross Rip Light-vessel, and when it is abeam follow the directions in section 2, following.

Bound through the sounds along the north shore.—When up to Handkerchief Light-vessel, follow the sailing directions in sections 1 and 2, pages 93–95.

At night.—Standing southward along the coast of Cape Cod, when Pollock Rip Shoals Light-vessel is sighted steer for it on any bearing between **S.** by **W.** and **W.** Pass 300 yards westward of the light-vessel and steer about **S.** by **W.** ¾ **W.** for Pollock Rip Light-vessel and follow the directions preceding as in the daytime.

The **tidal currents** have considerable velocity from the bell buoy in Pollock Rip Slue to about midway between Shovelful and Handkerchief light-vessels (see also Appendix I and pages 83 and 86).

Remarks.—The east shore of Cape Cod is described on pages 80–81.

The **S.** by **W.** course will lead about ¼ mile eastward of the whistling buoy off Chatham Bar, and about 2½ miles eastward of Chatham Lighthouses. Pollock Rip Shoals Light-vessel should be sighted before the vessel is abreast of the whistling buoy off Chatham Bar.

On the **S.** by **W.** ¾ **W.** course Pollock Rip Light-vessel will be directly ahead, and the bell buoy at the entrance to the slue will be on the port bow and should be left on the port hand. The gas-lighted buoy ⅝ mile **N.** of Pollock Rip Light-vessel will be a little on the starboard bow.

On the **WNW.** ¼ **W.** course Shovelful Shoal Light-vessel should be right ahead, and Monomoy Point Lighthouse on the starboard bow, with the low, sand beach of Monomoy Point showing southward of the lighthouse. When westward of Pollock Rip Light-vessel two red nun buoys and a skeleton iron beacon should be left well on the starboard hand. Nantucket Lighthouse should be seen southwestward.

When standing **SW.** by **W.** ⅛ **W.** for Handkerchief Light-vessel, several red buoys near the entrance to the passage between Shovelful and Handkerchief shoals will be left well on the starboard hand.

On the **W.** ½ **S.** course Cross Rip Light-vessel will be well on the starboard bow; the course leads to a position ¼ mile southward of the buoy (nun, red, No. 12) on the southeastern end of Horseshoe Shoal.

Dangers.—There are no dangers near the sailing lines until near the bell buoy, in Pollock Rip Slue. This slue leads between Pollock Rip and Broken Part of Pollock Rip (see descriptions on page 82). The shoaler water is generally marked by rips or breakers.

For descriptions of **Bearse** and **Shovelful** shoals, northward of the sailing lines, and **Stone Horse Shoal** and **Little Round Shoal**, southward of the sailing lines, see Monomoy Shoals, page 82.

A shoal with a least depth of 12 feet lies 700 yards **S.** by **W.** from Shovelful Shoal Light-vessel; its northern end is marked by a buoy (can, black, No. 5A).

Handkerchief Shoal is the extensive shoal, with from 3 to 18 feet over it, lying southwestward of Monomoy Point. It is about 4¼ miles long **N.** and **S.**, and its greatest width is about 2 miles. Its southern end, which rises abruptly from a depth of 8 fathoms to 10 feet, is about ¼ mile northward of Handkerchief Shoal Light-vessel and 5¼ miles **SW.** ¾ **W.** from Monomoy Point Lighthouse, and is marked by a buoy (nun, red, No. 10). Its northern end, rising gradually from 3½ fathoms to 15 feet, lies about 3 miles **WNW.** ¼ **W.** from Monomoy Point Lighthouse, and is marked by a buoy (spar, black, No. 3). On the eastern edge of the shoal are three buoys, which mark the edge of the narrow channel between it and Shovelful Shoal and Monomoy Point.

1 A. ***Entering Nantucket Sound through the South or Main Channel.—I. Passing close to Great Round Shoal whistling buoy.***—When 2 miles eastward of Cape Cod Lighthouse steer **S.** by **E.** about 13 miles and pass 2 miles eastward of Nauset Beach Lighthouses. When the lighthouses bear *NW.* by *W.*, distant 2½ miles steer, **S.** ⅝ **E.** This course made good about 26 miles should lead to the whistling buoy at the entrance to the South Channel.

From this buoy make good a **W.** course, leaving red nun buoys (Nos. 2, 4, 6, and 8) on the starboard hand and black can buoys (Nos. 1, 3, 5, and 7) on the port hand. The channel between these red and black buoys is about 1 mile wide and the least depth found in it

is on two spots with $5\frac{3}{4}$ and $6\frac{1}{4}$ fathoms. Great Round Shoal Light-vessel (see table, page 16) should be made right ahead and Nantucket Lighthouse a very little on the starboard bow; by keeping a little northward of the range of the two all danger from McBlair Shoal is avoided.

Pass close northward of Great Round Shoal Light-vessel, bring it to bear *SE.* $\frac{1}{2}$ *S.* and steer **NW.** $\frac{1}{2}$ **N.**, keeping it on that bearing astern and Handkerchief Light-vessel ahead; when up to the black and white perpendicularly-striped can buoy, and Nantucket Lighthouse bears *SW.* by *W.* $\frac{3}{4}$ *W.*, leave the buoy on the port hand and then make good a **WNW.** $\frac{1}{2}$ **W.** course. Cross Rip Light-vessel should be made a little on the port bow and kept bearing so as to pass 500 yards northward of it; then proceed as directed in section 2, following.

The above directions can be easily followed by day or by night in clear weather. If the whistling buoy is not made at night, bring Great Round Shoal Light-vessel to bear **W.** when it is distant about 9 miles and steer for it, keeping the bearing.

To pass through the sounds along the north shore.—Continue the **NW.** $\frac{1}{2}$ **N.** course from Great Round Shoal Light-vessel until nearly up to Handkerchief Light-vessel, then follow the directions in sections 1 and 2 of the sailing directions for that passage, pages 93–95.

The tidal currents at times have considerable velocity, and care should be taken to make the courses good (see pages 83 and 87).

Remarks and dangers.—The **S.** $\frac{5}{8}$ **E.** course leads $5\frac{3}{4}$ miles eastward of Chatham Lighthouses, about $4\frac{1}{2}$ miles eastward of Pollock Rip Shoals Light-vessel, and $5\frac{1}{2}$ miles eastward of Broken Part of Pollock Rip. If the whistling buoy is not made a vessel should manage to pick up some of the channel buoys lying $1\frac{1}{4}$ to 3 miles farther westward.

The **W.** course leads about $\frac{3}{4}$ mile northward of McBlair Shoal (see page 82), which is often marked by tide rips. As Great Round Shoal Light-vessel is approached the cupola on Squam Head and Nantucket Lighthouse should be seen, but very little of the shore will be visible. The buoys seen on both sides of the sailing line should be given a good berth.

The **NW.** $\frac{1}{2}$ **N.** course leads directly for the can buoy (black and white perpendicular stripes) which lies $4\frac{5}{8}$ miles **NE.** by **E.** $\frac{3}{4}$ **E.** from Nantucket Lighthouse.

On the **WNW.** $\frac{1}{2}$ **W.** course for Cross Rip Light-vessel, Nantucket Lighthouse will be left about 3 miles on the port hand and Handkerchief Light-vessel about $2\frac{3}{4}$ miles on the starboard hand. When within $2\frac{1}{2}$ miles of Cross Rip Light-vessel, Horseshoe Shoal (SE.) buoy (nun, red, No. 12) should be about $\frac{5}{8}$ mile distant on the starboard beam.

General descriptions of Nantucket and Monomoy shoals are given on pages 82–83, and a detailed description would be of no particular value; the directions above lead well clear of all of them.

II. Passing close eastward of Orion Shoal bell buoy.—From a position with Nauset Beach Lighthouses bearing *NW.* by *W.*, distant $2\frac{1}{2}$ miles, make good a **S.** $\frac{1}{4}$ **W.** course for $23\frac{1}{2}$ miles and pass close eastward of the red bell buoy off Orion Shoal. Then steer **SW.** $\frac{1}{4}$ **W.** heading for Sankaty Head Lighthouse and pass $\frac{1}{4}$ mile or more eastward of red nun buoy No. 6. When Great Round Shoal Light-vessel bears **W.** steer for it on the bearing and leave it close-to on the port hand. Then follow the directions under paragraph I, preceding.

At night when there is a chance of not sighting the bell buoy keep well eastward and bring Sankaty Head Lighthouse to bear **SW.** $\frac{3}{8}$ **W.** and steer for it on this bearing, keeping a sharp lookout so as not to run over the bell buoy. Continue the course until Great Round Shoal Light-vessel bears **W.** and then follow the directions in the preceding paragraph.

See tidal currents, pages 83 and 87.

Remarks and dangers.—The **S.** $\frac{1}{4}$ **W.** course leads nearly $2\frac{1}{2}$ miles eastward of Pollock Rip Shoals Light-vessel, and if made good the bell buoy off Orion Shoal should be made a little on the starboard bow. Orion Shoal (17 feet of water) is about $\frac{5}{8}$ mile **NW.** by **W.** from the bell buoy.

On the **SW.** $\frac{3}{8}$ **W.** course Sankaty Head Lighthouse will be seen on a clear day or at night, and Great Round Shoal Light-vessel will be broad off the starboard bow. There is a 27-foot spot lying nearly 1 mile **ESE.** from Orion Shoal bell buoy, and a 29-foot spot lies $\frac{5}{8}$ mile **E.** $\frac{1}{4}$ **N.** from the buoy. Passing $\frac{1}{4}$ mile eastward of the buoy leads in the best water.

See also the remarks and dangers preceding.

2. ***From Cross Rip Light-vessel to abreast Nobska Point Lighthouse.***—Having followed the directions in section 1 or 1 A, preceding, pass 300 to 500 yards northward of Cross Rip Light-vessel; then bring it to bear *ESE.* ¼ *E.* and steer **WNW.** ¼ **W.** keeping it on the bearing astern until Squash Meadow east end buoy (can, black, No. 19) is ¾ mile distant on the port beam and Nobska Point Lighthouse bears **NW.** by **W.** (If this lighthouse is brought on this bearing when Cape Poge Lighthouse bears *S.* by *E.*, it insures clearing Hedge Fence and Squash Meadow.)

With Nobska Point Lighthouse bearing **NW.** by **W.** steer for it, keeping it on that bearing until West Chop Lighthouse bears abeam distant a little over 1 mile. Then steer **W.** by **N.** until Nobska Point Lighthouse bears *N.* by *E.* distant a little over 1 mile, when proceed as directed in section 3, following.

At night.—The above directions can be as easily followed at night as in daytime. On the **WNW.** ¼ **W.** course West Chop Light will be directly ahead, and Nobska Point Light will be nearly on the *NW.* by *W.* bearing when Edgartown Light is on the port beam. Do not enter the red rays of West Chop or Nobska Point lights; the **NW.** by **W.** course leads in the white rays of Nobska Point and West Chop lights.

For tidal currents see Appendix I.

Remarks.—The **WNW.** ¼ **W.** course leads about 1¼ miles northward of Norton Shoal, about 1 mile southward of Horseshoe Shoal, and nearly 2¾ miles northward of Cape Poge Lighthouse. West Chop Lighthouse will be made directly ahead, East Chop Lighthouse will be a very little on the port bow, and Nobska Point Lighthouse on the starboard bow.

The **NW.** by **W.** course leads about ¾ mile northward of Squash Meadow, 1 mile northward of East Chop and West Chop lighthouses, and about ⅝ mile southward of Hedge Fence, which has 3 to 13 feet over it.

Dangers.—**Horseshoe Shoal** is the name of the extensive shoals lying in the west central part of Nantucket Sound. It extends about 8½ miles in a general **NW.** and **SE.** direction, but there are narrow slues with depths of 3 to 8 fathoms crossing it, thus cutting it into a number of shoal patches. The depth on the shoals is very irregular, but many of the shoalest parts have only 2 to 9 feet, and near its northwestern extremity it rises abruptly from a depth of 12 fathoms to ½ foot. At this extremity it is marked by a black spar buoy (No. 9), which lies 2⅜ miles **E.** ½ **S.** from Succonnesset Shoal Light-vessel. From the buoy an arm of the shoal extends eastward 4 miles; on its northern side it rises very abruptly from 5 and 11 fathoms to 8 and 16 feet, and is marked by a buoy (spar, black No. 7), which lies 2⅞ miles **WSW.** from Bishop and Clerks Lighthouse. The southeastern end of Horseshoe Shoal is marked by a red nun buoy (No. 12), lying 2⅜ miles **E.** from Cross Rip Light-vessel.

There are several spots with 14 to 18 feet of water over them lying just southward of Cross Rip Light-vessel.

Norton Shoal and **Hawes Shoal** extend from a point 1¼ miles eastward of Cape Poge to a point 5¾ miles **E.** ¾ **S.** from Cape Poge. Norton Shoal has 8 to 17 feet over it and is marked by two black buoys (spar, No. 11A, and can, No. 11) near its northern edge. Hawes Shoal is triangular in shape and is lumpy and very irregular in depth (4 to 16 feet). It is marked at its northwest end by a buoy (spar, black, No. 13) and at its southwest extremity by a buoy (spar, red, No. 4).

Cape Poge Flats make off ¾ to 1¼ miles eastward, northeastward, and northward from Cape Poge. Nearly 1½ miles **NE.** from Cape Poge Lighthouse a black buoy (spar, No. 15) is placed to guide clear of the flats.

Squash Meadow, with its northwestern end lying 1¾ miles **ESE.** from East Chop Lighthouse, extends a little over 1 mile in a **SE.** direction, is less than ¼ mile in width, has 5 to 13 feet of water over it, and is marked by two black can buoys, No. 19 at its southeastern extremity and No. 21 at its northwestern extremity.

Hedge Fence is the shoal lying on the north side of the channel nearly 2 miles northeastward of East Chop Lighthouse. This shoal is 3¼ miles long in a **NW.** by **W.** ¼ **W.** and **SE.** by **E.** ¼ **E.** direction, is only about 300 yards wide, has 3 to 13 feet over it, and has 5 to 8 fathoms all around it. It is marked by two buoys (both red and black in horizontal stripes), one off its northwest end is a nun and one off its southeast end is a spar. Between it and L'Hommedieu Shoal there is a passage with a depth of 3¼ to 11 fathoms and a least width of 1 mile.

3. ***From Nobska Point Lighthouse through Vineyard Sound.***—Pass about 1 mile *S.* of Nobska Point Lighthouse and make good a **WSW.** ¼ **W.** course for 11¾ miles until Gay Head Lighthouse is abeam bearing *S.* by *E.* ¾ *E.*; then steer about **W.** for Vineyard Sound Light-vessel. Leave this light-vessel on either hand and with it over the stern, then:

Bound into Buzzards Bay.—Steer **N.** for Hen and Chickens Light-vessel and follow the directions for entering Buzzards Bay from westward.

Bound into Sakonnet River.—Steer **NW.** by **W.** ⅛ **W.** and be guided by the directions for that river.

Bound into Narragansett Bay.—Steer **WNW.** for Brenton Reef Light-vessel and follow the directions for entering Narragansett Bay from eastward.

Bound to Fishers Island Sound.—Steer **W.** ½ **N.** for 21½ miles until up to the whistling buoy off Point Judith.

Bound through Block Island Sound to Long Island Sound.—Steer **W.**, which leads about midway between Point Judith and Block Island.

Bound to Sea.—The **WSW.** ¼ **W.** course through Vineyard Sound continued for 31½ miles after passing Gay Head Lighthouse will lead to a position 3¾ miles *SE.* of Block Island (SE.) Lighthouse.

For tidal currents see Appendix I.

Remarks.—The **WSW.** ¼ **W.** course leads along the southern shores of the Elizabeth Islands. Tarpaulin Cove Lighthouse will be seen on the starboard bow, and when past this lighthouse the course leads within ⅛-mile of the shore of Naushon Island; the shore is bold-to, and a depth of 5 to 9 fathoms will be found 300 yards from it until abreast Robinsons Hole. When nearing the western end of Naushon Island, Robinsons Hole, a narrow passage leading between Naushon and Pasque islands into Buzzards Bay, and then the broader passage of Quicks Hole between Pasque and Nashawena islands, will be opened out. The black bell buoy at the southwestern side of the entrance to Quicks Hole will be left ¾ mile on the starboard hand. Gay Head Lighthouse will be seen on the port bow, and when abreast of Quicks Hole, in clear weather, Vineyard Sound Light-vessel may be seen on the starboard bow.

To avoid Lucas Shoal, keep in the northern half of the sound. At night, keep well northward of a line joining Nobska Point and Gay Head lights while between Tarpaulin Cove and Robinsons Hole.

Dangers.—**Middle Ground** is the name of a narrow shoal extending from a point nearly ½ mile **NW.** from West Chop in a due **W.** direction for a distance of 3 miles. It has a uniform width of about 200 yards and depths for the greater part from 2 to 6 feet, increasing at its western end to 9 and 17 feet. The depths surrounding the shoal are from 6 to 11 fathoms. A buoy (can, red and black horizontal stripes) lying ½ mile **NW.** from West Chop Lighthouse marks the eastern end of the shoal.

Several **small, shoal spots,** with 14 to 17 feet over them, lie in a **W.** by **S.** direction, and distant 1 to 2 miles from the western end of the Middle Ground. A buoy (can, red and black horizontal stripes) lying 2½ miles **SE.** by **E.** ⅝ **E.** from Tarpaulin Cove Lighthouse marks the westernmost of these spots.

Lucas Shoal is a narrow shoal with 14 to 16 feet of water over it, lying about 2½ miles southward of Tarpaulin Cove Lighthouse and nearly in the middle of the sound. The shoal is about ⅓ mile long in a general **ENE.** and **WSW.** direction, and is marked at its western end by a buoy (can, red and black, horizontal stripes), which lies 2½ miles **S.** ¼ **W.** from Tarpaulin Cove Lighthouse. Nearly ⅞ mile **SW.** by **W.** from this buoy are two detached spots with 16 and 18 feet over them.

About 1 mile south of Pasque Island and midway between Robinsons Hole and Quicks Hole is **a spot** with 27 feet over it; this should be avoided by very deep draft vessels.

Devils Bridge is a rocky ledge making out ¾ mile in a **NW.** direction from Gay Head; it has 2 feet over it about ⅝ mile offshore and 17 feet at its outer edge. A buoy (can, black, No. 27) lies northwestward of the ledge and nearly 1¼ miles **NW.** ¾ **N.** from Gay Head Lighthouse.

Sow and Pigs Reef is a rocky ledge extending 1⅝ miles in a **WSW.** direction from Cuttyhunk. It is in part dry or awash at low water and has an average width of about 400 yards; at its outer end it has a depth of 15 feet, and is marked by a buoy (nun, red, No. 2) 1⅞ miles **SW.** by **W.** ¾ **W.** from Cuttyhunk Lighthouse.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS FROM WESTWARD.

The directions in sections 1, 2, and 3A are good for a draft of 25 feet, and in section 3 for a draft of 18 feet; strangers of deeper draft should take a pilot.

1. ***From Vineyard Sound Light-vessel to Nobska Point.***—Leave the light-vessel close-to on either hand and steer **E.** until Gay Head Lighthouse bears *S.* by *E.* ¾ *E.* Then steer **ENE.** ¼ **E.** for 11¾ miles until Nobska Point Lighthouse bears *N.*, distant 1 mile; then follow the directions in section 2.

Or, pass 1½ miles westward and northward of Gay Head, and when the lighthouse bears *S.* by *E.* ¾ *E.*, distant 1½ miles, steer **NE.** by **E.** until Tarpaulin Cove Lighthouse bears on

the port beam, distant 1 mile. Then steer **ENE.** ¼ **E.** until Nobska Point Lighthouse bears *N.*, distant 1 mile, and follow the directions in section 2.

Remarks and dangers.—The **E.** course should lead over ⅝ mile southward of Sow and Pigs Reef, which is partly bare at low water and extends 1⅝ miles **WSW.** from Cuttyhunk.

On the **ENE.** ¼ **E.** course the bell buoy off Quicks Hole will be left ¾ mile on the port hand, and after passing the entrance to Robinsons Hole, Lucas Shoal buoy (can, red and black horizontal stripes) should be left nearly 1½ miles on the starboard hand. Shortly after passing Tarpaulin Cove, Middle Ground West End buoy (can, red and black horizontal stripes) should be left nearly 1 mile on the starboard hand. When Nobska Point Lighthouse bears **N.** the bell buoy should be ½ mile distant and nearly in line with the lighthouse.

When rounding Gay Head, care must be taken to give it a berth of over 1 mile to clear Devils Bridge, which makes off about **NW.** from the head.

2. ***From Nobska Point to Cross Rip Light-vessel.***—When Nobska Point Lighthouse bears *N.* distant 1 mile, steer **E.** by **S.** until Nobska Point Lighthouse bears *NW.* by *W.* Then steer **SE.** by **E.**, keeping Nobska Point Lighthouse on the bearing astern, and continue this course until the black can buoy on the eastern end of Squash Meadow bears *S.* by *W.* ½ *W.* and West Chop Lighthouse bears *WNW.* ¼ *W.*

Then steer **ESE.** ¼ **E.**, keeping West Chop Lighthouse on the bearing astern; Cross Rip Light-vessel should be made ahead on this course, and as it is approached should be left 350 yards on the starboard hand. Then, if bound through Monomoy Passage, follow the directions in section 3; if bound through the South Channel (between Great Round Shoal and Point Rip) follow the directions in section 3 A.

Remarks and dangers.—The **SE.** by **E.** course leads about 1 mile northward of West Chop and East Chop lighthouses and in mid-channel between Hedge Fence and Squash Meadow. The two black can buoys marking the ends of Squash Meadow can be easily recognized in clear weather.

On the **ESE.** ¼ **E.** course the depth on the sailing line should not be less than 8½ fathoms, and Cape Poge Lighthouse should be about 2½ miles distant when on the starboard beam. The nearest shoals to the sailing line on either side, westward of Cross Rip Light vessel, are distant nearly 1 mile.

3. ***From Cross Rip Light-vessel to Pollock Rip Shoals Light-vessel.***—When Cross Rip Light-vessel bears *S.* distant 350 yards, steer **ESE.** ¾ **E.** about 2½ miles, so as to pass ⅜ mile south of red nun buoy No. 12, and when this buoy bears *N.* steer **E.** ¼ **N.** until abreast of Handkerchief Light-vessel, which should be left on the port hand.

Then bring Handkerchief Light-vessel to bear *SW.* by *W.* ⅛ *W.* over the stern and steer **NE.** by **E.** ⅛ **E.**, heading for Shovelful Shoal Light-vessel. Leave the latter 100 yards on the port hand and steer **ESE.** ¼ **E.**, heading for Pollock Rip Light-vessel. Pass 100 yards southward of this light-vessel and then steer **N.** by **E.** ¾ **E.**, heading for Pollock Rip Shoals Light-vessel; on this course leave the bell buoy (black), on the north end of the Broken Part of Pollock Rip, about 150 yards on the starboard hand. When up to the light-vessel, which can be left on either hand, the vessel will be well clear of the shoals and a course may be set to stand along the eastern shore of Cape Cod.

Remarks and dangers.—The **ESE.** ¾ **E.** course leads south of the eastern end of Horseshoe Shoal, and red nun buoy (No. 12) should be made off the port bow. After this buoy is passed and when on the **E.** ¼ **N.** course there are no shoals until up to Handkerchief Light-vessel.

On the **NE.** by **E.** ⅛ **E.** course care must be taken not to be set northward of the sailing line by the westerly current. Shovelful Shoal Light-vessel will be made ahead and should be steered for on this course. Strong rips are seen on Shovelful Shoal, a part of which shows bare at extreme low water. A black can buoy (No. 5A) lies about ¼ mile south of Shovelful Shoal Light-vessel and marks the north end of Stone Horse Shoal.

On the **ESE.** ¼ **E.** course Pollock Rip Light-vessel will be ahead, and as it is approached the remains of an iron frame beacon and two red nun buoys will be left well on the port hand. Strong tide rips usually mark Pollock Rip and Bearses Shoal.

On the **N.** by **E.** ¼ **E.** course a red gas-lighted buoy will be left well on the port hand, and a black bell buoy will be seen a little on the starboard bow. After passing the latter, a red whistling buoy will be seen on the starboard bow and should be left nearly ¼ mile on the starboard hand.

3 A. ***From Cross Rip Light-vessel to Sea, through the South or Main Channel.***—Passing 350 yards north of Cross Rip Light-vessel steer **ESE. ½ E.** about 14¾ miles until close to Point Rip Mid-channel buoy (can, black and white perpendicular stripes), and passing over ¾ mile northward of the two black spar buoys off Point Rip.

From the mid-channel buoy steer **SE. ½ S.**, heading for Great Round Shoal Light-vessel. Leave the light-vessel 200 yards on the starboard hand, and bring it to bear *W.* and steer **E.**, keeping the light-vessel on the bearing astern.

Continue the **E.** course about 9½ miles until close to Great Round Shoal whistling buoy. When close to the latter a **N. ⅝ W.** course will lead to a position 2 miles eastward of Nauset Beach Lighthouses.

Remarks and dangers.—The **ESE. ½ E.** course leads well northward of Point Rip, which extends 3¼ miles **ENE. ¾ E.** from Great Point. Nantucket Lighthouse should be distant 3 miles when it bears abeam, and before the vessel is up to the mid-channel buoy Great Round Shoal Light-vessel will be sighted well on the starboard bow.

On the **SE. ½ S.** course a black can buoy will be seen about ¼ mile southward, and a red nun buoy about ¾ mile northeastward, of the light-vessel.

On the **E.** course four black can buoys will be left well on the starboard hand, and three red nun buoys on the port hand; the sailing line leads about midway between the red and black buoys.

To pass close eastward of Orion Shoal, bound northward.—Follow the directions in section 3 A, preceding, and when Great Round Shoal Light-vessel is 200 yards distant on the starboard beam, steer **E.** for 3½ miles. Then steer **NE. ¼ E.**, leaving red nun buoy No. 6 about ¼ mile on the port hand and heading so as to pass 250 yards eastward of Orion Shoal bell buoy.

From this buoy a **N. ¼ E.** course should lead 2¼ miles eastward of Pollock Rip Shoals Light-vessel and along the eastern shore of Cape Cod at a distance of about 2 miles until abreast Nauset Beach Lighthouses.

Remarks.—See the remarks and dangers preceding.

On the **NE. ¼ E.** course Sankaty Head Lighthouse should be astern.

On the **N. ¼ E.** course care must be taken not to be set westward by the west current.

SAILING DIRECTIONS, NANTUCKET AND VINEYARD SOUNDS ALONG THE NORTH SHORE, FROM EASTWARD.

1. ***From Handkerchief Light-vessel to Succonnesset Shoal Light-vessel, Passing N. of Bishop and Clerks Lighthouse.***—This passage is not safe at low water for vessels drawing over 14 feet, as there are shoal spots near Bishop and Clerks with 15 to 17 feet over them; strangers should not attempt it at night.

Passing southward of Handkerchief Light-vessel and the red nun buoy (No. 10) on the south end of the shoal, bring Handkerchief Light-vessel astern bearing *SE. ¼ S.* and steer **NW. ¼ N.** Pass about ½ mile northeastward of Bishop and Clerks Lighthouse, and to a position about 300 yards southward of Hallets Rock buoy (spar, red and black horizontal stripes). Then steer **W. ½ S.**, and continue on this course until the east end of the breakwater in Hyannis Harbor is in range with Hyannis Lighthouse, bearing about *NNE.* Then steer **WSW. ¼ W.** for 4 miles, and when Succonnesset Shoal Light-vessel bears **W. ½ S.** steer for it, keeping it on that bearing. Pass the light-vessel close-to on either hand and then proceed as directed in section 2.

To pass south of Bishop and Clerks Lighthouse, proceed as directed in section 1 A, following.

Remarks.—On the **NW. ¼ N.** course Bishop and Clerks Lighthouse will be a little on the port bow, and the course leads near the eastern end of the shoal, with 15 to 18 feet of water over it, making out eastward from the lighthouse. When the lighthouse is abaft the port beam, Hallets Rock buoy should be made a little on the starboard bow.

On the **W. ½ S.** course from Hallets Rock buoy, the bell buoy off Hyannis entrance will be left about ⅝ mile on the starboard hand, and Hyannis Harbor is left on the starboard hand.

The **W. ½ S.** course heading for Succonnesset Shoal Light-vessel leads a little over ⅝ mile northward of the buoy (spar, black, No. 9) at the northwest end of Horseshoe Shoal, and fair between the buoy (spar, red, No. 16) southward of Wreck Shoal and the buoy (spar, black, No. 11) on the northern end of Eldridge Shoal.

Dangers.—**Bishop and Clerks** is the extensive shoal lying off the northern shore about 2 miles southward of Point Gammon. The shoal is marked by Bishop and Clerks Lighthouse, which stands near its center. On an arm of the shoal extending nearly ¾ mile southward from the lighthouse and marked at its end by a buoy (spar, red, No. 12), there are several rocks awash at low water; but that part of the shoal eastward, northward, and northwestward of the lighthouse has from 13 to 18 feet of water over it.

Hallets Rock, marked by a buoy (spar, red and black horizontal stripes), is a small spot with 12 feet over it, lying 1⅛ miles **N.** by **W.** ½ **W.** from Bishop and Clerks Lighthouse.

Senator Shoal, marked at its southern edge by a buoy (spar, red, No. 8), is the southern part of the shoal which extends over 1 mile southward and eastward from Point Gammon. Near the edge of this shoal and a little northwestward of the buoy there is only 11 feet of water.

Middle Ground, with 14 to 17 feet over it, lies **W.** by **N.** from Bishop and Clerks Lighthouse. A 12-foot spot on this shoal is marked by a buoy (spar, red and black horizontal stripes) which lies 1¾ miles **W.** by **N.** from the lighthouse and west of the shoal spot.

Along the north shore, between Point Gammon and Succonnesset Point there are a number of shoals, but the sailing line leads well southward of them.

Horseshoe Shoal is described on page 90.

Wreck Shoal has 8 to 15 feet of water over it with 3¼ to 5 fathoms around it, is ¼ to ⅜ mile wide, and 1¼ miles long in an **E.** and **W.** direction. Its western end is only ⅜ mile **NE.** ½ **E.** from Succonnesset Shoal Light-vessel. A buoy (spar, red, No. 16) is on the southern edge of the shoal.

Eldridge Shoal, lying ¾ mile **S.** of Wreck Shoal, has 3 to 18 feet over it, is less than ¼ mile wide, and is about ¾ mile long in a **NE.** by **E.** and **SW.** by **W.** direction. On its northern side is a buoy (spar, black, No. 11). The sailing line leads about midway between Wreck Shoal and Eldridge Shoal. Between the latter shoal and the western edge of Horseshoe Shoal there is a passage over 1 mile wide.

1 A. ***From Handkerchief Light-vessel to Succonnesset Shoal Light-vessel, Passing S. of Bishop and Clerks.***—Bring Handkerchief Light-vessel to bear *SE.* ⅞ *E.* and steer **NW.** ⅞ **W.** This course made good for 11¾ miles will lead about 1½ miles southwestward of Bishop and Clerks Lighthouse and to a point 2½ miles *W.* ½ *S.* from it. Succonnesset Shoal Light-vessel should then bear **W.** ½ **S.**; steer for Succonnesset Light-vessel on that bearing, keeping the lighthouse bearing *E.* ½ *N.*, and when up to the light-vessel pass it close-to on either hand, and proceed as directed in section 2, following.

Remarks.—On the **NW.** ⅞ **W.** course Bishop and Clerks Lighthouse will be on the starboard bow, and will be left about 1½ miles on the starboard hand. Bishop and Clerks buoy (spar, red, No. 12) should be left nearly 1 mile on the starboard hand, and Broken Ground Shoal (spar, black, No. 7) about ¾ mile on the port hand. The least depth on the course should not be less than 17 feet. At night the red sector of Bishop and Clerks Light should be entered when Bass River Light bears **NE.** ¾ **N.**

The **W.** ½ **S.** course leads over ⅝ mile northward of the northern edge of Horseshoe Shoal. This shoal will be cleared if a vessel keeps on the line joining Bishop and Clerks Lighthouse and Succonnesset Shoal Light-vessel. West Chop Light open a little southward of Succonnesset Shoal Light-vessel will insure clearing Wreck Shoal.

Dangers.—**Bishop and Clerks** is described above.

Broken Ground, with 17 to 18 feet of water over it, lies **SW.** from Bishop and Clerks Lighthouse, and extends in spots to the northeastern end of Horseshoe Shoal. The northern side near a depth of 16 feet is marked by a buoy (spar, black, No. 7).

Horseshoe Shoal is described on page 90; **Wreck Shoal** and **Eldridge Shoal** are described above.

2. ***From Succonnesset Shoal Light-vessel to Gay Head Lighthouse.***—Having followed the directions in section 1 or 1 A, bring Succonnesset Shoal Light-vessel directly astern, bearing *E.* ¾ *S.*, and steer **W.** ¾ **N.**, leaving 400 yards on the port hand the buoy (spar, red and black horizontal stripes) marking a 9-foot spot lying 1⅜ miles *W.* ¼ *S.* from the light-vessel, and passing ⅝ mile northward of the western end of L'Hommedieu Shoal. When Nobska Point Lighthouse is distant nearly 3¾ miles and Davis Neck Shoal buoy (spar, red, No. 20) is nearly ¼ mile distant on the starboard beam, steer about **W.** by **S.** so as to pass northward of black can buoy No. 19, about ½ mile southward of the lighthouse, and

close to the red bell buoy off Nobska Point. From this buoy steer **WSW.**, giving the shore of Naushon Island a berth of over $\frac{3}{8}$ mile, and when Gay Head Lighthouse bears about *S.* by *E.* $\frac{3}{4}$ *E.*, proceed as directed in section 3, page 90.

Remarks.—On the **W.** $\frac{3}{4}$ **N.** course Nobska Point Lighthouse will be on the port bow and Falmouth Heights on the starboard bow. The latter shows a steep, sand bluff the top of which is covered with houses; red spar buoy No. 26 should be made on the starboard bow. The northern shore should be given a berth of $\frac{3}{4}$ mile, as shoals make out from it in places to nearly that distance.

On the **W.** by **S.** course several black buoys will be left on the port hand when abreast of Falmouth Heights, the westernmost buoy (can, black, No. 19) should be left 300 yards or more on the port hand. Nobska bell buoy should be made ahead and be left on the starboard hand.

See also the remarks and dangers on page 91.

Dangers.—**Succonnesset Shoal** makes out southward and eastward from Succonnesset Point in an **E.** by **S.** direction a distance of over 2 miles. It is about 2 miles long in an **E.** and **W.** direction, has an average width of about $\frac{1}{4}$ mile, and the depth over the greater part of it is from 3 to 5 feet. It is marked at its southeastern extremity by a buoy (spar, red, No. 18) which is about $\frac{3}{8}$ mile **N.** by **E.** from Succonnesset Shoal Light-vessel. Between the light-vessel and buoy, and about 400 yards **S.** of the buoy, is a spot with 17 feet over it. A channel 500 yards wide with a depth of 5 fathoms leads between Succonnesset Shoal and Wreck Shoal.

Just southward of the sailing line is a 17-foot spot $\frac{3}{4}$ mile **W.** $\frac{1}{4}$ **N.** from Succonnesset Shoal Light-vessel.

Smalls Shoal, the 9-foot spot mentioned in the sailing directions, lies $1\frac{3}{8}$ miles **W.** $\frac{1}{4}$ **S.** from Succonnesset Shoal Light-vessel, and is marked on its northern side by a buoy (spar, red, and black horizontal stripes).

A **16-foot spot** lies $1\frac{3}{8}$ miles **W.** by **S.** from Succonnesset Shoal Light-vessel, and about midway between the red and black horizontally striped buoy marking Smalls Shoal and the black spar buoy marking the eastern end of L'Hommedieu Shoal.

L'Hommedieu Shoal extends from a point 2 miles **WSW.** from Succonnesset Shoal Light-vessel in a **WNW.** $\frac{3}{4}$ **W.** direction for a distance of $4\frac{1}{2}$ miles. It has a general width of about $\frac{1}{2}$ mile and depths from 3 to 13 feet. A buoy (spar, black, No. 13) marks its eastern end, and a buoy (spar, black, No. 15) marks the shoal near its western end. The latter buoy is $2\frac{1}{2}$ miles **NE.** $\frac{3}{4}$ **N.** from West Chop Lighthouse.

Several **narrow, shoal spots** lie from $2\frac{1}{8}$ to $2\frac{7}{8}$ miles **E.** $\frac{3}{4}$ **S.** from Nobska Point Lighthouse; they have depths of 11 to 18 feet, and their northern sides are marked at the eastern and western ends, respectively, by buoys (spar, black, No. 17, and can, black, No. 19).

Shoals make out about $\frac{5}{8}$ mile from the northern shore from Succonnesset Point to westward of Falmouth Heights, and in some places 6 to 9 feet will be found $\frac{3}{8}$ mile offshore. Just eastward of Falmouth Heights is Davis Neck Shoal with 14 feet near its outer edge. A buoy (spar, red, No. 20) lying $1\frac{1}{8}$ miles **SE.** from the precipitous face at Falmouth Heights marks the shoal.

CHATHAM ROADS AND STAGE HARBOR.*

Chatham Roads is at the northeast end of Nantucket Sound, between the extensive shoals which extend northwestward from the northern end of Monomoy Island and the shoals extending $1\frac{5}{8}$ miles from the south shore of Cape Cod at **Harwichport,** 3 miles westward of Stage Harbor Lighthouse. It is a good anchorage in $3\frac{1}{2}$ to $5\frac{1}{2}$ fathoms water, and good holding ground, but is insecure for small craft in heavy southwesterly gales. The approach to Chatham Roads from southward is westward of Handkerchief Shoal. There is a narrow, crooked channel, with strong tidal currents, between Handkerchief and Shovelful Shoals; this channel is buoyed, but it should not be attempted by a stranger.

Stage Harbor is a small, well-sheltered anchorage used by fishermen and small local craft. It is entered from Chatham Roads through a narrow, crooked channel which has a depth of 4 feet at low water and is marked by a number of buoys, but a stranger should not attempt to enter without a pilot on account of the sharp turns in the channel. The town of **Chatham,** on the northeastern side of the harbor, has no commerce except some vessels engaged in the fisheries, and occasionally a cargo of coal is brought in small coasting vessels. There is an approach by water from the eastern side of Cape Cod, but the channel depth is uncertain and the approach is now from Stage Harbor (see Chatham Bar, page 81).

Stage Harbor and Chatham lighthouses (see table, pages 14–16) are the guides for entering Chatham Roads and to the entrance of the buoyed channel into Stage Harbor. The western edge of **Common Flat,** the shoal on the eastern side of the roads, is marked by buoys.

Storm warning displays of the U. S. Weather Bureau are made near Chatham Lighthouses and near Monomoy Point Lighthouse.

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*Shown on chart **111**, scale $\frac{1}{80,000}$, price $0.50.

Marine Hospital.—Emergency relief is furnished at Chatham by the U. S. Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

Tides.—See table, page 11.

SAILING DIRECTIONS TO THE ANCHORAGE IN CHATHAM ROADS.

The directions in sections 1 and 1A are good for a draft of 18 feet. In heavy southwesterly gales the anchorage is insecure for small craft. Vessels of 7 feet draft can be taken into Stage Harbor at high water, but it requires local knowledge. No stranger should attempt to pass between Shovelful and Handkerchief shoals, as the channel is very narrow and the tidal currents strong; the buoys are the only aids.

1. ***Approaching and Entering from Southward or Southwestward.***—*I. From Handkerchief Light-vessel.*—Having followed the directions in section 1 or 1 A, (pages 87–89), pass south of Handkerchief Light-vessel and bring it to bear *E.*, distant about ½ mile; then steer **N.** about 2½ miles or until Monomoy Point Lighthouse bears *E.* by *N.* Then steer **NNE.** ½ **E.** about 6½ miles until Stage Harbor Lighthouse is in range with Chatham Lighthouses, bearing **ENE.** ⅝ **E.**

Steer for Stage Harbor Lighthouse, keeping it in range with Chatham Lighthouses, pass northward of red nun buoy No. 4, and when nearly up to Mid-channel buoy (spar, black and white perpendicular stripes) haul northward and anchor northward of the buoy in about 4¾ fathoms, soft bottom.

II. From Cross Rip Light-vessel.—When close to the light-vessel steer **E.** by **S.** about 2¾ miles, and when red nun buoy No. 12 is well abaft the port beam steer **NE.** ⅝ **E.** about 14 miles until Stage Harbor Lighthouse and Chatham Lighthouses are in range; then follow the directions in the preceding paragraph.

Remarks.—On the **N.** course the western edge of Handkerchief Shoal should be left ½ mile on the starboard hand. The shoal rises abruptly on this side and care should be taken not to be set eastward on to it.

On the **NNE.** ½ **E.** course the black spar buoy marking the northwest end of Handkerchief Shoal should be left nearly ¾ mile on the starboard hand; the houses of South Harwich will be made a little on the starboard bow and Harwichport (with prominent, tall, white church spire) on the port bow. Stage Harbor Lighthouse should be made broad off the starboard bow and on the high land eastward of it the Chatham Lighthouses will be seen.

As soon as Stage Harbor Lighthouse and Chatham Lighthouses are in range they should be steered for; this will lead clear of all shoals and into Chatham Roads. Southward and southwestward of Stage Harbor Lighthouse are several buoys marking the narrow channel from the Roads into Stage Harbor.

Dangers.—**The western edge of Handkerchief Shoal** extends 4¼ miles in a general **N.** by **E.** ¾ **E.** direction from the light-vessel. This edge of the shoal has from 6 to 16 feet of water over it and is marked at its southern end, just north of the light-vessel, by a buoy (nun, red, No. 10). The northwestern end of the shoal is marked by a buoy (spar, black, No. 3).

Rodgers Shoal has 13 to 18 feet of water over it, is about 1 mile long in a **NW.** and **SE.** direction, and is ¼ mile wide. It lies north of Handkerchief Shoal, and is marked at each end by a buoy (spar, red and black horizontal stripes). The channel between Handkerchief Shoal and Rodgers Shoal is about ⅜ mile wide and has a least depth of 3½ fathoms, and the channel between Rodgers Shoal and the shoal making westward from the southern end of Monomoy Island is ⅜ mile wide and has a depth of 4 fathoms.

Shoals make out a distance of 1 to 2¾ miles from the western shore of Monomoy Island, extending northward to Stage Harbor Lighthouse.

Common Flats, the shoal lying westward and northward of the north end of Monomoy Island, has a ruling depth of 1 to 4 feet, and rises abruptly on its northern and western edges from 4 fathoms to 5 and 8 feet, but is well marked by buoys.

Harwich Flats is an extensive shoal, with 5 to 17 feet of water over it, making off 1⅛ miles southward from the shore between South Harwich and Harwichport. It is on the northwestern side of Chatham Roads and protects the anchorage in northwesterly winds.

1 A. ***Approaching and Entering, from Westward.***—Vessels of 14 feet or less draft can pass $\frac{5}{8}$ mile north of Bishop and Clerks Lighthouse and steer **E.** for $6\frac{1}{2}$ miles. Bass River Lighthouse should then bear *NW.* by *N.*, and Kill Pond Bar buoy should be $\frac{3}{4}$ mile distant on the port beam. Then steer **ENE.** $\frac{5}{8}$ **E.**; on this course Stage Harbor Lighthouse should be made ahead and in range with Chatham Lighthouses. Then follow the range and proceed as directed in section 1, preceding.

Vessels passing south of Bishop and Clerks Lighthouse. When the lighthouse bears *N.*, distant $1\frac{1}{4}$ miles, steer **ENE.** $\frac{1}{2}$ **E.** As soon as Stage Harbor and Chatham lighthouses are made they should be brought in range and steered for. Anchor as directed under section 1.

Remarks.—The **E.** and **ENE.** $\frac{1}{2}$ **E.** courses lead about $\frac{3}{4}$ mile southward of the end of Kill Pond Bar and the buoy marking it. The northern shore should not be approached closer than $2\frac{1}{4}$ miles until standing on the range for entering the roads.

Dangers.—**Kill Pond Bar** has 4 to 7 feet of water over it and makes off from the shore eastward of Bass River Lighthouse; the end, marked by a buoy (spar, red, No. 6), is 3 miles **SE.** $\frac{3}{8}$ **S.** from the lighthouse and 2 miles **S.** from the wharves at Dennisport.

Harwich Flats and **Common Flat** are described under section 1.

NANTUCKET HARBOR.*

This harbor lies on the northern shore of Nantucket Island, midway between its eastern and western ends. The entrance is between the western point of **Coatue Beach** on the **E.** and **Brant Point** on the **W.**, and is $\frac{3}{8}$ mile wide, but the available channel is much contracted by Coatue Flats. Nantucket Harbor proper lies at the entrance to a large, shallow lagoon of very irregular shape which runs in a nearly **NE.** direction about $4\frac{3}{4}$ miles, the head of the lagoon being separated from the ocean by a strip of sand over which the sea breaks in heavy easterly gales.

Coatue Point, the eastern point at the entrance to the harbor, is a low, flat, sand point forming the western extremity of a long, sand beach, with a few trees, called **Coskata Beach** and **Coatue Beach,** which extends about 5 miles in a nearly **SW.** direction from the northeastern shore of Nantucket Island, and in no place is over $\frac{1}{4}$ mile wide. The body of water contained between this beach and the main land of Nantucket Island is known as Nantucket Harbor at its western end and Head of the Harbor at its northeastern end.

Brant Point, the western point at the entrance to the harbor, is a low, flat, sand point, extending out from the bluffs, and is easily recognized by **Brant Point Lighthouse,** which is built near its eastern end. The high perpendicular bluffs westward of it and large hotels will enable anyone to recognize the entrance to the harbor. When seen from westward these bluffs hide the town, except the tops of some of the higher steeples; but seen from northward, the thickly clustered houses will appear over the low land of Brant Point.

The town of **Nantucket** is built upon the western shore of the harbor just southward of Brant Point. The entrance to the harbor is closed to any but vessels of light draft by a shifting sand bar. The harbor is of but little commercial importance, and is rarely visited by strangers. Vessels may, however, make a good anchorage in southerly gales outside the bar in from 4 to 7 fathoms, sticky bottom; but no vessel of over 6 feet draft should attempt to enter the harbor without a pilot. In September, 1902, about 6 feet at low water could be taken in the buoyed channel across the bar. There are two stone jetties which extend northward from each point at the entrance, and are only partly visible at high water. At the end of each jetty is a pile of rocks with a lighted beacon.

Nantucket Cliff Range beacons (see page 16), two small pyramidal wooden structures, are near the foot of the bluffs and **NW.** by **W.** $\frac{1}{2}$ **W.** from Brant Point Lighthouse.

Storm warning displays of the U. S. Weather Bureau are made at Great Point and Nantucket. For an explanation of the signals, see Appendix III.

Tides.—See table, page 11.

Ice.—Except in severe winters, the harbor is seldom closed by local formations of ice, but is frequently closed by drift ice from the sound, which packs and remains across the entrance during northerly winds.

*Shown on charts **111**, scale $\frac{1}{80,000}$, price $0.50; **343**, scale $\frac{1}{10,000}$, price $0.25.

GENERAL DIRECTIONS, NANTUCKET HARBOR.

The following directions are good for a draft of 5 feet with smooth water:

Approaching and Entering.—From Handkerchief Light-vessel steer **S.** by **W.** $\frac{3}{4}$ **W.**; or from Cross Rip Light-vessel steer **SE.** by **E.** $\frac{3}{8}$ **E.** for Nantucket Lighthouse until Brant Point Lighthouse bears **S.** $\frac{1}{4}$ **E.**, when steer for it on that bearing until nearly up to the bell buoy off the entrance.

When close to the bell buoy stand into the harbor, heading from buoy to buoy, leaving the buoys on the side indicated by their color. Give Brant Point a berth of from 50 to 150 yards and anchor in 11 to 17 feet of water, sticky bottom, with Brant Point Lighthouse bearing between *NW.* and *N.* by *E.* and distant 200 to 550 yards.

Remarks.—The approach to the harbor, between Great Point and the eastern end of Tuckernuck Shoal, is about 6 miles wide and clear of dangers. Vessels should keep at least $1\frac{1}{2}$ miles offshore until on the range of Nantucket Cliff beacons. The channel over the bar and into the harbor is liable to change and vessels must be guided entirely by the buoys.

Dangers.—A detailed description of the dangers would be of no value: shoals make out over 1 mile from the shore at the harbor entrance and eastward and westward of it; the edge of this shoal at the entrance to the harbor is well marked by buoys.

Tuckernuck Shoal is the shoal extending about $6\frac{3}{4}$ miles in a northeasterly direction from Muskeget Island. It has depths over it varying from 3 to 18 feet, the ruling depths being 8 to 10 feet. The northeastern extremity of the shoal is marked by a buoy (can, black, No. 7) lying about $6\frac{3}{4}$ miles **WNW.** $\frac{3}{8}$ **W.** from Nantucket Lighthouse; this buoy is a Nantucket Sound buoy and should be left on the starboard hand by vessels approaching Nantucket entrance. A bell buoy (black and white perpendicular stripes) lies on the northern side of Tuckernuck Shoal, $3\frac{1}{4}$ miles **S.** by **E.** from Cross Rip Light-vessel, and marks a slue in the shoal through which the steamer to Nantucket passes in smooth weather.

HYANNIS HARBOR*

is a bight in the south shore of Cape Cod, about 15 miles westward of Chatham, which affords shelter from all but southerly winds. It is much used as a harbor of refuge by small coasting vessels bound through Nantucket Sound; those of 14 feet or less draft anchoring inside the breakwater, where there is a limited area protected from all winds; vessels of over 14 feet draft anchor outside. The area protected by the breakwater is about 175 acres, but much of it is very shallow, only a small part having been dredged to a depth of $15\frac{1}{2}$ feet.

The entrance to the harbor lies 12 miles **NW.** from Handkerchief Light-vessel, and **NNW.** $\frac{1}{4}$ **W.** from Bishop and Clerks Lighthouse; it is somewhat obstructed by shoals, which are, however, well marked by buoys or spindles. Bishop and Clerks Light and Hyannis Light and range beacon are the principal guides for entering at night. The old tower on **Point Gammon**, the eastern point at the entrance, is a prominent mark in the daytime.

Lewis Bay is the large, shallow body of water making northeastward from Hyannis Harbor; it is only used by small local craft, the entrance being obstructed by shoals.

The town of **Hyannis** is about 1 mile inland; **Hynanis Port** is at the head of the bight which forms Hyannis Harbor; it has a little trade and is a terminus of the New York, New Haven and Hartford Railroad. The railroad wharf has a depth of 9 feet at its end at low water, and is a conspicuous mark when entering.

The entrance is approached from eastward between Bishop and Clerks Lighthouse and Point Gammon, and from westward by the main channel from Succonnesset Shoal Light-vessel. The depth in the channel up to the breakwater is 15 to 16 feet.

Pilots are not generally taken, but a vessel desiring one should make signal when off the entrance.

Supplies.—Water and a limited supply of coal may be obtained at the railroad wharf, and provisions and some ship-chandler's stores at Hyannis.

Repairs.—Vineyard Haven is the nearest place at which repairs to hulls of vessels can be made, and New Bedford, Providence, or Boston for making repairs to the machinery of steamers.

Storm warning displays of the U. S. Weather Bureau are made near Hyannis Lighthouse (see Appendix III).

Marine Hospital.—Emergency relief is furnished at Hyannis by the United States Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

*Shown on chart **247**, scale $\frac{1}{20,000}$, price $0.25; and in part on charts **111**, **112**, scale $\frac{1}{80,000}$, price of each $0.50.

Ice seldom interferes with the movements of vessels, the prevailing northerly winds keeping the harbor clear (see ice, page 86).

Tidal data is given in the table on page 11.

SAILING DIRECTIONS, HYANNIS HARBOR.

The following directions are safe for vessels of 12 feet or less draft, and if closely followed are good for vessels of 14 feet draft.

1. ***Approaching and Entering, from Eastward.***—Pass about ½ mile northeastward of Bishop and Clerks Lighthouse on a **NW.** ¼ **W.** course, and about 300 yards southward of the buoy on Hallets Rock. When Bishop and Clerks Lighthouse bears *SSE.* ½ *E.* steer **NNW.** ½ **W.**

When Hyannis Lighthouse and range beacon are in range, bearing about **N.** by **E.** ⅛ **E.**, steer for them and take care to leave the end of the breakwater about 100 yards on the port hand. Then haul more northward, and anchor in 15½ feet of water, soft bottom, behind the breakwater.

Remarks.—Care should be taken not to approach Bishop and Clerks Lighthouse closer than ⅜ mile while passing it, and after the light has been passed a sharp lookout should be kept for the buoy on Hallets Rock, which should be left 300 yards on the starboard hand.

On the **NNW.** ½ **W.** course a red spar buoy will be made on the starboard bow, and when it is nearly abeam Hyannis Lighthouse and the range beacon will be in range and the course should be changed for them.

Standing in for anchorage on the range, red spar buoys Nos. 2 and 4 will be left on the starboard hand, and the spindle on Great Rock, about ¼ mile on the starboard hand; the spindle on the east end of the breakwater will be on the port bow. The best anchorage for light-draft vessels is behind the breakwater in 11 to 15 feet water. Vessels of 14 feet draft should anchor about 300 yards **NE.** by **N.** from the east end of the breakwater.

Dangers.—**Bishop and Clerks, Hallets Rock, and Senator Shoal** are described on page 94.

An extensive shoal, with numerous rocks, lies on the western side of the channel leading into Hyannis Harbor, between it and the channel into Centerville Harbor. Off its eastern side this shoal is marked by a buoy (spar, black, No. 1), which is a little westward of the range of Hyannis Lighthouse and range beacon.

A red bell buoy (in summer) is placed nearly ¾ mile **SSW.** ¾ **W.** from black spar buoy No. 1, and on the range of the east end of the breakwater and Hyannis Lighthouse.

Gardiners Rock, a detached rock with 8 feet of water over it, lies 1 mile **NW.** by **W.** ⅛ **W.** from the old light-tower on Point Gammon; off its western side it is marked by a buoy (spar, red, No. 2).

Great Rock is a bare rock on the western edge of the flats which make westward from Point Gammon; it bears about **NW.** ½ **W.**, distant 1 mile from the old light-tower on Point Gammon, and is marked by a red spindle with cage on top.

The edge of the shoal on the east side of the harbor east of the breakwater is marked by a buoy (spar, red, No. 4).

1 A. ***Approaching and Entering, from Westward.***—Passing close southward of Succonnesset Shoal Light-vessel steer **E.** ½ **N.** about 2¾ miles; then steer **ENE.** ¼ **E.** and pass at least ¼ mile southward of the bell buoy off Hyannis entrance. When a short distance past the bell buoy, Hyannis Lighthouse and range beacon will be in range; steer for them, course **N.** by **E.** ⅛ **E.**, and follow the directions in section 1, preceding.

Remarks.—On the **E.** ½ **N.** course Eldridge Shoal buoy (spar, black, No. 11) and Horseshoe (NW. part) buoy (spar, black, No. 9) will be left well on the starboard hand and Wreck Shoal buoy (spar, red, No. 16) on the port hand.

On the **ENE.** ¼ **E.** course Point Gammon will be on the port bow and Bishop and Clerks Lighthouse on the starboard bow. About the same time that the bell buoy is made on the port bow, the buoys marking the dangers at the entrance to Centerville Harbor may be seen well northward of the sailing line. When abreast the bell buoy, Hyannis Lighthouse will bear about **NNE.** ¼ **E.**

Dangers.—**Wreck Shoal, Eldridge Shoal, and Horseshoe Shoal** are described on pages 90 and 94.

For dangers entering the harbor see under section 1, foregoing.

CENTERVILLE HARBOR.*

This harbor is a bight in the south shore of Cape Cod, westward of Hyannis Harbor; it is about 2 miles wide, just westward of Hyannis Point. The approach to the anchorage is obstructed by rocks and shoals, through which a buoyed channel, with a depth of 10 feet at low water, leads to the anchorage, which has a depth of 15 to 21 feet and good holding ground. Vessels seldom anchor here for shelter, as the harbor is exposed to southerly winds; the shoals off the entrance somewhat break the force of the seas from southward, but not sufficiently to make it a safe anchorage. The deepest draft entering is about 12 feet.

The village of **Centerville** is some distance inland from the head of the harbor and is of little commercial importance. A church spire in the village is a prominent mark and is used as a guide for entering the harbor.

Pilots are seldom taken to enter, but may be had by making signal while off the entrance.

Ice closes the harbor in winter.

Tides.—The tides are practically the same as in Hyannis Harbor (see table, page 11).

SAILING DIRECTIONS, CENTERVILLE HARBOR.

These directions lead over a least depth of 10 feet. Strangers should not enter except in the daytime with clear weather.

1. ***Approaching and Entering, from Eastward.***—Follow the directions in section 1, page 93, until Hallets Rock buoy (spar, red and black horizontal strips) bears *N.*, distant about 300 yards; then steer **W.** $\frac{3}{4}$ **N.** about $2\frac{5}{8}$ miles, and when Centerville Church spire bears *N.* $\frac{1}{2}$ *W.* steer **N.** by **W.** $\frac{1}{2}$ **W.** and anchor about $\frac{1}{2}$ mile from the shore in 15 to 21 feet water, soft bottom.

Remarks.—See the remarks under section 1, page 93. On the **W.** $\frac{3}{4}$ **N.** course from Hallets Rock buoy the bell buoy off Hyannis Harbor entrance will be left about 300 yards, and Hodges Rock buoy about 400 yards, on the starboard hand. The **tall white church spire** in Centerville will be the most conspicuous landmark westward of Hyannis.

The **N.** by **W.** $\frac{1}{2}$ **W.** course leads eastward of black spar buoy No. 1, and about midway between red spar buoy No. 2 and the red and black horizontally striped spar buoy on Channel Rock. Red spar buoy No. 4 is left on the starboard hand; after passing this buoy the course may be changed a little more northward, but keep westward of red spar buoy No. 6, which will be seen in the northern part of the harbor.

Dangers.—**Hodges Rock** has 6 feet of water over it and lies $2\frac{1}{2}$ miles **WSW.** $\frac{3}{4}$ **W.** from the old tower on Point Gammon; it is marked off its southern side by a buoy (spar, red and black horizontal stripes).

Collier Ledge is awash at half tide and lies near the southern edge of the shoals making southward from the western side of Centerville Harbor; it is marked by a beacon (square wooden beacon with red cubical structure on top) which bears **W.** distant 4 miles from the old tower on Point Gammon.

Gallatin Rock is about 150 yards long in a general **E.** and **W.** direction and has a least depth of 4 feet over it. The rock lies nearly $\frac{3}{4}$ mile **E.** by **S.** from the beacon on Collier Ledge, and is marked off its southern side by a buoy (spar, black, No. 1).

Channel Rock is a small, detached rock with 4 feet of water over it and lies nearly $\frac{3}{4}$ mile **E.** by **N.** from the beacon on Collier Ledge; it is marked by a buoy (spar, red and black horizontal stripes).

Bearse Rock, a small, detached rock with 5 feet of water over it, lies on the eastern side of the channel about 700 yards eastward of Channel Rock; it is marked on its western side by a buoy (spar, red, No. 2).

Gannet Rocks are a detached ledge showing bare at low water and lying a little over $\frac{1}{4}$ mile **W.** by **S.** from Hyannis Point, the eastern point of the bight forming Centerville Harbor.

Gannet (Gurnet) Ledge, a detached spot with 6 feet over it, lying nearly $\frac{5}{8}$ mile **SSW.** from Gannet Rocks, is marked off its western side by a buoy (spar, red, No. 4).

Spindle Rock, showing bare at low water, is near the upper part of the harbor, and 1 mile **S.** by **E.** from the church spire in the village. A buoy (spar, red, No. 6) is placed southward of the rock.

There are two rocks, **Middle Ledge** and **Dead Neck Rock,** with 6 feet of water over them, lying from $\frac{3}{4}$ to 1 mile about **N.** by **E.** from the beacon on Collier Ledge. These are left well on the port hand when following the sailing directions.

*Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **247**, scale $\frac{1}{20,000}$, price $0.25.

1 A. ***Approaching and Entering, from Westward.***—Pass close southward of Succonnesset Shoal Light-vessel and steer **E.** ½ **N.** for 2¾ miles. Then steer **NE.** by **E.** for 3½ miles until the church steeple in Centerville bears **N.** ¼ **W.** Steer for the steeple on this bearing until Gallatin Rock buoy (spar, black, No. 1) is 500 yards distant on the port beam, and then steer **N.** by **W.** ½ **W.** and follow the directions in section 1, foregoing.

See the remarks and dangers under section 1 A, page 99, and section 1, preceding.

COTUIT ANCHORAGE AND COTUIT BAY.*

Cotuit Anchorage, or **Deep Hole,** is a small anchorage with 8 to 10 feet of water between the shoals making off from the shore about 6½ miles westward of Point Gammon. It is seldom used except by local craft, as it is exposed to southerly winds. The channel to the anchorage is marked by several buoys, and vessels of less than 6 feet draft should not experience any difficulty in keeping in the best water.

Cotuit Bay is a shallow body of water making in northward about 7 miles westward of Point Gammon, and northwestward of Cotuit Anchorage. It is used only by small local craft, the depth over the bar at the entrance being about 2½ feet at low water. The post village of **Cotuit** is on the western side of the bay, and the village of **Osterville** on the eastern side near its head. A stranger bound into Cotuit or Osterville bays should anchor at Cotuit Anchorage and take a pilot. Lone Rock buoy (can, red and black horizontal stripes), at the entrance to the channel, lies 7 miles **WNW.** ½ **W.** from Bishop and Clerk's Lighthouse, and **NE.** ¾ **N.** from Succonnesset Shoal Light-vessel.

GENERAL DIRECTIONS, APPROACHING AND ENTERING COTUIT ANCHORAGE.

The harbor is but little used and for the draft of vessels entering there are but few dangers in approaching.

In approaching from eastward give the bell buoy off Hyannis entrance a berth of ¼ mile and steer **W.** by **N.** for 4¼ miles, which will lead to the entrance. Red spar buoy will then be abaft the starboard beam, and Lone Rock buoy (can, red and black horizontal stripes) will be ahead.

When Lone Rock buoy is ⅜ mile distant ahead, steer about **NNW.** ½ **W.**, pass midway between red spar buoy No. 4 and black spar buoy No. 1, and anchor in 10 feet close northward of them, or haul sharply to **N.** by **E.** ¼ **E.** and anchor in 7 to 12 feet when ⅛ to ¼ mile from the shore.

If coming from westward bring Succonnesset Shoal Light-vessel astern while close to it and steer **NNE.**, leaving Succonnesset Shoal buoy (spar, red, No. 18) close-to on the port hand. When ½ mile past the buoy steer **NE.** ¼ **E.** Lone Rock buoy will be made on the port bow and red buoy No. 2 nearly ahead. When ⅜ mile eastward of Lone Rock buoy steer about **NNW.** ½ **W.** and enter as directed above.

FALMOUTH HARBOR.*

This name is applied to the open roadstead on the north shore of Vineyard Sound north of West Chop Lighthouse and about 2¼ miles east of Nobska Point Lighthouse. It is frequently used by large vessels with good ground tackle, who prefer the anchorage here to the one in Vineyard Haven on account of the crowded condition of the latter in bad weather. The anchorage in Falmouth Harbor affords a lee in northerly winds, and in heavy southerly gales the sea is somewhat broken by L'Hommedieu Shoal, so that vessels with good ground tackle can ride out a gale in comparative safety. The bottom is generally sticky and good holding ground, shoaling gradually toward the shore; the depth of water at the anchorage ranges from 4 to 6 fathoms.

Prominent features.—Nobska Point Lighthouse is the principal guide to the anchorage. A noticeable yellow bluff, **Falmouth Heights,** is just eastward of the village of Falmouth and about 2¾ miles **ENE.** from Nobska Point Lighthouse; this bluff, on which are numerous houses and a large hotel with large brown conical tower, is prominent, especially in coming from westward.

*Shown on chart 112, scale $=\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS FOR THE ANCHORAGE OFF FALMOUTH.

From Eastward.—Following the directions in section 2, page 94, when on the **W. ¾ N.** course from Succonnesset Shoal Light-vessel, continue this course until southward of Falmouth Heights; then haul a little northward and anchor in 4 to 5½ fathoms water, soft bottom, about ¾ mile from the beach.

Or, following the directions in section 2, page 90, when West Chop Lighthouse bears *S.* ½ *E.* steer **N.** ½ **W.**, pass 300 yards westward of black can buoy No. 19, and anchor in 4 to 5½ fathoms water about ¾ mile from the beach.

From Westward.—Standing through Vineyard Sound, when Nobska Point Lighthouse bears about *N.*, distant 1 mile, steer about **NE.** so as to leave the lighthouse at least ½ mile on the port hand. Anchor ¾ mile from the beach when the lighthouse is distant from 1 to 2½ miles.

Remarks.—Light-draft vessels can anchor closer to the shore in 15 to 17 feet water. **New Shoal**, which has 16 feet of water over it and lies westward of L'Hommedieu Shoal, is marked off its western end by black can buoy No. 19, which bears about **E. ¾ S.**, distant 2 miles from Nobska Point Lighthouse. In approaching the shore deep-draft vessels should observe the bearing of Nobska Point Lighthouse, and at night, if less than 2 miles eastward of Nobska Point, they should anchor just before Nobska Point Light comes in range with Tarpaulin Cove Light; if over 2 miles eastward of Nobska Point, vessels should keep well southward of this range.

EDGARTOWN HARBOR.*

This harbor is on the northern side of Marthas Vineyard, just westward of Cape Poge; it is divided into the outer and inner harbors, the former being principally used as a harbor of refuge in southerly and easterly winds and as an anchorage for the night. On the western side of the **outer harbor** are numerous rocks and shoals, which are well marked by buoys and a spindle. There is sufficient room eastward of these for a vessel to work to the anchorage. At the head of the outer harbor a narrow arm makes southward into Katama Bay, forming what is known as the **inner harbor**. This affords good anchorage in 3 to 5½ fathoms, but it is very narrow, and the tidal currents have considerable velocity. The bar south of Edgartown Lighthouse has only 15 feet of water over it. Strangers in sailing vessels seldom enter the inner harbor, as a fair wind is necessary to keep in the channel.

Katama Bay is a large, shallow body of water, only used by local fishermen. It has a shallow channel through which the fishing boats put to sea at high water with a smooth sea.

On the western shore of the inner harbor, and a short distance westward of Edgartown Lighthouse, is the town of **Edgartown**, which has a little commerce and a daily steamer to New Bedford. Some of the wharves have 15 feet of water at their outer ends.

Aids to navigation.—**Cape Poge Lighthouse** is the principal guide for the entrance, and **Edgartown Lighthouse** for the anchorage and entering the inner harbor (see table, page 16). The principal dangers are marked by buoys or spindles, and can easily be avoided.

The channel is free from dangers, and has a least width of ⅜ mile and depth of 4 to 6½ fathoms until nearly up to Edgartown Lighthouse; here it narrows and takes a sharp bend westward, with a depth of 15 feet, leading to the wharves of the town. Abreast the town the channel is narrow and has a depth of 4 to 6 fathoms; it then curves southward, its eastern edge marked by two black buoys, until about ½ mile above the upper wharf in the town, where it widens and has a depth of 3½ to 5 fathoms. This depth continues for 1½ miles into Katama Bay, where it gradually shoals.

Anchorages.—In easterly gales good shelter is found westward of Cape Poge, on the eastern side of the outer harbor. In westerly and southerly gales vessels find shelter in the southern end of the outer harbor, with Edgartown Lighthouse bearing between **W.** and **NW.**, distant about ⅜ mile. Vessels should not anchor in the channel abreast the town, where the bottom is hard sand, the channel narrow, and tidal currents strong. Above the town anchorage is found in the channel, south of Middle Ground Shoal, in 3½ to 5 fathoms, sticky bottom.

Pilots are not required for the outer harbor; a stranger of over 12 feet draft should take a pilot if bound into the inner harbor. Pilots will come out to a vessel making signal for one in the outer harbor.

*Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **346**, scale $\frac{1}{20,000}$, price $0.25.

Towboats are not used. A towboat is usually stationed at Vineyard Haven or Woods Hole in the winter and can be sent for by telephone from Edgartown.

Supplies.—Coal, in limited quantity, and water can be obtained alongside the wharf. Provisions and some ship-chandler's stores can be had in the town.

Marine Hospital.—Emergency relief is furnished at Edgartown by the U. S. Public Health and Marine-Hospital Service as for stations of Class IV (see Appendix IV).

Currents.—The tidal currents in the narrow part of the channel, inside Edgartown Lighthouse and off the town, have considerable velocity, but as a rule follow the direction of the channel. When the current turns from **E.** to **W.** in the sound off Edgartown, the southerly current is at its strength in the harbor.

Tidal data is given in the table on page 11.

Ice.—Drift ice from the sound, driven into the entrance by the wind, obstructs the entrance of sailing vessels during a part of the winter. The strong tidal currents keep the inner harbor open except for a few days at a time during severe winters.

SAILING DIRECTIONS, EDGARTOWN HARBOR.

The following sailing directions if closely followed are good for a vessel of 18 feet draft to the anchorage eastward of Edgartown Lighthouse, or for a vessel of 14 feet draft to the town wharves.

1. ***Approaching and Entering, from Eastward.***—Passing 100 to 500 yards northward of Cross Rip Light-vessel, steer **W. ¾ N.**, keeping a high dark water tower on Marthas Vineyard ahead on this course. When Cape Poge Lighthouse bears *S.* by *E.* steer **SW. ½ S.**, with Edgartown Lighthouse ahead. When Cape Poge Lighthouse bears *ESE.* ¼ *E.* and black spar buoy No. 1 is in range with it, steer **SSW. ½ W.**, leaving red spar buoy No. 8 about 300 yards on the starboard hand. Anchor in 23 to 31 feet of water with Edgartown Lighthouse bearing between *W.* and *NW.* and distant not more than ½ nor less than ¼ mile.

If of 14 feet or less draft.—When the buoy (spar, red, No. 10) lying about 350 yards *SE.* by *E.* from the lighthouse is made, haul a little westward and leave it close-to on the starboard hand on a **WNW. ½ W.** course. Continue this course up to the wharves, hauling gradually westward and southward.

At night.—From Cross Rip Light-vessel steer **WNW. ½ W.**, heading for East Chop Light, and when Edgartown Light bears **SW. ½ S.**, steer for it and proceed as directed for the daytime.

Remarks.—The **W. ¾ N.** course leads about ⅝ mile north of black spar buoy No. 15, which marks the shoal making northward from Cape Poge.

On the **SW. ½ S.** course the buoy (spar, black, No. 1), westward of Cape Poge will be left ⅜ mile on the port hand, and a number of red buoys will be seen on the western side of the harbor. Edgartown Lighthouse will be ahead, and the houses of Edgartown will be seen westward of it.

The **SSW. ½ W.** course leads for the anchorage; a buoy (spar, black, No. 3) will be left ⅜ mile on the port hand when Edgartown Lighthouse bears about **SW.** by **W.**

On the **WNW. ½ W.** course red spar buoy No. 10 will be left close-to, and the lighthouse about 150 yards on the starboard hand.

Dangers.—**Cape Poge Flats** extend 1⅝ miles northeastward from Cape Poge and are marked near their outer end by a buoy (spar, black, No. 15), which lies about **NE.** from the lighthouse. Vessels of 14 feet draft or more, should pass northward of the buoy; those of less draft can pass southward of it, but should give Cape Poge a berth of at least ¾ mile.

A shoal, with less than 18 feet, extends nearly ½ mile northwestward of Cape Poge, and its western edge is marked by a buoy (spar, black, No. 1) in 21 feet of water.

Sturgeon Flats, with 6 to 15 feet of water over them, make off about 600 yards from the eastern shore of the outer harbor southward of the narrow entrance to Cape Poge Bay. The western edge of the flats is marked by a buoy (spar, black, No. 3), from which the edge of the flats extend in a general **SW. ½ W.** direction to the head of the outer harbor.

On the western side of the harbor is a shoal which extends 2¾ miles in a **NNE.** direction from Edgartown Lighthouse and the shore just westward of the lighthouse. The northern extremity of this shoal lies about 2 miles **NW. ½ W.** from Cape Poge Lighthouse and is marked by a black bell buoy which is left on the starboard hand by vessels entering the harbor. Just inside of this buoy is a detached spot with only 11 feet over it. The depth on this shoal is very irregular, and there are a number of rocks with from 3 to 5 feet of water over them. **Allen Rock**, the farthest offshore, lies **WNW. ⅝ W.** from Cape Poge Lighthouse and 2 miles **NNE.** from Edgartown Lighthouse, has 4 feet of water over it, and is marked by a buoy (spar, red, No. 2). **Hatsett Rock, Monohansett Rock,** and **Mill Rock,** lying $\frac{3}{16}$ to ½ mile in a general southerly direction from **Allen Rock,** are others of the rocks on this shoal which lie well offshore and which are marked by buoys. The eastern edge of the shoal is marked by a buoy (spar, red, No. 8) lying nearly 1¼ miles **NE. ⅝ N.** from Edgartown Lighthouse. Light-draft steamers running between Edgartown, Cottage City, and points westward, cross this shoal, but strangers should not do so.

1 A. ***Approaching and Entering, from Westward.—I. Passing N. of Squash Meadow,*** make good the course **SE.** by **E.** with Nobska Point Lighthouse bearing directly astern until Cape Poge Lighthouse bears **SSE. ½ E.,** when steer for it on that bearing. When within about 2 miles of Cape Poge Lighthouse, and Edgartown Lighthouse bears *SSW.* ¾ *W.*, steer **SSW.** When about 400 yards eastward of red spar buoy No. 8, steer about **SSW. ½ W.,** and anchor when abreast and eastward of the lighthouse, as directed in section 1.

If desiring to enter the inner harbor proceed as directed under section 1, foregoing.

Remarks.—The **SE.** by **E.** course leads in a nearly parallel direction and about ¾ mile **S.** of Hedge Fence, and the buoy (red and black horizontal stripes) on its western end will be left about ¾ mile on the port hand. When nearing the turn from the **SSE. ½ E.** to the **SSW.** course into the harbor, two 18-foot spots will be left nearly ⅝ mile on the port hand.

On the **SSW.** course into the harbor, the buoys marking Allen Rock, Hatsett Rock, Monohansett Rock, and Mill Rock will be left well on the starboard hand, and red spar buoy No. 8 will be made a little on the starboard bow.

Dangers.—**Hedge Fence** and **Squash Meadow** are described on page 90.

Off the entrance are two **18-foot spots,** one 1¾ miles the other 2⅛ miles **N.** by **W. ⅝ W.** from Cape Poge Lighthouse.

See also dangers under section 1.

II. Passing S. of Squash Meadow.—Pass about ¾ mile east of East Chop Lighthouse, and bring Cape Poge Lighthouse to bear **SE.** and steer for it. Leave the buoy (can, black, No. 21), marking the western end of Squash Meadow, about 300 yards on the port hand, and when Edgartown Lighthouse bears *SW.* by *S.* steer **SSW.** When about 400 yards eastward of red spar buoy No. 8, steer about **SSW. ½ W.,** and anchor when abreast of and eastward of the lighthouse as directed in section 1.

Remarks.—The **SE.** course for Cape Poge Lighthouse leads close northward of the buoy (spar, black, No. 23) off East Chop Flats, and nearly parallel to and about ¼ mile southward of Squash Meadow, the western and eastern ends of which are marked by black can buoys, Nos. 21 and 19 respectively.

After passing East Chop the houses and two landings at Cottage City will be seen. When nearly up to the entrance of the harbor the black bell buoy will be made and it should be left on the starboard hand.

Dangers.—**Squash Meadow** is described on page 90; for other dangers see under section 1, preceding.

VINEYARD HAVEN.*

This harbor is a funnel-shaped bight about 1⅜ miles long in a **NE.** and **SW.** direction and about 1¼ miles wide at the entrance; it is on the northern side of Marthas Vineyard, 12½ miles **WNW. ⅝ W.** from Cross Rip Light-vessel, 6½ miles **NW.** from Cape Poge, and 3¾ miles **SE.** from Nobska Point Lighthouse.

The points at the entrance are **East Chop** and **West Chop,** each marked by a lighthouse (see table, pages 16–18). The harbor is easy of access and is the most important and generally used harbor of refuge for coasters between Provincetown and Narragansett Bay; it is exposed to northeastly winds, but vessels with good

* Shown on charts **112**, scale $\frac{1}{80,000}$, price $0.50; **347**, scale $\frac{1}{10,000}$, price $0.25.

ground tackle can ride out any gale. The greatest danger encountered by vessels at anchor in a northeast gale is from vessels with poor ground tackle, which are likely to drift and foul other vessels and then go ashore. The depth is sufficient for the largest vessels passing through Vineyard Sound; it ranges from 35 feet at the entrance to 15 feet near the head of the harbor. On the west shore, near the head of the harbor, is the town of **Vineyard Haven,** which has a little trade and daily communication by steamer with New Bedford. There is 13 feet of water at the end of the wharf at low water. On the east shore are numerous scattered houses and a wharf with 15 feet of water at its end at low water. A road leads from this wharf to Cottage City, which is an important summer resort.

The channel is unobstructed and the lead will be the best guide in selecting an anchorage. When well inside the entrance the water shoals gradually toward the western shore; toward the eastern shore the water shoals more abruptly and the shore should be given a berth of about 300 yards.

Anchorage.—Vessels anchor, according to draft, anywhere from the points at the entrance to the head of the harbor, the light-draft vessels favoring the western shore.

Pilots.—Coasting vessels do not take a pilot to enter the harbor, as the anchorage can be made without difficulty. Pilotage is compulsory for foreign vessels entering to discharge cargo. Pilots for Vineyard and Nantucket sounds can be obtained at Vineyard Haven.

Towboats.—A towboat will usually be found here in the winter.

Supplies.—Coal, in limited quantity, and fresh water can be obtained alongside the wharf for steamers of 15 feet draft or less; steamers of greater draft can have coal brought alongside in lighters. Provisions and some ship-chandler's stores can be had at Vineyard Haven.

Repairs.—There is one marine railway at Vineyard Haven, capacity about 200 tons, where vessels can be repaired. New Bedford is the nearest place at which repairs to the machinery of steamers can be made.

Storm warning displays are made on a staff near East Chop Lighthouse. For an explanation of the signals see Appendix III.

There is a **U. S. Marine Hospital** at Vineyard Haven to which seamen entitled to hospital treatment are sent. For regulations of the U. S. Public Health and Marine-Hospital Service see Appendix IV.

Currents.—The tidal currents have little velocity in the harbor; care should, however, be taken on the ebb, which sets westward, not to approach too closely to West Chop, as the current there sets on the ledges which make eastward and northward from the point.

Tidal data is given in the table on page 11.

Ice.—Both local and drift ice obstruct the movements of vessels in severe winters and at times entirely close the harbor. Strong northerly winds drive drift ice from Vineyard Sound into the harbor and endanger vessels at anchor.

SAILING DIRECTIONS, VINEYARD HAVEN.

Note.—The currents turn about ½ hour earlier inshore across the entrance of the harbor than in the channel through the sound. Vessels entering the harbor, with a head wind or light breeze at the end of a favorable current through the sound, should stand on in the channel until the harbor is well opened before standing in for the anchorage, so as to clear the points at the entrance.

1. ***Approaching and Entering, from Eastward.***—Steer for West Chop Lighthouse on a **WNW. ⅜ W.** bearing until East Chop Lighthouse bears *S.* by *E.*, and then steer **SW. ½ W.** directly into the harbor. Anchor according to draft, 1 mile to ½ mile from the head of the harbor.

Remarks.—On the **SW. ½ W.** course the eastern shore will be given a berth of about 500 yards until the head of the harbor is approached. A buoy (spar, black, No. 1) will be left about 150 yards on the port hand, and red spar buoy No. 4, near the southern end of the harbor, will be a little on the starboard bow. There is excellent anchorage in 20 to 23 feet of water a little northeastward of this buoy.

Dangers.—**Hedge Fence** and **Squash Meadow,** northeastward and eastward of the entrance, are described on page 90.

East Chop Flats have 8 to 18 feet of water over them and extend a little over ⅜ mile in a northeasterly direction from East Chop, and are marked off their northeastern end by a buoy (spar, black, No. 23).

Canal Flats, with 3 feet of water over them, make off 300 yards from the eastern shore of the harbor, about 1 mile inside of East Chop Lighthouse; their northwestern edge is marked by a buoy (spar, black, No. 1).

1 A. ***Approaching and Entering, from Westward.***—Passing Tarpaulin Cove Lighthouse, bring it to bear *W.* ¼ *S.* astern and steer **E.** ¼ **N.** When East Chop Lighthouse bears **SE.** by **S.**, steer for it until West Chop Lighthouse bears *W.* by *N.*, then steer **SSW.** ¾ **W.** for the anchorage and anchor as directed in section 1, foregoing.

Remarks.—The **E.** ¼ **N.** course leads ⅝ mile northward of the Middle Ground. When West Chop Lighthouse bears about **SE.** ¾ **E.** East Chop Lighthouse will open from behind it. On the **SE.** by **S.** course the buoys marking the shoals off West Chop will be left about ¼ mile on the starboard hand.

On the **SSW.** ¾ **W.** course the wharf on the eastern side of the southern part of the harbor and the Marine Hospital buildings farther back (and quite prominent) will be a little on the starboard bow.

See the note preceding section 1.

Dangers.—The **Middle Ground** westward of West Chop is described on page 91.

Shoals make off ¼ mile northward and eastward from West Chop; the edge of these shoals is marked by two buoys. West Chop buoy (spar, black, No. 25) is colored and numbered for the channel through Vineyard Sound; Low Point Flats buoy (nun, red, No. 2) is a guide for entering the harbor.

Alleghany Rock, with 6 feet of water over it, lies about 650 yards **N.** ¼ **E.** from West Chop Lighthouse, near the edge of the shoals; West Chop buoy is placed just north of the rock. A rock, awash at low water, lies ⅜ mile **SE.** ¾ **E.** from West Chop Lighthouse, near the eastern edge of the shoals, and several sunken rocks and rocks awash at low water lie inshore of it.

See also dangers under section 1, foregoing.

WOODS HOLE.*

This is a narrow passage, between the mainland and the easternmost of the Elizabeth Islands, leading from Vineyard Sound into Buzzards Bay; on its northern side are two coves known respectively as Little Harbor and Great Harbor. Woods Hole is little used as an anchorage on account of the strong tidal currents and the difficulty of entering or leaving except with a fair wind. The entrance from Vineyard Sound is westward of Nobska Point, between it and Nonamesset Island, and is about ⅞ mile wide; the whole of this width is not available as an entrance for vessels, as numerous rocks and shoals make out from both shores and lie in the middle of the entrance, leaving two narrow, buoyed channels. The passage through into Buzzards Bay is very narrow and has a depth of 9 feet. Although it is well marked by buoys, the tidal currents are so strong as to make even the passage of steamers dangerous without some local knowledge; the buoys in the narrowest parts of the channel are sometimes dragged under by the currents at strength. A stranger should not attempt to pass through without a pilot.

Little Harbor is the easternmost of the two coves in the north shore of the passage; it has a small anchorage with 9 to 12 feet water. A channel 130 feet wide and 10 feet deep was dredged to the anchorage and to the wharf of the lighthouse depot, which is on the western side of the cove, but the best depth is about 9 feet at low water. The village of Woods Hole is at the head of the cove and along the eastern shore of Great Harbor.

Great Harbor is about ½ mile long **NW.** and **SE.**, and nearly ¼ mile wide; its depth is irregular, ranging from 3½ to 12 fathoms in the channel, and the holding ground is mostly poor. On the eastern side of the harbor is the wharf and depot of the New York, New Haven and Hartford Railroad, and above this is the wharf, basin, and large buildings of the **U. S. Fish Commission**, which are prominent when entering from southward.

Channel.—The channel from Great Harbor to Buzzards Bay has a narrow but straight reach (the northern) at its eastern end and a broader reach (the southern), necessitating a sharp turn. The straight reach should be given the preference on account of the difficulty of handling a vessel in the strong currents.

Storm warning displays of the U. S. Weather Bureau are made on Nobska Point, near the lighthouse. (See Appendix III.)

A **time ball** is dropped daily, Sunday excepted, on a staff on the tower at the Fish Commission buildings, at 12 h. 00 m. 00 sec. of 75th meridian time, 5 h. 00 m. 00 sec. Greenwich mean time. This time signal can be seen by vessels at anchor in Great Harbor.

Tidal data is given in the table on page 11.

Currents.—The currents in the passage through Woods Hole have a greatest velocity of 5 miles during neap and 8 miles during spring tides and are somewhat influenced by the wind. Slack water is of short duration, and the current from Vineyard Sound into Buzzards Bay (west current) begins to run about 45 minutes before high water at Boston. The average duration of the west current is 5 h. 53 m. and of the east current 6 h. 32 m. These times are subject to a variation of as much as one hour, due principally to the wind.

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50; **348**, scale $\frac{1}{10,000}$, price $0.25.

In the upper part of Great Harbor, near the Fish Commission wharf, the currents are barely perceptible and vessels at anchor lie head to the wind.

The mean rise and fall of tides in the passage is 2¼ feet.

Ice.—The strong tidal currents usually keep the harbor open. Drift ice is brought through from Buzzards Bay, but seldom interferes with navigation, except in unusually severe winters, when it may close the entrance from that bay.

SAILING DIRECTIONS, WOODS HOLE TO AN ANCHORAGE IN GREAT HARBOR.

The directions in sections 1 and 1 A, if closely followed, will carry a least depth of over 3 fathoms at low water. Strangers should not attempt to enter except in the daytime with clear weather.

1. ***Approaching and Entering, from Eastward.***—Steer so as to pass about ½ mile southward of Nobska Point Lighthouse, and close to the red bell buoy off the point. Then steer **WNW. ¼ W.** until Woods Hole is opened, and the cupola of the Fish Commission building bears **N.**; steer for the cupola and keep it on that bearing. The black gas-lighted buoy at the entrance will be left about 120 yards on the port hand, red spar buoy No. 2 about 75 yards on the starboard hand, and red spar buoy No. 4 nearly 300 yards, and red spar buoy No. 6 about 50 yards, on the starboard hand.

When red spar buoy No. 6 is on the quarter, steer about **NNW. ¼ W.**, and leave the end of the Fish Commission wharf 75 yards on the starboard hand. Anchor 200 yards northwestward of the Fish Commission wharf in 5 to 8 fathoms.

Vessels of 7 feet or less draft may pass 300 yards south of Nobska Point, and steer **NW.** by **W. ¼ W.**, so as to pass about 200 yards south of Parkers Neck, leaving Coffin Rock and Great Ledge buoys well on the port hand and red spar buoy No. 4, off Parkers Neck, about 50 yards on the starboard hand. When the end of the railroad wharf shows well clear of the western shore of Parkers Neck, steer **N.** by **W. ¼ W.**, heading for the end of the Fish Commission wharf, and so as to leave red spar buoy No. 6 about 50 yards on the starboard hand. Give the end of the wharf a berth of 75 yards, and anchor 200 yards northwestward of it in 5 to 8 fathoms.

Remarks.—Passing south of Nobska Point, the bell buoy southward of the point can be left on either hand. When westward of the point a lookout should be kept for the black gas-lighted buoy on the western side of the entrance and the red spar buoy eastward of it. When between these buoys and steering **N.** for the Fish Commission building, the railroad wharf will be on the starboard bow, and red spar buoy No. 6 will be made a little on the starboard bow. On the port bow several buoys and a spindle, marking the two channels of the passage into Buzzards Bay, will be seen. The current from Buzzards Bay has a tendency to set vessels eastward.

On the **NNW. ¼ W.** course black spar buoy No. 3 is left on the port hand. Care must be taken to give the end of the Fish Commission wharf a good berth when the current is setting eastward through the passage and on to the end of the wharf. There is very little current northward and northwestward of the wharf, and vessels at the anchorage usually swing with the wind.

Dangers.—**Ledges**, showing partly bare at low water, make out 150 yards southward and southwestward from Nobska Point.

Coffin Rock, a small, detached rock with 5½ feet water over it, lies ⅝ mile **WSW.** from Nobska Point Lighthouse and is marked off its southeastern side by a buoy (spar, black, No. 1).

Great Ledge, with 1½ to 9 feet water over it, is about 200 yards in diameter and lies nearly ⅝ mile **W. ¾ S.** from Nobska Point Lighthouse. It is marked off its southwestern end by a buoy (spar, red, No. 2).

There is a **small spot**, with 11 feet water over it, about 175 yards **SW.** by **S.** from the buoy on Coffin Rock.

Nonamesset Shoal has depths of 10 to 16 feet over it and makes out ¼ mile eastward from the island on the western side of the entrance to Great Harbor. The southeastern end of the shoal is marked by a buoy (black, gas-lighted).

Parker Flats make off 200 yards from the shore southward of the railroad wharf and are marked off their western edge by a buoy (spar, red, No. 6).

Red Ledge and **Grassy Island** lie on the western side of the harbor opposite Parker Flats. The passage known as "**Lone Rock Passage**" leads between these dangers and is marked by a spindle and two buoys. The northern

end of the ledges surrounding Grassy Island is marked by a buoy (spar, black, No. 3). The channel to the anchorage in Great Harbor leads between this buoy and the end of the Fish Commission wharf.

The northwestern end of the harbor is shoal, with depths of 5 to 9 feet.

1 A. ***Approaching and Entering, from Westward.***—When abreast of Tarpaulin Cove Lighthouse, steer for Nobska Point Lighthouse, course about **NE.** by **E.** ½ **E.** When about 1 mile distant from Nobska Point Lighthouse watch the bearing of the cupola on the Fish Commission building and when it bears **N.** steer for it, passing midway between the black gas-lighted buoy and red spar buoy No. 2. Leave red spar buoy No. 6, which should be made on the starboard bow, about 50 yards on the starboard hand, and proceed as directed in section 1, foregoing.

Remarks.—When standing for Nobska Point Lighthouse, there are no dangers to look out for until up to Nonamesset Shoal; the shore of the islands should be given a berth of ¼ mile.

See the remarks and dangers under section 1, foregoing.

GENERAL DIRECTIONS, FROM GREAT HARBOR TO BUZZARDS BAY.

These directions are for small steamers of less than 9 feet draft, with sufficient power to be handled in strong currents.

Following the directions for entering Great Harbor, when the vessel is nearly up to Parker Flats buoy (spar, red, No. 6) a red spar buoy and a black spar buoy will be seen on the port beam, the red buoy being just southward of an iron spindle with a lantern. Turn sharply westward so as to pass midway between these buoys on a **W.** course, heading so as to leave a black nun buoy (No. 1) about 20 yards on the port hand; continue the **W.** course and leave a black spar buoy (just north of a spindle with two lanterns) about 25 yards on the port hand.

When the latter buoy is 200 yards distant on the port quarter, steer **NW.** by **W.** ¾ **W.** for the north end of Uncatena Island, and when the western tangent of Long Neck (the land on the starboard hand) bears abeam (*NNE.* ¼ *E.*), and red spar buoy No. 4 is in range with this tangent, steer **N.** by **W.** ½ **W.** and leave black spar buoy No. 5 about 250 yards on the port hand. Having stood nearly ¾ mile on the **N.** by **W.** ½ **W.** course; then—

Bound up Buzzards Bay or to Wareham, steer **N.** by **E.** ⅛ **E.** about 8 miles and follow the directions under those headings.

Bound to Mattapoisett, continue the **N.** by **W.** ½ **W.** course 6 miles, and follow the directions for Mattapoisett Harbor.

Bound to New Bedford, steer **NW.** by **W.** ¾ **W.** so as to pass ¼ mile north of Weepecket Rock and the buoy marking it. Continue on the **NW.** by **W.** ¾ **W.** course a total distance of about 7⅝ miles until up to the bell buoy off Mosher Ledge, and then follow the directions for New Bedford Harbor under that heading.

TARPAULIN COVE*

is a small bight in the south shore of Naushon Island, about 5 miles **WSW.** ¼ **W.** from Nobska Point Lighthouse; it affords shelter from northerly and northwesterly winds and is frequently used as an anchorage by vessels headed off by the wind or meeting a strong head tide, or as an anchorage for the night when passing through Vineyard Sound. The depth at the entrance is about 5 fathoms, and inside it is 15 to 18 feet, decreasing gradually toward the head of the cove; the bottom is good holding ground. The western point at the entrance is marked by **Tarpaulin Cove Lighthouse** (see table, page 18), and two buoys are placed to guide clear of rocks near the western shore of the cove.

Storm warning displays of the U. S. Weather Bureau are made at Tarpaulin Cove; for explanation of their meaning see Appendix III.

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50.

SAILING DIRECTIONS TO AN ANCHORAGE IN TARPAULIN COVE.

Good anchorage in 14 feet water can be found in the cove with Tarpaulin Cove Lighthouse bearing southward of *SW*. Deep-draft vessels should anchor with the lighthouse bearing westward of *SW*.

1. ***Approaching and Entering, from Eastward.***—When passing West Chop give it a berth of 1 mile and steer about **W.** As soon as Tarpaulin Cove Lighthouse is made steer for it, keeping it bearing southward of **W.** so as to clear the Middle Ground, and give the northern shore of the sound a berth of at least ¼ mile. When a little more than ½ mile distant from Tarpaulin Cove Lighthouse haul a little northward and anchor according to draft, giving the shores a berth of at least 250 yards.

Dangers.—Both shores should be given a berth of at least 150 yards when entering, as rocks and bowlders lie nearly that distance from shore.

Cove Rock lies nearly 300 yards **NE.** by **E.** ½ **E.** of Tarpaulin Cove Lighthouse, and is marked off its southern side by a buoy (spar, black, No. 1).

A rock, with only 1 foot over it at low water and 7 to 9 feet around it, lies 300 yards **NE.** ½ **N.** from Tarpaulin Cove Lighthouse, and about 80 yards from shore.

Single Rock, with 8 feet over it at low water, in a surrounding depth of 12 to 13 feet, lies 700 yards **N.** ½ **E.** from Tarpaulin Cove Lighthouse, and is marked off its southeastern side by a buoy (spar, red and black horizontal stripes.

1 A. ***Approaching and Entering, from Westward.***—Stand eastward, keeping Gay Head Lighthouse bearing southward of **SW.** to clear Lucas Shoal, and give the northern shore of the sound a berth of ⅜ mile until past Robinsons Hole. When Tarpaulin Cove Lighthouse is made, steer so as to give the shore southward and eastward of it a berth of at least ¼ mile, and then haul northward; stand in and anchor according to draft.

At night vessels should steer **NE.** by **E.** ½ **E.** for Nobska Point Light, until Tarpaulin Cove Light is made.

Remarks.—Tarpaulin Cove Light is shut in by the trees southwestward of it, and can not be seen at night until it bears about **NE.**

ROBINSONS HOLE AND QUICKS HOLE.*

Robinsons Hole is a narrow passage from Vineyard Sound to Buzzards Bay, leading between Naushon Island and Pasque Island; the southern entrance lies 2¼ miles westward of Tarpaulin Cove. This passage is buoyed and deep, but is narrow, full of rocks and ledges, has strong tidal currents, and should never be attempted by a stranger; local fishermen sometimes pass through it.

Quicks Hole, leading between Pasque Island on the east and Nashawena Island on the west, is the only passage from Vineyard Sound into Buzzards Bay eastward of Cuttyhunk available for a stranger of 9 feet or more draft. It lies about 4 miles westward of Tarpaulin Cove and is about ⅜ mile wide, with a clearly defined entrance which bears **N.** ¼ **E.** from Gay Head Lighthouse. The channel is nearly straight, has a width of 700 yards, and is marked by buoys. The general depth is over 5 fathoms, but there are several spots with 18 feet over them, and a number with depths of 24 to 27 feet. Vessels seeking shelter in strong westerly gales sometimes anchor in Quicks Hole, toward the western side of the passage and about ¼ mile WSW. from Quicks Hole Ledge buoy.

The **tidal currents** have considerable velocity, and a sailing vessel should not attempt to pass through unless with a strong favorable wind or a favorable current. When the current is setting westward through Vineyard Sound it is setting north through Quicks Hole, and vice versa. Strong winds affect the regularity of the currents.

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*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50; **345**, scale $\frac{1}{10,000}$, price $0.25.

SAILING DIRECTIONS, QUICKS HOLE.

Strangers should not attempt to pass through Quicks Hole at night. The following directions, if closely followed, lead in the best water and are good for a draft of 26 feet.

1. ***Passing through from Southward.***—Standing through Vineyard Sound, when Gay Head Lighthouse bears *S.* ¾ *W.* the entrance will be fairly opened. Steer northward so as to enter about midway between Pasque and Nashawena islands, and when nearly ⅝ mile eastward of the black bell buoy at the entrance, bring *North Rock* (the small, bare rock about 100 yards off the northeastern point of Nashawena Island) to bear **NNW.** ¼ **W.** and steer for the rock on this bearing. Leave Nashawena Flats buoy (spar, black, No. 1) about ¼ mile on the port hand, and when the tangents of the southern points of Pasque Island are in range, bearing *E.* ½ *S.*, steer **N.** ¼ **W.** so as to leave Quicks Hole Ledge buoy (nun, red, No. 2) about 100 yards on the starboard hand. Continue on this course until North Rock bears *W.*, and then steer **N.** by **E.** ¼ **E.** into Buzzards Bay, leaving Lone Rock buoy (nun, red and black horizontal stripes) about ¼ mile on the port hand.

Vessels of less than 20 feet draft.—A black bell buoy lies off the entrance about ½ mile *SE.* by *S.* from the southeastern end of Nashawena Island; a **N.** course made good from this buoy will lead close westward of red nun buoy No. 2 and about 350 yards eastward of Lone Rock buoy.

Remarks and dangers.—The tidal currents have considerable velocity, and deep-draft vessels must be careful not to be set off the courses. There are a number of detached 18-foot spots in the passage, but these are avoided by closely following the directions which lead eastward of them.

Nashawena Flats, with 7 to 12 over them, make off ¼ mile in a **SE.** direction from the southeast point of Nashawena Island, and are marked at their end by a buoy (spar, black, No. 1).

Quicks Hole Ledge is the extensive shoal, with bowlders, which makes off ¼ mile from the western shore of Pasque Island. Near its western edge are a number of spots with 4 feet over them, and just westward of these the edge of the shoal is marked by a buoy (nun, red, No. 2).

A **small 18-foot spot** lies ¼ mile from the eastern shore of Nashawena Island, and a little over ¼ mile **SSW.** from red nun buoy No. 2.

Felix Ledge consists of several spots with 18 feet over them, lying nearly ¼ mile from the eastern shore of Nashawena Island and ¼ mile **NW.** from red nun buoy No. 2.

Shoals make off for a distance of 350 yards from the eastern shore of Nashawena Island.

Lone Rock has 6 feet over it, and lies nearly ¾ mile **N.** by **E.** ¾ **E.** from the northeast point of Nashawena Island. A buoy (nun, red and black horizontal stripes) is placed off the north side of this rock, and there is foul bottom with depths of 15 to 23 feet for a distance of ¼ mile southward of this buoy. In 1903 a bell buoy temporarily marks Lone Rock.

1 A. ***Passing through from Northward.***—When 1 mile or more north of the entrance, and Gay Head Lighthouse can be seen in the middle of the opening between Pasque and Nashawena Islands, steer **S.** ½ **W.**, taking care to pass nearly ¼ mile eastward of Lone Rock buoy, and heading so as to pass 100 yards westward of red nun buoy No. 2. When the latter buoy is abeam, steer **S.** by **E.** and leave black spar buoy No. 1 and the black bell buoy about 350 yards on the starboard hand.

Remarks and dangers.—Approaching from northward care must be taken to avoid Lone Rock.

On the **S.** ½ **W.** course Gay Head Lighthouse will be ahead, and the southeastern point of Nashawena Island a little on the starboard bow. Pasque Island, on the port hand, should not be approached closer than ¼ mile, and the red nun buoy should be made on the port bow.

On the **S.** by **E.** course black spar buoy No. 1 and the black bell buoy should be on the starboard bow and be left well on the starboard hand.

See also the remarks and dangers under section 1, preceding.

BUZZARDS BAY*

indents the south shore of Massachusetts in a general **NE.** direction north of the Elizabeth Islands, the latter separating the bay from Vineyard Sound. The shores are irregular, being broken by bays and rivers, which, with the exception of New Bedford Harbor and Wareham River, are of little importance. The general character of the shore is rocky; large bowlders are a prominent feature, and in some places extend out some distance into the bay, rendering close approach to the shore dangerous.

The bay has deep water as far as Wings Neck Lighthouse, above which it is full of shoals. The entrances to the harbors are more or less obstructed by shoals and dangerous ledges, but the channels are marked by buoys or other aids.

There are four entrances to the bay, two of which, the main entrance and Quicks Hole, are used by sailing vessels. Woods Hole, Robinsons Hole, and Quicks Hole, the entrances from Vineyard Sound, are described on pages 106–110.

The western and main entrance is northward of Cuttyhunk Island, between it and Gooseberry Neck. Between these points it is about 5½ miles wide, but the ledge making westward from Cuttyhunk and another making southward from Gooseberry Neck leave an available width of 4¼ miles. The bottom in this entrance is irregular and rocky; spots with 3¾ to 5¾ fathoms (on which the sea breaks in heavy southwest gales), surrounded by deeper water, lie between Cuttyhunk and Old Cock Spindle, off Gooseberry Neck, so that extra caution is necessary for vessels of 22 feet or more draft when entering the bay. Cuttyhunk Lighthouse and Hen and Chickens Light-vessel are the guides for entering, and Gay Head Lighthouse and Vineyard Sound Light-vessel serve as guides for vessels approaching from southward.

New Bedford Harbor, Clark Cove, Apponaganset Bay, Mattapoisett Harbor, Sippican Harbor, Pocasset Harbor, Wareham River, and the extreme northeastern end of the bay are described under separate headings.

Cataumet, Wild, Hog Island, and Quamquisset harbors are small and shallow indentations along the eastern shore of Buzzards Bay, their relative positions being in the order named, beginning with the most northerly, which is about 8 miles northeastward of the northern entrance to Woods Hole. They are only available for small craft in the daytime, and are of no commercial importance. At mean low water 8½ feet may be taken into Cataumet Harbor, while the depth in the channels to the others varies from 5 to 7 feet at mean low water. The dangers in Cataumet and Quamquisset harbors are buoyed in accordance with the general system of buoyage in United States waters.

Pilots for Buzzards Bay and for many of its harbors can be had at Cuttyhunk or off the entrance of the harbor to which the vessel is bound. Pilotage is compulsory for certain vessels (see pilot laws in Appendix II).

Tides.—Tidal data for different points in the bay is given in the table on page 11.

Tidal currents at the entrance of the bay have considerable velocity at times when they are influenced by the winds. In the passages from the bay to Vineyard Sound the currents have great velocity, and require special attention.

Ice.—The head of the bay and the harbors in its vicinity are generally closed to navigation during the winter months, and the approaches to the harbors on the eastern shore are rendered dangerous by drift ice, which in severe winters extends across the bay and joins the local formations on the western shore, thus forming an impassable barrier. In the severe winter of 1874–75 the whole bay was closed during the greater part of the month of February as far down as a line from Dumpling Rock Lighthouse to Cuttyhunk Island. It forms more rapidly in the bay with the wind from **N.** to **W.** Under ordinary circumstances a **NE.** wind, if continued for 48 hours, will clear the bay of ice. Southerly winds, especially southeasters, diminish the extent and weaken the strength of the pack. The ice does not usually affect the positions of the spar buoys in the bay, but the light-vessels, and even the buoys, are sometimes carried away by unusually heavy floes.

In New Bedford Harbor steamers can generally make their way in and out during the winter, but sailing vessels require the assistance of a powerful towboat to break the ice. During very severe winters, however, the harbor is at times entirely closed to all navigation. Ice forms rapidly in calms or light winds from **N.** to **W.**, and strong winds from **N.** to **NE.** break it up and carry it off.

SAILING DIRECTIONS, BUZZARDS BAY TO WINGS NECK LIGHTHOUSE.

A draft of 20 feet can be taken up to abreast Wings Neck Lighthouse by following the directions in section 1 A or 1 B. By closely following the directions in section 1 B the

* Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50. The western entrance is shown on chart **113**, scale $\frac{1}{80,000}$, price $0.50. See also footnote on page 9.

deepest-draft vessels can be taken into the bay a distance of 14 miles above Cuttyhunk Island. See the remarks on approaching Vineyard Sound, Buzzards Bay, or Narragansett Bay from sea, page 28.

1. ***From Woods Hole.***—Having passed through Woods Hole, as directed on page 108, when Naushon Point Shoal buoy (spar, black, No. 5) bears on the port beam, distant about 100 yards, steer **N.** by **E.** ⅛ **E.** about 9¼ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1⅝ miles.

Remarks and dangers.—Having stood on this course about 7 miles, Cataumet Harbor will be open on the starboard hand. The sailing line passes about 1¼ miles westward of the buoys marking Southwest Ledge, the shoals between the entrances to Cataumet and Pocasset harbors, and nearly 1 mile eastward of Bird Island Lighthouse. To avoid the ledges making off from the eastern shore it should be given a berth of at least 1 mile.

There is a **rocky spot** with 17 and 18 feet over it, lying about 1⅛ miles **W.** ⅛ **N.** from Nyes Neck, the point at the southern side of the entrance to Cataumet Harbor.

Cleveland Ledge is a small, rocky spot with 16 feet of water, lying 2¼ miles **W.** ⅝ **N.** from Nyes Neck.

1 A. ***From Quicks Hole.***—Having passed through Quicks Hole from Vineyard Sound as directed on page 110, when Lone Rock buoy (nun, red and black horizontal stripes) is on the port beam, distant about 350 to 500 yards, steer **NE.** ⅝ **N.** about 14¾ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1¼ miles.

Remarks.—This course leads clear of all dangers and nearly in the middle of the bay; having stood on it about 10 miles Mattapoisett Harbor will be off the port beam, and having stood on 2¾ miles farther, Sippican Harbor will be open forward of the port beam. Bird Island Lighthouse should be left about ¾ mile on the port hand. **Tempes Knob,** a high, wooded hill at the head of the bay, will be a very little on the port bow.

1 B. ***From Hen and Chickens Light-vessel.***—*I. Vessels of more than 22 feet draft.*—Vessels when southward of Hen and Chickens Light-vessel should head for it on any bearing between **N.** ½ **W.** through *N.* to **NE.** ½ **N.**

Vessels when westward of Hen and Chickens Light-vessel should bring it to bear between **E.** ¼ **S.** and **E.** ½ **S.** and steer for it between these bearings.

Give the light-vessel a berth of about ¼ mile, and bring it to bear *S.*, distant ⅜ mile; then make good an **E.** by **N.** course for 9¼ miles. The old white light-tower on Clark Point should then bear *NNW.*, distant 5½ miles, and Dumpling Rock Lighthouse bear *NW.* by *W.* ¼ *W.*, distant 4¼ miles. From this position a **NE.** by **E.** course for a distance of 8 miles will lead in a depth of over 6 fathoms.

Remarks and dangers.—Soundings of 5 and 5¼ fathoms are found from 1½ to ¾ mile southwestward of Hen and Chickens Light-vessel, and these are avoided by standing for the light-vessel on the bearings given above. There is a black whistling buoy ¾ mile **SW.** by **W.** ⅝ **W.** from the light-vessel. When the vessel is ⅝ mile **N.** of the light-vessel, Hen and Chickens buoy (spar, black, No. 1) will be about ⅜ mile distant to the northwestward, and Old Cock spindle will be seen ¼ mile northwestward of the buoy.

Sow and Pigs Reef, with spots showing bare at low water, extends 1⅝ miles in a general **WSW.** ¼ **W.** direction from the western end of Cuttyhunk Island. The western end of the reef is marked by a buoy (nun, red, No. 2, with "S. & P." on side).

Hen and Chickens is the ledge making off nearly 1½ miles southward from **Gooseberry Neck,** the point on the northern shore at the entrance to Buzzards Bay northward of Hen and Chickens Light-vessel. It has a number of spots with 4 to 9 feet over them, and near the southern end are several rocks which show bare at half tide. **Old Cock,** one of these rocks, is 3 feet out at low water and marked by a spindle (black, openwork cage on top). The southernmost end of the ledge is marked by a buoy (spar, black, No. 1) which lies about ¾ mile **NNW.** ½ **W.** from Hen and Chickens Light-vessel.

On the **E.** by **N.** course Mishaum Ledge bell buoy (black) should be left a little over ¼ mile on the port beam. Dumpling Rock Lighthouse should be 2¾ miles distant when it is abeam, and Wilkes Ledge buoy (can, red and black horizontal stripes) should then be about 1 mile distant and nearly in range with the lighthouse. Care should be taken not to be set northward on this course.

Ribbon Reef is a small, detached ledge with 18 feet over it, lying 1½ miles **NW. ⅝ N.** from Cuttyhunk Lighthouse. It is surrounded by deep water and marked off its northern side by a buoy (nun, red and black horizontal stripes). About 1¼ miles **N.** from Ribbon Reef is a detached spot with 25 feet over it, on which the sea breaks in heavy southwest gales. It lies about 1⅝ miles **E. ¾ S.** from Hen and Chickens Light-vessel.

Mishaum Ledge is a number of shoal, rocky spots, one of which has a depth of 8 feet over it. The ledge lies 1½ miles off the northern shore and about 3 miles eastward of Gooseberry Neck; it is marked off its southeastern end by a black bell buoy. Strangers should pass southward of this buoy.

There is a detached rock with 23 feet over it lying nearly 1 mile **NW.** by **N.** from the northern end of Penikese Island, and another detached rocky spot with 18 feet over it about ½ mile **N.** by **E.** from the northern end of the island. The channel between the northernmost of these rocks and Mishaum Ledge is about 1½ miles wide.

Wilkes Ledge is a detached, rocky spot about ⅜ mile in diameter, with less than 24 feet over it, and a least depth of 9 feet; it lies 1¾ miles **S. ½ E.** from Dumpling Rock Lighthouse. It is marked off its southern side by a buoy (can, red and black horizontal stripes).

II. Vessels of 22 feet or less draft.—Steer for Hen and Chickens Light-vessel, keeping it bearing between **E. ½ S.** through *E.* and *N.* to **N.** by **W. ½ W.** Leave the light-vessel on either hand, bring it to bear *WSW.* ½ *W.* astern, and steer **ENE. ½ E.**, keeping the bearing. Continue on this course about 11½ miles, passing ⅝ mile south of the bell buoy off Mishaum Ledge and Wilkes Ledge buoy, and 1¾ miles *S.* of West Island Shoal buoy. When Clark Point old light-tower bears *NW.*, steer **NE. ⅜ N.** about 9½ miles. Wings Neck Lighthouse should then bear *E.* by *S.*, distant 1¼ miles.

Remarks.—If passing northward of Hen and Chicken Light-vessel, give it a berth of less than ½ mile. When about 5 miles eastward of the light-vessel on the **ENE. ½ E.** course, Dumpling Rock Lighthouse will bear about **N.** by **E.**, distant 2½ miles. The entrance to New Bedford Harbor will be left on the port hand and the old white tower on Clark Point will be seen. The large black can buoy off West Island Shoal can be seen a long distance. The **NE. ⅜ N.** course leads well clear of all dangers and about ¾ mile eastward of Bird Island Lighthouse.

NEW BEDFORD HARBOR.*

This harbor lies on the northwestern side of Buzzards Bay, and is the approach to the city of **New Bedford** and the towns of **Fairhaven** and **Acushnet**. The approach from Buzzards Bay and the entrance to the harbor are much obstructed by ledges and shoals. These, however, are well marked by buoys and other aids, so that in the daytime with clear weather no difficulty should be experienced in entering if assisted by the chart or sailing directions. Sailing vessels should not attempt to beat into the harbor unless well acquainted with the dangers. The approach between Sconticut Neck on the east and **Dumpling Rock Lighthouse** on the west is nearly 4 miles wide, and also serves as the approach to Apponaganset Bay and Clark Cove. The entrance to the harbor on its western side is marked by **Butler Flats Lighthouse** (see table, page 18), and 1¼ miles **N.** by **W. ¼ W.** from this by **Palmer Island Lighthouse**; on its eastern side are extensive shoals, which are marked by a large white stone beacon.

The channel, for a distance of ½ mile south of Palmer Island Lighthouse to the anchorage off New Bedford, is comparatively narrow, but is well marked by buoys and a range. At the head of the harbor, crossing the mouth of the Acushnet River, is a bridge with a draw, east of Fish Island, 100 feet wide in the clear. The principal water-borne trade of New Bedford is coal, cotton, and whale oil, and the greatest draft of vessels entering the inner harbor is about 21 feet. There is 16 to 22 feet of water alongside the wharves, according to location. The greatest draft taken up to Wamsutta Mills is about 14 feet at high water.

Channels.—The channel from the deep water off Clark Point to the wharves at the city of New Bedford has been improved, under the supervision of the U. S. Army Engineers, and a channel 18 feet deep and 200 to 250 feet wide leads up to the city wharves and through the draw of the Fairhaven bridge to the wharves on Fish Island. There are several channels leading up to Clark Point between the ledges which are described in connection with the sailing directions.

Ranges.—*Eastern channel ranges.*—Egg Island beacon (granite cone, spindle and vane on top), bearing **N. ¾ W.**, and in range with Rodgers House (a large white building with small black-topped cupola, in Fairhaven), will lead in a least depth of 30 feet until abreast Packet Rock. Egg Island beacon, bearing **N. ¼ W.**, and in range with Rodgers School (large red building with pointed red cupola, in Fairhaven), will lead in a least depth of 30 feet, but between Brooklyn Rock and the 18-foot spot east of North Ledge. Eastern Channel

*Shown on charts **112**, scale $\frac{1}{30,000}$; **249**, scale $\frac{1}{40,000}$; **252**, scale $\frac{1}{20,000}$, price of each $0.50.

Range beacon (a white pyramidal beacon on the beach south of Rodgers House) bearing **N. ½ W.** Westerly, and in range with a low, dark, flat-topped church tower with pointed corners, in Fairhaven, will lead close to Brooklyn Rock, and is not safe for vessels of over 16 feet draft. The range for entering at night is Palmer Island light, showing just clear eastward of Butler Flats Light, which leads 300 yards eastward of Hursell Rock buoy and 250 yards westward of Henrietta Rock buoy and up to the anchorage south of Butler Flats Light. This range (if visible) may be used in the daytime, carrying a least depth of 26 feet from Hursell Rock to the anchorage.

Middle channel ranges.—Egg Island beacon, bearing **N.** by **E. ⅛ E.**, and in range with the large, high, water tower in Fairhaven, will carry a least depth of 23 feet until nearly up to Clark Point. The old white light-tower on Clark Point, bearing **N.** by **E. ½ E.**, and in range with Rodgers House (large white building with small black-topped cupola, in Fairhaven), leads in a least depth of 24 feet until nearly up to Clark Point.

Inner harbor range.—Palmer Island Lighthouse, in range with the square tower on Wamsutta Mills (nearly over the middle of the draw in Fairhaven bridge), leads from abreast Butler Flats into the dredged channel eastward of Palmer Island, and carries a least depth of 18 feet; at night a white electric light is shown on the corner of the tower.

Anchorages.—The anchorage in what is known as the outer harbor, eastward and southward of Clark Point, has depths of 4 to 5 fathoms, but is exposed to southerly winds. The anchorage above Palmer Island has a limited area with a depth of about 23 feet, known as Deep Hole; the remainder has depths from 8 to 15 feet. This anchorage is well sheltered and has good holding ground. Light-draft vessels can anchor on the western side of the harbor, giving the wharves a berth of about 150 yards.

Pilots are generally taken by large vessels, and may be had by signaling off Cuttyhunk Lighthouse. In good weather pilots may board incoming vessels as far south as No Mans Land. For pilot laws and rates see Appendix II.

Towboats are generally taken by sailing vessels wishing to enter the inner harbor, and will come out to a vessel making the signal. A lookout for incoming vessels is kept by the towboat captains when they are not cruising.

Harbor regulations for the port are enforced by the harbor master, and are contained in the extracts from the laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix II.

Quarantine regulations.—See Appendix II.

Marine Hospital.—Relief is furnished at New Bedford as provided in the U. S. Public Health and Marine-Hospital Service regulations for stations of Class III (see Appendix IV). The nearest marine hospital is at Vineyard Haven.

Supplies.—Coal in unlimited quantities, water, and ship's stores may be obtained and will be put on board either at the wharves or anchorage.

Repairs.—At Fairhaven there is a marine railway by which vessels of 600 tons may be hauled out.

Storm warning displays of the U. S. Weather Bureau are made from a staff on one of the coal pockets of the Philadelphia and Reading Coal and Iron Company. An explanation of the use and meaning of these signals is given in Appendix III.

Ice.—See page 111.

Tides.—The mean rise and fall of tides is 4.2 feet (see also table on page 11).

SAILING DIRECTIONS, NEW BEDFORD HARBOR.

The following directions are good for the draft indicated, but clear weather is necessary for a stranger who should be able to see the aids when entering. The ranges (see "Ranges" in the general description preceding), when they can be seen, will be of great assistance when entering by the Eastern or Middle channels. The directions for the inner harbor are good for a draft of 17 feet; strangers of deeper draft should take a pilot, or, if in a sailing vessel they should employ a towboat. A stranger of over 14 feet draft should not attempt to enter at night, and should not go higher than the anchorage off Clark Point.

1. ***Approaching and Entering, by the Eastern Channel to Clark Point.—I. From Northward, for vessels of 20 feet or less draft.***—Coming down the bay steer **SW.**, and keep Bird Island Lighthouse bearing northward of *NE.* When Dumpling Rock Lighthouse bears **W. ½ S.** steer for it on this bearing; pass 400 yards south of black can buoy

No. 9 off West Island and the same distance south of Mosher Ledge bell buoy, and when the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—The **W.** ½ **S.** course leads nearly 1¼ miles southward of West Island. For dangers, see paragraph V.

II. Having come through Woods Hole.—Having followed the general directions, Great Harbor to Buzzards Bay, page 108, leave Mosher Ledge bell buoy about 200 yards on the starboard hand, and when the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—For dangers in the approach to New Bedford Harbor, see paragraph V.

III. Having come through Quicks Hole, for vessels of 20 feet or less draft.—From a position nearly ¼ mile *E.* of the buoy on Lone Rock steer **N.** ¾ **E.**, taking care not to be set eastward by the flood current. Having stood on this course about 5 miles, Mosher Ledge bell buoy should be ahead, and Hursell Rock buoy (spar, red and black horizontal stripes) should be on the port beam, and as it is passed should be left about ¼ mile on the port hand. When the white tower on Clark Point bears *NNW.* ¾ *W.* follow the directions in paragraph V.

Remarks.—Crossing Buzzards Bay the flood current has a general easterly set, and the ebb a general westerly set. There are no dangers until up to Hursell Rock. A small, detached, 22-foot spot lies a little over 1¼ miles **S.** by **E.** ½ **E.** from Hursell Rock buoy. See also dangers under paragraph V.

IV. From Westward, for vessels of 20 feet or less draft.—Follow the directions in section 1 B, page 112, and when Dumpling Rock Lighthouse bears *N.* by *W.* steer **NE.** heading for the south end of West Island. Leave Hursell Rock buoy (spar, red and black horizontal stripes) nearly ½ mile on the port hand, and when the white tower on Clark Point bears **NNW.** ¾ **W.** steer for it on the bearing and follow the directions in paragraph V.

Remarks.—On the **NE.** course heading for the south end of West Island, Wilkes Ledge buoy (can, red and black horizontal stripes) will be left about ¾ mile on the port hand; Hursell Rock buoy and Mosher Ledge bell buoy will be made on the port bow, and when the former is on the port beam the white tower (disused lighthouse) on Clark Point will be nearly on the bearing. The sailing line passes well clear of all dangers.

V. When the white tower on Clark Point bears **NNW.** ¾ **W.** steer for it on this bearing, and leave Mosher Ledge bell buoy 100 yards, and Henrietta Rock buoy (spar, red and black horizontal stripes) 200 yards, on the starboard hand. When Egg Island beacon bears **N.**, and is in range with the large red building with pointed red cupola (Rogers School), steer for the beacon on this range; or, when Butler Flats Lighthouse bears **N.** ¾ **W.**, steer for it on the bearing, and anchor ½ mile *S.* of Butler Flats Lighthouse. If bound to New Bedford, follow the directions in section 2.

Remarks.—On the **NNW.** ¾ **W.** course for the white tower (disused lighthouse), deep-draft vessels must keep close on the bearing, which leads about midway between Henrietta Rock and Brooklyn Rock, the channel between these rocks being about 500 yards wide. After Henrietta Rock buoy (spar, red and black horizontal stripes) has been passed, the range of Egg Island beacon and the large red building with pointed red cupola, in Fairhaven, will be seen broad off the starboard bow.

Dangers.—**West Island Shoal** extends nearly 1 mile in a general **SSE.** direction from the south end of West Island, and for half this distance has depths of 1 to 3 feet; for the remainder of the distance the depths range from 10 to 18 feet. A buoy (can, black, No. 9) is placed off the end of the shoal, and lies nearly 1 mile **S.** by **E.** from the southeast point of West Island. There is a **small, detached ledge** with 16 feet over it ⅜ mile **W.** ¼ **N.** from this buoy. A **small, detached rock** with 18 feet over it lies nearly 1¼ miles **S.** by **W.** ¼ **W.** from the southeast point of West Island.

Hursell Rock, a small, detached rock with 16 feet over it, lies 2⅝ miles **E.** ⅛ **N.** from Dumpling Rock Lighthouse, and 3¼ miles **S.** by **E.** ¾ **E.** from the white tower on Clark Point; it is marked on its eastern side by a buoy (spar, red and black horizontal stripes). In heavy southerly gales this buoy should be given a good berth, for depths of less than 5 fathoms, over which the sea occasionally breaks, extend ⅜ mile southward and ¼ mile westward from the rock.

Mosher Ledge is nearly $\frac{5}{8}$ mile long in a **N.** by **E.** and **S.** by **W.** direction, with depths of 7 to 18 feet. The shoalest water is near its southern end and lies 1 mile **S.** by **W.** $\frac{1}{4}$ **W.** from Sconticut Point. Depths of less than 25 feet extend nearly $\frac{3}{8}$ mile southward from the ledge, and a red bell buoy is placed in 26 feet of water off its southern end.

West Island Ledge is on the north side of the channel between West Island and Sconticut Point; it has a number of rocks showing bare at low water, and the depths over it range from 2 to 10 feet. A buoy (spar, red, No. 2) is placed on the southern end of the ledge.

Henrietta Rock is a small, detached rock with 11 feet over it, and lies nearly 1 mile **SW.** by **W.** $\frac{1}{2}$ **W.** from Sconticut Point. The rock is surrounded by deep water, and is marked by a buoy (spar, red and black horizontal stripes).

Brooklyn Rock, a small, detached rock with 18 feet over it, lies in the middle of the eastern channel between North Ledge and Henrietta Rock, and nearly 600 yards **WSW.** $\frac{3}{4}$ **W.** from Henrietta Rock buoy.

There is a small, detached, 18-foot spot lying nearly $\frac{1}{2}$ mile **W.** $\frac{3}{4}$ **N.** from Henrietta Rock buoy, and 400 yards eastward of the edge of North Ledge.

Packet Rock Ledge, and **Packet Rock** with a depth of 5 feet, is part of the shoal making westward from the south end of Sconticut Neck and is near the western edge of the shoal. The western edge of the shoal is marked by a buoy (spar, red, No. 6) which lies a little over $\frac{3}{4}$ mile **W.** $\frac{3}{4}$ **S.** from Sconticut Point, and $\frac{3}{8}$ mile **N.** by **E.** $\frac{1}{4}$ **E.** from Hursell Rock buoy. There is a black spar buoy 350 yards northeastward of the red buoy, and a red spindle nearly $\frac{5}{8}$ mile eastward of the red buoy.

Phinney Rock is a small, detached rock with 11 feet over it, lying in the middle of the entrance between the Eastern and Middle channels, and $1\frac{7}{8}$ miles **ENE.** $\frac{3}{8}$ **E.** from Dumpling Rock Lighthouse. The rock is marked by a buoy (spar, black, No. 1A).

North Ledge is nearly $\frac{1}{2}$ mile long in a **N.** and **S.** direction, and 450 yards wide; it lies in the middle of the entrance between the Eastern and Middle channels, and has depths of 10 to 18 feet over it. The eastern edge of this ledge is marked by two buoys, the southern (can, black, No. 3) the northern (spar, black, No. 3A).

Old Bartlemy is a rock on the edge of the shoal making eastward from Clark Point. The rock has a depth of $\frac{1}{2}$ foot, and lies 400 yards **ENE.** $\frac{3}{4}$ **E.** from the white tower on Clark Point. A buoy (spar, black, No. 7) marks the edge of the shoal, and a small spindle marks the rock.

A small, detached, 18-foot spot lies $\frac{7}{8}$ mile **ESE.** $\frac{1}{2}$ **E.** from the white tower on Clark Point.

VI. At night, for vessels of 14 feet or less draft.—Having approached the entrance as directed in paragraphs I to IV, inclusive, keep Dumpling Rock Light bearing northward of **W.**, and bring Butler Flats Light to bear **N.** by **W.** $\frac{1}{4}$ **W.** When the latter light is on this bearing, Palmer Island Light will show just eastward of Butler Flats Light and barely clear of it. Keep close on this range heading for Butler Flats Light, and anchor in 28 feet of water $\frac{1}{2}$ mile southward of it and a little westward of the range.

Remarks.—The range will lead 300 yards eastward of Hursell Rock buoy, and at least 250 yards westward of Henrietta Rock. For dangers, see paragraph V, preceding.

1 A. ***Approaching and Entering, by the Middle Channel.—From Hen and Chickens Light-vessel, for vessels of 20 feet or less draft.***—Following the directions in section 1 B, page 112, when on the **ENE.** $\frac{1}{2}$ **E.** course standing into Buzzards Bay, Dumpling Rock Lighthouse bears *N.* $\frac{1}{2}$ *E.*, distant 3 miles, steer **NE.** by **E.** so as to pass nearly $\frac{1}{2}$ mile southward of the red and black horizontally striped can buoy on Wilkes Ledge. When the white beacon (Egg Island beacon) is in range with the high water tower in Fairhaven, bearing **N.** by **E.** $\frac{5}{8}$ **E.**, stand northward keeping close on the range. Pass $\frac{1}{4}$ mile eastward of Wilkes Ledge buoy, and 50 yards westward of Great Ledge (W. part) buoy (spar, red, No. 6). When about 1 mile southward of Clark Point, open the water tower a little eastward of the beacon, and anchor $\frac{1}{2}$ mile southward of Butler Flats Lighthouse; or, if of less than 17 feet draft and bound to the city, proceed as directed in section 2.

Or, proceed as directed above, and when on the **NE.** by **E.** course the white tower on Clark Point is in range with a large white house with black-topped cupola (on this range a large red building with a pointed red cupola will be seen just eastward of the white house), stand northward keeping close on the range of the tower and white house, course **N.** by **E.** $\frac{1}{8}$ **E.** Pass over $\frac{1}{4}$ mile eastward of Wilkes Ledge buoy and 150 yards westward of Great Ledge (W. part) buoy; when the tower on Clark Point is $1\frac{1}{2}$ miles distant ahead, steer

NE. ¾ N.; and when Butler Flats Lighthouse bears **N.**, steer for it and anchor ½ mile south of the lighthouse; or, if of less than 17 feet draft and bound to the city, follow the directions in section 2.

Remarks.—If the weather is not clear enough to see the ranges when near Wilkes Ledge, pass ¼ mile eastward of Wilkes Ledge buoy and steer **N.** by **E.** ⅓ **E.** and continue on this course until the ranges can be seen, when either of them may be steered for.

Passing Wilkes Ledge care must be taken to give the buoy a good berth. At low water a small part of Great Ledge may just show bare. When standing on the range of the white tower and the white house (Rodgers House), and Clark Point is 1½ miles distant ahead, Sconticut Point will bear **E.** ¾ **N.**

On the **NE.** ¾ **N.** course Egg Island beacon and Butler Flats Lighthouse will be on the port bow; the least water on this course should not be less than 24 feet.

Dangers.—**Wilkes Ledge** is about ⅜ mile in diameter with depths of less than 24 feet, and has a least depth of 9 feet near its northern side. The middle of the ledge lies 1¾ miles **S.** ½ **E.** from Dumpling Rock Lighthouse, and it is marked at its southern side by a buoy (can, red and black horizontal stripes).

The **Sandspit** is 600 yards long in a general **E.** and **W.** direction, is about 250 yards wide, and has 10 to 18 feet over it. The eastern end of this ledge lies ⅝ mile **SE.** ¼ **S.** from Dumpling Rock Lighthouse, and is not marked; its western end is marked by a buoy (bell, red).

Great Ledge is 600 yards in diameter with depths of less than 24 feet, and near its middle has 1 foot over it; the ledge is 400 yards in diameter, with depths of less than 18 feet, and is marked by two buoys—a black spar buoy, No. 7, on its eastern side, and a red spar buoy, No. 6, on its southwestern side.

Middle Ledge and **Inez Rock** lie on the western side of the Middle Channel about **NE.** ¾ **N.**, distant 1¼ and 1⅝ miles, respectively, from Dumpling Rock Lighthouse. They are small, detached ledges, and each is marked by a red and black horizontally striped spar buoy. Middle Ledge has a least depth of 5 feet and Inez Rock a depth of 11 feet over it.

Phinney Rock is described under section 1, preceding.

Church Rock and **Decatur Rock** are a part of two ledges on the eastern side of Middle Channel, nearly 2 miles **S.** of Clark Point. The former has a depth of 15 feet, and the latter a depth of 7 feet over it. The two ledges are close together, and extend nearly 800 yards in a general **N.** and **S.** direction with a width of 200 yards. The southern end of the ledges (Church Rock) is marked by a buoy (spar, red, No. 6A), and the northwestern end (Decatur Rock) is marked by a buoy (spar, red, No. 8).

North Ledge is described under section 1; the buoys marking the eastern side of this ledge should be given a berth of 600 yards or more when in the Middle Channel.

A **small, detached, 17-foot spot** lies a little over ¼ mile **S.** by **E.** from the white tower on Clark Point.

A **small, detached, 21-foot spot** lies ⅝ mile **SSE.** ¾ **E.** from the white tower on Clark Point.

Old Bartlemy is described under section 1.

1 B. ***Approaching and Entering by the West Channel.—I. For vessels of 20 feet or less draft.***—With Hen and Chickens Light-vessel bearing *WSW.* ½ *W.*, steer **ENE.** ½ **E.** until Dumpling Rock Lighthouse bears **NE.** by **N.**, and then steer for the lighthouse on this bearing. When the red bell buoy on the Sandspit is made, steer so as to pass about 200 yards westward and northward of it and about 600 yards southeastward of the lighthouse. When passing this buoy, shape the course **NE.** ½ **N.**, pass about 600 yards eastward of the lighthouse and Middle Ledge buoy. Continue the course until Egg Island beacon and the high water tower in Fairhaven are in range; then stand northward on this range and anchor about ½ mile south of Butler Flats Lighthouse, or follow the directions in section 2.

Dumpling Rock Lighthouse can be steered for bearing anywhere between **NE.** ¾ **N.** and **N.** ½ **E.**

Remarks.—The **NE.** by **N.** course leads about ⅜ mile eastward of the bell buoy off Mishaum Ledge, and about the same distance eastward of Salter Point Ledge buoy. Wilkes Ledge buoy will be left well on the starboard hand. **Round Hill**, the point just westward of Dumpling Rock Lighthouse, will show quite prominently. As Dumpling Rock Lighthouse is approached the bell buoy on Sandspit and the black spar buoy marking the shoals southward of the lighthouse will be seen; the sailing line leads about midway between these buoys. Egg Island beacon and Butler Flats Lighthouse will be seen just eastward of Clark Point when the vessel is abreast of Dumpling Rock Lighthouse.

On the **NE.** ½ **N.** course Middle Ledge buoy should be made on the port bow and be left on the port hand; Inez Rock buoy will be seen and left well on the port hand. The buoys marking Church and Decatur rocks and North Ledge will be left well on the starboard hand.

When standing on the range Clark Point will be left about ⅝ mile on the port hand.

Dangers.—The dangers until up to Wilkes Ledge are described on pages 112–113.

Salters Point Ledge is a detached ledge with 2 feet of water over it, and lies a little over 1 mile **SW.** ¾ **W.** from Dumpling Rock Lighthouse; it is marked on its eastern side by a buoy (spar, black, No. 5).

Sandspit and **Great Ledge** are described under section 1 A, preceding.

Dumpling Rocks have 5 to 10 feet over them, and extend southward and southwestward from the small island on which the lighthouse is situated. The eastern edge of these rocks is marked by a buoy (spar, black, No. 7).

White Rock is a small, bare rock lying a little over ½ mile **N.** by **E.** from Dumpling Rock Lighthouse. It is a prominent mark for vessels bound into Apponaganset Bay. Ragged Rocks, showing bare, and Fatal Rock, with 3 feet over it and marked by a red and black horizontally striped spar buoy, lie westward of White Rock, between it and the shore.

Middle Ledge, Inez Rock, Church Rock, and **Decatur Rock** are described on page 117, and North Ledge and Old Bartlemy on page 116.

At night, for vessels of 14 feet or less draft.—Follow the directions for entering Buzzards Bay, and when on the **ENE.** ½ **E.** course Dumpling Rock Light bears **NE.** by **N.**, steer for the light on this bearing, taking care to keep in its white rays. As the light is approached steer so as to leave it 600 yards on the port hand, and when the light bears *N.* by *W.* ½ *W.* the vessel should be about 200 yards northward of the bell buoy on the west end of the Sandspit. Then steer **NE.** ½ **N.**, and watch the bearing of Butler Flats Light; when it bears **N.** by **E.** ¼ **E.** steer for it on this bearing, and having stood on this course about 1 mile, haul more eastward so as to bring the light to bear **N.**; then steer for it on the latter bearing, and anchor when the light is ½ mile distant ahead.

See the remarks and dangers preceding.

2. ***From Clark Point to the Anchorage in the Inner Harbor.—For vessels of 17 feet or less draft, in the daytime.***—When ½ mile south of Butler Flats Lighthouse, bring Palmer Island Lighthouse in range with the middle of the draw in Fairhaven bridge (the right-hand one of the two highest chimneys of the Wamsutta Mills will then be seen nearly over the middle of the draw). Then bring the lighthouse in range with this chimney, and stand in on the range so as to pass eastward of Butler Flats Lighthouse and black spar buoy No. 9, which marks the edge of Butler Flats.

Continue close on the range after passing Butler Flats Lighthouse; a number of buoys will be seen ahead. Leave these buoys on the side indicated by their color, giving them a berth of about 40 yards, and when abreast of red spar buoy No. 12, or when Range beacon (high triangular pyramidal white beacon with black ball on top) bears on the starboard beam, steer about **N.** so as to leave red spar buoy No. 14 on the starboard hand and black spar buoy No. 15 on the port hand. When 250 yards above the latter buoy anchor in 23 to 26 feet of water, soft bottom.

If bound to the city wharves a towboat should be employed.

Remarks.—When on the range heading for Palmer Island Lighthouse, red spar buoy No. 10 and Egg Island beacon are left about 400 yards on the starboard hand, and when past the beacon several buoys will be seen on both bows. Before the first buoy (spar, black, No. 11) is reached, care should be taken to keep fair on the range, which will lead eastward of black spar buoys Nos. 11 and 13, and about 40 yards westward of red spar buoy No. 12. The **Range beacon** will be seen on the beach a little over ¼ mile eastward of buoy No. 12. When the course is changed northward from this buoy, it should lead about 50 yards westward of red spar buoy No. 14, and about 50 yards eastward of black buoy No. 15. The anchorage northeastward of Palmer Island Lighthouse is known as the **Deep Hole.**

Dangers.—**Butler Flats** makes off ⅝ mile from the western shore, about ⅜ mile northward of Clark Point; it has 4 to 12 feet over it and is marked at its northeastern edge by a buoy (spar, black, No. 9). Butler Flats Lighthouse is about 200 yards inside the eastern edge of the flat.

Egg Island Flat is the extensive shoal which lies on the eastern side of the channel and surrounds Egg Island beacon, extending ¾ mile southeastward from it. The shoalest part of the flat is northeastward and

eastward from the beacon. A buoy (spar, red, No. 10) is placed in 18 feet of water, about 450 yards southward of the beacon, as a guide to keep vessels off the shoal part of the flat. **Egg Island beacon** is a white granite cone with spindle and vane on top.

Shoals extend along the eastern side of the channel from Fort Point to Egg Island beacon.

Eleven-foot Bank makes off from the western shore about ½ mile southward of Palmer Island Lighthouse; it has from 7 to 11 feet over it, and is marked at its eastern edge by a buoy (spar, black, No. 11).

Palmer Island Shoal surrounds Palmer Island and extends nearly ¼ mile southward from it. The eastern edge is marked by two buoys (spars, black, Nos. 13 and 15).

Fort Flat extends southward and westward from **Fort Phoenix**, the eastern point at the entrance to the inner harbor. The western edge of the flat is marked by two buoys (spars, red, Nos. 12 and 14).

Dix Ledge has 5 feet over it and lies well over toward the eastern shore of the inner harbor, about **ENE. ½ E.** from Palmer Island Lighthouse; it is marked on its western side by a buoy (spar, red, No. 16).

Crow Island lies in the northeastern part of the harbor, about 160 yards from the upper wharves in Fairhaven. The water is shallow eastward and northeastward of the island; there is 9 to 12 feet of water southward and westward of the island.

CLARK COVE*

makes northward just west of the entrance to New Bedford Harbor; between **Clark Point**, marked by a granite fort and white tower, on the east and Moshers Point on the west the entrance is about ¾ mile wide. The cove has anchorage in 12 to 22 feet water, but is exposed to southerly winds and is seldom used; the channel is marked by several buoys. The houses and spires of the city of New Bedford can be seen at the head of the cove. The tides are the same as at New Bedford (see table, page 11).

SAILING DIRECTIONS, CLARK COVE.

The following directions are good in the daytime for a draft of 14 feet to an anchorage above Moshers Point. At night, anchor eastward of Clark Point and wait for daylight. See also the note preceding the sailing directions for New Bedford Harbor.

Approaching and entering.—Follow the directions in section 1, 1 A, or 1 B, pages 114–118, for approaching and entering New Bedford Harbor.

I. Following the directions in paragraph V, page 115.—On the **NNW. ¾ W.** course, when Henrietta Rock buoy bears abaft the starboard beam, steer **NW. ½ W.**, taking care to pass northward of black spar buoy No. 3A. After passing this buoy, Clark Point buoy (spar, red, No. 2) should be made on the starboard bow; pass southward of this buoy, and then haul northward, course about **N. ½ W.**, and pass about 100 yards westward of it. Red spar buoy No. 4 should be made on the starboard bow. Anchor anywhere on the course; the water shoals gradually toward the head of the cove.

II. Following the directions in section 1 A, page 116.—Steer for the white tower on Clark Point on the **N.** by **E. ⅛ E.** course until Ricketsons Point, the north point at the entrance to Apponaganset Bay, bears *W.* by *N.* Then steer **NNW. ¾ W.**, pass westward of red spar buoy No. 2, and anchor as directed in the preceding paragraph.

III. Following the directions in section 1 B, page 117.—In standing on the range of Egg Island beacon and the high water tower in Fairhaven when Ricketsons Point (north point at entrance to Apponaganset Bay) bears on the port beam, steer **NNW. ¾ W.**, pass about 100 yards westward of red spar buoy No. 2, and anchor as directed in paragraph I.

For **remarks and dangers** see those under sailing directions for New Bedford Harbor. After entering the cove there are no dangers, until near the head of the harbor, for vessels of 11 feet or less draft if the shores be given a berth of about 400 yards.

APPONAGANSET BAY*

is the bight southwestward of Clark Cove and about 2 miles northward of Dumpling Rock Lighthouse, and is the approach by water to the village of **South Dartmouth (Padanaram)**. On the south side of the entrance is the village of **Nonquitt**. The extension of the bay above the bridge at South Dartmouth is known as Apponaganset **River**, into which several small streams flow.

*See footnote on page 113.

Apponaganset Bay is sometimes called **Padanaram Harbor**. It is shallow and of but little importance, the depth above the entrance ranging from 7 to 12 feet; small coasting vessels occasionally enter with cargoes of coal and building material for local use, and small yachts sometimes anchor here during the summer, but the anchorage is insecure in southeasterly storms. A breakwater is being built, extending southward from the shoal at Ricketsons Point; at present (1903) the southern end of the breakwater is 1,025 feet **S.** by **W.** ¾ **W.** from the point. The approach to the bay is obstructed by numerous ledges and rocks, some of which are described under the heading, New Bedford Harbor. A stranger should not attempt to enter except in the daytime with clear weather.

The mean rise and fall of tides is about the same as in New Bedford Harbor (see table, page 11).

SAILING DIRECTIONS, APPONAGANSET BAY.

The following directions are good for a draft of 12 feet or less, in the daytime when the aids can be seen, and lead to an anchorage inside the breakwater.

1. ***Approaching and Entering, from Eastward.***—Coming down Buzzards Bay follow the directions in paragraph 1, page 114, and when ¼ mile south of West Island Shoal buoy (can, black, No. 9) steer **W.** ¼ **N.**; leave Mosher Ledge bell buoy close-to on the starboard hand, and pass about 350 yards north of Phinney Rock buoy, and ¼ mile south of Church Rock and Middle Ledge buoys.

When Dumpling Rock Lighthouse bears *SW.* steer **NW.** by **N.**, fair for the middle of the entrance to Apponaganset Bay. Leave Middle Ledge and Lone Rock buoys about 450 yards on the starboard hand, and Hussey Rock buoy 500 yards on the port hand, and enter Apponaganset Bay passing south of the end of the breakwater off Ricketsons Point. Dartmouth Rock buoy, in Apponaganset Bay, will be made on the starboard bow. Anchor in 14 feet of water, soft bottom, about 200 yards westward or northwestward of Dartmouth Rock buoy.

Remarks.—On the **W.** ¼ **N.** course, Mosher Ledge bell buoy (red) will be made ahead, and Dumpling Rock Lighthouse will be on the port bow.

On the **NW.** by **N.** course, the southern end of the breakwater off Ricketsons Point will be a little on the starboard bow.

Dangers.—The principal dangers, **Hursell Rock, Phinney Rock, Church Rock,** and **Middle Ledge,** are described under the sailing directions for New Bedford Harbor, pages 115, 116, and 117.

White Rock and **Ragged Rocks** lie about ½ mile offshore and about the same distance north of Dumpling Rock Lighthouse and are always bare and easily seen. Several other rocks lie close in to the western shore. The sailing lines lead well clear of all of these.

Fatal Rock, with 3 feet over it, lies ½ mile **N.** by **W.** ¼ **W.** from Dumpling Rock Lighthouse. The rock is marked on its north side by a buoy (spar, red and black horizontal stripes).

Hussey Rock, with 4 feet over it, is nearly ⅝ mile offshore, and a little over 1 mile **N.** ¾ **E.** from Dumpling Rock Lighthouse, and is marked by a buoy (spar, black, No. 1).

Lone Rock, with 2 feet over it, and marked by a buoy (spar, red and black horizontal stripes) lies 1⅜ miles **NNE.** ¼ **E.** from Dumpling Rock Lighthouse.

1 A. ***Approaching and Entering, from Westward.***—Follow the directions in section 1 B, page 117, until Dumpling Rock Lighthouse bears *W.*, distant about ⅜ mile. Then steer **N.**, passing about 400 yards eastward of White Rock, and the same distance eastward of Hussey Rock buoy (spar, black, No. 1). When this buoy bears four points abaft the port beam, steer **NW.** by **N.** into the harbor; pass south of the breakwater off Ricketsons Point and anchor as directed in section 1, preceding.

Remarks and dangers.—See under section 1, foregoing. **White Rock** is the easternmost of the bare rocks lying about ½ mile northward of Dumpling Rock Lighthouse.

MATTAPOISETT HARBOR*

lies about 4 miles northeastward of New Bedford Harbor, and is marked on its north side by **Ned Point Lighthouse** (see table, page 18). The entrance, between **Angelica** and **Strawberry points** on the east, and **Mattapoisett Neck** on the west, is about 1½ miles wide, but is much obstructed by shoals and ledges, between which a buoyed channel leads to the anchorage off the village of **Mattapoisett**, which is situated on the north shore about ¾ mile above Ned Point. The harbor is exposed to southeasterly winds, but the ledges at the entrance somewhat break the sea from that direction. It is little frequented except by yachts. The carrying trade of Mattapoisett is comprised in a few cargoes of coal and building material for local use. The least depth in the channel as far as the anchorage off the village is 14 feet at mean low water. A draft of 8 feet may be taken to the wharves and 14 feet to the anchorage off Ned Point.

Pilots are not usually taken, but one may be had by signaling when off the entrance, anchoring if necessary until one comes from the shore. Pilotage is compulsory only for certain vessels. See pilotage laws in Appendix II.

Tides.—The mean rise and fall of tides is 3.9 feet.

SAILING DIRECTIONS, MATTAPOISETT HARBOR.

The following directions lead to an anchorage in 15 feet westward of Ned Point. Anchorage in 10 to 13 feet will be found off the wharves of the town. Strangers should not attempt to enter at night.

1. ***Approaching and Entering, from Woods Hole or from Quicks Hole.***—Having come through Woods Hole, when black buoy No. 5 at the western side of the entrance to Woods Hole bears *W.*, distant about 200 yards, steer **N.** by **W.** ½ **W.** about 5½ miles; Ned Point Lighthouse should then be seen bearing about *NNW.* and the buoy (can, black) on Nyes Ledge should be about ¾ mile distant and just open to the left of the lighthouse. Steer for Ned Point Lighthouse, keeping it bearing **NNW.**; leave Nyes Ledge buoy, Mattapoisett Ledge buoy, and Gallatin Rock buoy 300 to 400 yards on the port hand, and when the latter buoy is on the port beam haul more westward, course about **NW.** by **W.** Pass southward of Snow Rock buoy, and about 300 yards north of Sunken Ledge buoy, and when the latter buoy is abeam steer about **NNW.** and anchor when Ned Point Lighthouse bears **E.**

To anchor off the town, continue the **NNW.** course and anchor southward of the wharves, giving them a berth of 300 yards.

Having come through Quicks Hole.—When eastward of Lone Rock buoy steer **NE.** ¾ **N.** about 9¾ miles with Bird Island Lighthouse ahead. When Ned Point Lighthouse bears **NNW.**, steer for it on that bearing and follow the directions above.

Remarks.—On the **NNW.** course for Ned Point Lighthouse, the buoys marking the channel will be on the port hand.

On the **NW.** by **W.** course Snow Rock buoy (spar, red, No. 4) should be on the starboard bow and Sunken Ledge buoy on the port bow; a low point with a small wharf and clump of trees upon it will be seen ahead.

On the **NNW.** course for the anchorage, a white church spire will be a little on the starboard bow, and Barstow Rock buoy should be left about 250 yards on the starboard hand. The lead should be used when standing to the anchorage; the water shoals gradually toward the wharf at the head of the harbor.

Dangers.—**Nyes Ledge** is a large, detached ledge, with a least depth of 7 feet over it, lying nearly 1½ miles southeastward of Mattapoisett Neck, and is marked off its eastern end by a buoy (can, black). The ledge can be avoided by keeping Bird Island Lighthouse bearing northward of **NE.** until Ned Point Lighthouse bears westward of **NNW.** There is a narrow channel westward of this ledge, but strangers should not attempt it.

Mattapoisett Ledge extends nearly 1 mile southeastward from Mattapoisett Neck, has a depth of 1 foot nearly ⅛ mile from the shore, and is marked at its eastern end by a buoy (spar, black, No. 1).

*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$; **252**, scale $\frac{1}{20,000}$; price of each $0.50.

Gallatin Rock, a detached rock with 10 feet over it, lies on the western side of the entrance, about 1⅛ miles **S.** ⅝ **E.** from Ned Point Lighthouse, and is marked off its eastern side by a buoy (spar, black, No. 3).

Sunken Ledge has 3 feet over it, lies ¼ mile from the western shore and **S.** by **W.** ¼ **W.** from Ned Point Lighthouse, and is marked off its eastern side by a buoy (spar, black, No. 5).

Snow Rock, with a least depth of 5 feet over it, lies on the eastern side of the channel, nearly ¾ mile **S.** ⅛ **E.** from Ned Point Lighthouse, and is marked by a buoy (spar, red, No. 4).

Barstow Rock, a detached rock with 8 feet over it, lies a little over ½ mile **S.** ½ **W.** from Ned Point Lighthouse, and is marked by a buoy (spar, red and black horizontal stripes) placed off its southern end.

Ned Point Shoal makes off about 400 yards southeastward from the point and is marked by a buoy (spar, red, No. 6) off its end.

Landing Rock, with 3 feet over it, lies about 100 yards from the wharf on the northern shore of the harbor, and about ¾ mile **NW.** ¾ **W.** from Ned Point Lighthouse, and is marked by a buoy (spar, red, No. 8).

1 A. *Approaching and Entering, from Hen and Chickens Light-vessel.*—Follow the directions in section 1 B, page 112, and on the **ENE.** ½ **E.** course from the light-vessel, when Dumpling Rock Lighthouse bears *NNW.* steer **NE.** by **E.** about 5¼ miles, passing about ⅜ mile southward of West Island Shoal buoy (can, black, No. 9). When the south end of Sconticut Point is in range with the white tower on Clark Point, bearing *NW.* by *W.* ½ *W.*, steer **NE.** so as to pass about ⅜ mile southward of Nyes Ledge buoy. When Ned Point Lighthouse bears **NNW.** steer for it and follow the directions in section 1, preceding.

Remarks.—The remarks and dangers up to West Island Shoal are given under section 1 B, page 112.

When on the **NE.** course care should be taken to keep Bird Island Lighthouse bearing a little northward of **NE.** until Ned Point Lighthouse comes on the **NNW.** bearing; this will clear Cormorant Rock and Nyes Ledge, the two most prominent dangers off the western shore between New Bedford entrance and Mattapoisett Harbor.

Dangers.—**Cormorant Rock**, which shows bare at half tide and is marked by a spindle (black, with cage on top), lies 1⅞ miles **NE.** by **E.** ⅛ **E.** from the southern point of West Island and 2¾ miles **S.** ¾ **W.** from Ned Point Lighthouse. Shoal water extends a little over ¼ mile southward of the spindle, and about 200 yards eastward of it, and a 14-foot spot lies nearly ¼ mile **NE.** by **E.** ¼ **E.** from the spindle. There is a channel between the rock and Ram Island off Mattapoisett Neck, but strangers should not attempt it.

Nyes Ledge and the dangers in Mattapoisett Harbor are described on pages 121–122.

SIPPICAN (MARION) HARBOR*

makes into the north shore of Buzzards Bay about 2¼ miles northeastward from Mattapoisett entrance, and is marked by **Bird Island Lighthouse** (see table, page 18), which is on a small, low island ⅜ mile southward of the eastern point at the entrance to the harbor. The entrance between **Sippican Neck** on the east and **Charles Neck** on the west is about 1⅛ miles wide, and has few dangers. Above the entrance the width of the harbor gradually lessens, and at **Ram Island**, 2¼ miles above Bird Island Lighthouse, the width between the island and western shore is only 300 yards. The harbor is seldom used as an anchorage except by yachts; it is entered by a few vessels each year with cargoes of coal and lumber. The town of **Marion** is on the west shore, about 2½ miles above Bird Island Lighthouse.

The depth of water in the channel to Nyes Wharf, abreast Ram Island, is 12 feet, and to the anchorage off the town 7 feet at mean low water. About 9 feet can be taken to the head of navigation, on high tides. The greatest draft entering the harbor is about 10 feet.

Pilots are generally taken by strangers bound up to the town; they may be had by signaling at the entrance, westward of Bird Island. If necessary vessels may anchor in the entrance of the harbor until boarded by a pilot. Pilotage is not compulsory for coasting vessels (see Appendix II).

Towboats are seldom used; one may be had by telegraphing to New Bedford.

Tides.—The mean rise and fall of tides is 3.9 feet. See also table on page 11.

Ice.—The harbor is usually closed to navigation for a month or more each winter. See page 111.

*Shown on charts 112, scale $\frac{1}{80,000}$; 249, scale $\frac{1}{40,000}$, price of each $0.50; 349, scale $\frac{1}{20,000}$, price $0.20.

GENERAL DIRECTIONS, SIPPICAN HARBOR.

The following directions are good for vessels of 12 feet or less draft to an anchorage in 14 feet about 1½ miles above Bird Island Lighthouse, and are good for vessels of less than 7 feet draft to the anchorage off the town of Marion. Some local knowledge is necessary to keep vessels in the best water up to the town; strangers should not attempt to enter at night.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 112–113, and when abreast Mattapoisett Harbor haul more northward and steer for Bird Island Lighthouse on any bearing northward of **NE.** Bring Bird Island Lighthouse to bear *NE.*, distant 1 mile, and steer **N.** so as to leave the lighthouse about ¾ mile on the starboard hand and the western point at the entrance about ⅜ mile on the port hand. When Bird Island Lighthouse bears *SE.*, steer **N.** by **W.** ¾ **W.**, pass about 100 yards eastward of Seal Rocks buoy (spar, black, No. 1), and anchor about ¼ mile northward or northeastward of the buoy in 15 feet, soft bottom.

Vessels of less than 7 feet draft bound to the town.—When 100 yards eastward of Seal Rocks buoy, continue the **N.** by **W.** ¾ **W.** course, heading for Little Island, a low, rocky islet close to the western shore of the harbor, and so as to pass close eastward of Black Rock buoy (spar, black, No. 3). From black buoy No. 3 steer so as to leave red spar buoy No. 4 about 10 yards on the starboard hand. From this buoy steer about **N.** so as to leave Little Island about 50 yards on the port hand, and anchor off the town eastward of black buoy No. 5.

Remarks and dangers.—When approaching the entrance, care should be taken to avoid **The Bow Bells,** with 11 feet over it, which is marked by a buoy (spar, black, No. 11) nearly 1½ miles **SW.** by **W.** from Bird Island Lighthouse, and should be left on the port hand. The large summer houses and stone wharf near the southern end of Charles Neck are conspicuous when entering.

On the **NE.** course Centerboard Shoal buoy should be left about ¼ mile on the starboard hand, and Seal Rocks buoy (spar, black, No. 1) should be on the port bow.

Centerboard Shoal, a small, detached, 12-foot spot, lies ¼ mile **SW.** ¾ **W.** from Bird Island Lighthouse, and is marked off its southern end by a buoy (spar, red, No. 2).

Charles Neck, on its southern and eastern sides, should be given a berth of ¼ mile. Seal Rocks, on the eastern side of Charles Neck, extend about 400 yards from shore, and are largely bare at low water. A buoy (spar, black, No. 1) marks the eastern edge of the shoals which lie outside the rocks.

On the **N.** by **W.** ¾ **W.** course, **Ram Island,** high and wooded, will be on the starboard bow; and black spar buoy No. 3, westward of the island, should be nearly ahead. Passing eastward of this buoy, **Little Island,** a small, rocky islet with a cluster of bushes on it, and lying about 100 yards from the western shore, should be ahead; and red spar buoy No. 4 should be a little on the starboard bow. The channel abreast Ram Island is narrow, and has a number of dangers, some of which are sometimes marked by small spar buoys placed by local parties. These dangers can be avoided by closely following the directions or by studying the chart. The currents sometimes have considerable velocity in this part of the channel.

When passing eastward of Little Island, two black buoys will be seen to the northward. The anchorage is eastward of the lower buoy, taking care to avoid a small, detached rock, with 9 feet over it, lying 200 yards **NNE.** ½ **E.** from the northeastern end of Little Island.

WAREHAM RIVER*

empties into the northwestern end of Buzzards Bay, the entrance lying 3½ miles northward of Bird Island Lighthouse and 3½ miles **NW.** by **N.** from Wings Neck Lighthouse. The river is the approach to the town of Wareham, situated on the west bank at the head of navigation, nearly 2 miles above its mouth. Off the entrance and in the river are extensive shoals and numerous ledges, through which a narrow, buoyed channel, with a depth of 10 feet, leads from the deep water of the bay to the wharves of the town. There is no anchorage in the river except in the channel, but vessels waiting for a fair wind or tide usually anchor off the mouth of the river northeastward of Great Hill.

The town of **Wareham** has extensive iron manufactories. The deepest-draft vessels trading here are about 12 feet. There is from 5 to 10 feet of water at the wharves.

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*Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$, price of each $0.50.

Pilots are necessary for vessels of over 9 feet draft, and should be taken by all strangers. They may be obtained by making signal when off Bird Island Lighthouse or at anchor off Great Hill. Pilotage is not compulsory for coasting vessels.

Towboats are usually employed by the larger vessels, especially in winter. They may be ordered from New Bedford by telegraph or telephone at Wareham.

Supplies.—Coal, water, and provisions can be had at Wareham.

Tides.—The mean rise and fall of tides is 4.1 feet. See also table on page 11.

Tidal currents.—The velocity of the currents is not great enough to materially interfere with a vessel having a good breeze. During the first half of the ebb the current sets across the flats below the wharves of the town, westward of the channel; and during the whole of the ebb it sets across the flats below **Long Beach**, at the mouth of the river, eastward of the channel.

Ice.—The river is closed part of each winter by ice. See also page 111.

SAILING DIRECTIONS, WAREHAM RIVER.

The following directions lead to the anchorage off Great Hill, above which no stranger should go without a pilot.

Approaching and to an Anchorage off Great Hill.—Follow the directions for Buzzards Bay, pages 112 113; when Bird Island Lighthouse is made, steer so as to pass ¾ mile eastward of it, and when the lighthouse bears *WNW.*, distant about ¾ mile, steer **N. ¼ E.**, keeping the eastern end of Great Hill on the port bow. Pass about 300 yards eastward of the northeastern end of Great Hill, and anchor about 400 yards eastward of the wharf on the northeastern side of Great Hill, in 15 feet of water, soft bottom.

Remarks.—On the **N. ¼ E.** course, Bird Island Reef buoy should be left ¼ mile on the port hand, and the eastern shore of Sippican Neck should be given a berth of ½ mile; **Great Hill**, a high, wooded headland with a cleared space and large hotel on its northeastern end, should be kept on the port bow. A black buoy off the southeastern end of Great Hill will be left well on the port hand, and the eastern shore of Great Hill should be given a berth of at least 250 yards.

Dangers.—**Bird Island Reef** extends about ½ mile eastward from Bird Island, and is part of the shoal making southeastward and eastward from Sippican Neck. It has depths of 4 to 6 feet over it for a distance of over ¼ mile from the island, and is marked off its eastern side by a buoy (spar, black, No. 13).

Dry Ledge, bare at half tide, lies 1 mile **E.** by **S.** from **Great Hill Point**, the southeastern point of Great Hill. The southern end of the ledge is marked by a buoy (spar, red, No. 12), which lies about 1⅞ miles **NW. ⅜ N.** from Wings Neck Lighthouse. The depths north of the ledge, to Little Bird Island, range from 4 to 9 feet.

Wings Cove Flats extend southward from Great Hill Point, the southeastern point of Great Hill, and are marked off their end by a buoy (spar, black, No. 15).

Great Flats is an extensive shoal extending southward from the eastern side of the entrance to Wareham River. The southern end of this shoal is about 150 yards northeastward of the wharf on the northeastern end of Great Hill, and is marked by a buoy (spar, red, No. 14).

BACK RIVER, ONSET BAY, MONUMENT RIVER, COHASSET NARROWS, AND BUTTERMILK BAY*

are unimportant waters at the northeastern end of Buzzards Bay, the common entrance to which lies between **Wenaumet (Wings) Neck**, on the south, and **Great Neck**, marked by **Tempes Nob** (high and prominent hill), on the north. The indentation, of which the above-named waters are a part, is very irregular in outline, and includes a large number of bights, coves, and shallow streams, whose channels are all more or less obstructed by shoals and rocks.

There are two narrow and crooked channels after passing the common entrance, the dangers of which are nearly all buoyed. The western channel leads with a least depth of 12 feet to an anchorage in Onset Bay. The eastern channel leads past Monument Beach and Back River to the entrance to Cohasset Narrows, which in turn leads to Buttermilk Bay. The least depth in the channel to Back River entrance is 11 feet, and to Cohasset Narrows 6 feet.

There is very little trade by water to any of the villages on these waters, and few vessels enter them. A stranger should not attempt to enter without a pilot.

* See footnote on page 123.

POCASSET HARBOR AND RED BROOK HARBOR.*

These two small, unimportant harbors lie southeastward of **Wenaumet (Wings) Neck**, and northeastward of **Scraggy Neck**, and their common approach is between the two. **Bassetts Island**, low, narrow, and of very irregular shape, separates the two harbors, Pocasset Harbor lying northward and westward of this island, and Red Brook Harbor southeastward.

Pocasset Harbor is entered through a narrow, buoyed passage northward of the western end of Bassetts Island. About 12 feet can be taken into the harbor.

Red Brook Harbor is very shallow, having 3 to 8 feet of water, and is entered around either the southern or the northern end of Bassetts Island. A draft of 6 feet can be taken into the harbor.

The village of **North Pocasset** lies near the eastern end of Pocasset Harbor, and the village of **South Pocasset** near the southeastern extremity of Red Brook Harbor.

Pilots are not necessary for small vessels making an anchorage in Pocasset Harbor. If desiring a pilot, one may be had by making signal when off Wings Neck Lighthouse, or after anchoring between Wenaumet Neck and Scraggy Neck.

Tides.—The mean rise and fall of tides is 4.1 feet.

GENERAL DIRECTIONS, TO ENTRANCE OF POCASSET HARBOR.

The following directions are good for vessels of not more than 14 feet draft to the anchorage south of Wenaumet Neck, where there is good holding ground in 15 to 26 feet of water.

Approaching and Entering.—Follow the directions for Buzzards Bay, pages 112–113, and when Wings Neck Lighthouse bears **NE.** by **E.** steer for it. When the lighthouse is ¾ mile distant ahead, steer **E.** ½ **N.** and anchor when it bears about *NW.*

Remarks.—When heading for Wings Neck Lighthouse on the **NE.** by **E.** course, Southwest Ledge (north part) buoy should be left ¼ mile on the starboard hand. On the **E.** ½ **N.** course the lighthouse should be left over ¼ mile on the port hand. A vessel should not approach the northern shore closer than 400 yards, and should not stand eastward of a line drawn from the west end of Scraggy Neck to the entrance of Pocasset Harbor.

Dangers.—**Southwest Ledge** lies about ⅝ mile westward of **Scraggy Neck**; it is about ¾ mile long in a general **N.** and **S.** direction, and is awash in one place at low water, near its northern end. The southwestern part of the ledge, which lies a little over 1½ miles **SSW.** from Wings Neck Lighthouse, and the northwestern end, lying about ⅞ mile **SW.** by **S.** from the lighthouse, are marked by buoys (spars, red, Nos. 8 and 10, respectively). The passage between Scraggy Neck and the ledge is unsafe for a stranger.

Shoals and **detached spots**, with 17 to 18 feet over them, extend from the end of Wenaumet Neck to Southwest Ledge. **Spots** with 10 and 12 feet over them lie about ¼ mile **SW.** from the northwestern end of Bassetts Island. The eastern part of the harbor, between Bassetts Island and Scraggy Neck, is shoal.

CATAUMET HARBOR, WILD HARBOR, HOG ISLAND HARBOR, AND QUAMQUISSET HARBOR.*

These are all small and unimportant harbors on the eastern side of Buzzards Bay, and have but a little trade.

Cataumet Harbor is south of Scraggy Neck and has its entrance about 1¾ miles **S.** by **E.** from Wings Neck Lighthouse. The channel into the harbor is buoyed, and a draft of 9 feet can be taken well into the harbor to an anchorage in 15 to 19 feet of water. A narrow crooked channel with a depth of 8 feet leads to the village of Megansett.

Wild Harbor, a small cove about ½ mile southward of the entrance to Cataumet Harbor, has a depth of about 15 feet, and affords anchorage during northerly or easterly winds just inside the entrance. It may be entered without danger by keeping about midway between its northern and southern points of entrance.

Hog Island Harbor, 2 miles **S.** of Wild Harbor, has a depth of 3 feet in its entrance, is not buoyed, and strangers should not attempt to enter it.

Quamquisset Harbor, a very small harbor lying about 1 mile northeastward from the northern entrance to Woods Hole, is small and has a narrow, crooked channel. There is about 9 feet of water in the channel, and an anchorage depth of 12 to 18 feet inside; although the most important dangers are buoyed, a stranger should not attempt to enter.

* See footnote on page 123.

CUTTYHUNK HARBOR*

is in the south side of Buzzards Bay, near the western entrance, and is formed by a bight between the eastern end of Cuttyhunk and western end of Nashawena Island. It is about ¾ mile wide, and affords anchorage in 12 to 24 feet water, but is exposed to northeasterly winds. Northward of the harbor are **Penikese** and **Gull** islands and a number of ledges, which shelter it from that direction. The shores on both sides of the harbor are foul, and the anchorage is in the middle; it is sometimes used by weather-bound coasting vessels and fishermen. The principal dangers are marked by buoys, and the approach from the westward is marked by **Cuttyhunk Lighthouse** (see table, page 18), which is near the western end of the island. Canapitsit Channel, the dredged cut between Nashawena and Cuttyhunk islands, has a depth of 6 feet, and is marked by several buoys.

SAILING DIRECTIONS, CUTTYHUNK HARBOR.

Strangers should not enter except in the daytime with clear weather and a fair wind. If entering from westward a greater draft than 15 feet should not be taken in.

1. ***Approaching and Entering, from Eastward.***—When westward of Quicks Hole and Lone Rock, steer **W.** by **S.** for the northern end of Cuttyhunk Island, giving the northern shore of Nashawena Island a berth of about ½ mile. When the east end of Gull Island is on the starboard beam, steer **SW.** by **W.**, heading for red spar buoy No. 6 and passing 300 yards south of black spar buoy No. 5. When red spar buoy No. 6 is ¼ mile distant ahead, anchor in the middle of the harbor eastward of the buoy. Or, if of less than 9 feet draft, steer about **S.** and anchor a little over ¼ mile from the shore in 16 feet water.

Remarks.—When approaching from eastward, Penikese and Gull islands should be on the starboard bow; care should be taken to avoid Lone Rock, which lies about ¾ mile northward from the northeastern end of Nashawena Island. Black spar buoy No. 5 marks the southern end of a rocky ledge making southward from Gull Island. The eastern point at the entrance and the eastern shore of the harbor should be given a berth of over 300 yards. Several buoys will be seen over toward the western shore of the harbor. The best anchorage is eastward of the southernmost red buoy.

1 A. ***Approaching and Entering, from Westward.***—Steer for Cuttyhunk Lighthouse, bearing between **E. ¾ N.** and **SE.**, and pass about ½ mile northward of it. When the lighthouse bears *S.*, distant ½ mile, steer **NE.** by **E. ¼ E.** for black spar buoy No. 1, which should be made ahead. Leave this buoy about 30 yards on the port hand and steer about **E. ¼ S.**, heading for black spar buoy No. 3. Leave the red and black horizontally striped spar buoy marking Middle Ledge on the starboard hand, and when it is passed haul a little southward so as to leave black spar buoy No. 3 about 100 yards on the port hand. When this buoy is 150 yards abaft the port beam steer about **S.**, heading for the entrance to Canapitsit Channel, and leave the buoys on the western side of the harbor well on the starboard hand. Anchor eastward of the southernmost red buoy in 14 to 19 feet water, soft bottom.

Remarks.—In approaching Cuttyhunk Lighthouse between the bearings given, Sow and Pigs Reef is left on the starboard hand and Ribbon Reef on the port hand. On the **NE.** by **E. ¼ E.** course the eastern end of Penikese Island will be on the port bow, and the northeastern end of Cuttyhunk Island will be given a berth of over ¼ mile. Care should be taken not to mistake the buoys, which are rather close together; black spar buoy No. 1 should appear as the farthest northward.

On the **E. ¼ S.** course for black spar buoy No. 3, another black spar buoy (No. 5) will be seen about ⅝ mile farther eastward. The buoys marking detached rocks and ledges will be seen southward; when standing southward for the anchorage these should be left well on the starboard hand.

Dangers.—**Sow and Pigs** and **Ribbon Reef** are described on pages 112–113.

Shoal water extends from Penikese Island to Gull Island, and no attempt should be made to pass between them.

* Shown on charts **112**, scale $\frac{1}{80,000}$; **249**, scale $\frac{1}{40,000}$; price of each $0.50; **297**, scale $\frac{1}{10,000}$, price $0.25.

Shoals extend out about ½ mile northeastward from Cuttyhunk Island, **Whale Rock** and **Pease Ledge** being the names given to the parts which show at low water. A detailed description of the dangers would be of but little use; vessels must be guided mainly by the buoys.

WESTPORT HARBOR*

is the name given to the small anchorage just inside the mouth of **Westport River,** which empties into the northern part of the large bight between Gooseberry Neck and Sakonnet Point. The entrance is about 4½ miles **NNW. ¾ W.** from Hen and Chickens Light-vessel and **ENE.** from the dry rocks southward of Sakonnet Point.

Westport River has a narrow and crooked channel, with a depth of 7 feet on the outer bar and 5 feet on the inner bar below the village of **Westport Point,** which is about 1½ miles above its mouth, on the point of land between the two branches. The channel is well marked by buoys, but is too narrow and crooked to be followed, except with local knowledge. In southerly gales a heavy sea breaks on the bar at the entrance, making it unsafe to enter the harbor. About 1 mile above its mouth Westport River divides into two branches, East Branch and West Branch, which have narrow and shallow channels and are only navigated by small vessels.

About 6½ feet can be taken into the entrance of the harbor at low water, and 9 feet is the deepest draft that can be taken to the village at high water. There is 10 feet of water alongside some of the wharves.

Strangers entering the harbor take a pilot, lying off and on eastward of Two Mile Rock with signal set until boarded by one. Vessels should not attempt to enter at night. On the western side of the entrance is a peculiar, rounded nubble, about 30 feet high, on which a flagstaff is erected, which serves as a guide to the entrance.

Tides.—The mean rise and fall of tides is 3.1 feet.

The **tidal currents** set in and out of the entrance with considerable velocity, and should be allowed for.

SAILING DIRECTIONS, TO THE ENTRANCE OF WESTPORT HARBOR.

The following directions lead to the entrance of Westport River, where a pilot should be taken.

1. ***Approaching from Eastward.***—Bring Hen and Chickens Light-vessel to bear *E.* by *S.*, distant about 1 mile, and steer **N.** by **W.** ¼ **W.** Leave Lumber Rocks buoy (spar, red, No. 2) about ⅝ mile on the starboard hand, and Two Mile Rock buoy (spar, black, No. 1) and spindle (black, with spherical cage on top) about ¼ mile on the port hand. Continue this course until the flagstaff on The Nubble, at the western side of the entrance, bears about *NW.*, and anchor in about 4¾ fathoms until a pilot is obtained.

From Vineyard Sound Light-vessel steer **N.** by **W.** ⅛ **W.**; pass about 1 mile westward of Hen and Chickens Light-vessel and follow the directions above.

Remarks.—The bight eastward and northeastward of Two Mile Rock spindle is free from dangers, and the shore can be approached as close as 400 yards, but the western side of Gooseberry Neck is foul, and should be given a berth of over ¼ mile. Close attention should be given the buoys, which are the best guides for a stranger.

Dangers.—There are numerous rocks and shoals around Gooseberry Neck and along the shore from Westport entrance to Sakonnet Point, and only the most important are described.

Hen and Chickens and **Old Cock** are described on page 112.

Lumber Rock, with 5 feet of water over it, lies nearly ⅝ mile **SW. ¾ W.** from the southern end of Gooseberry Neck, and is marked by a buoy (spar, red, No. 2) on its southern side. Shoal water extends from this rock to Gooseberry Neck, and ¼ mile northward to Browing Ledge, which has 6 feet of water over it.

Two Mile Rock lies a little over 1 mile **SSE.** from The Nubble, and is marked by an iron spindle (black, 35 feet high, spherical cage on top) and a buoy (spar, black, No. 1), 400 yards southward of the spindle.

Joe Burris Ledge, with 13 to 17 feet over it, lies about midway between Half Mile Rock and Two Mile Rock.

Half Mile Rock is a bare rock lying close southward of the channel into Westport Harbor.

*Shown on chart **113**, scale $\frac{1}{80,000}$, price $0.50.

1 A. ***Approaching from Westward.***—Passing about 1 mile *S.* of Sakonnet Lighthouse and ¼ mile *S.* of Schuyler Ledge buoy (spar, red, No. 2), steer **ENE.** ⅝ **E.** about 6½ miles. Leave Elisha Ledge buoy (can, red and black horizontal stripes) ⅜ mile on the starboard hand, and pass ¼ mile southward of Two Mile Rock buoy (spar, black, No. 1). When this buoy is well abaft the port beam, steer **N.** so as to pass about 400 yards eastward of the buoy and the spindle northward of it. Continue the **N.** course until the flagstaff on The Nubble bears about *NW.*, and anchor until boarded by a pilot.

Remarks.—The bight northward of the sailing line has many unmarked dangers and vessels should not stand northward until the buoy on Two Mile Rock has been passed.

On the **ENE.** ⅝ **E.** course the opening between Gooseberry Neck and Horse Neck Beach will be a very little on the starboard bow. See also the remarks under section 1, preceding.

Dangers.—**Two Mile Ledge** extends, from the western side of Westport entrance, 1 mile in a southerly direction. It is about 200 yards wide, has a spot with only 3 feet of water over it near its southern end, and 6 to 10 feet northward of this spot; there are 6 to 7 fathoms of water on its western side, and 4½ to 5½ fathoms on its eastern side. Several spots with 8 to 9 feet lie between the ledge and Two Mile Rock.

Palmer Ledge, Briggs Ledge, and **Churches Ledge** lie from ¼ to 1¾ miles westward of Two Mile Ledge, and the shore should in this vicinity be given a berth of 1¼ miles. Farther westward the shore may be approached as close as ½ mile, being careful to avoid **Elisha Ledge** and **Schuyler Ledge,** which lie farther offshore and are described in connection with the sailing directions for approaching Sakonnet River.

SAKONNET RIVER*

is the name given to the body of water which leads northward between the mainland on the east and Rhode Island on the west. It is about 12 miles long and forms an approach from the sea to Mount Hope Bay, and from it to points in the northern part of Narragansett Bay. The entrance, which is marked by **Sakonnet Lighthouse** (see table, page 18) on its eastern side, is 18 miles **NW.** by **W.** ¼ **W.** from Gay Head and 13½ miles **ENE.** ¼ **E.** from Point Judith; between Sakonnet Point on the east and Sachuest Neck on the west it is about 2¼ miles wide and has comparatively few dangers. Above the entrance its width gradually diminishes for 5 miles until up to **Fogland Point,** where it is about ¾ mile; above the point for a distance of 3½ miles the width is 1¼ miles; it then contracts to a width of ¼ mile and is crossed by a stone bridge having a draw 40 feet wide. Nearly ¾ mile above this bridge is a railroad bridge with a draw 100 feet wide. Between these two bridges is a kind of basin in which the water level differs from the level outside as much as 2 feet at certain stages of the tide, causing dangerous currents through the draws of the bridges. Vessels passing through these draws usually do so at or near the time of slack water at the bridges.

The river is little used except by fishing steamers, and small vessels carrying coal and general freight to **Tiverton Four Corners** and **Tiverton,** two villages in Tiverton township on the eastern shore, about 7 and 10 miles, respectively, above Sakonnet Lighthouse. On the northeast end of Rhode Island, a short distance north of the railroad bridge, is a large fish-oil factory, and a marine railway for the use of fishing steamers. The vessels trading to Tiverton usually enter the river from Mount Hope Bay. In summer a small steamer makes trips from Providence to Sakonnet Point, stopping at intermediate landings.

The least depth in the channel is 13 feet, found at the draw of the stone bridge. The channel for a distance of 7¼ miles above Sakonnet Point is good for a least depth of 20 feet and has few unmarked dangers; about ¾ mile above Fogland Point it contracts in width, leading between extensive shoals up to the first bridge, the depth ranging from 3½ to 9 fathoms. Between the bridges the depth ranges from 5 to 10 fathoms and there are no dangers if a mid-river course is kept. Above the second (railroad) bridge 4 fathoms can be carried into Mount Hope Bay.

Anchorages.—There is good anchorage in 3½ to 4½ fathoms water just below **High Hill Point,** about 5 miles above Sakonnet Lighthouse, and in northerly winds it is easier of access than Newport for vessels up to 20 feet draft, there being more room to work in. Though open southward a heavy sea seldom reaches as far as the anchorage, and in southeasterly gales the water is comparatively smooth inside the mouth of the river. Above Fogland Point, over toward the eastern shore, is an anchorage which is much used by fishermen seeking shelter. The depths on the flats range from 10 to 14 feet; in the channel the depth is about 5 fathoms. The river is, however, seldom used as an anchorage except in case of necessity.

Tides.—The mean rise and fall of tides at Sakonnet Point is 3.6 feet; corrected establishment, 7 h. 40 m.

Shown on charts **113**, scale $\frac{1}{80,000}$, price $0.50; **353**, scale $\frac{1}{40,000}$, price $0.75.

SAILING DIRECTIONS, SAKONNET RIVER.

The following directions carry a least depth of 20 feet up to Fogland Point, and are good for steamers of 12 feet draft into Mount Hope Bay.

1. ***Approaching and Entering, from Eastward, to Fogland Point.***—Bring Hen and Chickens Light-vessel to bear *E.* ½ *S.* and steer **W.** ½ **N.**; or bring Vineyard Sound Light-vessel to bear *SE.* by *E.* ⅛ *E.* and steer **NW.** by **W.** ⅛ **W.** Pass at least 1 mile southward of Sakonnet Lighthouse, and when it bears *NNE.* steer **N.** ½ **E.** Pass a little over ¼ mile westward of the lighthouse and nearly ¼ mile westward of red bell buoy No. 4, which is about 2¼ miles above the lighthouse. When Black Point is on the port quarter, distant nearly ⅝ mile, steer **N.** by **W.** ½ **W.**, so as to leave Sandy Point 300 yards on the port beam; when Sandy Point is on the port quarter, distant about 400 yards, steer **NNE.** ½ **E.**, and then:

To anchor northward of Fogland Point.—When the lower of the two wharves above Fogland Point bears **E.** steer for the wharf on this bearing, and anchor on the flats in 10 to 15 feet water when Fogland Point bears westward of **S.**

To proceed up the river, follow the directions in section 2.

Remarks.—Passing south of Sakonnet Lighthouse Schuyler Ledge buoy should be left ¼ mile on the starboard hand. In the summer there are usually a number of fishing buoys southward of Sakonnet Point, which should not be mistaken for the ledge buoy.

On the **N.** ½ **E.** course Fogland Point will be made nearly ahead (a little on the starboard bow), and **High Hill Point**, bold and dark, will be quite prominent about ¾ mile **S.** of Fogland Point. After passing **Church Point**, the point on the eastern shore 2¾ miles above Sakonnet Lighthouse, the course leads midway between the eastern shore and **Black Point**, the point on the western shore, about 2 miles above Church Point.

On the **N.** by **W.** ½ **W.** course **Sandy Point**, low, with a strip of sand beach near its end and backed by sloping highland, will be on the port bow. A red buoy will be seen on the eastern side of the channel northeastward of the point, but there is a shoal, with 15 to 18 feet over it, westward of the buoy, and to avoid it the course is laid close to Sandy Point.

The **NNE.** ½ **E.** course leads a little over ¼ mile westward of Fogland Point and clears the shoals making southwestward from it. When standing eastward for the anchorage the water shoals rapidly from 30 to 10 feet.

Dangers.—**Elisha Ledge**, a small, detached, pinnacle rock with 13 feet over it, lies 2 miles **SE.** by **E.** ⅝ **E.** from Sakonnet Lighthouse, and is marked by a buoy (can, red and black horizontal stripes), which should be given a berth of ¼ mile.

Schuyler Ledge, a small, detached ledge, the outermost of the ledges southward of Sakonnet Point, has 8 feet over it and bears **S.** by **E.**, distant nearly ¾ mile from Sakonnet Lighthouse, and is marked off its south side by a buoy (spar, red, No. 2).

Cormorant Reef, with 2 feet over it, lies 2 miles **WNW.** ½ **W.** from Sakonnet Lighthouse and about ¼ mile southward of Cormorant Rock, and is marked by a buoy (spar, black, No. 1) placed close southward of the reef.

Cormorant Rock is a bare, dark rock off the western side of the entrance to Sakonnet River, lying about ¾ mile **S.** by **W.** from **Sachuest Point**, the southern point of Sachuest Neck. Vessels should not pass between the rock and Cormorant Reef.

Island Rocks, showing bare at low water, extend eastward about 500 yards from the northeastern side of Sachuest Neck.

Church Point Reef makes off about 900 yards in a southwesterly direction from Church Point. A group of bare rocks, known as the **Old Bull Rocks**, are near the southwestern end of the reef, and are marked off their western side by a buoy (bell, red, No. 4).

Flint Point Ledge has a depth of 10 feet over it, lies about 900 yards **NE.** ¾ **N.** from **Flint Point**, the northern point of Sachuest Neck, and is marked off its eastern side by Smith Reef buoy (spar, black, No. 3).

Shoals fill the bight westward of Flint Point and the bight between Black and Sandy points.

Shoals with 9 to 15 feet over them extend about 900 yards southward and southwestward from Fogland Point. A buoy (spar, red, No. 6) is placed westward of a 9-foot spot lying about 600 yards **SW.** by **S.** from the southwestern end of the point.

McCurry Point Shoal has 5 feet of water near its outer end and extends about 650 yards in a southeasterly direction from **McCurry Point**, the point on the western shore about 1 mile above Fogland Point.

1 A. ***Approaching and Entering, from Westward.***—From Brenton Reef Light-vessel steer **E.** by **S.**; or, from the whistling buoy off Point Judith, steer **ENE.** ½ **E.** As soon as Sakonnet Lighthouse is made steer for it on any bearing between **E.** and **N.** Bring the lighthouse to bear *E.*, distant ¾ mile, and steer **N.** by **E.**, heading up the middle of the river. When ½ mile above Black Point, the point on the western shore about 2¾ miles above the northern point of Sachuest Neck, steer **N.** by **W.** ½ **W.** and continue as directed in section 1, preceding.

Remarks.—When steering for Sakonnet Lighthouse, Cormorant Rock will be left at least ¾ mile on the port hand. The **N.** by **E.** course leads about ¾ mile eastward of Sachuest Neck, and ½ mile westward of Church Point. Fogland Point will be ahead; and **High Hill Point,** which appears as a nubble with a steep face westward, will be a little on the starboard bow. Two small hills on **Fogland Point** will show westward of High Hill Point. See also the remarks and dangers under section 1, preceding.

2. ***From Fogland Point to Mount Hope Bay.***—Having followed the directions in section 1 or 1 A, preceding, continue the **NNE.** ½ **E.** course past Fogland Point, and leave black spar buoy No. 5 on the port hand. When *Gould Island*, which will show prominently, bears **N.** by **E.** ⅛ **E.**, steer for it, keeping the bearing, with the western end of Fogland Point astern. As Gould Island is approached haul a little eastward so as to leave it about 250 yards on the port hand and then steer **N.** by **E.** for the draw of the stone bridge. From this bridge steer directly for the draw of the railroad bridge, about ¾ mile farther up; and when through the latter draw make good a **N.** by **E.** ½ **E.** course into Mount Hope Bay, taking care to avoid an 11-foot shoal lying off the fish factory just westward of mid-channel.

Bound to Fall River, follow the eastern shore, giving it a berth of about ¼ mile until Spar Island (the small, low, grassy island in Mount Hope Bay) bears **NW.** by **W.**, when haul closer in and give the shore a berth of about 300 yards until up to the city.

Bound into Narragansett Bay, round *Common Fence Point*, the point about 1 mile above the second bridge, at a distance of at least ¼ mile, and leave the red bell buoy 150 yards on the port hand. Then steer about **SW.** by **W.** ¾ **W.**, heading midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse, with Hog Island Shoal Lighthouse directly ahead. Leave Hog Island Shoal Lighthouse 300 yards on the starboard hand, and steer **W.**

Remarks.—Vessels of 12 feet or less draft can easily follow the above directions without danger. The only trouble will be in passing through the draws of the bridges. The great difference of water level in that part of the river between the two bridges and that outside causes a very strong current, and makes passing through the draws dangerous.

Dangers.—The bight northward of Fogland Point has a depth of 9 to 15 feet; and the whole western half of the river between McCurry Point and the stone bridge is shoal, with a depth varying from 7 to 17 feet.

For the dangers from Common Fence Point to Hog Island, see "Sailing Directions, Mount Hope Bay," page 142.

NARRAGANSETT BAY.*

The entrance to this bay is between **Brenton Point,** the southwestern point of Rhode Island on the east and Point Judith Neck on the west. Sakonnet River, strictly speaking, may be regarded as a part of Narragansett Bay, but is treated under a separate heading (see page 128). Between Brenton Point and **Narragansett Pier** (at the northern extremity of Point Judith Neck) the entrance is about 4½ miles wide; but above this the width of the bay varies from 3 to 6 miles, and appears somewhat irregular in shape on account of deep indentations and the two large islands, Conanicut and Prudence, nearly in its middle. The length of the bay, from the entrance to its northern extremity at the mouth of the Providence River, is 16 miles. It is the approach by water to the cities of Newport, Providence, Fall River, and Taunton, and to a number of towns and villages, the most important of which are Bristol, Wickford, and Greenwich.

Conanicut Island, lying in the lower part of the bay near its entrance, is about 7½ miles in length in a **NNE.** and **SSW.** direction, is irregular in shape, but has an average width of about 1 mile. Its surface is hilly and

* Shown on charts **8**, scale $\frac{1}{400,000}$; **113**, scale $\frac{1}{80,000}$, price of each $0.50; **353**, scale, $\frac{1}{40,000}$, price $0.75; and in part on chart **353**[2], scale $\frac{1}{20,000}$, price $0.40.

undulating, the greatest height being about 135 feet, and its shores are in general fairly bold to. On its eastern side opposite the city of Newport is the village of **Jamestown**, which has communication with Newport by a steam ferry.

Prudence Island, in the northern part of the bay, is irregular in shape, about 5½ miles long in a general **N. ½ E.** and **S. ½ W.** direction, with a width varying from ¼ mile to 1¼ miles. Near the center of the southern part of the island the land attains its greatest height, 160 feet.

Besides the two large islands described, there are a number of small islands in the bay, which are sufficiently described in the remarks following the sailing directions.

The entrances to the bay are well marked by the lighthouses and **Brenton Reef Light-vessel** (see table, page 18), making entering easy in fair weather, and in thick weather if close attention be given to the fog signals.

The **Eastern Passage**, between Rhode Island on the east and Conanicut and Prudence islands on the west, is good for a least depth of about 10 fathoms in the channel for a distance of 12 miles above the entrance, and a depth of about 4½ fathoms to Providence River entrance, but it requires some local knowledge to carry the latter depth above the entrance to Bristol Harbor. It is also the most direct passage to Newport, Bristol, Mount Hope Bay, and Taunton River.

The **Western Passage**, between Conanicut and Prudence islands on the east and the mainland on the west, is the approach to Dutch Island Harbor, Wickford, Greenwich, and Providence River. The recently dredged cut south of Warwick Neck and the cut east of Rocky Point now form a passage through which a depth of 25 feet can be taken to Providence. Strangers of over 16 feet draft rarely go above Dutch Island Harbor without a pilot; but vessels of 16 feet draft should have no difficulty in going to the head of the bay and Providence by following the directions.

Prominent features and aids.—On the western shore, a little southward of Narragansett Pier—a much frequented summer resort—is a **tall tower** which can be seen nearly 20 miles on a clear day. **Point Judith Lighthouse**, a prominent mark for vessels standing along the coast and through the sounds, is 3½ miles southwestward of this tower. It is the turning point for vessels coming from westward and bound into the bay. The land on both sides of the entrance is hilly, and on the eastern side are a number of large summer residences with extensive lawns. The southern end of **Conanicut Island**, which is in the middle of the entrance and separates the Eastern and Western passages, is marked by **Beavertail Lighthouse** (see table, page 18). **Castle Hill Lighthouse** is on the eastern side of the Eastern Passage, and **Whale Rock Lighthouse** on the western side of the Western Passage. The passages are well marked by lighthouses, and the principal dangers by buoys, beacons, or spindles, so that the navigation of the bay is comparatively easy in clear weather.

Anchorages.—The principal anchorages for vessels seeking shelter from storms are Newport Harbor, in the Eastern Passage, and Dutch Island Harbor, in the Western Passage. These harbors afford anchorage with good holding ground for vessels of the deepest draft, and are used by coasting vessels on the passage between Vineyard Sound and Long Island Sound. Good anchorage will be found almost anywhere in the bay under the lee of the islands or the shore, and vessels becalmed or at night frequently anchor. Point Judith harbor of refuge is just west of the point.

Pilots for Narragansett Bay and the harbors in Rhode Island will sometimes be found cruising between Point Judith and Cuttyhunk and also off Block Island. If a vessel passes into the bay without having been boarded by a pilot, one may be obtained at Newport or Dutch Island Harbor. Pilotage is compulsory for foreign vessels, or vessels from a foreign port (see pilot laws for the State of Rhode Island in Appendix II).

Towboats are frequently used by vessels in the bay, especially those bound to Providence by the Western Passage, and may sometimes be found off the entrance or in Newport Harbor. It is usual for vessels entering by the Western Passage to put into Dutch Island Harbor, and from there telephone to the towboat office at Providence.

Quarantine.—The quarantine laws for Rhode Island and Massachusetts govern the ports in the respective States. Local boards of health have the power to establish rules for the quarantine of their ports (see Appendix II).

Marine Hospital.—Relief is furnished at Newport and Providence, as provided in the United States Public Health and Marine-Hospital Service regulations for stations of Class III (see Appendix IV).

Supplies.—Coal, water, and some ship-chandler's stores can be obtained at Newport, Providence, and Fall River, and provisions at most of the towns on the bay or its tributaries.

Repairs to the hulls of vessels can be made at Fall River and Providence, and to the machinery of steamers at Providence.

Storm warning displays of the United States Weather Bureau are made at Point Judith, Narragansett Pier, Newport, Saunderstown (opposite Dutch Island), and Fall River (see the table on page 24, and Appendix III).

Fogs.—In the entrance to the bay and its approach fogs are more prevalent from April to October than during the rest of the year; they are brought in by winds from **E.** through **S.** to **SW.**, and are cleared off by northerly and westerly winds; their usual duration is 4 to 12 hours, but periods of 4 to 6 days have been known, with but short clear intervals. The head of the bay will sometimes be free from fog when the entrance is completely shut in.

Ice.—Navigation in the bay and its tributaries is sometimes impeded by floating ice, and in severe winters by pack or field ice. The ice breaking up in Providence River and Mount Hope Bay is set by **N.** and **NE.** winds down the bay through the Eastern Passage, and if there is much ice a gorge is sometimes formed at Fort Adams, but is of short duration. The passages are rarely closed for any length of time below Gould Island in the Eastern, and Dutch Island in the Western, passage. During January and February Mount Hope Bay, Bristol, Providence River, Greenwich, Warren, and Wickford are usually closed to sailing vessels unaided by steam. The inner harbor of Newport is also sometimes closed during the same months, with the exception of a channel kept open by the New York steamers.

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE EASTERN PASSAGE.

The following directions are good for the deepest-draft vessels to the anchorage off Newport and up the bay to the entrance of Mount Hope Bay, and for a draft of 20 feet to the entrance of Providence River and to the city of Providence. Vessels of over 20 feet draft if bound to Providence, and vessels of over 18 feet draft if bound to Fall River, should take a pilot.

Note.—Approaching the entrance in thick weather, Brenton Reef Light-vessel should be made and passed close-to. From the light-vessel a stranger should be able to make the anchorage in Newport outer harbor by closely following the directions and paying attention to the fog signals. See also the remarks on page 28.

1. ***Approaching and Entering, from Eastward.***—***From Buzzards Bay.***—Bring Hen and Chickens Light-vessel to bear *E.* ¼ *S.* and steer **W.** ¼ **N.** about 8 miles, to a position 1¼ miles *S.* of Sakonnet Lighthouse; and then steer **W.** by **N.** about 8 miles.

From Vineyard Sound.—Bring Vineyard Sound Light-vessel to bear *ESE.* and steer **WNW.** about 17 miles.

Passing about 1 mile south of No Mans Land.—Steer **NW.** ¾ **W.** about 27½ miles.

The above directions all lead close to Brenton Reef Light-vessel. As soon as the light-vessel is made it should be steered for, taking care, however, to keep it bearing northward of **W.** by **N.** Pass on either side of Brenton Reef Light-vessel, bring it to bear *S.* by *W.* ¾ *W.*, and steer **N.** by **E.** ¾ **E.** for 2 miles, passing about 400 yards westward of Butter Ball red bell buoy and about 650 yards westward of Castle Hill Lighthouse. When this lighthouse bears one point abaft the starboard beam, steer **NE.** by **E.** ¼ **E.**, heading for Newport Harbor (Goat Island) Lighthouse. Then:

Bound into Newport Harbor, follow the sailing directions under that heading, page 139.

Bound up the bay, proceed as directed in section 2, following.

Remarks.—When approaching the entrance, the tall tower southward of Narragansett Pier will be a conspicuous mark on the port bow. In clear weather Brenton Reef Light-vessel may be left ½ mile on the port hand, and the course into the entrance should then be **N.** ¾ **E.** to pass westward of Castle Hill; but in thick weather the light-vessel should be passed close enough to hear the fog whistle and get a bearing.

On the **N.** by **E.** ¾ **E.** course with Brenton Reef Light-vessel astern, **Castle Hill Lighthouse** will be on the starboard bow; the lighthouse, and the bell buoy about 600 yards southwestward of it, should be left at least 150 yards on the starboard hand. **Mackerel Cove**, the long cove making into the southern side of Conanicut Island,

will be opened on the port bow. The head of this cove is separated from Dutch Island Harbor by a low, narrow strip of beach over which the vessels at anchor in Dutch Island Harbor can sometimes be seen when standing in through the Eastern Passage.

On the **NE.** by **E.** ¼ **E.** course for **Newport Harbor** (Goat Island) **Lighthouse, Fort Adams,** a large granite structure with sodded parapets, will be on the starboard bow. **Fort Wetherell** (Fort Dumpling) will be on the port bow. As the latter draws on a beam bearing, the stretch up the bay westward of Rose Island will be opened. The eastern shore above Castle Hill Lighthouse can be approached as close as 150 yards, but the northern shore, off the eastern side of the entrance to Mackerel Cove, should be given a berth of 500 yards; in the vicinity of Fort Dumpling, the shore and bare rocks should not be approached closer than 200 yards.

Dangers.—**Seal Ledge,** a detached ledge with a least depth of 17 feet over it, lies about ¾ mile **S.** by **E.** ½ **E.** from Brenton Point, and is marked at its southern side by a buoy (nun, red, No. 2).

Seal Rock is a bare rock, surrounded by shoal water, lying ½ mile **SE.** ½ **S.** from Brenton Point.

Brenton Reef, showing bare in places at low water, extends about ½ mile in a **SSW.** ½ **W.** direction from Brenton Point, and is marked at its southern end by a buoy (nun, red, No. 4).

Newton Rock has 3 feet over it, and is part of the ledge which extends about 400 yards southward from **Beavertail**, the southern end of Conanicut Island. A red and black horizontally striped bell buoy is placed about ¼ mile southwestward of the rock and about 350 yards from the southern end of the ledge.

Butter Ball Rock, a small, bare rock about 150 yards from the southern end of Castle Hill, is marked off its western side by a red bell buoy which is a little over ¼ mile southwestward of Castle Hill Lighthouse.

Kettle Bottom Rock is on the northern side of the channel about 300 yards southeastward of the eastern point of the entrance to Mackerel Cove. The rock is always bare, and there are spots with 8 to 15 feet over them northeastward of it. The shore in this vicinity should be given a berth of 500 yards.

If beating into the Eastern Passage.—To avoid Brenton Reef, when standing eastward go about just before Castle Hill Lighthouse bears *N.* by *E.* ¼ *E.* When well up to Castle Hill Lighthouse, to avoid Butter Ball Rock, pass westward of the bell buoy lying 300 yards westward of the rock. Above Castle Hill Lighthouse the eastern shore can be approached as close as 200 yards.

When standing westward care should be taken to avoid Newton Rock and the ledge making southward from Beavertail. The shore from Beavertail Lighthouse to the entrance of Mackerel Cove should be given a berth of about 400 yards to insure safety. The entrance of Mackerel Cove has deep water; but care must be taken to avoid Kettle Bottom Rock, which should in no case be approached closer than 150 yards from southward. When well eastward of Kettle Bottom Rock give the south shore a berth of 200 yards, and on the north shore keep 200 yards outside of a line drawn from one dry rock to another. Kettle Bottom Rock and the dangers off the north shore, between Fort Dumpling and Mackerel Cove, can be avoided by keeping Newport Harbor Lighthouse open to the right of Fort Wetherell (Fort Dumpling).

1 A. ***Approaching and Entering, from Westward.***—When Point Judith Lighthouse is made, steer so as to pass about 1 mile southward of it and close to the whistling buoy, and from the latter steer **NE.**, heading for Castle Hill. When nearly up to Castle Hill Lighthouse haul a little northward so as to pass about ¼ mile westward of it; and when it bears **SE.** steer **NE.** by **E.** ¼ **E.** for Newport Harbor Lighthouse, and follow the directions in section 2, following. If bound into Newport Harbor follow the directions for that harbor.

See also the directions preceding for beating into the Eastern Passage.

In thick weather, from the whistling buoy off Point Judith steer **NE.** ½ **E.** for 7 miles until close to Brenton Reef Light-vessel, and then follow the directions in section 1, foregoing.

Remarks.—When standing on the **NE.** course from the whistling buoy off Point Judith, Brenton Reef Light-vessel will be made on the starboard bow and Beavertail Lighthouse on the port bow, and the course leads about midway between them. Castle Hill Lighthouse should be made ahead. The Western Passage into Narragansett Bay will be open between Beavertail Lighthouse on the east and Whale Rock Lighthouse on the west. *If beating,* a good rule to follow is to go about when ¼ mile from the shore between Point Judith and Whale Rock. See also the remarks under section 1, preceding.

Dangers.—There are **several detached spots** with 3½ to 4¾ fathoms over them lying from ¼ to 1 mile southward and southwestward from Point Judith. In heavy southerly gales the sea breaks on these spots.

The shore for a distance of 2¾ miles northeastward of Point Judith is foul and should be given a berth of ½ mile. Abreast the tower it is bold-to, but abreast Narragansett Pier there are shoals and rocks which extend about 300 yards from the shore. A **small, detached, 14-foot spot,** lying ¾ mile **SW.** by **W.** from Whale Rock Lighthouse, is marked by a black spar buoy.

See also the dangers under section 1, foregoing.

2. ***From abreast Fort Adams to Prudence Island Lighthouse.***—Having followed the directions in section 1 or 1 A, preceding, when, on the **NE.** by **E.** ¼ **E.** course for Newport Harbor (Goat Island) Lighthouse, the outer bare rocks of The Dumplings are on the port beam and Rose Island Lighthouse bears *NNE.*, steer **N.** by **E.** When Gull Rocks Lighthouse bears *E.* by *S.* steer **NNE.** ¾ **E.** about 6½ miles; Prudence Island Lighthouse should then bear on the port beam distant ¼ mile. Then:

Bound to Fall River or Taunton, follow the sailing directions under the heading Mount Hope Bay and Taunton River.

Bound to Bristol, follow the sailing directions under the heading Bristol Harbor.

Bound to Warren River, Providence, or Rocky Point, proceed as directed in section 3, following.

Remarks.—When the course has been changed from **NE.** by **E.** ¼ **E.** to **N.** by **E.**, Fort Adams will be on the starboard beam, and the western edge of **Gould Island** should be a very little on the starboard bow. The course leads about 400 yards eastward of The Dumplings, and 400 yards westward of Rose Island Lighthouse. Gull Rocks Lighthouse will be nearly abeam when past the northern end of Rose Island, and a number of buoys will be seen eastward of the sailing line. The large buildings of the U. S. Training Station and Naval War College will show conspicuously on **Coaster Harbor Island,** and at night the lights in the buildings and around the grounds will be plainly visible.

On the **NNE.** ¾ **E.** course **Gould Island,** lying in the middle of the Eastern Passage about 2 miles above Rose Island, and **Prudence Island,** large hilly island, will be on the port bow. On the eastern side of Gould Island is the lighthouse, and on **Sand Point,** a small point on the eastern side of Prudence Island, is **Prudence Island Lighthouse.** Gould Island will be left ⅝ mile on the port hand. **Coddington Cove,** a good anchorage in southerly and easterly winds, will be on the starboard beam when abreast Gould Island. Vessels in the Eastern Passage, when bound to Wickford or East Greenwich, pass between Conanicut and Prudence islands, carrying a depth of 3½ to 4½ fathoms. The sailing line passes ⅝ mile eastward of Halfway Rock spindle and about midway between Prudence Island and **Dyers Island,** the small, low, grass-covered island lying east from the southern end of Prudence Island. The shore of Prudence Island, for a distance of 1¼ miles below the lighthouse, is bold-to and can be approached as close as 150 yards.

Dangers.—**The Dumplings** are a cluster of bare and sunken rocks lying off **Bulls Point,** the southeastern point of Conanicut Island. They are easily avoided by passing over 200 yards eastward of the rocks, which are out of water.

Rose Island North Shoal extends about 300 yards northward and 550 yards northeastward from the north end of Rose Island and has 9½ feet of water at its end. The northwestern end of the shoal is marked by a buoy (spar, red, No. 6) and the northeastern end by a buoy (spar, red, No. 8).

Bishop Rock Shoal, a small, detached shoal with 8½ feet of water over it, lies about 300 yards westward of **Bishop Rock,** the small, bare rock about ¼ mile **N.** from Coasters Harbor Island. The shoal is marked off its western side by a buoy (bell, red).

The Sisters, a small, rocky shoal, which shows bare at low water, lies about 200 yards from the shore and about ¼ mile **N.** by **E.** ¾ **E.** from Bishop Rock. The western side of the shoal is marked by a buoy (spar, red, No. 10).

Halfway Rock, a small ledge showing bare at its southern end, lies nearly 1⅞ miles **NNE.** ⅝ **E.** from Gould Island Lighthouse and about ⅞ mile **SSW.** from the southern end of Prudence Island. A spindle (black, cage on top) is on the bare part of the ledge.

Fiske Rock, a detached rock with 12 feet over it, lies ¼ mile **NE.** ½ **N.** from the spindle on Halfway Rock, and is marked by a buoy (spar, red and black horizontal stripes). Strangers should not pass between the buoy and spindle.

Dyers Island Shoal, a part of which is bare at low water, extends nearly ⅝ mile southward and southwestward from Dyers Island, and is marked on its western edge by a buoy (spar, red, No. 12). A bar, with 8 to 17 feet over it, extends southward from the buoy to the shore.

Coggeshall Ledge has 7 feet at its end, extends nearly ⅝ mile **N.** from **Coggeshall Point,** the point on the eastern shore 1⅛ miles **SE.** by **S.** from Prudence Island Lighthouse, and is marked at its northern end by a buoy (spar, red, No. 14).

3. ***From Prudence Island Lighthouse to Providence River Entrance.***—When Prudence Island Lighthouse bears *W.*, distant about ¼ mile, steer **N.** by **E.** about 1¼ miles until Hog Island Shoal Lighthouse bears *E.* Then steer **N.** by **W.** about 1¾ miles, passing nearly ⅜ mile westward of Popasquash Neck. When *North Point* (the northern point of Prudence Island) bears *NW.* ½ *W.*, steer **N.** by **E.** until Conimicut Lighthouse bears **NNW.** ¾ **W.**; then steer for the lighthouse, keeping close on this bearing, until it is ¼ mile distant ahead, and then follow the sailing directions under the heading Providence River.

Vessels of less than 14 feet draft bound to Rocky Point.—Steer **N.** by **E.** from Prudence Island Lighthouse as directed above; and when Hog Island Shoal Lighthouse bears *E.*, steer **N.** by **W.** ¾ **W.** about 4 miles, leaving the northern end of Prudence Island more than ½ mile on the port hand. When the wharf at Rocky Point bears **WNW.** steer for it, and anchor in 15 feet water about 500 yards from its end.

Bound into Warren River, follow the sailing directions under heading Warren River.

Remarks and dangers.—On the **N.** by **E.** course from Prudence Island Lighthouse, Popasquash Neck will be ahead. **Hog Island,** the hilly island in the entrance to Bristol Harbor, with Hog Island Shoal Lighthouse off its southeast end, will be on the starboard bow. When Hog Island Shoal Lighthouse bears **E.**, the red buoy marking the southwest point of Hog Island Shoal should be nearly ½ mile distant forward of the starboard beam.

Hog Island Shoal has 3 to 12 feet over it, and extends about ⅝ mile southward and southwestward from Hog Island. The southwestern end of the shoal is marked by a buoy (spar, red, No. 18).

On the **N.** by **W.** course, when North Point (of Prudence Island) bears **NW.** ½ **W.**, the highest part of Popasquash Neck will be a little forward of the starboard beam.

Shoals make off nearly ⅜ mile from the eastern shore of Prudence Island from 1⅛ miles above the lighthouse to its northern end. Abreast Hog Island the shoal has 7 to 14 feet over it; **Mount Tom Rock,** bare at lowest tides, is on this shoal about 350 yards from Prudence Island. A buoy (spar, black, No. 5) marks the eastern edge of the shoal, 400 yards eastward of Mount Tom Rock.

Popasquash Point Shoal makes southward about 400 yards from the point, and is marked at its southeastern end by a buoy (spar, black, No. 1).

The **N.** by **E.** course passes nearly ⅜ mile westward of Popasquast Neck, which can be approached as close as 300 yards with 3¾ fathoms water; a white church spire will be conspicuous a little on the port bow. Ohio Ledge buoy will be made on the port bow, and to carry the best water it should be left ⅜ mile on the port hand. The entrance to Warren River will be opened on the starboard bow, and the white tower on Nayat Point and Conimicut Lighthouse will be well on the port bow.

A **shoal** with a depth of about 10 feet over it makes northward a little over ½ mile from the north point of Prudence Island, and is marked near its northern end by Fork Rock buoy (spar, red and black horizontal stripes).

Ohio Ledge, a small ledge with 8 feet over it, lies nearly 1⅜ miles **NE.** by **E.** from the north point of Prudence Island, and 2¼ miles **S.** by **E.** ½ **E.** from Conimicut Lighthouse. The ledge is near the southeastern end of an extensive shoal, with 15 to 17 feet over it, which extends nearly 1 mile northward; it is marked near its southern end by a buoy (can, red and black horizontal stripes). At night a narrow red sector in Conimicut Light covers this ledge.

On the **NNW.** ¾ **W.** course care should be taken to keep close on the bearing so as to carry more than 25 feet of water. Vessels desiring a towboat for Providence River can anchor in 5 to 8 fathoms water about ⅜ mile southeastward of Conimicut Lighthouse.

Shoals, with depths of 9 to 18 feet over them, fill the bight between Warren River entrance and Nayat Point, the eastern point at entrance to Providence River. These can be avoided by keeping Conimicut Lighthouse bearing northward of **NW.** ½ **N.** until within ½ mile of it.

Conimicut Middle Ground is the extensive shoal which makes off 1 mile from the shore south of Conimicut Point. The depths on this shoal range from 2 to 15 feet and the bottom has many rocky patches. On the eastern edge of the Middle Ground, and a little over ⅝ mile **S.** ½ **E.** from Conimicut Lighthouse, is a buoy (black, gas-lighted).

SAILING DIRECTIONS, NARRAGANSETT BAY TO THE ENTRANCE OF PROVIDENCE RIVER, BY THE WESTERN PASSAGE.

The least depth on the sailing lines is 4 fathoms as far as Providence River entrance, but local knowledge is required for a greater draft than 16 feet.

1. ***Approaching and Entering, from Eastward.***—Follow the directions in section 1, page 132, until up to Brenton Reef Light-vessel. Pass on either side of the light-vessel, bring it to bear *SE.* by *E.* ¼ *E.*, and steer **NW.** by **W.** ¼ **W.**, heading for Whale Rock Lighthouse. When Beavertail Lighthouse bears *NE.* make good a **N.** by **E.** ¼ **E.** course directly for Dutch Island Lighthouse, taking care to keep Plum Beach Lighthouse open a little westward of Dutch Island. When ½ mile from Dutch Island Lighthouse proceed as directed in section 2, following.

Bound into Dutch Island Harbor, follow the directions under that heading.

Remarks.—The **NW.** by **W.** ¼ **W.** course leads a little over ⅝ mile southward of Beavertail Lighthouse, and about 600 yards south of the bell buoy off Newton Rock. When abreast the bell buoy, the Western Passage will be opened, and Dutch Island Lighthouse will be seen northward.

The deep-water channel from Beavertail to Dutch Island is over ½ mile wide, but the depth is variable, ranging from 4¼ to 10 fathoms.

Dangers.—**Newton Rock,** southward of Beavertail, is described on page 133.

Whale Rock, on the western side of the entrance to the Western Passage, is marked by **Whale Rock Lighthouse,** which bears **W.** ⅝ **S.**, distant 1⅛ miles from Beavertail Lighthouse. There is a **7-foot spot** about 200 yards northward of Whale Rock Lighthouse. A channel with a depth of about 8 fathoms leads between the lighthouse and the western shore, but strangers should not use it.

Jones Ledge, a small, detached, rocky spot with 9 feet over it, lies on the western side of the channel 1⅛ miles **NNE.** from Whale Rock Lighthouse. The eastern side of the ledge is marked by a buoy (spar, red and black horizontal stripes).

Austin Hollow, the bight in the western shore of Conanicut Island about 1 mile northward of Beavertail, is full of shoals, but the shore of the island above the bight to the entrance of Dutch Island Harbor can be approached as close as 200 yards.

A 17-foot spot lies about 350 yards from the western shore, and a little over ¾ mile **SW.** ½ **W.** from Dutch Island Lighthouse. The western shore between Bonnet Point and South Ferry should be given a berth of 400 yards.

1 A. ***Approaching and Entering, from Westward.***—Pass about 1 mile *S.* of Point Judith Lighthouse, and from the whistling buoy steer **NE.** ¾ **N.** about 7¼ miles, heading fair between Beavertail and Whale Rock lighthouses. When Beavertail Lighthouse bears **SE.**, distant nearly ½ mile, steer **N.** by **E.** ¼ **E.**, heading for Dutch Island Lighthouse, and when nearly up to it proceed as directed in section 2, following.

Bound into Dutch Island Harbor, follow the directions under that heading.

Remarks.—On the **NE.** ¾ **N.** course the entrance to the western passage will be ahead, Whale Rock Lighthouse a little on the port bow, and Beavertail Lighthouse on the starboard bow.

At night a careful study of the characteristics of the lights is necessary, as a number of the lights marking the Eastern Passage will be seen on the starboard bow. The course leads nearly ½ mile southeastward of Whale Rock Light, and gives the shore between Point Judith and the light a berth of at least ¾ mile.

On the **N.** by **E.** ¼ **E.** course the southern entrance to Dutch Island Harbor will be open just eastward of Dutch Island Lighthouse, and the passage up the bay is westward of it.

See the remarks and dangers under section 1 A, pages 133-134, and for the dangers above Whale Rock Lighthouse see the dangers under section 1, preceding.

2. ***From Dutch Island Lighthouse to Warwick Lighthouse.***—Having followed the directions in section 1 or 1 A until Dutch Island Lighthouse is ½ mile distant ahead, haul more northward and westward, steering so as to leave the lighthouse and island about ¼ mile on the starboard hand. When the northern end of Dutch Island is abeam, steer **NE.** by **N.** until Dutch Island Lighthouse bears *S.* by *W.* ⅝ *W.*, and then with it over the stern make good a **N.** by **E.** ⅝ **E.** course and pass 600 yards eastward of Plum Beach Lighthouse.

Continue on the **N.** by **E.** ⅝ **E.** course up the bay, leaving Conanicut Island Lighthouse (on the northern end of Conanicut Island) about ⅞ mile, and Hope Island (1½ miles northward of Conanicut Island) about ⅝ mile, on the starboard hand. Warwick Lighthouse should be made ahead; steer for Warwick Lighthouse, keeping it close on the bearing **N.**

by **E.** ⅝ **E.**, until a little less than ½ mile from it, and the red, gas-lighted buoy off Patience Island is 500 yards distant on the starboard beam. Then steer **NE.** by **E.** ¾ **E.**, and follow the directions in section 3.

Remarks.—The western shore of Dutch Island should in no case be approached closer than 250 yards. Dutch Island Lighthouse should be brought on the bearing astern when the northern end of the island is less than ¾ mile distant, to avoid Plum Beach Shoal.

On the **N.** by **E.** ⅝ **E.** course, in clear weather, a prominent **high circular tower** at Rocky Point will be nearly ahead, and Warwick Lighthouse will be made ahead and a very little westward of the tower. The course leads at least ⅝ mile from the shore of Conanicut Island and about 400 yards eastward of Plum Beach Shoal buoy (spar, black), and nearly midway between Quonset Point and Hope Island. When 2 miles from Warwick Lighthouse, the course leads into the dredged cut through the shoals off Potowomut Neck.

Dangers.—**Plum Beach Shoal** has 12 to 16 feet over it, and makes out about ½ mile from the western shore about 1 mile above Dutch Island. The southeastern end of the shoal is marked by a buoy (spar, black), and the northeastern end is marked by Plum Beach Lighthouse (see table, page 20).

Great Ledge stretches along the west shore of Conanicut Island for a distance of 1¾ miles, its southern end lying about ⅞ mile northward of Dutch Island. The distance to which this ledge extends from the shore varies from 175 yards at its southern to 500 yards at its northern end; it comprises a number of bare and sunken rocks and rises abruptly from the deep water of the channel.

General Rock, James Ledge, and **Brig Ledge** are the easternmost of a number of dangerous ledges and rocks which lie in the northern side of the bight at the entrance to Wickford Harbor, and southwestward of Quonset Point. General Rock has 10 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). James Ledge has 2 feet over it, and is marked by a buoy (can, black, No. 1). Brig Ledge has 12 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). These buoys bear about **SSW.** from Quonset Point.

Quonset Point Shoal extends about 450 yards southeastward from **Quonset Point,** the point on the west shore 1¾ miles **NW.** ½ **W.** from Conanicut Island Lighthouse. The shoal is marked at its eastern end by a buoy (spar, black, No. 3).

Several rocks and shoals lie close to the shores of Hope Island, but they may all be avoided by giving the shores of that island a berth of ¼ mile.

Shoals fill the bight between Quonset Point and **Calf Pasture Point,** the point about 2¼ miles northward. To avoid these a vessel should haul eastward when the water shoals to 18 feet. Abreast Calf Pasture Point and for some distance northward of it, a shoal extends ½ mile eastward from the shore.

Shoals make eastward from the entrance to Greenwich Bay, and extend nearly to Patience Island. For a distance of 1 mile eastward of **Pojac Point,** the southern point at the entrance to Potowomut River, the shoal has depths of 2 to 12 feet of water over it, and has a number of rocks and ledges, which are marked by a beacon (black spindle with barrel). The beacon lies ⅞ mile **SW.** by **W.** ½ **W.** from Warwick Lighthouse, and is surrounded by rocks with from 1 to 6 feet over them; **Hunts Ledge,** with 12 feet over it, lies ¼ mile **SE.** from it, and is the easternmost of the rocks surrounding the beacon. From this beacon a shoal with 14 to 17 feet over it extends ⅝ mile northward and eastward and 1¾ miles in a **SSE.** ¼ **E.** direction; its southern point is marked by a buoy (spar, black, No. 5). Between this shoal and the shoal making westward and southward from Patience Island there is a channel with a least width of 300 yards and a depth of from 3¼ to 12 fathoms, leading up to Warwick Neck. The dredged channel, 400 feet wide and 25 feet deep, leads through this shoal on a **N.** by **E.** ⅝ **E.** bearing for Warwick Lighthouse.

A **shoal** with 12 to 15 feet over it extends about 600 yards westward of Patience Island, and its edge is marked by a buoy (red, gas-lighted), lying ½ mile **S.** by **E.** ¼ **E.** from Warwick Lighthouse.

3. ***From Warwick Lighthouse to Providence River Entrance.***—Having followed the directions in section 2 to a position nearly ½ mile *S.* by *W.* ⅝ *W.* from Warwick Lighthouse, steer **NE.** by **E.** ¾ **E.**, passing about midway between the lighthouse and the northwestern point of Patience Island. This course made good for 1¾ miles will lead a little northward of the buoy (spar, red and black horizontal stripes) lying ½ mile northward of North Point (of Prudence Island). When Conimicut Lighthouse bears *N.* by *E.*, steer **NNE.** ¼ **E.** until Conimicut Lighthouse bears *NNW.* Then haul up for the lighthouse and follow the directions for Providence River.

Remarks.—On the **NE.** by **E.** ¾ **E.** course, the red gas-lighted buoy westward of Patience Island should be left about 300 yards on the starboard hand. The southern extremity of Rumstick Neck will be a little on the port bow, and the buoy off North Point (of Patience Island) will be a little on the starboard bow.

The **NNE. ¼ E.** course leads in the dredged cut through the shoals eastward of Rocky Point. The black gas-lighted buoy marking the eastern edge of Conimicut Middle Ground will be on the port bow, and will be left on the port hand when through the dredged cut.

Dangers.—A **shoal** with 10 to 14 feet over it extends about 700 yards northeast from the northern side of Patience Island.

Extensive shoals make off from the eastern side of Warwick Neck, and extend out about 2 miles to Ohio Ledge, with depths of 15 to 24 feet. The channel between these shoals and those making northward from Patience and Prudence islands is about ¼ mile wide, with depths of 4 to 10 fathoms. A dredged cut, 400 feet wide and 25 feet deep, with depths of 17 to 21 feet on either side of it, leads through the shoals eastward of Rocky Point. A spot with 15 feet over it lies on the western edge of the dredged cut, **SE.** by **E.** from Rocky Point.

The **shoal** making northward from Prudence Island, **Ohio Ledge,** and **Conimicut Middle Ground** are described on page 135.

NEWPORT HARBOR.*

This harbor is on the eastern side of the Eastern Passage of Narragansett Bay, about 3½ miles above the entrance. It is divided by Goat Island into an **inner** and **outer** harbor, and is an important harbor of refuge for coasters and yachts. The approach is well marked by lighthouses and fog signals, making it one of the easiest harbors on the coast for large vessels to enter at any time.

The **Outer Harbor** is on the western side of Goat Island, northward of Fort Adams and southeastward of Rose Island. Its entrance from southward is unobstructed; the entrance from northward, passing westward of Rose Island, is clear, but the passage eastward of Rose Island is obstructed by the rocks and ledges which lie between Coasters Harbor Island and Rose Island. The depth ranges from 6½ to 9 fathoms, and the holding ground is good. The anchorage is anywhere westward of Goat Island and the breakwater, giving them a berth of over 250 yards, and taking care not to get too near the rocks and ledges eastward of Rose Island.

The **Inner Harbor** is on the eastern side of Goat Island, and extends along the western front of the city of **Newport.** It has two entrances, the northern leading eastward of Newport Harbor (Goat Island) Lighthouse and the southern leading around the southern end of Goat Island, between it and Lime Rock Lighthouse. A channel, with a depth of 16 feet at low water, leads through the harbor from the southern to the northern entrance; but the anchorage, which is eastward of this channel, has a depth of 13 feet. The depth of water at the principal wharves is 13 feet, and at the railroad wharf 16 feet.

Brenton Cove is the bight in the southern part of Newport Harbor between **Lime Rock Lighthouse** on the east and Fort Adams on the west. It has anchorage in 15 to 17 feet water, but the holding ground is not good throughout and it is seldom used.

The city of **Newport,** on the eastern shore of the inner harbor, is one of the principal summer resorts on the Atlantic coast. It has considerable trade in coal, lumber, and building material, carried in coasting vessels; few foreign vessels enter the port.

Prominent objects.—Many prominent objects will be seen, whether the harbor be approached from southward or northward, among which are the following: Fort Adams, the buildings of the Training Station and Naval War College on Coasters Harbor Island, the buildings of the Torpedo Station on Goat Island, and the large hotels and a tall red water tank at Jamestown on the eastern shore of Conanicut Island, opposite Rose Island. Although these objects are plainly visible in clear weather, the lighthouses should be the guides at all times.

Pilots.—Strangers sometimes take a pilot; vessels can obtain one by making signal off Block Island, or lying off and on outside Brenton Reef Light-vessel with signal set until boarded. Pilotage is compulsory for certain vessels (see pilot laws for the State of Rhode Island in Appendix II).

Towboats are often used by vessels in the inner harbor when desiring to go alongside the wharves. They can be had by making signal.

Quarantine regulations for the port and quarantine anchorage will be found in Appendix II.

Marine Hospital.—Relief is furnished at Newport as provided in the United States Public Health and Marine Hospital Service regulations for stations of class III (see Appendix IV).

Storm warning displays of the United States Weather Bureau are made on the top of the customhouse and are visible from all parts of the harbor.

A **time ball** is dropped from a mast on the top of a machine shop of the United States Torpedo Station on Goat Island at noon of the 75th meridian—that is, 5 hours, 0 minutes, 0 seconds Greenwich mean time. The

* Shown on chart 353[3], scale $\frac{1}{20,000}$, price $0.40. See also footnote on page 130.

ball is mastheaded 5 minutes before noon, and in case it fails to drop at the proper moment, is lowered by hand 5 minutes after noon.

Supplies.—Coal and water can be had alongside the wharves or in the stream. Provisions and some ship-chandler's stores can be obtained in the city.

For **tidal data**, see the table on page 11.

For **variation of the compass**, see page 11.

Ice sometimes obstructs navigation in the inner harbor (see "Ice," page 132).

SAILING DIRECTIONS, NEWPORT HARBOR.

The following directions are good during either day or night for the deepest draft vessels to the Outer Harbor, and for vessels of less than 12 feet draft to the Inner Harbor.

1. ***Approaching and Entering, from Southwestward.***—Follow the directions in section 1 or 1 A, pages 132–133, for entering Narragansett Bay by the Eastern Passage, and then proceed as directed in paragraphs I, II, or III, following.

I. To an anchorage in the Outer Harbor.—Steer for Newport Harbor Lighthouse, keeping it bearing **NE.** by **E.** ¼ **E.** until past Fort Adams, when anchor anywhere in 8 to 9 fathoms westward of Goat Island and the breakwater, giving the shore and breakwater a berth of between ¼ and ⅜ mile.

Remarks and dangers.—**Fort Adams** will be left about ¼ mile on the starboard hand, and there are no dangers if the shore be given a berth as directed.

Mitchell Rock, a small, detached rock with 14 feet over it, lies nearly ½ mile **WNW.** ⅝ **W.** from Newport Harbor Lighthouse, and is marked by a buoy (spar, black, No. 1).

Tracey Ledge is a small, detached rock with 9½ feet over it, lying nearly ½ mile **NW.** by **N.** from Newport Harbor Lighthouse; it is marked on its southwestern side by a buoy (spar, black, No. 1½).

The above rocks lie about 200 yards eastward from the edge of the extensive shoals which surround Rose Island, and are marked near their southern end by a black spindle and near their eastern edge by a red pile dolphin.

II. To enter the Inner Harbor, passing south of Goat Island.—Steer **NE.** by **E.** ¼ **E.** for Newport Harbor Lighthouse until Lime Rock Lighthouse is opened from the dock north of Fort Adams, and then round the northern end of the dock, giving it a berth of at least 150 yards. Steer **SE.** by **E.** ¼ **E.**, with Lime Rock Lighthouse on the starboard bow and Goat Island dolphin on the port bow. Pass over 200 yards southeastward of Goat Island, and 150 yards south of the pile dolphin, and steer about **NE.** ½ **E.** Anchor in 13 to 16 feet of water, soft bottom, but not close enough to the wharves to interfere with the steamer and ferry traffic, and about 400 yards from Goat Island, so as not to lie in the track of the Sound steamers.

Remarks.—There is a fog bell on the northern end of the dock north of Fort Adams.

At night, when between Goat Island dolphin and Lime Rock Lighthouse, a vessel may steer for the electric lights on Commercial wharf or those at the railroad wharf, farther northward.

Anchorage in 15 to 17 feet, hard bottom, will be found in Brenton Cove, which may be entered without danger by giving its shores a berth of about 225 yards.

Dangers.—There are no dangers if the directions be even approximately followed.

A **shoal** makes out nearly 150 yards southward and southeastward from the southern end of Goat Island. A buoy (spar, black, No. 1) marks the southern edge of this shoal, and **Goat Island dolphin** (with a white electric light at night) marks its southeastern end; vessels should not attempt to pass between the island and the dolphin.

The eastern shore of Goat Island has shoals extending nearly 200 yards from it between Goat Island dolphin and the Torpedo Station wharf.

III. To enter the Inner Harbor, passing north of Goat Island.—Keep Newport Harbor Lighthouse bearing **NE.** by **E.** ¼ **E.** until within ½ mile of it, when steer more northward

and round the lighthouse at a distance of about 200 yards, and when it bears *SW.* steer **S.** ½ **W.** into the harbor.

When abreast the Torpedo Station wharf haul eastward and anchor as directed in paragraph II.

Remarks.—After rounding the lighthouse and when on the **S.** ½ **W.** course, the railroad wharf will be on the port bow and Lime Rock Lighthouse will be a little on the starboard bow. The shore of Goat Island northward and southward of the wharf on its eastern side should be given a berth of at least 200 yards. Good anchorage in 13 feet of water is found between Commercial wharf and the railroad wharf, giving the latter a berth of over 200 yards.

1 A. ***Approaching and to the Anchorage in the Outer Harbor, from Northward.***—*I. From abreast Prudence Island Lighthouse.*—Make good a **SSW.** ¾ **W.** course so as to pass ⅜ mile eastward of Gould Island and ¼ mile westward of Rose Island.

When Newport Harbor Lighthouse bears *E.* ½ *S.*, steer about **ESE.**, and anchor about ¼ mile from the shore of Goat Island or the breakwater extending northward from it.

II. From a position 1 mile eastward of Conanicut Island Lighthouse.—Make good a **S.** by **W.** course, passing 300 yards westward of Gould Island and ¼ mile westward of Rose Island. When Newport Harbor Lighthouse bears *E.* ½ *S.* follow the directions in the preceding paragraph.

Remarks and dangers.—On the **SSW.** ¾ **W.** course, Dyer Island will be left nearly ⅜ mile on the port hand, and Fiske Rock buoy and Halfway Rock spindle about ½ mile on the starboard hand. Gould Island will be on the starboard bow and Rose Island will be on the port bow; the latter should be given a berth of 400 yards to avoid the shoals making off from its north end.

On the **S.** by **W.** course all dangers will be avoided by giving the shores a berth of 300 yards until passing south of Rose Island.

The southern end of Rose Island and its eastern side should be given a good berth. See also the remarks and dangers under section 1, paragraph 1, preceding.

1 B. ***Approaching and to the Anchorage in the Inner Harbor, from Northward.***—Passing eastward of Gould Island, give it a berth of at least 200 yards. Bring Gould Island Lighthouse to bear *N.* ½ *W.*, and steer **S.** ½ **E.** heading for Newport Harbor Lighthouse, and so as to pass 150 to 200 yards eastward of Gull Rocks Lighthouse. After passing Gull Rocks Lighthouse, steer a little more eastward so as to pass nearly 200 yards eastward of Newport Harbor Lighthouse; and when the latter is abeam steer **S.** ½ **W.** When abreast the wharf at the Torpedo Station on Goat Island, stand over for the wharves of the city and anchor in 13 to 16 feet of water as directed in section 1, paragraph II.

Remarks.—When southward of Gould Island, Bishop Rock Shoal buoy (bell, red) will be left on the port hand. The shore of Coasters Harbor Island should be given a berth of over 100 yards, and the buoy (spar, black, No. 3) north of Gull Rocks Lighthouse should be left at least 100 yards on the starboard hand. The course after passing Gull Rocks Lighthouse leads about 120 yards from the ends of the steamboat wharves opposite the north end of Goat Island.

Dangers.—**The Sisters** and **Bishop Rock** are described on page 134.

Rose Island is surrounded by shoals which rise abruptly from deep water. On its northern and northeastern sides the shoal extends off about 450 yards, and has from 4 to 12 feet over it, with only about 5 feet on its eastern edge. Red spar buoy No. 6 marks the northwestern edge of the shoal, and a 9-foot spot off its northeastern end is marked by a buoy (spar, red, No. 8), which lies 450 yards **NW.** by **W.** ¼ **W.** from Gull Rocks Lighthouse. See also the description under paragraph I, page 139.

Gull Rocks lie about midway between Rose Island and Coasters Harbor Island, and are small in extent. **Gull Rocks Lighthouse** (see table, page 18) is on the middle of the rocks, and may be approached as close as 100 yards on its eastern and western sides, but the shoals and rocks extend over 100 yards northward of it and 300 yards southward. These rocks are surrounded by a depth of 4¼ to 5 fathoms, and north of the lighthouse are marked by a buoy (spar, black, No. 3). A small, detached 17-foot spot lies nearly 600 yards **N.** by **W.** from Gull Rocks Lighthouse.

There is a deep channel between Rose Island and Gull Rocks, and also between the latter and Coasters Harbor Island; the latter channel is the safer for strangers.

Tracey Ledge and **Mitchell Rock** are described on page 139.

A shoal, with 5 to 18 feet over it, extends nearly 400 yards southward from the southern end of Coaster Harbor Island, and extends eastward to the shore of Rhode Island.

St. Patricks Rock, with 6 feet over it, lies 150 yards from the eastern shore, and 800 yards **NE. ¾ N.** from Newport Harbor Lighthouse, and is marked by a buoy (spar, red, No. 4).

An unmarked 18-foot spot lies 275 yards from the shore, and 450 yards **NE. ¾ N.** from Newport Harbor Lighthouse; it is not a danger for the draft of vessels entering the Inner Harbor.

MOUNT HOPE BAY AND TAUNTON RIVER.*

Mount Hope Bay lies in the northeastern part of Narragansett Bay and is the approach by water to the city of Fall River, and to Taunton River, which empties into its northeastern end. It is about 6 miles long in a **NE.** by **N.** and **SW.** by **S.** direction and 2½ miles wide at its widest part. The northwestern and northern parts of the bay have depths of 13 to 17 feet, with few dangers, which are described under the sailing directions; the deep water of the bay is in its southern end and along the eastern shore. Several shallow rivers empty into the northern part of Mount Hope Bay, but they are of no commercial importance. There are two approaches by water to this bay—one through Sakonnet River and the other through the Eastern Passage of Narragansett Bay; the former is little used (see heading Sakonnet River); the entrance from the latter is marked by three lighthouses, and has a least depth of 7 fathoms in the channel until in the bay.

Taunton River has a narrow and crooked channel, with a depth of about 9 feet at mean high water, as far as Taunton. Three drawbridges cross the river between Fall River and the head of navigation. Vessels bound into the river take a towboat at Fall River.

The city of **Fall River**, on the eastern shore at the entrance to Taunton River, has a considerable coasting trade; large cargoes of coal are brought for its factories. At high water a draft of 24 feet (the deepest) has been taken up to the city; the depth at the wharves is 10 to 20 feet at low water.

Somerset, about 5¼ miles, and **Dighton**, about 7½ miles above Fall River, on the west bank of Taunton River, are two villages to which vessels occasionally bring cargoes. A draft of 16 feet can be taken to Somerset and 14 feet to Dighton.

Taunton is an important manufacturing city at the head of navigation, 12½ miles above Fall River. It has a large coasting trade in lumber and coal, carried principally in barges. Vessels of 9 feet draft can come to the city, but, as the channel is very narrow, sailing vessels are obliged to use a towboat.

Anchorage.—There is good anchorage in 3½ to 5 fathoms water abreast the city of Fall River. Vessels can anchor anywhere in the bay where the depth and bottom are suitable.

Pilots for vessels bound to Fall River can be obtained at the entrance to Narragansett Bay; the rates of pilotage are the same as for ports in Rhode Island (see Appendix II).

Towboats are seldom used except by the largest vessels and those bound into Taunton River; they can be had from Fall River or may be taken at Newport.

Supplies.—Ship's supplies and coal for steamers can be had at Fall River.

Repairs.—There is one marine railway capable of hauling out vessels of about 800 tons.

Storm warning displays of the United States Weather Bureau are made at Fall River.

Harbor regulations for Fall River are contained in the extracts from the Laws of the Commonwealth of Massachusetts, under the heading "Harbor Control," in Appendix II.

Quarantine.—Extracts from the Regulations of the Board of Health of the city of Fall River are given in Appendix II.

For **tides** see table, page 11.

Ice generally closes Taunton River from December to March. Mount Hope Bay is occasionally closed to navigation. See also page 132.

SAILING DIRECTIONS, MOUNT HOPE BAY.

These directions if closely followed will carry a least depth of 18 feet at low water to the city of Fall River; vessels of deeper draft should take a pilot.

Directions are given on pages 129–130 for approaching Mount Hope Bay through Sakonnet River, and passing up the bay to Fall River.

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*Shown on chart 358, scale $\frac{1}{40,000}$, price $0.75.

Entering and passing through Mount Hope Bay to Fall River.—Having followed the directions on pages 132–134 for the Eastern Passage of Narragansett Bay, when abreast Prudence Island Lighthouse bring Hog Island Shoal Lighthouse in range with Bristol Ferry Lighthouse, bearing about **NE.** ⅜ **E.**, and steer for Hog Island Lighthouse, keeping the range. When ¼ mile from the lighthouse, steer so as to pass 300 yards southward of it, and then make good a **NE.** by **E.** course, passing about midway between Bristol Ferry Lighthouse and Muscle Shoal Lighthouse.

Having stood on the **NE.** by **E.** course nearly 4 miles from Hog Island Shoal Lighthouse, black spar buoy No. 5 should be left about 75 yards on the port hand and red spar buoy No. 2 on the starboard hand; Borden Flats Lighthouse should be a little on the starboard bow. Continue on the course, following the line of black spar buoys, and leaving buoys Nos. 7 and 9 about 75 yards on the port hand. When Borden Flats Lighthouse is about 1¼ miles distant ahead, and Spar Island bears on the port quarter, steer **NE.** by **E.** ¾ **E.** so as to pass about 300 yards eastward of the lighthouse, taking care, however, to give the eastern shore a berth of over 200 yards. Anchor eastward or northeastward of the lighthouse in 3¼ to 7¼ fathoms of water.

Bound up Taunton River, a stranger should take a pilot.

Remarks.—**Bristol Ferry Lighthouse** is on the northern side of the entrance to Mount Hope Bay, and **Muscle Shoal Lighthouse** on the southern side. The lighthouses furnish excellent guides; all shoals and dangers with less than 16 feet over them can be avoided until nearing Borden Flats by keeping Prudence Island Lighthouse bearing between Bristol Ferry and Muscle Shoal lighthouses, and giving the eastern shore of the bay within these bearings a berth of about 200 yards. Vessels of over 16 feet draft must follow the directions closely to avoid the shoals on both sides of the channel.

Dangers.—The shore southward of Hog Island Shoal Lighthouse should be given a berth of at least 500 yards.

Between Muscle Shoal Lighthouse and **Common Fence Point** (the western point at the northern entrance to Sakonnet River) shoals make out from the shore to a distance of 300 to 600 yards; northward of Common Fence Point the extremity of the shoal is marked by a buoy (bell, red).

There are **shoals** and **rocks** in the bight between Bristol Ferry Lighthouse and **Mount Hope Point** (the point 1⅝ miles northeastward of the lighthouse), but near the edge of the shoals are two buoys (spars, black, Nos. 1 and 3).

Spar Island, the small, low, flat-topped island near the center of Mount Hope Bay, is surrounded for a distance of nearly 400 yards by shoals, with 3 to 10 feet over them.

The **eastern edge of the shoals** lying between Mount Hope Point and Borden Flats Lighthouse, has 14 to 17 feet over it, and is marked by five black spar buoys, the southernmost of which is No. 5.

Spots with 17 and 18 feet over them lie on the eastern side of the channel, about 300 yards eastward of black spar buoys Nos. 5, 7, and 9. A red spar buoy, No. 2, marks the eastern side of the channel abreast buoy No. 5.

Borden Flats, with 5 to 10 feet on them, extend from Borden Flats Lighthouse to **Brayton Point,** nearly 1 mile westward of the lighthouse.

In the bight northward of the railroad wharves at Fall River there is a depth of 13 to 17 feet.

BRISTOL HARBOR*

is a cove lying between **Bristol Neck** on the east and **Popasquash Neck** on the west, and northward of Hog Island, which lies in the middle of the entrance with a channel on either side of it. The cove is about 2 miles long **N.** and **S.**, and 1¼ miles wide at its southern end, narrowing to ⅛ mile at its northern end. The harbor proper (northern part of the cove) is about 1 mile long and nearly ½ mile wide, has a depth of 15 to 17 feet, and excellent anchorage in soft bottom abreast the town. The northern part of the harbor above the railroad wharf is shallow, having a depth of 5 to 12 feet.

Bristol, a town on the eastern side of the harbor, has but little trade and is of no commercial importance. Near the southern end of the water front of the town is a shipyard where torpedo boats and yachts are built.

Channels.—There are two channels leading up to the entrance of the harbor proper. The **Eastern Channel,** eastward of Hog Island, between it and Bristol Neck, has a width varying from 200 to 600 yards (the average width being only about 300 yards) and a depth of 3 to 4½ fathoms. The **Western Channel,** westward of Hog Island, between it and Popasquash Neck, has a width of 300 to 600 yards (the average width being about 500

*Shown on chart 354, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

yards) and a depth of 3 to 4¾ fathoms. These two channels converge and come together ⅞ mile northward of the northern end of Hog Island, at the extremity of the shoal making off from it, and at the lower end of the harbor proper. The Western Channel is the better marked and one mostly used.

Pilots are not necessary for vessels desiring to enter the harbor.

Anchorage.—Good anchorage is found in 15 to 17 feet abreast the town, giving the eastern and western shores a berth of 200 yards.

Wharves.—At low water 8 to 11 feet can be taken to some of the wharves.

Communication.—Bristol is connected by rail with Warren, which is in turn connected by rail with Providence and Fall River. A regular steamer line between Fall River and Providence stops at Bristol.

Supplies.—Provisions and coal, in limited quantities, can be obtained at Bristol.

Tides.—The mean rise and fall of tides is 4.1 feet.

The velocity of the **tidal currents** is not great enough to interfere materially with the navigation of the channels and harbor.

Ice.—See remarks on page 132.

SAILING DIRECTIONS, BRISTOL HARBOR.

The following directions are safe for vessels of 15 feet, or less, draft to an anchorage abreast the town.

1. ***Approaching and Entering, by the Eastern Channel.***—Follow the directions for entering Mount Hope Bay, and when a little over ¼ mile eastward of Hog Island Shoal Lighthouse steer **N. ½ W.** Pass about ¼ mile westward of Pearce Rock buoy (spar, red, No. 2), and 200 yards eastward of Hog Island Rock buoy (spar, black, No. 3) and continue the course about 1 mile farther, passing 250 yards eastward of Middle Ground buoy (spar, red and black horizontal stripes). Then stand fair into the harbor, and anchor abreast the town, giving the shores a berth of at least 200 yards.

Remarks and dangers.—**Shoals** make out over ⅝ mile southward of Hog Island, and vessels must pass at least 150 yards southward of Hog Island Shoal Lighthouse.

Pearce Rock lies nearly ¼ mile **W.** from Bristol Ferry Lighthouse and is marked by a buoy (spar, red, No. 2).

The southern and western shores of Bristol Neck should be given a berth of at least 250 yards to avoid the shoals making off that distance.

The eastern shore of Hog Island should be given a berth of at least 350 yards to avoid the shoals on its eastern side. Hog Island Rock buoy (spar, black, No. 3) marks the eastern edge of the shoal about ½ mile northward of the southeastern end of the island, and is eastward of Hog Island Rock, which has a least depth of 3 feet.

Making northward from Hog Island is **an extensive shoal** with depths of 8 to 12 feet. For about ½ mile northward of the island this shoal ground has a width of ⅓ mile, thence it narrows to a point at the junction of the eastern and western channels 1 mile northward of the island. The northern end of the shoal, known as the **Middle Ground**, has a depth of only 5 feet, and is marked by a buoy (spar, red and black horizontal stripes). Near the western edge of the shoal, about ½ mile northward of the northwestern end of the island, is **Castle Island**, a small, bare rock marked by Castle Island beacon (stone tower, surmounted by a red ball).

1 A. ***Approaching and Entering, by the Western Channel.***—*I. Coming from Southward.*—From a position about ¼ mile eastward of Prudence Island Lighthouse, make good a **N. ¾ E.** course for 2 miles, and when the southwestern point of Hog Island is nearly in range with Hog Island Shoal Lighthouse, the lighthouse bearing *SE.* by *E.*, steer **NE. ¼ N.** Popasquash Point Shoal buoy will be left about 200 yards on the port hand; Castle Island beacon and Middle Ground buoy should be left 300 yards on the starboard hand, and Usher Rocks buoy about 200 yards on the port hand. When Middle Ground buoy bears *E.*, stand northward up the middle of the harbor, and anchor abreast the wharves in 16 to 17 feet water.

II. Coming from Northward.—Give the eastern shores of Prudence Island a berth of over ¼ mile, and the western shore of Popasquash Neck a berth of at least 300 yards.

Round Popasquash Point at a distance of ¼ mile, leaving the buoy on the port hand; and when the point bears about *W.*, steer **NE. ¼ N.**, and follow the directions in paragraph 1, foregoing.

Remarks.—On the **N. ¾ E.** course, the highest part of Popasquash Point near its western side is directly ahead.

Dangers.—**Castle Island** and **Middle Ground** are described under section 1, foregoing. The southwestern end of Hog Island Shoal, making off southwestward from the island, is marked by a buoy (spar, red, No. 18).

Popasquash Point Shoal makes off 400 yards in a **SSE.** direction from Popasquash Point, has 3 to 17 feet over it, and is marked at its southern edge by a buoy (spar, black, No. 1).

Usher Rocks, bare at low water, lie on the western side of the channel 800 yards **NNW. ¾ W.** from Castle Island beacon. Eastward of the rocks on the edge of the channel is Usher Rocks buoy (spar, black, No. 3).

Usher Cove, lying westward of Usher Rocks, is shoal.

WARREN RIVER*

is a small river emptying into the head of Narragansett Bay, about 2 miles southeastward of the mouth of Providence River. **The channel** leading up to the town is narrow and crooked, and although well buoyed, strangers should not attempt to ascend the river without a pilot. A draft of about 14 feet can be taken up to Warren at high water.

Warren, the town on the east bank of Warren River, about 1½ miles above its mouth, is of but little commercial importance.

Tides.—The mean rise and fall of tides is 4.6 feet.

The **tidal currents** in some parts of the river run with considerable velocity, especially along the town front.

GENERAL DIRECTIONS TO AN ANCHORAGE IN THE MOUTH OF WARREN RIVER.

The following directions lead in a least depth of 15 feet to the anchorage.

In approaching from southward be guided by the directions in section 3, page 135, for approaching Providence River by the Eastern Passage. Give the western shore of Popasquash Neck a berth of 400 yards, and when abreast North Point (the point where the shore of the neck turns abruptly eastward) steer **NE. ½ N.** Leave Rumstick Shoal buoy (black, gas-lighted) 250 yards on the port hand, and steer about **NE.** by **N.** Anchor about ¼ mile from the eastern shore when Rumstick Rock bears *WNW.*, in 15 to 16 feet, soft bottom.

If coming from northward, bring Conimicut Lighthouse to bear *NW.* by *N.* and steer **SE.** by **S.** until Rumstick Rock bears *NE.* by *E.* Then change the course to **ESE. ½ E.**, and pass at least 300 yards southward of Rumstick Shoal buoy (black, gas-lighted). Then haul up to **NE.** by **N.**, passing 250 yards eastward of the buoy, and anchor about ¼ mile from the eastern shore when Rumstick Rock bears *WNW.*, in 15 to 16 feet, soft bottom.

Remarks.—From the anchorage the river will be fairly opened and the houses of the town of Warren can be seen. The next buoy (black, No. 3) marking the channel lies nearly ¼ mile **N. ½ E.** from the anchorage, but strangers should not attempt to go above it without a pilot.

Dangers.—The dangers in approaching the river are described under section 3, page 135.

A sunken rock and **rock awash** at low water lie about 200 yards northward of North Point.

Deyer Rock, a rock awash at low water, lies about 125 yards from the eastern shore, a little over ¾ mile above North Point.

The Brothers are two sunken rocks, with 7 feet over them, lying a little over 200 yards from the shore and about 350 yards northward of Deyer Rock.

The above-described dangers may be easily avoided by giving the eastern shore a berth of over 300 yards.

Rumstick Shoal extends nearly ⅝ mile southward from Rumstick Neck, is about ⅝ mile wide, and has a depth of 3 to 12 feet, the ruling depth being about 7 feet. Near its southeastern extremity it is marked by a black gas-lighted buoy, and on its eastern edge, nearly ¼ mile **SE. ½ E.** from the southern extremity of Rumstick Neck, is black spar buoy No. 3.

*Shown on chart **355**, scale, $\frac{1}{10,000}$, price $0.20. See also footnote on page 130.

Rumstick Rock, showing well above water at all stages of the tide, is on Rumstick Shoal and lies **WSW. ¼ W** from the southern extremity of Rumstick Neck.

Rumstick Ledge, a bare ledge nearly 100 yards long in a **NW.** and **SE.** direction and about 15 yards wide, lies about 150 yards northwestward of Rumstick Rock and near the western edge of Rumstick Shoal. The ledge is surrounded by a depth of 2 to 5 feet but 100 yards westward of it the water deepens to 21 feet.

PROVIDENCE RIVER*

empties into the head of Narragansett Bay, and is the approach by water to the city of Providence and town of Pawtuxet. The entrance between Nayat Point on the east and Conimicut Point on the west is about ¾ mile wide, but is obstructed by shoals on both sides, which leave an available channel about ¼ mile wide. On **Nayat Point** there is an old lighthouse tower now only serving as a day mark, and on the shoal making out from **Conimicut Point** is **Conimicut Lighthouse** (see table, page 20).

The city of **Providence,** about 7 miles above the entrance to the river and at its junction with Pawtucket River, is an important commercial port. The deepest draft taken to the city is 24 feet. **East Providence,** a suburb of the city of Providence, is on the east bank of the river and is connected with the city proper by three drawbridges crossing the Pawtucket River.

Pawtucket is a city at the head of navigation on the **Pawtucket River** about 4½ miles from its mouth. For about 1 mile above its mouth the river has a deep but crooked channel, but higher up it is very shallow. Under the supervision of the U. S. Army Engineers a channel 100 feet wide and 12 feet deep at mean low water has been completed as far as the city wharves, and was good for a draft of 14 feet in 1902. The channel is buoyed, but it is too crooked and narrow for sailing vessels to navigate without the assistance of a towboat.

The village of **Pawtuxet,** on the west bank of Providence River about 3½ miles above its mouth, has no commerce and can only be reached at high water by vessels of 7 feet draft.

Channel.—The channel of Providence River, leading between extensive shoals which make out from both shores, is well marked by lighthouses and other aids and can be readily followed in the daytime in clear weather. For a width of 400 feet the channel has a least depth of 25 feet to the city of Providence. From Conimicut Lighthouse to abreast **Sabine Point Lighthouse,** a distance of 3 miles, the 3½-fathom channel has a width varying from 250 to 300 yards. From Sabine Point Lighthouse to the city, a distance of nearly 4 miles, the channel is dredged through flats having from 3 to 8 feet of water over them.

Anchorage.—The anchorage ground in the harbor of Providence is very limited; vessels usually anchor on the edge of the channel between Field Point and Fox Point, where the channel has been somewhat widened in order to furnish anchorage. There is anchorage eastward of Fox Point, where some of Green Jacket Shoal has been dredged to a depth of 25 feet.

Wharves and drawbridges.—There are depths of 10 to 25 feet at the wharves below the bridges. The least width of the drawbridges crossing Pawtucket River at Providence is 75 feet. Point Street drawbridge, crossing Providence River 600 yards above **Fox Point** (the point at the junction of the two rivers), has a clearance on each side of the central pier of 98 feet, and a draft of 20 feet can be taken through them to the wharves above.

Pilots.—Vessels desiring a pilot can get one at Newport, Dutch Island Harbor, or off the entrance to Narragansett Bay. See "Pilots," page 131, and the pilotage laws for the State of Rhode Island, in Appendix II.

Towboats are generally used by the larger sailing vessels, and will sometimes be found at the entrance of the river waiting for vessels expected to arrive; they may also be obtained at Newport or by telephone from Dutch Island Harbor.

Harbor and quarantine regulations for the port are given in Appendix II.

Marine Hospital.—Relief is furnished at Providence by the United States Public Health and Marine-Hospital Service as for stations of Class III. Patients requiring long-continued treatment are sent to the Marine Hospital at Chelsea, Mass. See also Appendix IV.

Supplies.—Coal and water can be obtained alongside the wharves; provisions and ship-chandler's stores in the city.

Repairs.—In East Providence there is one dry dock with a capacity for vessels of 1,300 tons, and one marine railway capable of hauling out vessels of 500 tons. There are large machine shops in Providence, with excellent facilities for repairs to the machinery of steamers.

For **tides,** see table, page 11.

Tidal currents are not strong, and generally follow the direction of the channel.

Ice.—In severe winters the river is closed to navigation, but in ordinary winters the towboats and steamers keep the channel open. See also "Ice," page 132.

*Shown on charts **113**, scale $\frac{1}{80,000}$, price $0.50; **353**, scale $\frac{1}{40,000}$, price $0.75; and in part on **352**, scale $\frac{1}{10,000}$, price $0.20.

SAILING DIRECTIONS, PROVIDENCE RIVER.

From the Entrance to the City of Providence.—These directions are good for a draft of 20 feet to the city of Providence.

Having followed the directions in section 3, page 135 or 137, until nearly up to Conimicut Lighthouse, haul a little eastward and leave the lighthouse about 230 yards on the port hand, and as it is passed haul more westward and steer **NW.** Bullock Point Lighthouse will be broad on the starboard bow, and will soon come in range with Sabine Point Lighthouse, bearing about *N.* $\frac{5}{8}$ *W.*; when this range is crossed, and Bullock Point Lighthouse is nearly in range with Sabine Point, haul up to **N.** $\frac{1}{2}$ **W.** and pass 250 yards westward of Bullock Point Lighthouse. Continue the **N.** $\frac{1}{2}$ **W.** course, leaving Gaspee Point buoy (spar, black, No. 3) about 125 yards, and Seal Rock Flats buoy (spar, black, No. 5) 200 yards, on the port hand; and pass about 200 yards westward of Sabine Point Lighthouse.

A red spar buoy (No. 2) will be seen a little northward of Sabine Point Lighthouse; leave this buoy 75 yards on the starboard hand, and make good a **NE.** $\frac{5}{8}$ **N.** course for $\frac{3}{4}$ mile, heading for Pomham Rocks Lighthouse. Great Bed Shoal buoy (spar, black, No. 7) will be left 75 yards on the port hand; when abreast of Pomham Rocks buoy (spar, red, No. 4), change the course to **N.** $\frac{3}{4}$ **E.** Pass about 100 yards westward of Pomham Rocks Lighthouse, and steer about **N.** $\frac{3}{4}$ **W.**, leaving black spar buoys Nos. 9 and 11 about 75 yards on the port hand; and when about 75 yards westward of Lovett Rock buoy (spar, red, No. 6), change the course to **NNW.** $\frac{1}{2}$ **W.**

Pass 75 yards westward of Fuller Rock lighted beacon, and steer **NW.** $\frac{3}{4}$ **N.**, with Sassafras Point lighted beacon a very little on the port bow. Leave red spar buoy No. 8 about 75 yards on the starboard hand, and pass 75 yards eastward of Sassafras Point lighted beacon. Then make good a **N.** by **W.** $\frac{3}{4}$ **W.** course nearly $\frac{3}{8}$ mile; and then change the course to about **N.** $\frac{1}{2}$ **W.**, and stand up to the city, following the buoys until up to Fox Point.

Remarks.—Vessels should be guided mainly by the lighthouses and buoys; the distance from one to another is short and the channel narrow. When standing on the given courses, care must be taken not to be set off them by the currents, especially between Sabine Point Lighthouse and Fuller Rock lighted beacon. A number of vessels may be found anchored in the channel above Field Point, and close attention must then be given to the buoys which mark the channel.

Dangers.—**Shoals** bound the channel its entire length, rising very abruptly in many places, and no useful description can be given of them.

GREENWICH BAY*

is situated at the northwestern end of Narragansett Bay, its entrance being between **Warwick Neck** and **Potowomut Neck.** The bay is about 2½ miles long **E.** and **W.**, has an average width of about 1 mile, and an average depth for the greater part of its area of about 10 feet. **Old Warwick Cove** and **Brush Neck Cove** are shallow coves in the northeastern part of Greenwich Bay; on **Oakland Beach,** between these coves, is a large hotel and flagstaff which show conspicuously in Greenwich Bay. **Apponaug River,** a shallow stream, empties into the northwestern part. Nearly 1 mile above the mouth of the river is the village of **Apponaug.**

Greenwich Cove, 1¼ miles long, 300 to 600 yards wide, and with a general depth of 7 to 10 feet, makes southward from the southwestern end of Greenwich Bay. On the western shore of the cove is the town of East Greenwich.

The channel into Greenwich Cove is very narrow, with a depth of 10 feet, and strangers should not attempt to navigate it without a pilot.

Tides.—The mean rise and fall of tides is 4.5 feet.

SAILING DIRECTIONS, GREENWICH BAY.

To the Entrance of Greenwich Cove.—The following directions are good for vessels of 9 feet draft or less.

Follow the directions in section 2, page 136; pass 500 yards south of Warwick Lighthouse, and make good a **NW.** $\frac{1}{8}$ **W.** course for 1 mile. Leave Sandy Point Shoal buoy

*Shown on chart 351, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

(spar, black, No. 1) about 130 yards on the port hand, and change the course to **NW.** by **W.** ⅞ **W.** Sally Rock buoy (spar, black, No. 3) will be made on the port bow; pass about 100 yards northward of Sally Rock buoy, and steer **WSW.** ½ **W.** On this course, Chippanogset Island Shoal buoy (spar, red, No. 2) will be made right ahead; anchor eastward of this buoy in 10 to 13 feet water, and if bound to the village take a pilot.

Remarks and dangers.—The dangers eastward of Potowomut Neck are described on page 137.

A number of **sunken rocks** lie southward and southwestward of Warwick Neck, but they may be easily avoided by giving the shore a berth of over 300 yards.

Sandy Point Shoal buoy (spar, black, No. 1), lying nearly 1 mile **NW.** by **W.** ¾ **W.** from Warwick Lighthouse, marks the northern edge of the extensive shoal, with 3 to 7 feet over it, which makes off from Sandy Point.

Sally Rock, with 5 feet over it, lies nearly ¼ mile northward of Potowomut Point (the north point of Potowomut Neck), and is marked by a buoy (spar, black, No. 3). Between this buoy and the shore are other rocks and shoals, and vessels should never pass southward of it.

Chippanogset Island is the small island, with yellow bluff facing eastward, in the extreme western part of the bay, and northward of the entrance to Greenwich Cove. From this island shoals, with 1 to 4 feet over them, make off 500 yards northward and 250 yards eastward and southeastward; the southeastern extremity is marked by a buoy (spar, red, No. 2).

Shoals make out northward and northwestward for a distance of about 300 yards from Long Point, the northwestern point of Potowomut Neck. The western end of the shoals is marked by a buoy (spar, black, No. 5).

WICKFORD HARBOR,*

in the west shore of Narragansett Bay, westward of the northern end of Conanicut Island, comprises an outer and inner harbor. The **outer harbor** is a broad bight between **Quonset Point** on the north and **Wild Goose Point** on the south; between these points it is about 2 miles wide, but the northern part is full of rocks and shoals which extend nearly 1¼ miles in a southerly direction from Quonset Point; the southern part has good anchorage (soft, sticky bottom) in 14 to 17 feet of water, and the dangers on the south side of the outer harbor will be avoided by keeping eastward of a line joining **Fox Island** (the island lying ½ mile southeastward of Wild Goose Point) and Wickford Harbor Lighthouse.

The entrance to the **inner harbor** is a little more than ¼ mile wide between **Sauga Point** on the north and **Poplar Point** on the south, but the shoals making out from these points leave only a narrow channel, which is marked by and lies just northward of **Wickford Harbor Lighthouse,** which is on Old Gay Rock, about 300 yards **NE.** by **E.** from the old lighthouse tower on Poplar Point.

The entrance channel between the points leads to the common junction of three coves, **Fishing Cove** making northward, **Mill Cove** making northwestward, and **Wickford Cove** making southwestward. The first two of these coves are shallow and of no importance. Wickford Cove has a depth of about 10 feet; but the channel is very narrow—to the steamboat wharf its width is 60 feet and depth 9 feet. Strangers should not enter without a pilot, who may be had by making signal while eastward of the lighthouse.

The town of **Wickford,** on the west side of Wickford Cove, is of little commercial importance; cargoes of coal are brought to it in vessels of 12 feet draft, and a steamer runs to Newport, connecting at Wickford with the railroad. The depth at low water alongside the wharves is 7 to 10 feet.

Tides.—The mean rise and fall of tides is 4.2 feet.

Ice.—In severe winters the inner harbor is closed by ice, but the outer harbor is usually open, although drift ice is occasionally encountered. See also "Ice," page 132.

SAILING DIRECTIONS, WICKFORD HARBOR.

The following directions are safe for vessels of 12 feet draft to an anchorage ¼ mile southeastward from Wickford Harbor Lighthouse; vessels should take a pilot to enter the inner harbor.

1. ***From Northward or Northeastward.***—Pass ½ mile eastward of Quonset Point and steer **SW.** ½ **S.,** with Fox Island ahead; or, round Conanicut Lighthouse, giving it a berth of at least 300 yards, and steer **W.** ¾ **S.**

*Shown on chart 357, scale $\frac{1}{20,000}$, price $0.20. See also footnote on page 130.

Leave General Rock buoy (spar, red and black horizontal stripes), marking the southernmost of the ledges southward of Quonset Point, about 200 yards on the starboard hand. When Wickford Harbor Lighthouse bears **NW.** by **W.** ½ **W.** steer for it, being careful to keep it bearing between *NW.* by *W.* ½ *W.* and *NW.* ½ *N.* Anchor in 14 to 15 feet when within ¼ mile of the lighthouse, or anywhere in approaching it between the bearings given above.

Remarks.—The courses given above lead clear of all dangers, and can be easily followed. All dangers off the southern shore of the harbor will be cleared by giving Fox Island a berth of over 300 yards when eastward of it, and keeping eastward of a line joining Fox Island and Wickford Harbor Lighthouse. The rocks and ledges on the north side of the harbor are avoided by keeping Fox Island bearing westward of **SW.** ½ **S.**, and Wickford Harbor Lighthouse bearing northward of **NW.** by **W.** ½ **W.**

Dangers.—**A shoal,** with numerous ledges and rocks, makes southward and southwestward, nearly 1¼ miles from Quonset Point; a number of these rocks and ledges are buoyed, and 7 feet may be taken across the shoal; but strangers should always pass southward of **General Rock,** the southernmost, which has 10 feet over it, and is marked by a buoy (spar, red and black horizontal stripes). **James Ledge** has 2 feet over it, and is marked by a buoy (can, black, No. 1). **Brig Ledge,** with 12 feet over it, is marked by a buoy (spar, red and black horizontal stripes). These three are the easternmost of the dangers, and lie from ⅝ to nearly 1¼ miles **SSW.** ¼ **W.** from Quonset Point.

South White Rock, marked by a granite beacon, is the southwesternmost of the rocks southward of Quonset Point, and is ⅜ mile **NNW.** ½ **W.** from General Rock.

1 A. ***From Southward.***—Follow the directions in sections 1 and 2, pages 136–137, for entering and passing up Narragansett Bay by the Western Passage, until past Dutch Island. Make good a **N.** by **E.** ⅝ **E.** course, with Dutch Island Lighthouse over the stern, until Wickford Harbor Lighthouse bears **NW.** ½ **N.,** then head for the lighthouse on that bearing.

Keep Wickford Harbor Lighthouse bearing between *NW.* ½ *N.* and *NW.* by *W.* ½ *W.* as it is approached, and anchor between these bearings about ¼ mile from the lighthouse in 13 to 17 feet of water.

See remarks and dangers under section 1, preceding.

DUTCH ISLAND HARBOR*

lies in the Western Passage of Narragansett Bay about 3 miles above Beavertail, and is a semicircular indentation ½ by 1 mile in extent making into the western side of Conanicut Island. **Dutch Island** is on the western side of the harbor, which may be entered by passing either northward or southward of the island. The harbor affords excellent anchorage in 2 to 8 fathoms, sticky bottom, is easy of access, and is frequently used as a harbor of refuge by coasters. The southern entrance is good for a depth of over 6 fathoms; but the northern entrance has a few spots with 3½ fathoms over them, and should not be attempted by vessels of over 18 feet draft.

Dutch Island Lighthouse is on the extreme southern end of Dutch Island, and is the guide for vessels coming up the Western Passage and entering Dutch Island Harbor by the southern entrance.

SAILING DIRECTIONS, DUTCH ISLAND HARBOR.

1. ***From Southward.***—Follow the directions in section 1, page 136, until less than ¼ mile from Dutch Island Lighthouse, then change the course to **NE.** ½ **E.** and stand into the harbor. Leave the black spar buoy south of Dutch Island on the port hand, and pass northward of Beaverhead Point Shoal buoy (spar, red, No. 2); anchor according to draft and direction of the wind (see remarks below).

Remarks.—In seeking anchorage, if of over 18 feet draft, give the eastern shore of the harbor a berth of at least ⅜ mile; if of less than 14 feet draft, the eastern shore may be approached as close as 300 yards and closer in places, the general depth being 15 to 17 feet. The eastern shore of Dutch Island should be given a berth of 150 yards.

* See footnote on page 130.

In the southeastern part of the harbor there is a very shallow cove which makes southeastward about ½ mile, and is only separated from Mackerel Cove by a narrow neck of land which joins Beavertail peninsula to the main body of the island.

Dangers.—A narrow spit makes out about 150 yards southward from Dutch Island Lighthouse, and has 6 feet of water near its extremity, where it is marked by a buoy (spar, black, No. 1).

On the south side of the entrance is a high point known as **Fox Hill**, which terminates in a bluff, rocky face northward, known as **Beaverhead**. From it a shoal makes out 250 yards westward and 400 yards northward. At its northern extremity the shoal rises abruptly from 8½ fathoms to 7 feet, and is marked by a buoy (spar, red, No. 2).

1 A. ***From Northward.***—Make good a **S.** by **W.** ⅝ **W.** course for Dutch Island Lighthouse until about ½ mile past Plum Beach Lighthouse, and then steer **S.** by **E.** into the harbor with Plum Beach Lighthouse astern. Give the northeastern end of Dutch Island a berth of at least 100 yards, and anchor according to draft and direction of the wind (see remarks under section 1, preceding).

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APPENDIX I.

EXPLANATION OF THE CURRENT DIAGRAM OF NANTUCKET AND VINEYARD SOUNDS.

The diagram represents average conditions of the surface currents along the middle of the channel (sailing line), from the whistling buoy in Pollock Rip Slue through Butlers Hole, passing Handkerchief and Cross Rip Light-vessels, between Squash Meadow and Hedge Fence, and through Vineyard Sound, favoring the Elizabeth Islands until abreast Gay Head. 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," all currents setting eastward of N. and S. are designated, and by "West Current" those setting westward of N. and S. At Pollock Rip the current turns around the compass "with the hands of a watch" (that is, from N. to E., to S., etc.), and there is but a short perceptible slack.

Distances along the sailing line are given at the top and bottom of the chart; the larger divisions represent 5 miles and smaller divisions 2½ miles. The small figures within the colored surface denote the velocity of the current in knots and tenths per hour at certain points along the sailing line, as shown by the distances at top or bottom of the chart.

The time of high water at Boston Navy Yard is taken as zero (0) hours, and on the sides of the chart are the hours before and after high water at that place; the small divisions represent 30 minutes.

The width between the 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.

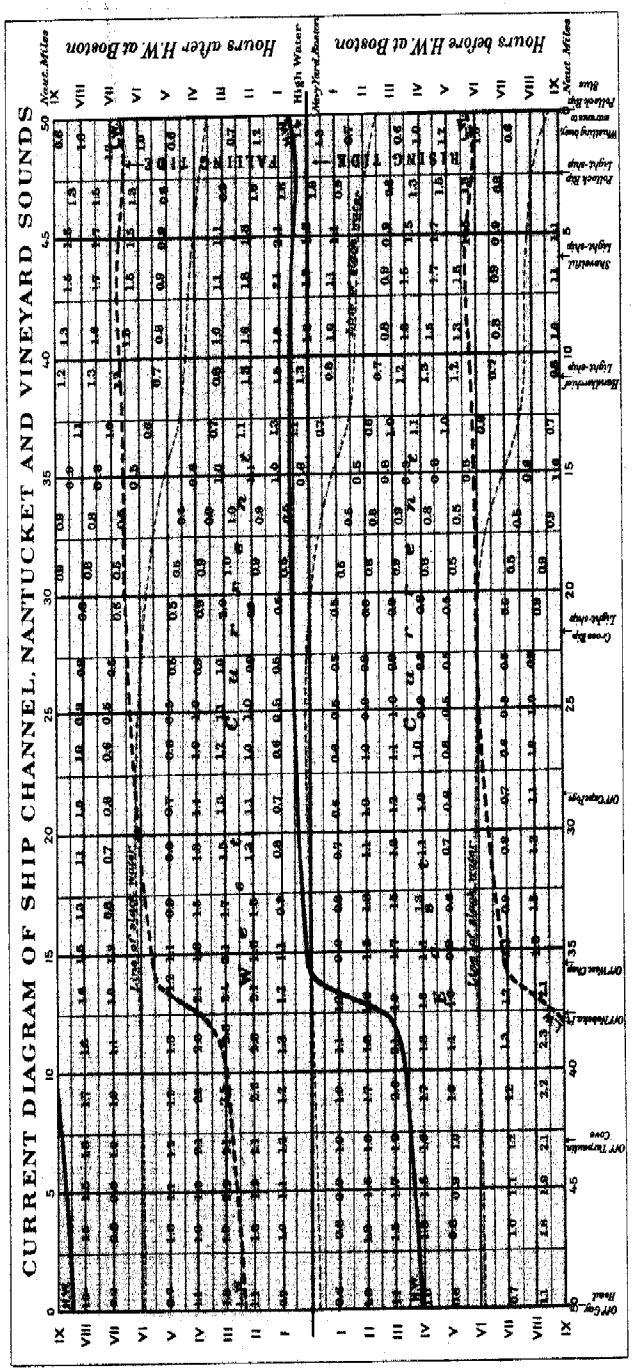
EXAMPLE.—A vessel enters Pollock Rip Slue at 2 p. m., January 5, 1908, and maintains a speed of 10 knots; what will be the state of the tide and how will she encounter the currents as she passes into and through the sounds?

From the Coast and Geodetic Survey Tide Tables, 1908, the time of the nearest high water at Boston Navy Yard is 3 hours 44 minutes p. m., hence the vessel enters Pollock Rip Slue 1 hour 44 minutes before high water at Boston Navy Yard. From the 0 on the right-hand edge of the diagram, follow down to the time 1¾ hours and interpolate for the 14 minutes, and from that point draw a line, *AB*, parallel to the speed line of 10 knots on the diagram for a vessel bound westward. The line *AB* 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 (westerly) current the whole distance through the sounds, but that the velocity of this current is not uniform. For the first 15 miles from the whistling buoy, or until 4 miles westward of Handkerchief Light-vessel, the average velocity is 0.9 knot, and as this is favorable a new speed line for 11 knots (the approximate speed the vessel is making over the bottom) should be drawn from the point *A*, and this will represent the vessel's track with regard to the current and the tide for the first 15 miles. It will then be seen that the velocity of the current for the next 15 miles is very slight, and a 10-knot speed line can be drawn from the vertical 15-mile line about 25 minutes before high water at Boston to the vertical 30-mile line; from this latter point a speed line of nearly 12 knots will represent the current and tide conditions from off Cape Poge to abreast Gay Head. From these lines it will be seen that the vessel will have a rising tide for half the distance and then a falling tide until nearly abreast Gay Head.

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 Boston. 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 Boston) of arrival at any point along the sailing line may be noted and a new line drawn to indicate the continuation of the track. Similarly, a vessel beating may note the time of crossing the sailing line, and then read from the chart the state of the tide and current at any place along the sailing line.



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APPENDIX II.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

MASSACHUSETTS.

PILOTS AND PILOTAGE.

Extracts from Chapter 67 of the Revised Laws of Massachusetts, 1902.

Sec. 17. A pilot shall have a lien for his pilotage fees upon the hull and appurtenances of every vessel liable to him therefor under the provisions of this chapter for sixty days after the completion of his services; but the lien of a pilot for the harbor of Boston shall not attach until it has been approved by the pilot commissioners. Lien of pilots for their fees.

Sec. 18. A pilot shall be liable for all damages which may accrue from his negligence, unskillfulness, or unfaithfulness. Liability of pilots for negligence, etc.

Sec. 19. A pilot shall, if so required, exhibit his commission to the master of any vessel of which he may take charge. Pilots to exhibit their commission.

Sec. 20. A pilot who takes charge of a vessel drawing more water than his commission authorizes shall be suspended or removed. Not to take charge of certain vessels.

Sec. 21. Pilots shall first board such vessels, irrespective of size, as may have signals set for a pilot. If there are no such signals to be seen, pilots shall offer their services to the first vessel which they can board; and if a vessel liable to pilotage refuses to take a pilot, the pilot offering his services shall inform the officers of such vessel that she will be held to pay the regular fees for pilotage, whether such services are accepted or not. To board first vessel showing signal.

Sec. 22. Every inward-bound vessel shall, except as provided in sections twenty-five and twenty-eight, receive the first pilot who holds a commission for her port of destination who offers his services, and such vessels shall, except as provided in sections twenty-six and twenty-seven, be held to pay to such pilot the regular fees for pilotage, whether his services are accepted or not. Inward vessel to take first pilot offering.

Sec. 23. Every outward-bound vessel, except whaling vessels outward bound from the port of New Bedford, which is liable to pilotage if inward bound, shall, whether the services of a pilot are accepted or not, be held to pay the regular fees to the pilot who brought her into port or to some other pilot of the same boat, if he offers his services before she gets under way; or if such pilot does not so offer, or if such vessel was not piloted into port, then to the pilot who first offers his services. Outward vessel to pay fees to inward pilot.

Sec. 24. No vessel shall be liable to pay pilotage fees in or out of any port other than her ports of departure and destination, unless the aid of a pilot is requested, in which case the pilot shall be bound to act as such, and shall be entitled to the regular compensation therefor. Ports where pilotage is compulsory.

Sec. 25. Every pilot is authorized and directed to take charge, within the limits of his commission, of any vessels, not exempt from compulsory pilotage by section twenty-eight, and of vessels not bound from one port to another within the commonwealth, unless they are in the completion of a voyage from a port out of the commonwealth. What vessels pilots are to take charge of.

Sec. 26. Vessels of not more than two hundred tons burden, or vessels under three hundred and fifty tons register, bound into the port of Boston, which decline the services of a pilot, shall, if otherwise liable under the provisions of this chapter to the payment of pilotage fees, be liable to one-half of the regular fees; but if they request and receive such services, they shall pay the regular rates. Certain vessels liable only for half fees.

Sec. 27. If steam towage is taken by the desire of the master, the vessel shall pay full pilotage fees; but if taken by direction of the pilot in charge, such vessel shall pay the pilot but 75 per cent of the regular fees. Fees of vessels taking steam.

Sec. 28. Steam vessels regulated by the laws of the United States and carrying a pilot commissioned by United States commissioners, vessels regularly employed in the coasting trade, fishing vessels other than whalers, Vessels exempt from compulsory pilotage.

vessels of less than 7 feet draft of water, vessels bound into the harbor of Boston and otherwise liable to pilotage, which arrive within a line drawn from Harding's Ledge to the Graves and thence to Nahant Head before the services of a pilot have been offered, and vessels under three hundred and fifty tons register bound out of the port of Boston, shall be exempt from the compulsory payment of pilotage, but if any such vessel requests the aid of a pilot, he shall serve the same in like manner as vessels which are not exempt, and shall be entitled to the regular compensation therefor.

National vessels.

Sec. 29. National vessels which employ a pilot shall pay the same rates as vessels in the merchant service.

Period for winter and for summer rates.

Sec. 30. The period for winter rates of pilotage, if such rates are established, shall be from the first day of November to the thirtieth day of April, inclusive, and for summer rates, from the first day of May to the thirty-first day of October, inclusive. In the harbors of Boston, Cohasset, Salem, and Beverly, the rates shall be the same during the whole year; and in the harbors of Cohasset, Salem, and Beverly, the rates shall be the same as those in the harbor of Boston.

Additional fees in case of detention.

Sec. 31. If a vessel is anchored for twelve hours or more under any regulation relative to quarantine or to alien passengers, the pilot in charge, upon piloting such vessel to her port of destination, shall be entitled to an addition of twenty-five per cent to the regular fees.

Pay of pilot when carried to sea.

Sec. 32. If a pilot, without fault or negligence of his own or of his associates, is unable to leave the vessel under his charge and is carried to sea, he shall be entitled to two dollars for each day on which he is necessarily detained from home.

Anchoring of vessel, with alien passengers.

Sec. 33. A pilot who fails to anchor a vessel carrying alien passengers or a vessel subject to quarantine, at the place assigned by the proper authorities, shall be suspended or removed.

Persons not pilots forbidden to act as such.

Sec. 35. No person, unless he holds a commission as a pilot, shall, if a commissioned pilot offers his services, or can be obtained within a reasonable time, assume or continue to act as pilot in the charge or conduct of any vessel within the waters of this commonwealth, unless he is actually employed on such vessel for the voyage. * * *

PILOTAGE—SPECIAL REGULATIONS.

BOSTON HARBOR.*

Extracts from a pamphlet edition of the Laws, Rules, and Regulations for the Port of Boston to 1901.

Boston pilots, boats, and regulations. (As amended 1901.)

There shall be five pilot boats constantly employed by the Boston pilots; each boat shall have a number which shall be painted in black figures of not less than forty-eight inches in length, in the mainsail and jib. * * *

* * * * * * *

Inner station.

Each one of the pilot boats employed for the harbor of Boston, in alternate weeks, and in the order of their numbers, shall cruise on a station at the entrance of Boston Harbor outside of Boston Light, and within the limits of a line drawn from Minot's Ledge to Nahant Head; and the boat on said station shall at all times show the established pilot-boat signal, and shall by day and by night, at all times, remain on said station whenever the weather does not render it impracticable, and be on the lookout for vessels approaching Boston Harbor; and shall at all times be furnished with pilots without leaving her station, and shall offer the services of a pilot to all vessels entering said harbor, * * * and she shall receive on board pilots from outward-bound vessels, * * *

Not less than three pilot boats shall at all times cruise in Boston Bay, outside of the limits prescribed for the station boat.

Cape Cod station for Boston pilots. (Chap. 276, acts of 1873.)

There shall be two stations for Boston pilots for inward-bound vessels. The outer station shall include a distance in sight of land in fair weather from the boat's deck, from where Race Point bears south to where the Highland Light bears west-northwest. * * *

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* Includes all places accessible to vessels from sea included within the limits of Nahant Rock on the north and Point Allerton on the south.

The existing regulations of law for the inner station shall also apply to the Cape Cod station created by this act. (Chap. 276, acts of 1873.)

* * * * * * *

In addition to the stations now established, there shall be a third station for Boston pilots for inward-bound vessels which shall be established near the Boston light-ship; and the inner cruising line of this station shall be drawn from Minot's Light to Half Way Rock off Marblehead, and the outer limit of this station shall be with the light-ship in sight by day, and the lights of said light-ship in sight by night, in clear weather. Light-ship station. (Acts of 1901.)

The existing regulations of law for the two stations already established, known as the Cape Cod station and the inner station, shall also apply to the light-ship station created by this act. (Acts of 1901.)

* * * * * * *

It shall be the duty of every pilot, after having brought a vessel to the inner harbor of Boston, to have such vessel properly moored in the stream, or secured to a wharf (below the bridges), at the option of the master, within twenty-four hours after arrival, weather and tide permitting, without extra charge.

If any vessel outward bound, having a pilot on board, should anchor in Nantasket Roads, it shall be the duty of the pilot to remain on board said vessel, if requested by the master, until the next high water, and if detained after that time he shall be entitled to receive three dollars per day for each and every day so detained. Nantasket Roads.

No pilot shall leave a vessel outward bound, until to the eastward of Georges Island, without permission of the master of said vessel. * * *

The fees for hauling a vessel from the stream to a wharf (below the bridges) after the expiration of twenty-four hours from arrival, shall be four dollars; and for hauling a vessel from the wharf to the stream, provided the vessel does not proceed to sea within twenty-four hours from the time of anchoring, four dollars.

Every commissioned pilot for Boston Bay shall be attached to a pilot boat. * * *

No pilot shall take charge of any vessel of a larger draught of water than his commission authorizes, nor shall any other person, not having a commission, be put on board of any vessel from either of the pilot boats in the capacity of a pilot. But in the event of the master of any vessel taking on board an unauthorized person to assist him in going into port, the person so taken shall state the circumstances to the master of said vessel, and keep the usual signal flying for a pilot until within a line from the Harding Ledge to The Graves and Bass Point, and shall give the vessel up to any authorized pilot who may offer himself. Draught of vessel not to exceed authority of commission, and only pilot to act, except, etc.

The established pilot signal by day is a white and blue flag, white next to the mast, and in the night a red light. * * * Signals.

The pilots of the port of Boston shall have an office, or keep a desk in some counting-room in some central situation, where all communications may be left for them, and it shall be the duty of the pilots, when in Boston, to call at said office or desk twice a day at least. Boston office of pilots.

RATES OF PILOTAGE FOR BOSTON HARBOR.

Outward Rates.			Inward Rates.		
Draft of water.	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.
Feet.			*Feet.*		
7	$1.65	$11.55	7	$2.64	$18.48
8	1.66	13.28	8	2.69	21.52
9	1.67	15.03	9	2.73	24.57
10	1.70	17.00	10	2.77	27.70
11	1.74	19.14	11	2.80	30.80
12	1.78	21.36	12	2.85	34.20
13	2.00	26.00	13	2.95	38.35
14	2.00	28.00	14	3.45	48.30
15	2.10	31.50	15	3.50	52.50
16	2.25	36.00	16	3.55	56.80
17	2.50	42.50	17	3.75	63.75
18	2.75	49.50	18	3.80	68.40
19	3.00	57.00	19	4.00	76.00
20	3.25	65.00	20	4.25	85.00
21	3.50	73.50	21	4.50	94.50
22	3.75	82.50	22	4.50	99.00
33	4.00	92.00	23	5.00	115.00
24	4.25	102.00	24	5.00	120.00
25	5.00	125.00	25	5.00	125.00
26	----------	130.00	26	----------	130.00
27	----------	135.00	27	----------	135.00
28	----------	140.00	28	----------	140.00
29	----------	145.00	29	----------	145.00
30	----------	150.00	30	----------	150.00
31	----------	155.00	31	----------	155.00
32	----------	160.00	32	----------	160.00
33	----------	165.00	33	----------	165.00
34	----------	170.00	34	----------	170.00
35	----------	175.00	35	----------	175.00

Neponset River.—The pilotage for the several landing places in the towns of Dorchester and Neponset shall not be compulsory. When the services of a pilot are required, the rates of pilotage authorized by the commissioners shall be one dollar per foot on inward draft. Outward vessels without cargo, $5.00 per vessel; with cargo, same as inward.

Hingham, East Weymouth, Quincy, Quincy Point, Weymouth, East Braintree, and Nantasket.—The pilotage for the above places shall not be compulsory. When the services of a pilot are required, and are offered outside of a line drawn from Nantasket Point to the east point of Pettick's Island, from thence a line drawn to the northwest point of said Pettick's Island, from thence in a line to Sunk Island, from Sunk Island in a direct line to Hangman's Island, the rates of pilotage authorized by the commissioners shall be, viz:

1869.			1869.			1901.		
East Weymouth.			Quincy Point.			Hingham.		
Draft of water	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.	Draft of water.	Rate per foot.	Amount.
Feet.			*Feet.*			*Feet.*		
7	$0.88	$6.16	7	$0.72	$5.04	7	$0.92	$6.44
8	.90	7.20	8	.72	5.76	8	.95	7.60
9	.92	8.28	9	.72	6.48	9	.97	8.70
10	.93	9.30	10	.80	8.00	10	1.00	10.00
11	.99	10 89	11	.92	10.12	11	1.00	11.00
12	1.10	13.20	12	1.00	12.00	12	1.10	13.20
13	1.25	16.25	13	1.25	16.25	13	1.25	16.25
14	1.40	19 60	14					
15	1.50	22.50	15					
16	1.60	25.60	16					
17	1.70	28.90	17					
18	1.80	32.40	18					

Nantasket, Quincy, Weymouth Landing, and Braintree, same rates as East Weymouth. Inward and outward rates the same.

Lynn.—The pilotage for the harbor of Lynn shall not be compulsory. The rates of pilotage authorized by the commissioners, 1865, shall be, viz:

To Lynn on vessels drawing 12 feet of water, or less, $4.20 per vessel.

To West Lynn, $4.20 per vessel. Up the river through bridges, $5.60 per vessel.

The outward rates shall be one-half the inward rates.

Extracts from the acts of 1862 except where otherwise indicated by marginal references in parentheses.

SOUTH SHORE.

Rates west from certain line to places named established.

The rates for piloting from west of a line drawn from Sakonnet Point to No Mans Land, to the ports herein named, shall be as follows, viz: Into Tarpaulin Cove, one dollar and fifty cents per foot; * * * Falmouth Port, and Holmes Hole, one dollar and seventy-five cents per foot. Into Edgartown and Hyannis, two dollars per foot; and to the bar of Nantucket Harbor, two dollars and twenty-five cents per foot. And into any other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot.

Outward rates from said ports, etc.

The outward rates of pilotage from all of the above-named ports and from the bar of Nantucket Harbor, if taken westward past Gay Head, shall be three-fourths of the above; and the outward and inward rates shall be increased by twenty per cent for all piloting done between the first day of November and the thirtieth day of April, inclusive.

Rates east of said line to said ports, etc.

The rates for piloting vessels into any of the above-named ports, and to the bar of Nantucket Harbor, from any point east of a line drawn from Sakonnet Point to No Mans Land, and between said line and a line drawn due south from Tarpaulin Cove Lighthouse, shall be twenty-five per cent less than the above-named rates; and if said pilot is taken east of line drawn due south from Tarpaulin Cove Lighthouse, fifty per cent shall be deducted from said specified rates; and in case the master then declines taking a pilot, said pilot offering shall be entitled to one-quarter pilotage, agreeably to these regulations; and if no pilot shall have offered his services before passing a line drawn from the West Chop Lighthouse to the Nobska Lighthouse, there shall be no obligation on the part of the master or owner to pay pilotage if the master shall then decline receiving a pilot.

Vessels from eastward to same ports, etc.

The rates of pilotage for vessels coming from the eastward, bound to the aforesaid ports, shall be from east of a line drawn due north from Nantucket Great Point Lighthouse to the bar of Nantucket, one dollar and fifty cents per foot of said vessel's draught. Into Edgartown and Hyannis, one dollar and seventy-five cents per foot. Into Holmes Hole and Falmouth Port, * * * two dollars per foot; and into all other ports on the south coast of Barnstable County or on the Vineyard Sound, one dollar and seventy-five cents per foot; and from west of said line drawn due north from Great Point Lighthouse, twenty-five per cent less than the foregoing. The outward rates, when passing to sea to eastward of Nantucket Shoals, shall be three-fourths of the inward rates, and both outward and inward rates shall be increased by twenty-five per cent for all pilotage done between the first of November and the thirtieth of April, inclusive.

* * * * * * * *

Pilotage of vessels in and out of Woods Holl Harbor. (Chap. 275, act of 1889.)

Sec. 1. The rates for pilotage for vessels in and out of Woods Holl Harbor shall be as follows: Whenever a pilot shall take charge of a vessel bound into said port from sea, east of a line drawn from Sakonnet Point to No Mans Land, the fees shall be two dollars and twenty-five cents a foot of the vessel's draught. If said vessel takes a pilot east of a line drawn due south from Tarpaulin Cove Lighthouse the fees for pilotage shall be one dollar and twenty-five cents a foot of the vessel's draught. For all pilotage done between the first day of November and the thirtieth day of April twenty-five cents a foot additional shall be charged as winter rates. The outward pilotage from Woods Holl for vessels bound west shall be one dollar and twenty-five cents a foot of the vessel's draught to a line drawn due north from Gay Head Lighthouse. When the pilot is taken east of a line drawn due north from Great Point Lighthouse the fee shall be two dollars and twenty-five cents of the vessel's draught. When the pilot takes charge of a vessel west of a line drawn due north from Nantucket Great Point Lighthouse, bound into Woods Holl, the fee shall be one dollar and twenty-five cents a foot of

the vessel's draught; all outward bound vessels from Woods Holl, when bound east over Nantucket Shoals, when taken past and over said shoals, shall be subject to the full fees of two dollars and twenty-five cents a foot of the vessel's draught.

NANTUCKET AND VINEYARD SOUNDS AND BUZZARDS BAY.

Rates.

The rates for piloting vessels through the Vineyard Sound over Nantucket Shoal into Boston Bay, or to any port of destination eastward thereof, if the pilot be taken westward of a line drawn due south from Tarpaulin Cove Lighthouse, or between said line and a line drawn from No Mans Land to Sakonnet Point, from the first day of November to the thirtieth day of April, inclusive, shall be for vessels not drawing more than eleven feet of water, three dollars and fifty cents per foot; if drawing more than eleven feet of water and not more than fourteen feet, four dollars per foot; if drawing more than fourteen feet, four dollars and fifty cents per foot. And from the first day of May to the thirty-first day of October, inclusive, for vessels drawing not more than eleven feet of water, two dollars and fifty cents per foot; if drawing more than eleven feet and not more than fourteen feet, three dollars per foot; if drawing more than fourteen feet, three dollars and fifty cents per foot. And if the pilot be taken west of said line drawn from Sakonnet Point to No Mans Land, ten per cent shall be added to the above specified rates; and if said pilot be taken at any point east of said line drawn due south from Tarpaulin Cove Lighthouse, ten per cent shall be deducted from said rates; and if, during the navigation aforesaid, the pilot is detained in any port at the request of the master, commander, or owner of said vessel, and not from stress of weather, he shall be allowed three dollars per day for all such detention; and in all cases five dollars shall be added to the rates aforesaid if the vessel shall be taken to a port of destination east of Cape Ann and not eastward of Portsmouth; and if the port of destination be Portsmouth or eastward thereof, ten dollars shall be added to said rates; *provided, however*, that any other rates may be agreed upon, by written contract between the master, commander, or owner of any vessel to be piloted, and the pilot taking charge of the vessel.

Vineyard Sound rates.

The rates of pilotage from one port to another on the Vineyard Sound, including the south coast of Barnstable County, and from the said ports to the bar of Nantucket Harbor, and *vice versa*, shall be uniformly one dollar and twenty-five cents per foot, and twenty-five per cent additional for all pilotage done between the first day of November and the thirtieth day of April, inclusive; and for pilotage inward or outward over the bar of Nantucket Harbor only, at all seasons of the year, one dollar per foot.

Nantucket Shoals, authority of pilot.

Any person holding a commission as pilot for Nantucket Shoals, is authorized to pilot vessels from any part of the Vineyard Sound, Nantucket Shoals, and ports bordering on the waters of the same, to the harbor pilot's limits of any port in Buzzards Bay, or ports west of said bay, at the following rates of pilotage: From any point east of a line drawn due north from Cape Poge, at two dollars per foot of such vessel's draught, and if taken westward of said line drawn due north from Cape Poge, one dollar and fifty cents per foot; and if no port pilot offers his services, with the consent of the master, they may proceed with said vessel to her destination and claim the whole amount of pilotage; *provided, however*, that no vessel passing through the waters of the Vineyard Sound, or over the Nantucket Shoals to ports beyond them, shall be holden to pay compulsory pilotage. But in no case shall an unauthorized pilot take charge of any vessel when a commissioned pilot can be obtained at a proper time. Pilots holding commissions for Vineyard Sound and Nantucket Shoals, who may have piloted a vessel over said shoals whose destination is a port in Barnstable or Boston Bay, or eastward thereof, on arrival at the port of her destination, and no harbor pilot offering his services, may, with the consent of the master (but not otherwise), pilot such vessel into her port of destination and receive the regular port pilot fees therefor.

Proviso.

NEW BEDFORD AND FAIRHAVEN.

Authority of pilots.

Pilots especially commissioned for the purpose shall be authorized to pilot vessels from sea, which are bound into the ports of New Bedford and Fairhaven, to abreast of Clark Point Lighthouse, and to the port pilot limits of other ports in Buzzards Bay (or westward thereof), and if no port pilot offers

his services, they may, with the consent of the master or owner, proceed with such vessel to her port of destination, and claim the full amount of pilotage.

Rates.

The rates of pilotage from sea from vessels bound into the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be one dollar and ninety cents per foot, and from abreast of Clark Point Lighthouse to the inner harbors of New Bedford and Fairhaven, thirty-five cents per foot, and twenty per cent additional to the sea or bay pilotage, from the first day of November to the thirtieth day of April, when a pilot offers his services or is taken west of a line drawn from Sakonnet Point to the south point of No Mans Land.

The outward rates of pilotage from the ports of New Bedford and Fairhaven to abreast of Clark Point Lighthouse shall be thirty-five cents per foot; from abreast of Clark Point Lighthouse to sea, one dollar and fifty cents per foot.

Vessels to other ports in bay, exemption defined.

Vessels bound into other ports (than New Bedford and Fairhaven) in Buzzards Bay, and ports west of said bay, are exempt from paying compulsory bay pilotage, when coming from sea, from westward to the port pilot limits of the several ports; but if a pilot is employed, he shall be entitled to receive two dollars per foot, and if no port pilot offers his services, he may, with the consent of the master or owner, conduct said vessel to the port of her destination and claim the whole amount of pilotage.

Harbor pilotage in bay, except, etc., rates.

The rates of port or harbor pilotage for all the different ports bordering on Buzzards Bay, and to the westward thereof, excepting New Bedford and Fairhaven, shall be for vessels inward bound, drawing less than twelve feet of water, one dollar per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen and not more than eighteen feet of water, two dollars per foot; and for those drawing over eighteen feet of water, two dollars and fifty cents per foot; and the rates of pilotage for vessels outward bound from said ports shall be three-quarters of said inward rates, and both outward and inward rates shall be increased by twenty per cent for all pilotage done between the first day of November and the thirtieth of April, inclusive.

NEWBURYPORT, MERRIMACK RIVER AND HARBORS, ROCKPORT, LANES COVE, AND ANNISQUAM, GLOUCESTER, SALEM AND BEVERLY, MARBLEHEAD, COHASSET, PLYMOUTH, PROVINCETOWN, TAUNTON RIVER.

Newburyport.

Newburyport.—The rates of pilotage for vessels liable to pay pilotage bound into or out of the harbor of Newburyport shall be, for outward bound vessels, from seven to twelve feet draught of water, sixty-five cents per foot; from twelve to fifteen feet, inclusive, eighty-five cents per foot; upwards of fifteen feet, one dollar and five cents per foot. The summer rates of pilotage for inward bound vessels, drawing from seven to under twelve feet, ninety-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and twenty-five cents per foot; over fifteen feet, one dollar and sixty cents per foot. The winter rates of pilotage for inward bound vessels, drawing from seven to twelve feet of water, one dollar and twenty-five cents per foot; from twelve to fifteen feet, inclusive, one dollar and sixty-five cents per foot; over fifteen feet, two dollars and ten cents per foot.

Limits of district.

The district limits of the port of Newburyport shall be from Chebacco Bar, on the south, to the Isles of Shoals, on the north. Vessels not spoken until within the bar shall pay only half pilotage; if not spoken until within the Black Rocks shall pay no compulsory pilotage.

Boats.

The pilots of Newburyport will be required to keep one or more * * * boats, and one boat shall be upon the cruising ground at all times, when the weather will permit.

Merrimack River and Harbors.

Merrimack River and Harbors.—The pilotage on the Merrimack River, between Newburyport and Haverhill, shall not be compulsory. When the services of a pilot are required, the rates of pilotage authorized by the commissioners shall be, between Newburyport and ship-yards at Bellville, thirty cents per foot; between Newburyport and Salisbury, fifty cents per foot; between Newburyport and Amesbury, sixty-two and one-half cents per foot; between Newburyport and Groveland, eighty-seven and one-half cents per foot; between Newburyport and Haverhill, one dollar per foot.

Rockport, Lanes Cove, and Annisquam.

Rockport, Lanes Cove, and Annisquam.—The rates of pilotage shall be, for vessels under twelve feet draught of water, seventy-five cents per foot; of

twelve to fifteen feet, inclusive, one dollar per foot; over fifteen feet, one dollar and fifty cents per foot. The inward and outward rates shall be the same.

Rates for pilotage into Gloucester Harbor. (Chap. 228, acts of 1873.)

Gloucester.—Sec. 1. The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Gloucester, shall be for vessels drawing seven feet and less than twelve feet, one dollar and fifty cents per foot; for those drawing twelve feet and upwards, the same as for the ports of Salem and Beverly.

Salem and Beverly.

Salem and Beverly.—The pilots for the ports of Salem and Beverly shall keep one or more good decked boats, and shall cruise for the purpose of bringing vessels into said ports whenever the weather does not render it impracticable.

The harbor lines of the ports of Salem and Beverly shall be a line running north by east from Half-Way Rock to the northern shore, and a line running northwesterly from Half-Way Rock to Marblehead Fort, within which lines there shall be no compulsory inward pilotage. The rules for pilotage, both for inward and outward bound vessels, shall be as follows, viz: * * *

Rates of pilotage for ports of Salem and Beverly to be same as for Boston. (Chap. 204, Supp. to P. S.)

Sec. 1. The rates of pilotage for the ports of Salem and Beverly shall hereafter be the same as those established for outward and inward bound vessels for the port of Boston.

* * * Any Salem and Beverly pilot, having brought a vessel in, shall have such vessel properly moored in the harbor or secured at the wharf, at the option of the master, within twelve hours after the arrival of said vessel, if the weather permits, without extra charge; but if called upon after the expiration of the twelve hours to haul any vessel into the wharf, the pilot shall be entitled to receive two dollars for his services, and the same sum for taking a vessel from the wharf into the harbor, if said vessel shall not proceed to sea within twelve hours from the time of her being anchored in the harbor. The signal for the pilot boats for the ports of Salem and Beverly shall be their accustomed signal by day, viz, a red flag with a white P, and a black ball painted on the upper part of mainsail and jib; and by night a green light.

Marblehead.

Marblehead.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Marblehead shall be, for vessels drawing from seven to eleven feet of water, sixty-seven cents per foot; from twelve to fourteen feet, ninety cents per foot; from fifteen to seventeen feet, one dollar and twenty cents per foot; eighteen feet and upwards, one dollar and sixty cents per foot.

The harbor limits of Marblehead shall be bounded by a line drawn from the south point of the Neck to Marblehead Rock, thence to Cat Island Rock, and thence westerly to Gerrys Island; within this line there shall be no compulsory inward pilotage. The outward rates shall be the same as the inward.

Pilot for Cohasset Harbor. (Chap. 298, Supp. to P. S., Sec. 2.)

Cohasset Harbor.—The rates of pilotage for said harbor shall be the same for outward and inward bound vessels as those established for the harbor of Boston.

Plymouth.

Plymouth.—The rates of pilotage for vessels liable to pay pilotage bound into the harbor of Plymouth shall be one dollar per foot. Vessels arriving inside of the Gurnet, and no pilot previously offering his services, are exempt from compulsory pilotage, if a pilot's services are then refused. Rate of pilotage outward, seventy-five cents per foot.

Bay and harbor pilots, six; appointment and duties.

Provincetown.—There shall be commissioned from the port of Provincetown not more than six persons, who shall be competent as bay and harbor pilots, and who shall keep a * * * boat, * * * and shall cruise in all seasons, for the purpose of taking vessels into Provincetown or Cape Cod Harbor. Said pilots shall also be entitled to take vessels, when outside the limits of the line hereinafter defined, to or within said limits, or until spoken by a Boston pilot. Vessels bound into the port of Boston, and liable to pay pilotage, will take such pilots, when first spoken by them, and said pilots shall have authority to pilot any such vessels until spoken by a Boston pilot, when the vessel shall be given up to the first pilot commissioned for the port of Boston who may hail her; but the cape pilot shall continue on board until relieved by a Boston pilot, to whom the vessel shall be given up; and the pilotage of such vessel shall be divided between the two pilots, *pro rata*, in proportion to the distance each may have charge of her, after passing a line drawn from Plymouth Lights to Thacher Island, Cape Ann, in which event distance-money shall be wholly for the benefit of the cape pilots—otherwise for the Boston

pilots; but the compensation of the first pilot shall in no case be less than five dollars, which amount shall be deducted from the regular pilotage, so that in no instance shall there be any addition to the usual rates of pilotage in consequence of taking such cape pilots.

Cape Cod and Provincetown pilots.

The limits outside of which such Cape Cod or Provincetown pilots may take a vessel bound into Boston shall be a line drawn northeast from the Gurnet or Plymouth Lights; but all commissioned pilots for the port of Boston shall have the privilege of cruising outside of said line, as heretofore.

Vessels via cape, for Salem, etc.

Vessels coming by Cape Cod and bound for the ports of Salem, Beverly, or Marblehead, who may desire the services of a cape pilot, may take such pilot as may be competent, to the several ports or pilots, under the same restrictions as are provided for vessels bound to Boston, as above.

Rates for vessels bound to Provincetown, taken south of line west from Race Point.

The rates of pilotage for all vessels liable to pay pilotage bound into the harbor of Provincetown, if taken south of a line drawn due west from Race Point Lighthouse, or between that and a line drawn due south from Wood End Bar, shall be for vessels drawing less than twelve feet of water, one dollar per foot; for those drawing from twelve to fifteen feet of water, inclusive, one dollar and thirty cents per foot; for those drawing more than fifteen feet and not more than eighteen feet of water, two dollars per foot; for those drawing more than eighteen feet and not more than twenty-one feet of water, two dollars and fifty cents per foot; for those drawing more than twenty-one feet and not more than twenty-five feet of water, three dollars and fifty cents per foot, and no more. But no vessel shall be liable to pay compulsory pilotage if the services of a pilot are refused after passing a line drawn due south from Wood End Bar. And the outward rates of pilotage shall be three-fourths the amount of said inward rates.

Taunton River.

Taunton River.—The pilotage for Taunton River shall not be compulsory. When the services of a pilot are required, the rates of pilotage on all vessels piloted from Fall River to Somerset, drawing not over twenty feet of water, is two dollars. From Fall River to Dighton, on vessels drawing twelve feet of water, seven dollars; eleven feet, six dollars and fifty cents; ten feet, six dollars; nine feet, five dollars and fifty cents; eight feet, five dollars; under eight feet, four dollars. From Somerset to Dighton and Berkley, fifty cents per foot for vessels drawing from eight to twelve feet of water; under eight feet, three dollars per vessel. The downward pilotage from the aforesaid places shall be one-half of the upward rates.

HARBOR CONTROL.

Extracts from Chapter 66 of the Revised Laws of Massachusetts, 1902.

Penalty for boarding vessels without leave.

Sec. 1. Whoever, not being a pilot or public officer, boards or attempts to board a vessel arriving in the harbor of Boston, Salem, Fall River, New Bedford and Fairhaven, or Gloucester, before such vessel has been made fast to the wharf, without the previous permission of the master or person having charge thereof or the previous permission in writing of its owners or agents, or whoever, without such leave and without authority of law, boards a vessel in any of said harbors after having been forbidden so to do by a person having charge thereof at the time, or, having boarded such vessel, refuses or neglects to leave it when ordered so to do by the person having charge of it, shall forfeit not more than fifty dollars for each offense.

Harbor limits.

Sec. 6. For the purpose of the five preceding sections, the outer limits of Boston harbor shall be a line drawn from Harding's Rock to the Outer Graves and from thence to Nahant Head, and said harbor shall include the shores of Chelsea; the outer limits of Salem harbor shall be the chops of said harbor; the harbor of Fall River shall include the waters of Taunton Great River and Mount Hope Bay, from the south line of the town of Freetown to Rhode Island state line, including the shores of Somerset; the harbors of New Bedford and Fairhaven shall be considered one harbor, the outer limits of which shall be the outer limits of Buzzards' Bay; and the outer limits of Gloucester harbor shall be a line drawn from Eastern Point to Norman's Woe.

Stones, etc., not to be deposited in harbor.

Sec. 17. Whoever wilfully and without lawful authority or license therefor, deposits in a harbor or other navigable tide waters stones, gravel, mud, ballast, cinders, ashes, dirt or any other substance tending to injure the navigation or to shoal the depth thereof shall be punished by a fine of not more than twenty dollars for each offense.

No line to be passed across channel.

Sec. 18. No warp or line shall be passed across a channel or dock so as to obstruct vessels passing along the same.

Powers of harbor masters.

Sec. 21. The master of a vessel within a harbor for which a harbor master is appointed shall anchor his vessel according to the regulations of the harbor master, and shall move to such place as the harbor master directs. The master of a towboat having a vessel in tow and a pilot having a vessel in charge shall allow such vessel to anchor only in such place as the regulations of the harbor master provide for anchorage.

Powers of harbor masters.

Sec. 22. The master of a vessel, before unloading lumber in the stream or channel of a harbor having a harbor master, shall obtain from him a permit, designating where such lumber may be rafted.

Powers of harbor masters.

Sec. 23. A vessel lying in a harbor or at a wharf or pier in a harbor shall, if so directed by the harbor master, cockbill the lower yards, brace the topsail yards fore and aft and rig in the jib-boom.

Removal of vessel lying in harbor.

Sec. 24. A harbor master may, at the expense of the masters or owners thereof, cause the removal of any vessel which lies in his harbor and is not moved when directed by him, and upon the neglect or refusal of such master or owner on demand to pay such expense, he may recover the same from them in an action of contract, to the use of the city or town in which the harbor is situated.

—of vessel lying at wharf.

Sec. 25. If the master or other person in charge of a vessel occupying a berth at a wharf or pier fails, after notice from the wharfinger thereof or his agent, to remove his vessel from such berth within such time as the harbor master adjudges reasonable, the harbor master shall cause such vessel to be moved to some other berth or anchored in the stream, and may recover the expense of such removal * * * from the master or owners. * * *

Regulation of station of vessels, etc.

Sec. 26. A harbor master may, in the harbor for which he is appointed, regulate and station all vessels in the streams or channels thereof, and may remove such as he determines are not fairly and actually employed in receiving or discharging their cargoes, to make room for such others as require to be more immediately accommodated for such purposes.

Penalty for violating preceding sections.

Sec. 28. Whoever violates any of the provisions of the ten preceding sections or refuses or neglects to obey the lawful orders of a harbor master, or resists him in the execution of his duties, shall be punished by a fine of not more than fifty dollars, and shall be liable in an action of tort to any person suffering damage thereby.

GLOUCESTER HARBOR.

Extracts from chapter 315, acts of 1885.

Harbor master to be appointed.

Sec. 1. That the mayor and aldermen of the city of Gloucester may * * * appoint a harbor master for the harbor of said city. * * *

May appoint deputy.

He may appoint a deputy whenever the mayor and alderman deem it necessary. * * * He and his said deputy shall have the powers and duties, and shall enforce the regulations and penalties set forth in the last twelve sections of chapter sixty-nine of the Public Statutes, and in this act, and in any other laws which are or may be in force applicable to said office and to said harbor. * * *

Certain passageway to be kept open.

Sec. 2. From Tenpound Island to Fivepound Island, a sufficient passageway of not less than two hundred feet in width on the northerly side of said harbor, leaving Babson Ledge buoy on the port hand going in and a passageway of not less than one hundred and fifty feet in width from any wharf in Upper Cove, Smiths Cove, and Harbor Cove in said harbor, shall be at all times kept open for the passageway of vessels; and no vessel shall be anchored or allowed to lie at anchor in said passageways or in the track of the ferryboats regularly running in said harbor.

A man to be on board each vessel; light, etc.

Sec. 3. At least one man shall at all times be kept on board each vessel at anchor in said harbor; and a clear and distinct light shall be kept suspended not less than six feet above the deck of every such vessel during the night.

BOSTON HARBOR.

Extracts from the statutes.

Sec. 1. No vessel which shall cast anchor in the harbor of Boston, between India Wharf and Grays Wharf, shall anchor within five hundred feet of the line described in the second section of an act entitled "An act to preserve the harbor of Boston, and to prevent encroachments therein," passed on the nineteenth day of April, in the year one thousand eight hundred and thirty-seven; and no vessel which shall cast anchor between the easterly side of Lamsons Wharf and the easterly side of Tuttles Wharf, at East Boston, shall anchor within five hundred feet of the line described in the fifth section of "An act concerning the harbor of Boston," passed the seventeenth day of March, in the year one thousand eight hundred and forty, unless for the purpose of hauling in, as soon as practicable, to some wharf in said harbor, or unless compelled to do so by reason of stress of weather or unavoidable casualty. * * *

Anchorage to be only within certain limits. (Chap. 234, acts of 1847.)

Provided, etc.

Sec. 4. All vessels at anchor in the harbor of Boston shall keep an anchor watch at all times, and shall keep a clear and distinct light, suspended at least six feet above the deck, during the night. * * *

Concerning anchor watch and lights at night. (Chap. 314, acts of 1848.)

Sec. 1. No vessel propelled by steam shall, either in Boston Harbor or Charlestown Harbor, pass within one hundred yards of any wharf at greater speed than the rate of five miles an hour.

Steam vessels not to pass wharves faster than five miles an hour. (Chap. 16, acts of 1872.)

Extracts from a pamphlet edition of the Rules and Regulations of the Harbor Master, 1901.

1. All vessels anchoring on the south side of the channel shall anchor within the following marks, viz:

The Twin Towers of St. Mary's Church on Thacher street in range with granite block on Long Wharf and south-east of a line drawn between the Elevators in East and South Boston.

2. All vessels anchoring on the north side of the channel shall anchor within the following marks, viz:

Long Island Light-house in range with the Half Moon Battery on Governor's Island, and south-east of a line drawn between the Elevators in East and South Boston.

3. All vessels of light draft shall anchor inside the above ranges in order that sufficient room may be given to vessels of deep draft.

4. No vessels shall lie at anchor in the tracks of the Ferry-boats, nor in Fort Point Channel.

5. No more than two vessels at a time shall anchor, or make fast to any that are anchored, between the East Boston North and South Ferries.

6. All light vessels shall anchor south-east of a line drawn between the Boston, Revere Beach & Lynn Railroad Ferry in East Boston and the New Commonwealth Pier in South Boston.

7. No vessel shall anchor in the dredged channel to the Metropolitan Coal Company's Wharf, at South Boston.

8. A master of a vessel, before discharging or loading any cargo within the anchorage limits, shall obtain a permit from the Harbor Master, and have a berth assigned him.

9. Yachts anchoring on the Yacht Anchorage, off Rowe's Wharf, shall anchor by the following marks:

The Round Chimney on Cold Storage building on Richmond street, between Commercial street and Atlantic avenue, in range with east end of granite block on Long Wharf; to westward of the mouth of the State Dock; the flagstaff on freight house No. 2, New York & New England Railroad (in Fort Point Channel), in range with northerly side of the Atlas Stores building in South Boston; and not less than 500 feet from the New York & New England Railroad Wharf.

QUARANTINE.

Extract from Chapter 75 of the Revised Laws of Massachusetts, 1902.

Town may establish a quarantine ground.

Sec. 131. A town may establish a quarantine ground in a suitable place. * * *

Quarantine of vessels.

Sec. 132. The board of health in a seaport town may from time to time establish the quarantine to be performed by vessels arriving within its harbor, and may make quarantine regulations for the health and safety of the inhabitants, * * *

Quarantine of suspected vessels.

Sec. 133. Such board may at any time cause a vessel arriving in port, if such vessel or the cargo is, in its opinion, foul or infected so as to endanger the public health, to be removed to the quarantine ground and thoroughly purified at the expense of the owners, consignees, or persons in possession of the same; and may cause all persons arriving in or for any purpose visiting such vessel, or handling the cargo, to be removed to any hospital under the care of the board, there to remain under its orders.

Penalty for refusal to answer on oath.

Sec. 134. Any person belonging to or arriving in a vessel on board of which any infection then is or has lately been, or is suspected to have been, or which has been at or has come from a port where an infectious distemper prevails which may endanger the public health, who refuses to make answer on oath, to be administered by any member of the board, to questions relating to such infection or distemper asked by the board of health of the town to which such vessel may come shall forfeit not more than two hundred dollars.

Quarantine expenses, how paid.

Sec. 135. All expenses incurred on account of any person, vessel, or goods which are under quarantine regulations shall be paid by the owner of such vessel.

GLOUCESTER HARBOR.

Extract from a pamphlet edition of the Regulations of the Board of Health, 1897.

Reg. 32. Every vessel entering the Harbor of Gloucester from any sickly port, or having any case of contagious or doubtful disease on board, or on board of which any person shall have died of any contagious or doubtful disease, shall be brought to anchor in that part of the harbor between Ten Pound Island and Eastern Point, and shall immediately display a yellow flag at the head of the foremast, which shall be kept flying so long as said vessel shall be at anchor in said place.

SALEM HARBOR.

Extracts from a pamphlet edition of the Regulations of the Board of Health, 1897.

Reg. 51. From the first day of April in any year to the first day of January next following, all vessels arriving in this harbor from any foreign port or from any port south of Virginia, and also vessels arriving from any place in the United States where they may have touched on their way from any foreign port or place above named, shall come to and stop at the quarantine ground in said harbor.

Reg. 54. No vessel arriving in said harbor from the ports aforesaid shall leave the quarantine ground until the examination provided by said regulation 53 shall have been fully completed, nor without a written permit from the board of health or its said agent.

Reg. 56. While a vessel remains at the quarantine ground its cargo shall not be handled nor shall anything whatsoever be removed from such vessel; nor shall any person or persons go on board or leave the same without the permission of the board of health or its said agent. Every vessel while at the quarantine ground shall constantly keep hoisted a yellow flag, not less than three feet in length and two feet in width.

Reg. 57. For any permit granted under regulation 54 or 55, the said clerk shall have the right to demand and receive from each vessel, her masters or owners, the fee established by the board of health.

BOSTON HARBOR.

Extracts from a pamphlet edition of the Quarantine Regulations, in force 1902.

ORDERED, That any vessel arriving at this port, which has on board at the time of her arrival, or has had during her passage to this port, any sickness of a contagious, infectious, or doubtful character which may be dangerous to the public health, or which has come from or has been in any port or place which has been epidemically infected with any contagious

or infectious disease within the six months next preceding such arrival, or has on board any merchandise which has come by transhipment from any such infected port or place within the six months next preceding, or has on board any immigrants (except from British America) shall be anchored at Quarantine.

All old rags, paper stock, hair, feathers, hides, skins, wool, and similar materials which are liable to convey disease germs must be accompanied by satisfactory certificates as to their place of collection and packing for shipment.

No article of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the written consent of the Board of Health or the Quarantine Physician; nor shall any such article be removed from any vessel at her dock without such permission; all such articles which are to be destroyed, shall be burned in the harbor under the supervision of the Quarantine Physician, in the furnaces of the steamers.

No vessel shall leave Quarantine, nor shall her cargo, or any part thereof, be discharged, nor any person be allowed to go on board or to leave her while in Quarantine, without the written permit of the Port Physician, who is hereby authorized and instructed to take such measures with regard to said vessel, cargo, and persons, as, in his judgment, the public health may require.

It is also hereby ordered, that during June, July, August, September, and October of each year, subject to such changes as circumstances may from time to time require, all vessels arriving in this harbor from the following ports shall stop at the Quarantine Station, viz: all vessels from any port in Europe, from the Western, Madeira, Canary, or Cape de Verde Islands; from the Mediterranean or Straits thereof; from the west coast of Africa, or around the Cape of Good Hope; from the West India, Bahama, or Bermuda Islands; from any American port south of Virginia, including Central and South America; and vessels arriving from any place in the United States or British America, where they may have touched on their way from any foreign port or place above named.

No such vessel shall leave Quarantine or unload her cargo or any part thereof, nor shall any person go on board or leave the vessel while in Quarantine without the written permit of the Port Physician, who is hereby authorized and instructed to take any measures in regard to such vessels as in his judgment the public health may require.

The Port Physician is hereby authorized and instructed to demand and receive the Quarantine fees which are hereby made and established by this Board and which are as follows:

For examination of vessels of five hundred tons and upwards (registration tonnage), eight dollars.

For examination of vessels under five hundred tons (registration tonnage), five dollars.

For disinfecting vessels, from ten to fifty dollars.

For baths and disinfecting personal clothing and baggage, one dollar for each person.

For vaccination, twenty-five cents for each person.

For board of patients in hospital, ten dollars a week.

PROVINCETOWN HARBOR.

Extracts from Quarantine Regulations adopted April 1, 1899, and in force 1902.

1. Quarantine Ground of Provincetown. That portion of the harbor lying without a line drawn due northeast from the eastern extremity of Long Point and eastwardly three-fourths of a mile from Provincetown shore, shall be known as Quarantine grounds.

2. All vessels arriving from or having on board any persons or goods of any description from any foreign port where smallpox, cholera, typhus or ship fever or yellow fever, or any contagious disease is known to be prevailing or has lately been known to have prevailed, are hereby forbidden to cross quarantine line to come into harbor, or to land, within the harbor or limits of this town, any person whether of crew or passenger, or any goods, personal effects, or merchandise as aforenamed, until so permitted by the Board of Health after due inspection, or approval of the bill of health by said Board. Such vessel may however put to sea in preference to going into quarantine provided there be no infection aboard in which latter condition they will be subject to Regulation 3.

3. Any vessel having on board a case of any of the above named diseases shall immediately take a position upon Quarantine grounds, and shall there remain under the special supervision of the Board of Health until discharged by them, which will not be until after proper disinfection of the said vessel, crew and cargo. No persons, nor any goods, personal effects, or merchandise, shall be landed from any vessel in quarantine; nor shall any person visiting such vessel again land until the vessel's quarantine is finished, except by a permit from the Board of Health. Filthy or unclean vessels shall be subject to quarantine for purposes of purification. All vessels liable to quarantine shall discharge in quarantine and be detained thereafter for necessary purification.

8. A fee of five dollars shall be charged each vessel inspected by the Health officers and fifty cents addition for each passenger. All vessels arriving from foreign ports shall be subject to inspection during every month of the year, and all vessels from domestic ports south of Hatteras from April first to November first inclusive.

NEW BEDFORD HARBOR.

Extracts from the Quarantine Regulations in the annual report of the Board of Health, 1893.

1. Every vessel arriving from a foreign port shall immediately proceed to the quarantine grounds, and shall be visited by the quarantine officer between sunrise and sunset as soon as possible after such arrival. Such officer shall examine the bill of health, and shall inspect the vessel. * * *

2. * * * And it shall be the duty of the Board of Health to provide a suitable number of yellow flags, and whenever any vessel or vessels shall be ordered to the quarantine grounds for purification, the master of said vessel shall hoist one of said flags at the head of the mainmast, there to be kept during the daytime, so long as said vessels shall remain at quarantine.

5. * * * A quarantine shall be had of all vessels, their officers and crews, passengers and cargoes that come within the harbor of New Bedford, on board of which any person shall have died or been sick of any contagious or infectious disease during the passage to New Bedford, or which are foul or infected after their arrival, or which are from, or have brought their present cargo or any part thereof from any port or place where any infectious or contagious disease prevails, or recently has prevailed. * * *

6. The quarantine shall be had and performed at an anchorage ground south of the Eleven Foot bank, under the direction of the quarantine physician; and shall continue on every such vessel, until the master shall receive a certificate from the said physician, that he may be discharged. Provided, however, that in case of unreasonable delay by the quarantine physician to grant such certificate, the owner, agent, or consignee of such vessel, or any part of her cargo, may apply to the Board of Health, who may on being satisfied of the propriety of discharging such vessel from quarantine, issue such certificate.

7. The master of every vessel discharged from quarantine shall, within twenty-four hours after such discharge, deliver at the Board of Health office the certificate and flag he shall have received of the quarantine physician, and pay into the city treasury the sum of five dollars, for which he shall be entitled to a certificate from the City Clerk to authorize his entry at the customhouse.

8. During the time that such vessel is performing quarantine, no person, without a permit from the quarantine physician, shall go on board thereof, except those employed by or under the quarantine physician, and no person without a permit as aforesaid shall go within a line upon the land adjoining any public hospital, to be designated by the quarantine physician, except as aforesaid.

10. Any person offending against any of these regulations, from the first to the ninth, both inclusive, shall pay a sum not less than three, nor more than twenty dollars; and in addition he shall be liable to all the penalties provided by the laws of the commonwealth in relation to quarantine.

PORT OF FALL RIVER.

Extracts from a pamphlet edition of the Regulations of the Board of Health, 1899.

Reg. 55. All vessels arriving at this port from any port where Asiatic cholera, yellow fever, typhus fever, smallpox or any other contagious disease prevailed at the time of said vessel's sailing therefrom, or having on its arrival, or having had during its voyage any of said diseases on board, shall anchor southerly from the "Lighthouse on Borden Flats," and not less than two thousand feet westerly from the easterly shore of Mount Hope Bay, at quarantine, and remain there until examined by the City Physician, and pending such examination no person shall be permitted to visit or go on board such vessel, except under the direction of the Board of Health. Such vessels shall only be allowed to come up to the city after such examination, and upon the certificate of said physician that in his opinion the health of the city would not be endangered thereby. The penalty for any violation of this regulation shall be a fine of one hundred dollars.

RHODE ISLAND.

Extracts from the General Laws of the State of Rhode Island and Providence Plantations, 1896.

PILOTS AND PILOTAGE.

CHAPTER 117.

Sec. 3. Every pilot shall take charge of all registered vessels entering the ports or waters of the state, or going out of the same, except fishing vessels not whaling vessels, coastwise vessels, vessels sailing from one port to another within the state and not in completion of a voyage from a place out of the state and passenger steam vessels regulated by United States laws and carrying a United States pilot. Duties of pilots.

Sec. 4. Every vessel inward bound, other than those included in the exception in the preceding section, shall pay to the first pilot offering his services, the regular pilotage fee; but coastwise vessels not taking a pilot shall be exempt therefrom; provided, however, that no vessel shall be obliged to take a pilot or to pay pilotage if she is bound into the harbors of Newport, Bristol or Warren, unless a commissioned pilot shall offer his services before such vessel passes the line from point Judith to Brenton's Reef light-boat. Vessels liable to pilotage fee, when.

Sec. 5. Every pilot shall have a lien for his pilotage fees, for the space of sixty days, upon the hull and appurtenances of any vessel liable to him therefor. Pilotage fees a lien on vessels.

Sec. 6. Coastwise vessels shall not be required to take a pilot, but if they elect to take a pilot, the pilotage shall be the same as for registered vessels. Coastwise vessels may refuse pilots.

Sec. 9. The commissioners may from time to time make rules and regulations concerning pilots and pilotage and fixing the rates of pilotage, * * * Rules for pilots and pilotage.

Sec. 11. Vessels taking steam towage into or out of a port or harbor of the state by direction of the owner or master shall pay full pilotage; but whenever steam towage is taken by request of the pilot the vessel shall be liable to pay only seventy-five per centum of the rates of pilotage to which such vessel would otherwise be liable. Rates of pilotage for vessels taking steam towage.

Sec. 12. Whoever, not holding a commission as a pilot under the provisions of this chapter, except persons employed on board of the vessel for the voyage, exercises the duties of a pilot on board of any vessel within the waters of the state where a commissioned pilot offers his services or can be obtained at a reasonable time, shall be fined * * *, whether the vessel is liable to compulsory pilotage or not, * * *. Penalty for acting as pilot without being commissioned.

Extracts from pamphlet edition of Laws, By-laws, and Rates of Pilotage, 1892.

RATES OF PILOTAGE FIXED BY THE PILOT COMMISSIONERS.

The rates to all ports in Rhode Island except Newport and Dutch Island are as given in the following table:

Draft.	Rate per foot.	Total.	Draft.	Rate per foot.	Total.	Draft.	Rate per foot.	Total.
7½ feet and under	$1.25	$9.37	11½ feet	$1.75	$20.12	15½ feet	$2.75	$42.62
8 feet	1.50	12.00	12 feet	2.00	24.00	16 feet	3.00	48.00
8½ feet	1.50	12.75	12½ feet	2.00	25.00	16½ feet	3.00	49.50
9 feet	1.50	13.50	13 feet	2.25	29.25	17 feet	3.25	55.25
9½ feet	1.50	14.25	13½ feet	2.25	30.37	17½ feet	3.25	56.87
10 feet	1.75	17.50	14 feet	2.50	35.00	18 feet and over	3.50	63.00
10½ feet	1.75	18.37	14½ feet	2.50	36.25			
11 feet	1.75	19.25	15 feet	2.75	41.25			

The rates to Fall River, Mass., are the same as given above.

To Newport and Dutch Island the rates are as follows: 10 feet draft and under, $1 per foot; 10½ to 12 feet, $1.50 per foot; 12½ to 15 feet, $2 per foot; 15½ to 20 feet, $2.50 per foot; 20½ feet and over, $3 per foot.

The outward rates of pilotage for all ports in Rhode Island are the same as the inward rates.

HALF RATES.

If bound into Wickford and past the range of Fox Island and the Beacon, half the regular rates of pilotage.

If bound to East Greenwich or Apponaug (so called) and past the range of the Beacon and Warwick Neck Lighthouse, half of the regular rates of pilotage.

If bound to Providence and past the line of Warwick Neck Lighthouse and Popposquash Point, half of the regular rates of pilotage.

If bound into Mount Hope Bay and past Sandy Point Lighthouse, half of the regular rates.

WINTER RATES.

From November 1 to May 1, 50 cents per foot extra in addition to the foregoing rates.

No vessel bound to Providence shall be compelled to take a pilot unless spoken by a branch pilot below Nayatt Point; or if bound to East Greenwich or Apponaug, below Warwick Neck and the Spindle; or Mount Hope Bay, below the pyramid at Bristol Ferry.

Pilots shall not charge for less than 4 inches of water, but when a vessel draws 4 inches, then the pilot shall charge for the half foot.

Extracts from the General Laws of the State of Rhode Island and Providence Plantations, 1896.

PROTECTION TO NAVIGATION.

CHAPTER 118.

No cinders shall be thrown from steamboats in certain waters.

Sec. 4. No person shall throw * * * into the Waters of Providence river or Seekonk river or Narragansett bay north of a line drawn from Nayatt Point to Rocky Point any cinders or ashes from any steamboat. * * *

Dumping of mud, etc., in Providence river, Warren river, and portions of Narragansett bay forbidden.

Sec. 5. No person shall deposit any mud, earth, sand, gravel, ashes, cinders or other substances in the main channel of Providence river leading to the city of Providence, or in any part of the said river or of Warren river or of Narragansett bay lying east of the said main channel and north of a line drawn east and west across the said channel, and from the easterly line thereof to the eastern shore of the said bay, in the range of the lower buoy off Rumstick Point, or in the waters of Narragansett bay, within one mile of the shores of Bristol county or Hog Island; * * *

QUARANTINE.

CHAPTER 95.

Health offices in seaport towns; his duties and compensation.

Sec. 1. Each seaport town, or the town council thereof, may appoint a health officer.

To designate place of anchorage, define quarantine limits, etc.

Sec. 4. They shall designate the particular place in the harbor, bay or river, adjacent to such town, where all ships or vessels arriving, subject to examination or quarantine, shall come to anchor, and shall define the limits of such quarantine ground, and assign the time for which such ships or vessels shall be detained, and where and how unladen.

Penalty for neglect to anchor.

Sec. 6. Every commander of a ship or vessel who shall * * * refuse or neglect to bring his ship or vessel to anchor within the limits as above described, shall be fined not exceeding five hundred dollars nor less than twenty dollars, to the use of the town.

Penalty for leaving quarantined vessel.

Sec. 8. Every person who shall leave any ship or vessel under order of quarantine, without permission from the health officer or the town council of such town, shall be fined not exceeding twenty dollars; * * *

Of vessels bound to Providence.

Sec. 9. If any vessel shall arrive in the waters of the state, bound to the port of Providence, at any time while the quarantine regulations of the city of Providence are in force, no person on board such vessel shall leave the same until such vessel shall have been visited and examined by the health officer * * *

CHAPTER 94.

Infected vessel not to anchor, where, without license from town council.

Sec. 1. Every commander of any vessel which shall come into any port or harbor of the state, and shall have any person on board sick of the smallpox or any other contagious or infectious distemper, or which has had any person

sick of such distemper during the passage to such port or harbor, or shall come from any port or place usually infected with the smallpox, or where any other contagious or infectious distemper is prevalent, who shall bring such vessel to anchor in any of the ports or harbors of the state within the distance of one mile from any public ferry, pier or landing place, or permit or suffer any person on board such vessel to be landed, or any person to come on board such vessel, without a license first had and obtained from the town council of the town where such vessel shall arrive, shall be fined four hundred dollars.

Penalty.

Sec. 2. Such commander, on his arrival in any of the waters of the state, shall forthwith hoist and keep his colors in the shrouds of such vessel, as a signal that he has come from some such infected place or has infection or contagion on board.

Signals to be kept in shrouds.

Sec. 3. If any person shall come on shore from on board such vessel, without license first had and obtained as aforesaid, the town council may send back such offender immediately on board such vessel, or confine him on shore in such convenient place as to them shall appear most effectual to prevent the spreading of any infection; and the person so offending shall satisfy and pay all charges that shall arise thereon, and shall also be fined forty dollars.

Penalty for leaving such vessel without license.

Sec. 32. The health officer of the city of Newport shall * * * have authority * * * in all matters arising under this chapter in relation to any vessel coming within Dutch Island harbor or within the waters of the East (Sakonnet) river below the bridges between Portsmouth and Tiverton.

Powers of the health officer of Newport.

NEWPORT, R. I.

HARBOR REGULATIONS.

Extracts are from the City Ordinances, 1902.

CHAPTER 17.

Sec. 1. All vessels entering the harbor shall be anchored, by the master or commander thereof, according to the directions of the harbor master.

Vessels entering harbor to be anchored under directions of harbor master.

Sec. 2. All vessels lying in the harbor, not anchored according to the directions of the harbor master, and not having sufficient crew to move them, shall be moved by the harbor master, * * *

Of vessels not so anchored.

Sec. 3. The harbor master shall have authority to remove * * * such vessels as are not employed in receiving or discharging their cargoes, * * * he being sole judge as to the fact of their being fairly or properly employed in receiving or discharging their cargoes; and he also, for any purpose in his discretion, may move or order or cause to be moved any vessel lying anywhere in the harbor, whether at a wharf or elsewhere, * * *

Powers of harbor master.

CHAPTER 39.

Sec. 1. It shall be the duty of the captain or engineer of every ship or boat which is propelled by steam, to cause the speed of his said ship or boat while passing through the inner harbor of said city, between the lighthouse on Goat Island Breakwater and the south end of Goat Island, to be regulated to not exceeding the rate of five miles an hour.

Speed of steamboats in inner harbor not to exceed 5 miles per hour.

QUARANTINE.

CHAPTER 18.

Sec. 1. A quarantine shall be had of all vessels, their officers, crews, passengers, and cargoes that come within the harbor of Newport, which are from any port or place whatever, where any infectious, contagious or malignant disease prevails, or recently has prevailed, or which are foul or infected after their arrival; no vessel coming from any infected district, or on board which, during her voyage, any person may have died of any infectious disease, or whose cargoes or any part thereof has recently been brought from any such port or place, shall be unladen of any article which may be deemed by the health officer capable of generating or communicating disease, until written permission therefor can be obtained from the mayor, * * *

What vessels, etc., subject to quarantine.

The quarantine ground.

Sec. 2. The quarantine ground of the City of Newport shall comprise those portions of the harbor of Newport which lie to the northward of the lighthouse on the breakwater of Goat Island and to the southward of Coasters' Harbor Island, and west of a straight line drawn from said lighthouse to the western part of said Coasters' Harbor Island. * * *

Quarantined vessels to wear colors in shrouds.

All vessels that may be ordered into quarantine shall during the time they remain in quarantine, wear a color in their shrouds in such manner as to be seen at a safe distance.

No one to visit quarantined vessels, except, etc.

Sec. 3. During the time any vessel is performing quarantine, no person shall go on board thereof. * * *

Duties of sentinel of quarantine.

Sec. 4. It shall be the duty of the sentinel to board every vessel arriving at this port between the 30th day of June and the 1st day of November of any year, and examine their condition, and if such vessel is liable to quarantine, to order said vessel to the quarantine ground and deliver the captain or commanding officer a copy of these regulations, * * *

Of vessels coming from other quarantine ports.

Sec. 9. All vessels arriving at this port, after having discharged their cargoes in any other port of the United States, agreeably to the quarantine regulations of such port, shall anchor on the quarantine ground, and be visited and examined by the said health officer, and be subject to the provisions of the first section of this chapter, the same as if said vessel came direct to this port.

Powers of inquiry of health officer.

Sec. 12. The said health officer shall have authority to put such interrogatories and inquiries to the captain or commanding officer, or any other person on board of any vessel arriving at this port and subject to quarantine, as he shall deem proper, * * *

PROVIDENCE, R. I.

HARBOR REGULATIONS.

Extracts from a pamphlet edition of the Revised City Ordinances, 1899.

Sec. 1. The harbor master shall have full power and authority to prescribe regulations and give directions regarding the anchorage station, management and control of all vessels within the harbor of Providence.

Sec. 2. Every vessel entering said harbor shall be anchored by the master or person in command thereof, according to the directions of the harbor master.

Sec. 3. All vessels not anchored according to the directions of the harbor master shall be forthwith moved by their crews under his direction; and if any such vessel have not sufficient crew to move the same, such vessel shall be moved by the harbor master. * * *

Sec. 4. No warp or line shall be passed across the channel so as to obstruct vessels passing along the same.

Sec. 5. Vessels shall not in any case be placed alongside of any wharf in said harbor more than three deep, without permission of the harbor master.

Sec. 6. The master, owners or persons in charge of any square-rigged vessel shall, as soon as may be after such vessel is made fast to any wharf or other vessel, cause the lower yards to be cockbilled, and the topsail yards to be braced fore and aft; and the jib-boom of any vessel shall be rigged in whenever so directed by the harbor master.

Sec. 7. The harbor master may remove * * * any vessel not employed in receiving or discharging cargo, * * * and shall be the sole judge of the fact of any vessel's being fairly and legitimately engaged in the receiving or discharging of cargo. He may also determine the extent, time, and manner of accommodation respecting the stations of vessels, which should be extended by the owners or masters thereof to each other, and to require such accommodation to be extended.

Sec. 8. The master * * * of every vessel intending to unload lumber in the stream shall first obtain from the harbor master a permit designating the locality where such lumber may be rafted; but no vessel shall obstruct the channel in so doing.

Sec. 9. Every vessel drawing more than twenty feet of water, and approaching the harbor at any other than high tide, shall anchor below "The Crook" (so-called) until the tide shall warrant a free passage.

Sec. 10. No steamboat shall proceed at a greater speed than five miles an hour between Sassafras Point and Crawford Street bridge, in entering or leaving or moving within the harbor.

QUARANTINE.

Extracts from the rules adopted by the Board of Aldermen, and in force 1902.

Rule 28. The quarantine ground of the port of Providence shall be that portion of the harbor lying eastward of the main channel of Providence River, extending from Field's point to Sassafras point.

Rule 29. Every vessel bound for the harbor of Providence that shall have on board, or that shall have had on board during the passage, any person sick with fever of any description, with cholera, smallpox or other contagious or infectious disease, and every vessel that shall be subject to quarantine under any order or rule that may be established from time to time by the board of aldermen, shall anchor at the quarantine ground and be subject to examination and quarantine, although such vessel may have called at, or discharged its cargo at, any other port in the United States; and the person in command of such vessel shall place in the main shrouds thereof a flag as a signal, and such vessel shall remain at anchor at said ground with the flag in the shrouds, until written permission shall have been given for such vessel to leave by the health officer.

Rule 30. The health officer may demand such information, and ask such questions as he shall deem necessary or proper, of the captain or commanding officer, or other person on board of any vessel arriving at this port and subject to quarantine, respecting the condition of such vessel, and the health of the persons on board the same; * * *

Rule 31. If any vessel in the harbor of the city, whether subject to quarantine or not, shall have any sickness on board, or if such vessel or the cargo thereof is in a condition dangerous to the public health, in the opinion of the health officer, said health officer may subject such vessel to the regulations of quarantine, so far as in his opinion may be necessary to prevent all such danger.

Rule 32. No provisions, spirituous liquors or other articles shall be permitted to be brought on board any vessel at quarantine, without the written permission of the health officer.

Rule 33. No portion of the cargo, personal baggage, clothing or other goods shall be delivered from on board any vessel at quarantine, except in such manner and at such places as the health officer shall in writing direct.

Rule 34. No person in any boat or vessel shall go alongside of any vessel at quarantine, nor be at anchor or remain within one hundred yards of such vessel at quarantine, without written permission from the health officer.

Rule 35. Every vessel at quarantine shall be stationed at such place as the health officer shall direct.

Rule 40. The superintendent of health shall receive the sum of three dollars for each visit made by him to any vessel subject to quarantine, together with his necessary expenses in making such visit, to be paid by the owners, agents or commanders of the vessels visited by him.

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APPENDIX III.

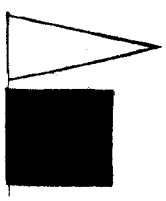
STORM WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

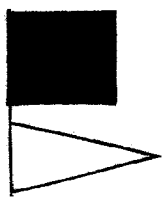
A red flag with a black center indicates that the storm is expected to be of marked violence.

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.

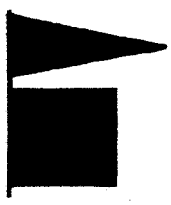
STORM WARNING FLAGS.



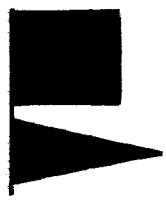
Northwesterly winds.



Southwesterly winds.

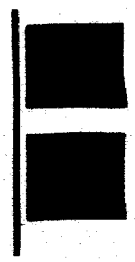


Northeasterly winds.



Southeasterly winds.

By night a red light will indicate easterly winds and a white light above 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 NOVEMBER 21, 1902.

(*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 $1 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 officer 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 be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

U. S. Rev. Stat., 4803.

421. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman 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.

Money not to be paid to seamen for expenses of sickness.

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.

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 vessel 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 intended 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.

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.

Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

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.

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.

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. Permits for hospital relief.

STATIONS OF THE FOURTH CLASS.

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 for hospital relief.

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 or 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.*)

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.

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.

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, May 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.

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, Atlantic Coast.

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, AND SCOPE.

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 light, 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. [*Article 9, act of August 19, 1890, was repealed by act of May 28, 1894, and article 10, act of March 3, 1885, was reenacted in part by act of August 13, 1894, and is reproduced here in part as article 9. It will be the object of further consideration by the maritime powers:*]

Fishing-vessels of less than twenty tons net registered tonnage, 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 the 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.

The following portion of this article applies only to fishing-vessels and boats when in the sea off the coast of Europe lying north of Cape Finisterre:

(*a*) All fishing-vessels and fishing-boats of twenty tons net registered tonnage 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.

(*b*) All vessels when engaged in fishing with drift nets shall exhibit two white lights from any part of the vessel where they can be best seen. Such lights shall be placed so that the vertical distance between them shall be not less than six feet and not more than ten feet, and so that the horizontal distance between them, measured in a line with the keel of the vessel, shall be not less than five feet and not more than ten feet. The lower of these two lights shall be the more forward, and both of them shall be of such a character and contained in lanterns of such construction as to show all around the horizon, on a dark night, with a clear atmosphere, for a distance of not less than three miles.

(*c*) All vessels when trawling, dredging, or fishing with any kind of drag-nets 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, on a dark night, with a clear atmosphere, the white light to a distance of not less than three miles and the red light of not less than two miles.

(*d*) A vessel employed in line-fishing, with her lines out, shall carry the same lights as a vessel when engaged in fishing with drift nets.

(*e*) If a vessel, when fishing with a trawl, dredge, or any kind of drag-net, becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light and make the fog signal for a vessel at anchor.

(*f*) Fishing-vessels may at any time use a flare-up in addition to the lights which they are by this article required to carry and show. All flare-up lights exhibited by a vessel when trawling, dredging, or fishing with any kind of drag-net shall be shown at the after-part of the vessel, excepting that if the vessel is hanging by the stern to her trawl, dredge, or drag-net they shall be exhibited from the bow.

(*g*) Every fishing-vessel when at anchor between sunset and sunrise shall exhibit a white light, visible all around the horizon at a distance of at least one mile.

(*h*) In a fog a drift-net vessel attached to her nets, and a vessel when trawling, dredging, or fishing with any kind of drag-net, and a vessel employed in line-fishing with her lines out, shall, at intervals of not more than two minutes, make a blast with her fog horn and ring her bell alternately.

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 light 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 IN FOG, ETC.

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 tnis 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, ETC.

(*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 invoke 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 close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled 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 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 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 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 fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS 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. 229.]

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 AND SCOPE.

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:

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.

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 sea-going 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 sea-going vessels and ferry-boats) 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 head-light 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 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.

LIGHTS FOR ROWING BOATS.

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 drag-nets 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 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.

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 authorized 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 IN FOG, ETC.

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.

**Resolved*, That all coal boats, trading-boats, produce boats, canal boats, oyster boats, fishing boats, and other water craft navigating any bay, harbor, or river, propelled by hand power, horse power, sail, or by the current of the river, or which shall be moored in or near the channel or fairway of any bay, harbor, or river, shall carry one bright white light forward, not less than 6 feet above the rail or deck.

Rafts of one crib and not more than two in length shall carry one bright white light on a pole not less than twelve feet high; three or more cribs in length, shall carry one white light at each end of the raft at the same height. Boom rafts with cross binders towed ahead of steamers on the Mississippi and Ohio rivers, and other waters flowing into the Gulf of Mexico, and on the Red River of the North, shall carry a white light *twelve feet high* at the forward end of the raft, and one such light at each side midway between the forward and after end.

Rafts of more than one crib abreast shall carry one white light on each outside corner of the raft, making four lights in all. Bag or boom rafts navigating or anchored in the fairway of any bay, harbor, or river shall carry a white light at least twelve feet high at each end of the raft, and one of such lights on each side midway between the forward and after end.

Rowboats shall carry one white light two feet above the stem.

JAS. A. DUMONT,
Supervising Inspector General,
President Board of Supervising Inspectors.

Approved, February 16, 1891.

A. B. NETTLETON,
Acting Secretary.

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, ETC.

(*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 closed-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled 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 further 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 rain-storms, when vessels can not so see each other, fog-signals only must be given.

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.

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 fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS 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 VESSELS IN SIGHT OF ONE ANOTHER.

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.

ART. 30. [See page 236.]

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.

ADDITIONAL RULES.

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 ferry-boats 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 ferry-boats and steam-vessels, which rules shall be kept posted up in conspicuous places in such vessels.

PENALTY.

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.

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