TREASURY DEPARTMENT
UNITED STATES COAST AND GEODETIC SURVEY
O. H. TITTMANN
SUPERINTENDENT

UNITED STATES COAST PILOT

ATLANTIC COAST

PART VIII

Gulf of Mexico, from Key West to the Rio Grande

SECOND EDITION

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2nd ed.
(1901)

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TREASURY DEPARTMENT.

UNITED STATES COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *April 15, 1901.*

This volume covers the coast from Key West to the Rio Grande, 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 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. Glennie Tarbox, U. S. N., and Mr. John Ross. In the present (second) edition the text has been revised and brought up to date by Mr. John Ross, under the general 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 April 15, 1901.

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

O. H. TITTMANN,
Superintendent.

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NOTE.

All bearings and courses are *magnetic*.
All distances are in *nautical miles*, except where otherwise stated.
Except where otherwise stated, all depths are at *mean low water*.

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 United States 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.

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

◊ 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.

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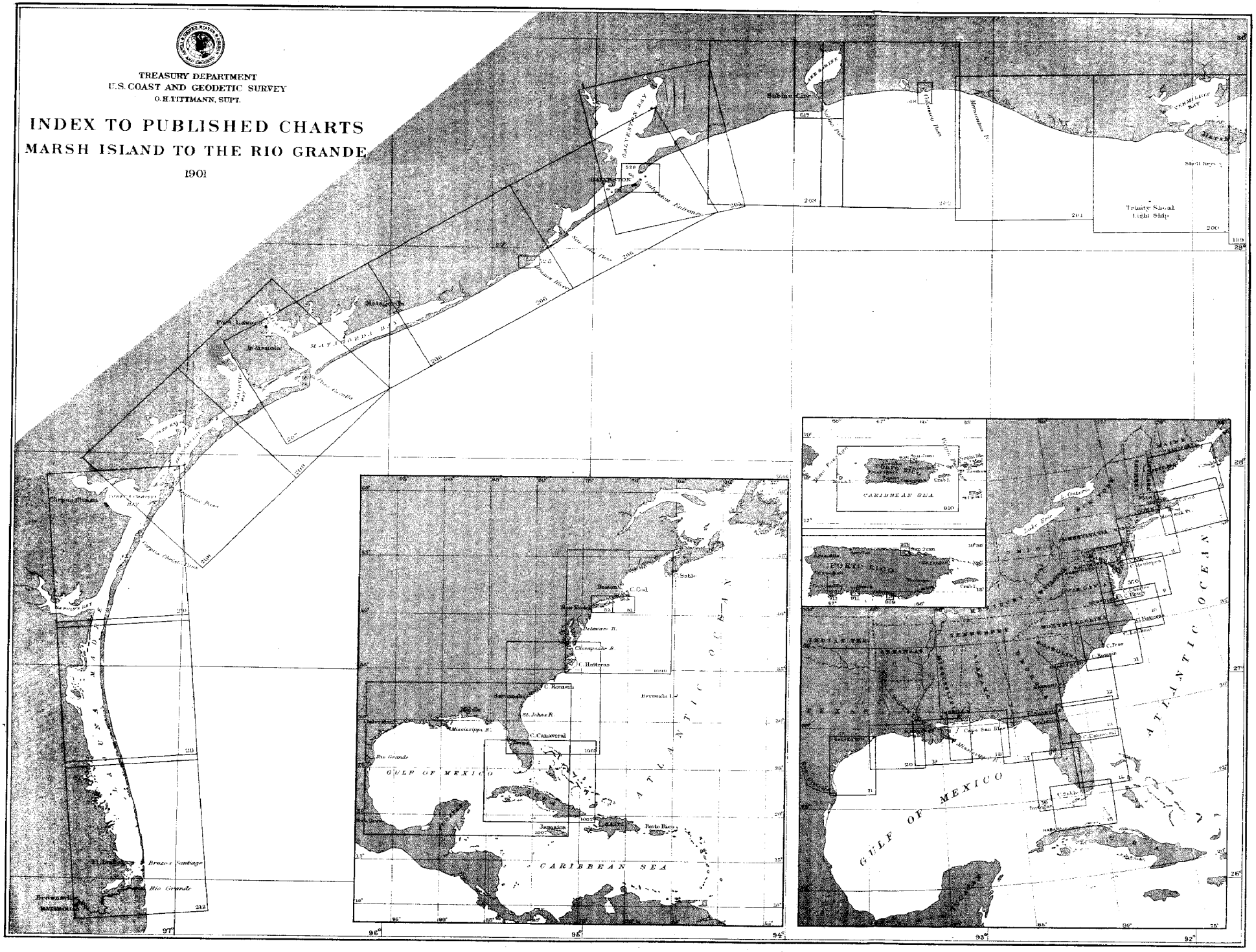

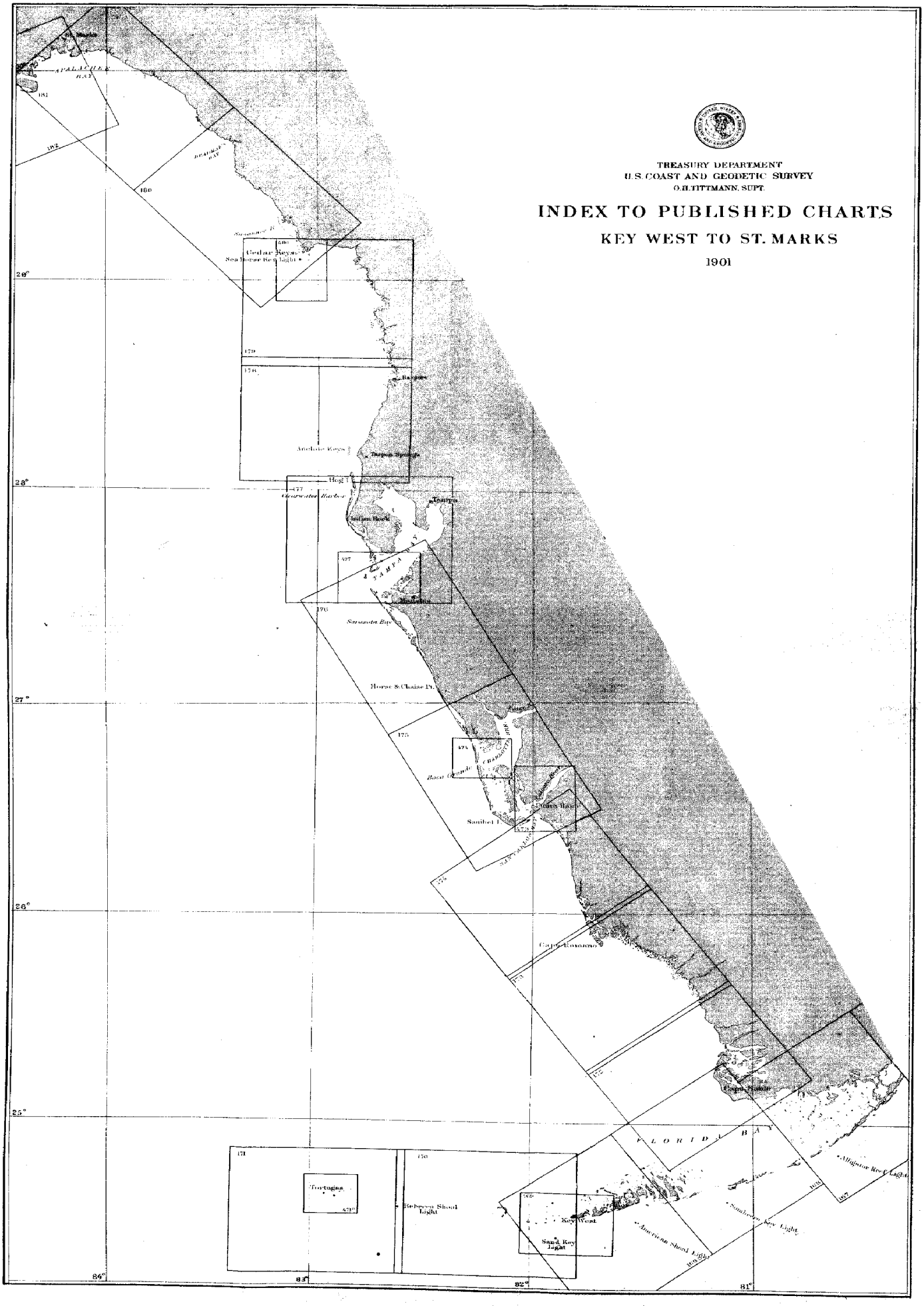
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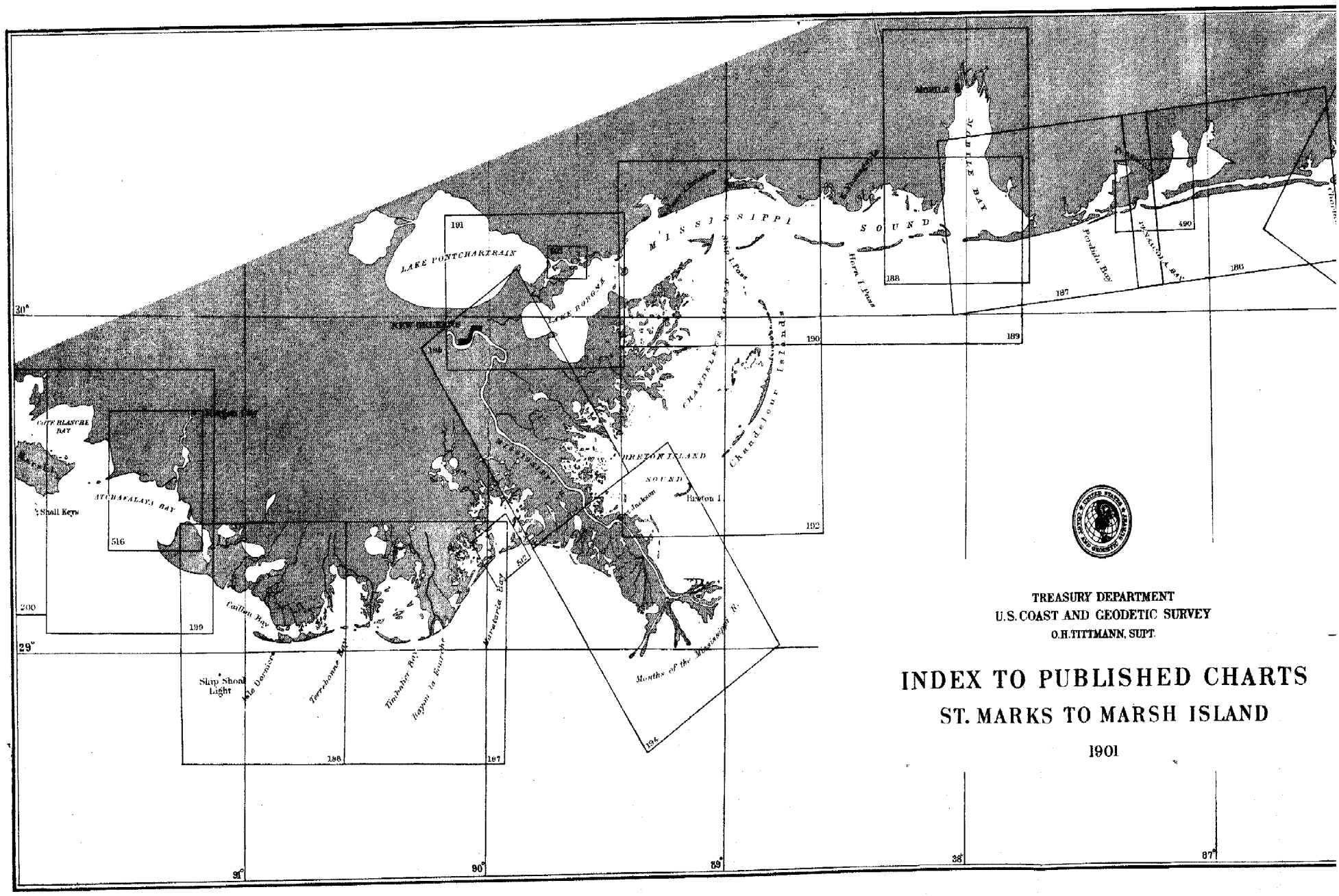
Indian Rock
TAMPA BAY
Sarasota Bay
Horse & Chaise Pt.
Boca Grande
Sanibel I.
Cape Romano
Cape Sable
FLORIDA BAY
Alligator Reef Light
Sombrero Key Light
American Shoal Light
Tortugas
Rebecca Shoal Light
Key West
Sand Key Light
28°
27°
26°
25°
84°
83°
82°
81°



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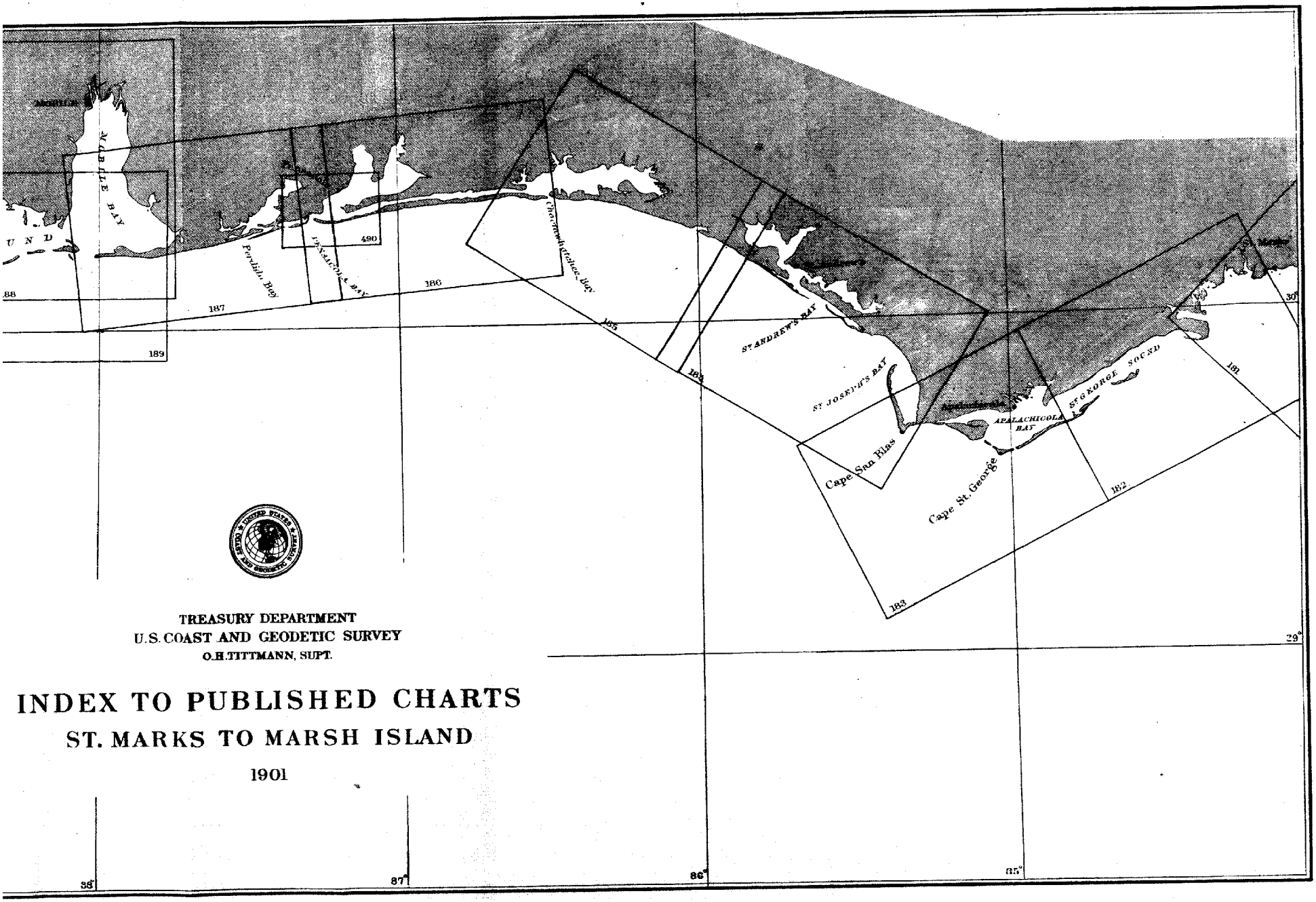

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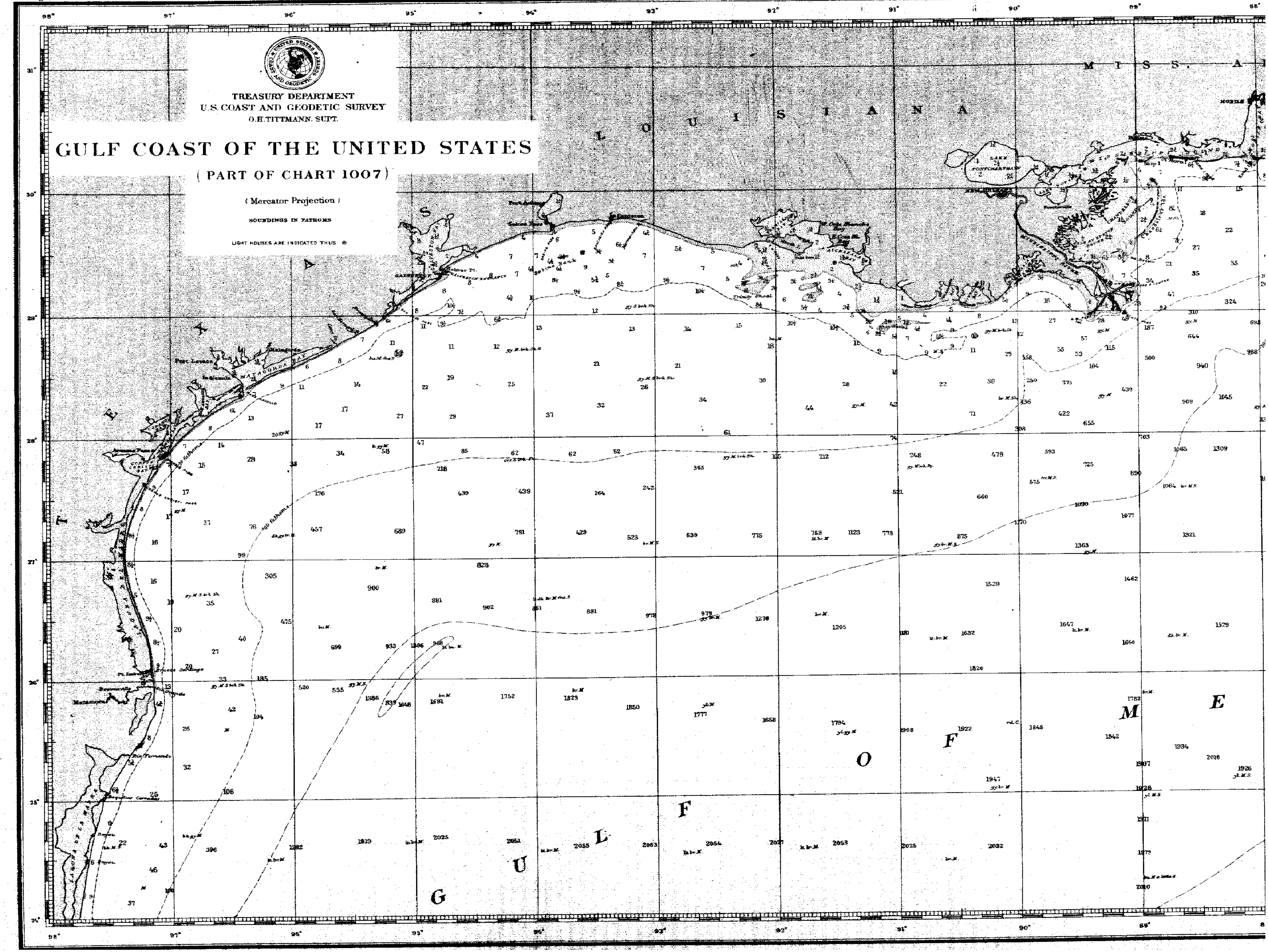

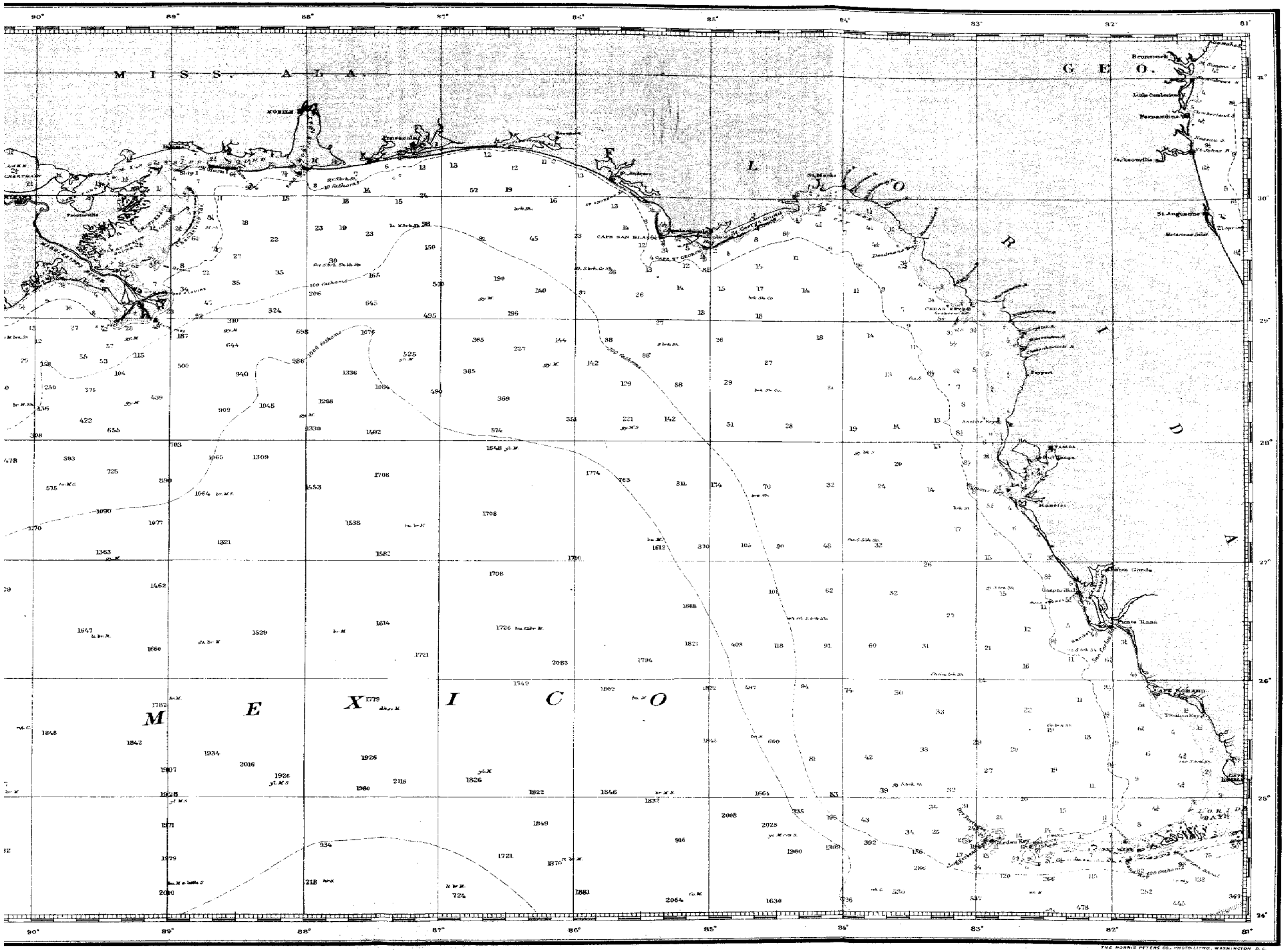
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Pascagoula
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Chandeleur Sd.
Lake Borgne
Lake Pontchartrain
Lake Maurepas
Pass Christian
Bay St. Louis
Lake Ponchartrain
Lake Borgne
Lake Maurepas
Pass Christian
Bay St. Louis
Lake Pont

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART VIII.

GULF OF MEXICO, FROM KEY WEST TO THE RIO GRANDE.*

GENERAL REMARKS.

This volume, Part VIII, of the "United States Coast Pilot, Atlantic Coast," covers the coast of the United States bordering on the Gulf of Mexico between Key West, Fla., and the Rio Grande. That portion of the coast of the United States between Chesapeake Bay entrance and Key West is covered by "United States Coast Pilot, Atlantic Coast, Part VII."

Within the limits covered by this volume (Part VIII), the coast, which has an approximate length of 1,500 miles, is low and generally sandy, and presents no marked natural features to the mariner approaching it from seaward. The principal points and harbor entrances are marked by lighthouses and these are the chief guides for approaching or standing along the coast. The harbors are all obstructed by bars at their entrances, which, in a heavy sea, prevent the deeper draft vessels from entering.

The principal harbors are Dry Tortugas, Charlotte Harbor, Tampa Bay, Apalachicola (East and West Pass), St. Josephs Bay, Pensacola, Mobile, Pascagoula, Ship Island, South Pass (New Orleans), Sabine Pass and Port Arthur, Galveston, and Brazos River. These, with the harbors and anchorages of lesser importance, are described under their respective headings.

Pilots.—For all the principal harbors and many of those of lesser importance pilots are appointed by the State and local authorities. Pilots will usually be found cruising off the entrances or just outside the bars of the harbors, or, they will come out to a vessel making signal for one. Pilot laws and rates for pilotage are given in Appendix I.

Towboats.—At nearly all of the principal harbors towboats can be had outside of the bar by making signal (see "Towboats" under the headings of the different harbors).

Quarantine.—There are National Quarantine stations at Key West and at Ship Island. All the ports have local quarantine stations which are controlled by the State and local boards of health (see quarantine laws, Appendix I, and National Quarantines, Apprendix IV).

U. S. Marine Hospital Service regulations are given in Appendix IV. See also the "General remarks for approaching and sailing along the coast of the United States in the Gulf of Mexico" in another part of this volume.

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*Shown on the following Coast and Geodetic Survey charts, **1007**, Sailing Chart, Mercator projection, Deg. Lat.=2.0 inches, price, $0.50; **16, 17, 18, 19, 20, 21**, General Charts of the coast, scale $\frac{1}{400,000}$, price of each $0.50; **167** to **212**, both inclusive, 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 and 8. Facing page 8 are index maps 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.

19555——2

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the **Seventh and Eighth Lighthouse Districts** of the United States. These districts extend from Jupiter Inlet, Florida, including the inland waterways (except the Mississippi River and its tributaries above New Orleans) and coast to the Rio Grande, Texas. The Light list for the seacoasts of the United States and the Buoy list for the Seventh and Eighth Districts give full descriptions of the aids to navigation.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
1	SAND KEY	24 27 10 81 52 40	Fixed white for 1 minute, varied in next minute by a white flash of 10 seconds' duration, preceded and followed by partial eclipses of 25 seconds from S. by W. 3/8 W. to SW. 1/4 W.; from W. 3/4 S. through southward to ENE. 1/4 E.; from E. 7/8 N. to SE. by E. 7/8 E., and from SE. 5/4 E. to S. 1/2 W.; fixed red for 1 minute, varied in the next minute by a red flash of 10 seconds' duration, preceded and followed by partial eclipses of 25 seconds throughout the intervening sectors.	1	109	16¼
2	Key West Harbor. — Key West	24 32 58 81 48 04	Fixed white, from N. 1/4 W. through southwestward to NE. 5/8 E.; from NE. by E. 1/8 E. through westward to SE. 3/8 E., and from SE. 1/8 S. through the northward and eastward to NW. 1/4 N., fixed red throughout the intervening sectors.	3	90½	15¼
3	Key West Harbor. — Main Ship Channel Range. — Key West (front)		Fixed red	Post lantern.	16½	
4	Key West Harbor. — Main Ship Channel Range. — Key West (rear)		Fixed red	Post lantern.	35½	
5	Key West Harbor. — Northwest Channel. — Middle Ground Beacon					
6	Key West Harbor. — Northwest Channel. — Northwest Passage	24 37 (04) 81 53 (58)	Fixed white, from S. by W. 3/8 W. through northeastward to NW. 3/4 W., and from NNW. 1/8 W. through southward and westward to S. by W.; fixed red throughout the intervening sectors.	4	47	12¼
7	Key West Harbor. — Northwest Channel. — Northwest Bar Beacon					
8	Rebecca Shoal	24 35 (03) 82 35 (07)	Flashing alternately red and white, excepting from WSW. 1/4 W. southward to NW. by W. 1/2 W. in which sector every flash is red; interval between flashes, 5 seconds.	4	66	13¾
9	DRY TORTUGAS	24 38 04 82 55 42	Fixed white, with a fixed red sector from NE. by N. northward to ENE. 1/2 E.	1	151½	18¼
10	Tortugas Harbor	24 37 (46) 82 52 (50)	Fixed white from SW. to SW. 3/4 W.; from W. 1/2 N. through southward to NE. by E. 1/4 E; and from E. 3/4 N. through northwestward to S.; fixed red throughout the intervening sectors.	4	67	13¾
11	SANIBEL ISLAND	26 27 11 82 00 43	Fixed white, varied by a white flash every 2 minutes.	3	98	15¾
12	Charlotte Harbor. — Range. — Gasparilla Island (front)	26 43 (01) 82 15 (41)	Fixed white	Post lantern.	20	
13	Charlotte Harbor. — Range. — Gasparilla Island (rear)	26 43 (06) 82 15 (34)	Fixed white, varied by a red flash every 20 seconds.	3½	41	11¾
14	Charlotte Harbor. — Charlotte Harbor	26 45 (35) 82 06 (29)	Fixed white	5	36	8½
15	Charlotte Harbor. — Mangrove Point Beacon	26 53 (56) 82 07 (18)	Fixed white	Post lantern.	29½	
16	Charlotte Harbor. — Peace Creek Beacon	26 55 (50) 82 06 (10)	Fixed red	Post lantern.	29½	
17	Egmont Key	27 36 04 82 45 40	Fixed white, with a narrow fixed red sector between N. 23° 00′ E. (NNE. 1/8 E.) and N. 27° 15′ E. (NNE. 7/8 E.) and another narrow fixed red sector between S. 86° 15′ E. (E. 1/8 S.) and S. 82° 45′ E. (E. 5/8 S.).	3	84¾	14¾

KEY WEST TO THE RIO GRANDE.

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 Lighthouse Board, Washington, D. C., or to the Inspector of the Seventh Lighthouse District, Custom-House, Key West, Fla., and Inspector of the Eighth Lighthouse District, New Orleans, La. They can also be had on application at the United States Branch Hydrographic Office at New Orleans, La.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Brown pyramidal framework, on pile foundation, inclosing square dwelling and stair cylinder; lantern, black.		
2	White tower and black lantern; detached white dwelling, with green blinds	80	
3	Lantern on a white pyramidal framework		
4	Lantern on a square, pyramidal structure covered with slats, painted black with a central, vertical white stripe on the channel face, on ridge of buoy shed.		
5	*To be established*		
6	White dwelling surmounted by a black lantern, on a brown screw-pile foundation		
7	*To be established*		
8	Square one-and-one-half-story dwelling, surmounted by lantern, on iron pile foundation. Foundation, brown; dwelling, white, with green blinds; lantern, black.		
9	Conical tower; lower half, white; upper half, lantern, and dome, black. Oil room near tower; dwelling a short distance to southward; both of yellow brick.	143	
10	Brown, hexagonal, pyramidal tower; lantern, black	25	
11	Brown, square, pyramidal, skeleton iron tower with stair cylinder and lantern. Two white dwellings near tower.	96	
12	Square, black, pyramidal, skeleton structure		
13	White, one-story frame dwelling, with green blinds and shingled roof, surmounted by a black lantern; brown pile foundation. A similar structure, without the lantern, stands about 70 feet NE. by E.		
14	Square, white, one-and-one-half-story structure, with green blinds and red roof, surmounted by a black lantern and resting on brown screw-pile foundation.		
15	Square, black, pyramidal skeleton structure, covered with horizontal slats, on 4 piles.		
16	Square, red, pyramidal skeleton structure, covered with horizontal slats, on 4 piles		
17	White tower; lantern, black; two white dwellings, detached; green blinds. Weather signal flagstaff 230 feet NE. ¼ N. from light-tower, on northeasterly end of buoy shed.	81	Anderson fog horn sounded in anwer to signals from passing vessels.

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
			° ′ ″				
18	Tampa Bay.	Mullet Key Shoal	27 37 (46) 82 40 (53)	Fixed white	Lens lantern.	38	———
19	Tampa Bay.	Point Pinelos Beacon	27 42 (46) 82 36 (27)	Fixed white	Lens lantern.	31	———
20	Tampa Bay.	Indian Hill	27 41 (45) 82 32 (39)	Fixed red	Lens lantern.	38	———
21	Tampa Bay.	South Cut (Lower)	27 47 (38) 82 34 (22)	Fixed red	Lens lantern.	31	———
22	Tampa Bay.	South Cut (Upper)	27 48 (38) 82 34 (23)	Fixed white	Lens lantern.	50	———
23	Tampa Bay.	North Cut (Lower)	27 49 (57) 82 33 (58)	Fixed red	Lens lantern.	33	———
24	Tampa Bay.	Long Shoal	27 52 (45) 82 27 (24)	Fixed white	Lens lantern.	35	———
25	Tampa Bay.	Middle Ground	27 54 (27) 82 28 (19)	Fixed red	Lens lantern.	35	———
26	Tampa Bay.	Barrel Stake	27 55 (16) 82 28 (22)	Fixed white	Lens lantern.	34	———
27	Tampa Bay.	Snead Point Shoal Beacon	27 32 (10) 82 39 (55)	Fixed white	Lens lantern.	29½	———
28	Tampa Bay.	Manatee River Cut Beacon	27 31 (48) 82 39 (17)	Fixed red	Lens lantern.	30½	———
29	Tampa Bay.	Terraceia Bay Beacon Light No. 1	———	Fixed white	Lens lantern.	20	———
30	Tampa Bay.	Bird Key Beacon Light No. 9	———	Fixed white	Lens lantern.	24½	———
31		Anclote Keys	28 10 (02) 82 50 (44)	Flashing red every 30 seconds	3	101	15¾
32		Cedar Keys	29 05 49 83 03 58	Fixed white, varied by a white flash every minute.	4	74½	14¼
33		Turning Point Beacon	29 06 (13) 83 03 (26)	Fixed red	Post lantern.	31	———
34		St. Marks	30 04 28 84 10 50	Fixed white	4	82	14¾
35	St. George Sound. Range.	Carrabelle River Bar (front) Beacon	29 50 (20) 84 39 (53)	Fixed red	Post lantern.	18½	———
36	St. George Sound. Range.	Carrabelle River Bar (rear) Beacon	29 50 (38) 84 40 (09)	Fixed white	Post lantern.	32	———
37	St. George Sound. Range.	Crooked River (front)	———	Fixed white	Lens lantern.	48	———
38	St. George Sound. Range.	Crooked River (rear)	29 49 (42) 84 42 (05)	Flashing white; group of 2 flashes every 10 seconds; interval between flashes in group, 2½ seconds.	4	115	16½
39	St. George Sound.	Six-Foot Spot Beacon	29 43 (10) 84 48 (22)	Fixed white	Lens lantern.	29	———
40	St. George Sound.	Porter Bar Beacon	29 41 (53) 84 49 (18)	Fixed red	Lens lantern.	29	———
41	Apalachicola Bay. Range.	Bulkhead Cut (front) Beacon	29 42 (48) 84 54 (03)	Fixed red	Lens lantern.	30	———
42	Apalachicola Bay. Range.	Bulkhead Cut (rear) Beacon	29 42 (53) 84 54 (16)	Fixed white	Lens lantern.	45	———
43	Apalachicola Bay.	Outer Beacon	29 41 (51) 84 58 (32)	Fixed red	Lens lantern.	36	———
44	Apalachicola Bay. Range.	Apalachicola Bay (front)	29 43 (35) 84 58 (54)	Fixed red	Lens lantern.	20	———
45	Apalachicola Bay. Range.	Apalachicola Bay (rear)	29 44 (05) 84 58 (59)	Fixed white	Lens lantern.	35	———
46	Apalachicola Bay.	St. Vincent Bar Beacon	29 37 (20) 85 02 (21)	*To be lighted*	———	———	———
47		Cape St. George	29 35 18 85 02 52	Fixed white	3	72	14
48		Cape San Blas	29 40 (00) 85 21 (30)	Flashing alternately red and white; interval between flashes, 30 seconds.	3	98	15¾

KEY WEST TO THE RIO GRANDE—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
18	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure black.		
19	Square, black, pyramidal structure, covered with horizontal slats, on four piles		
20	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure red.		
21	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure red.		
22	Column, from which lantern is suspended, and a lamp house on a triangular platform on three iron-cased piles. Excepting lamp house, which is white, entire structure is brown.		
23	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure red.		
24	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure black.		
25	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure red.		
26	Column, from which lantern is suspended, on a triangular platform on three iron-cased piles; entire structure black.		
27	Square, black, pyramidal structure, covered with horizontal slats, on four piles		
28	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
29	Black triangular platform of piles, with post		
30	Black triangular platform of piles, with post		
31	Brown, skeleton tower and black lantern. Two white dwellings, with green blinds, in rear of tower.	96	
32	Lantern on white dwelling	18	
33	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
34	White tower and dwelling attached; balustrade, lantern, dome, and cowl, black	75	
35	Black, triangular, pyramidal structure, covered with horizontal slats, on three piles		
36	Black, triangular, pyramidal structure, covered with horizontal slats, on three piles		
37	Lantern suspended from top of a white iron column, with small white lamp house at its base.		
38	Square, dark red, pyramidal, skeleton, iron tower; lantern, black. Square, white, frame dwelling, with green blinds, to the northeastward and another to the westward of the tower. *Color of tower to be changed to white.*	96½	
39	Square, black, pyramidal structure, covered with horizontal slats, on four piles		
40	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
41	Square, black, pyramidal structure, covered with horizontal slats, on four piles		
42	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
43	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
44	Square platform, on four piles, with lantern house and post from which lantern is suspended; all black.		
45	Square, red, pyramidal structure, covered with horizontal slats, on four piles		
46	Black, square, pyramidal structure, upper part covered with latticework, on piles		
47	White tower; lantern, dome, and cowl, black; white dwelling. White dwelling 240 feet E. of the lighthouse.	68	
48	Square, pyramidal skeleton iron tower, with stair cylinder and lantern; all brown	90	

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
49	St. Joseph Point					
50	St. Andrews Bay. Range. St. Andrews Bar (front) Beacon	30 04 (14) 85 36 (36)	Fixed red	Lens lantern.	27	
51	St. Andrews Bar (rear) Beacon	30 04 (18) 85 36 (32)	Fixed white	Lens lantern.	45	
52	St. Andrews Bay. Range. St. Andrews Bay (front) Beacon	30 04 (50) 85 38 (18)	Fixed red	Lens lantern.	30	
53	St. Andrews Bay (rear) Beacon	30 05 (07) 85 38 (29)	Fixed white	Lens lantern.	42	
54	Range. Santa Rosa Sound (front) Beacon	30 24 (05) 86 35 (45)	Fixed red	Lens lantern.	36½	
55	Santa Rosa Sound (rear) Beacon	30 24 (05) 86 35 (55)	Fixed white	Lens lantern.	51½	
56	Deer Point Beacon		Fixed white	Lens lantern.	50½	
57	Pensacola Bay. Range. PENSACOLA	30 20 47 87 18 32	Flashing white every minute	1	190¾	20
58	Bar Beacon	30 20 (42) 87 18 (30)	Fixed white	6	55	11¼
59	Range. Caucus Cut (front) Beacon		Fixed red	Lens lantern.	36½	
60	Caucus Cut (rear) Beacon		Fixed white	Lens lantern.	52½	
61	Range. Fort McRee (front)	30 19 11 87 19 11	Fixed red	Post lantern.	36	
62	Fort McRee (rear)	30 19 14 87 19 18	Fixed white	Post lantern.	49	
63	Range. Fort Barrancas (front)	30 20 45 87 18 08	Fixed red	Post lantern.	36	
64	Fort Barrancas (rear)	30 20 49 87 18 07	Fixed white	Post lantern.	75	
65	Devils Point	30 29 29 87 08 28	Fixed red	Lens lantern.	30	
66	White Point	30 21 (00) 87 02 (41)	Fixed white	Lens lantern.	30	
67	Middle Beacon		Fixed red	Lens lantern.	44	
68	Escribano Point	30 31 (07) 87 01 (46)	Fixed white	Lens lantern.	30	
69	Range. SAND ISLAND (front)	30 11 19 88 03 02	Fixed white	2	131	17½
70	Sand Island Beacon (rear)		Fixed white	Refl'r	35	11
71	Mobile Point Beacon	30 13 37 88 01 29	Fixed white	Post lantern.	35	
72	MOBILE POINT	30 13 44 88 01 26	Fixed red	4	49	11¼
	The numerous lighted beacons along the dredged cut in Mobile Bay have been omitted on account of frequent and numerous changes.					
73	Horn Island Pass Beacon	30 13 (22) 88 29 (44)	Fixed red	Lens lantern.	30	
74	Horn Island	30 13 (13) 88 31 (45)	Fixed white, varied by a red flash every minute.	4	43	11¾
75	Mississippi Sound. Round Island	30 17 29 88 35 07	Fixed white	4	50	12½
76	Round Island Spit Beacon	30 19 (38) 88 38 (02)	Fixed red	Lens lantern.	30	
77	Range. Pascagoula River (front)	30 20 (39) 88 34 (06)	Fixed white	Post lantern.	22	
78	Pascagoula River (rear)	30 20 (47) 88 34 (13)	Fixed red	Post lantern.	40	
79	East Pascagoula River	30 21 01 88 34 06	Fixed white	5	36½	11¼
80	Ship Island	30 12 (53) 88 57 (56)	Fixedred	4	73	11¼

KEY WEST TO THE RIO GRANDE—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
49	*To be established*		
50	Brown mast		
51	Brown mast		
52	Red, triangular, pyramidal structure, covered with horizontal slats, on piles		
53	Black, triangular, pyramidal structure, covered with horizontal slats, on piles		
54	White, triangular, pyramidal structure, covered with horizontal slats		
55	Red, triangular, pyramidal structure, covered with horizontal slats		
56	Black, triangular, pyramidal structure, on three piles		
57	Conical brick tower, lower third, white; upper two-thirds and lantern, dome, and cowl, black.	160	
58	Front of beacon, white; sides, black	26¼	
59	Black, triangular, pyramidal structure, covered with horizontal slats; a white vertical stripe on channel face.		
60	Red, triangular, pyramidal structure, covered with horizontal slats		
61	Square, white, pyramidal framework	30	
62	Square, red, pyramidal framework		
63	Square, white, pyramidal framework	30	
64	Square, red, pyramidal framework	50	
65	Square, red, pyramidal framework		
66	Square, red, pyramidal framework		
67	Red, square, pyramidal structure on four piles		
68	Square, red, pyramidal framework		
69	Black, conical tower; white dwelling with green blinds, on brick foundation, 768 feet N. by W. ¾ W. from tower. Square pyramidal fog-bell tower about 470 feet N. by W. ¼ W. from the light tower. Rear light on the middle of the ridge of the roof of the keeper's dwelling.	125	Bell struck by machinery every 20 seconds.
70			
71	Square, red, pyramidal framework		
72	Pyramidal, brown skeleton tower, upper part inclosed. White dwelling outside of fort. Oil house in rear of dwelling.	30	
73	Red, square, pyramidal structure, upper part latticework, on piles		
74	Black lantern on square one-and-one-half story frame dwelling. Dwelling, white, with lead-colored trimmings and green blinds.	28	
75	Conical white tower; lantern, black; white dwelling near	45	
76	Brown, triangular, pyramidal structure, upper part latticework		
77	Black triangular, pyramidal framework		
78	Black triangular, pyramidal framework		
79	Lantern on white dwelling	35	
80	Black lantern on square, white pyramidal tower. One story white frame dwelling, with green blinds alongside.	50	

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
			° ′ ″				
81	Mississippi Sound. Range.	South Channel (front) Beacon	30 12 (47) 89 58 (05)	Fixed red	Post lantern.	28½	-------
82	Range.	South Channel (rear) Beacon	30 12 (54) 89 58 (05)	Fixed white	Post lantern.	40½	-------
83	Mississippi Sound.	Biloxi	30 23 44 88 54 04	Fixed white	5	60½	13
84	Mississippi Sound.	Beacon Light A	30 22 (42) 88 54 (08)	Fixed red	Lens lantern.	35	-------
85	Mississippi Sound.	Beacon Light B	30 23 (13) 88 54 (06)	Fixed red	Lens lantern.	35	-------
86	Mississippi Sound.	Beacon Light C	30 23 (21) 88 54 (05)	Fixed red	Lens lantern.	35	-------
87	Mississippi Sound.	Beacon Light D	30 23 (30) 88 53 (57)	Fixed red	Lens lantern.	35	-------
88	Mississippi Sound.	Cat Island	30 13 (56) 89 09 (41)	Fixed white, varied by a white flash every 90 seconds.	5	45½	12
89	Mississippi Sound.	Merrill Shell Bank	30 14 (17) 89 15 (28)	Fixed white	4	42	11¾
90		Lake Borgne	30 10 (35) 89 27 (33)	Fixed white	5	43½	11¾
91		Long Point Beacon	30 08 (51) 89 35 (26)	Fixed red	Lens lantern.	30	-------
92	Lake Pontchartrain.	West Rigolets	30 10 33 89 44 34	Fixed white	5	29	10
93	Lake Pontchartrain.	Pointe aux Herbes	30 09 20 89 51 12	Fixed red	5	37½	8½
94	Lake Pontchartrain.	Bayou Bonfuca Beacon	30 14 (51) 89 52 (11)	Fixed white	Lens lantern.	30	-------
95	Lake Pontchartrain.	Bayou Lacombe Beacon	30 15 (18) 89 57 (03)	Fixed white	Lens lantern.	-------	-------
96	Lake Pontchartrain.	Port Pontchartrain	30 01 59 90 03 43	Fixed white	5	47	11¾
97	Lake Pontchartrain.	Bayou St. John	30 01 56 90 04 57	Fixed red	6	33	7½
98	Lake Pontchartrain.	New Canal	30 01 41 90 06 47	Fixed white	5	47½	12¼
99	Lake Pontchartrain.	Chefuncte River	30 22 50 90 10 08	Fixed white	5	49	12¼
100	Lake Pontchartrain.	Pass Manchac	30 17 52 90 17 52	Fixed white	5	31	10¾
101		Amite River	30 17 53 90 33 28	Fixed white	Post lantern.	45	-------
102		Chandeleur	30 02 (58) 88 52 (19)	Fixed white	3	99	15¾
103	Passes of the Mississippi River.	PASS A LOUTRE	29 11 30 89 02 28	Fixed white, varied by a white flash every 45 seconds.	3	63	13½
104	Passes of the Mississippi River.	*South Pass Light-Vessel, No. 43*	28 59 (09) 89 06 (47)	Fixed white	Refl'r	40	11½
105	Passes of the Mississippi River.	South Pass East Jetty	28 59 (28) 89 08 (08)	Fixed red	5	52	8½
106	Passes of the Mississippi River.	South Pass West Jetty	-------	Fixed white	5	26	10¼
107	Passes of the Mississippi River. Range.	South Pass Beacon (front)	-------	Fixed white	Refl'r	17	-------
108	Passes of the Mississippi River. Range.	SOUTH PASS (rear)	29 09 (59) 89 10 (01)	Flashing white every 5 seconds	1	108	16¼
109	Passes of the Mississippi River.	SOUTHWEST PASS	28 58 22 89 23 30	Fixed white	1	123½	16
110	Passes of the Mississippi River.	Head of Passes	29 08 34 89 15 05	Fixed white	5	38	11½

KEY WEST TO THE RIO GRANDE—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
81	Brown, square, pyramidal structure, covered with horizontal slats		
82	Brown, square, pyramidal structure, covered with horizontal slats		
83	Conical white tower; dwelling near	48	
84	Red, triangular, pyramidal structure, covered with horizontal slats		
85	Red, triangular, pyramidal structure, covered with horizontal slats		
86	Red, triangular, pyramidal structure, covered with horizontal slats		
87	Red, triangular, pyramidal structure, covered with horizontal slats		
88	Square, white, screw-pile structure; piles and lantern, red	40	
89	Square, white, screw-pile structure with pyramidal roof; lantern, black	51	Bell struck by machinery every 20 seconds.
90	Square tower rising from roof of square, white dwelling on brown pile foundation; roof, brown; lantern, black.		Bell struck by machinery every 30 seconds.
91	Red, triangular, pyramidal structure, covered with latticework, on piles		
92	Black lantern on square, white dwelling, with pyramidal roof		
93	Black lantern on square, white dwelling, standing on five white piers	38	
94	Black, triangular, pyramidal structure, covered with latticework, on piles		
95	Black, triangular, pyramidal structure on piles		
96	Conical white tower; lantern, black; white dwelling, detached	36	
97	Lantern on a white cylindrical column, with small white building at base, supported on platform on piles.	28	
98	Square, white, two-story frame dwelling, surmounted by black lantern and resting on pile foundation. White, square, pyramidal fog-bell tower about 10 feet northerly of lighthouse.	28	Bell struck by machinery every 30 seconds.
99	Conical white tower; lantern, black; one-story white frame dwelling, with pyramidal roof, detached. White pyramidal fog-bell tower between tower and dwelling.	43	Bell struck by machinery every 30 seconds.
100	Cylindrical, white, brick tower attached to white brick dwelling. White, square, pyramidal fog-bell tower about 10 feet southerly of light tower.	30	Bell struck by machinery every 30 seconds.
101	One-story white frame dwelling, on four brown wooden piles; blinds, green. White, square, pyramidal fog-bell tower adjoining the lighthouse.		Bell struck by machinery every 30 seconds.
102	Square, pyramidal, skeleton, iron tower, brown below the gallery and black above. Two square white dwellings with pyramidal roofs, on iron piles, one 30 feet southwesterly and the other 30 feet northwesterly from the tower. Brick oil house.	56	
103	Conical black tower, white dwelling 90 feet to southward. Black day beacon of open framework, surmounted by a ball, bears E. ½ S. from tower.	70	
104	Two masts, schooner rigged, no bowsprit, red elliptical iron cagework day mark at each masthead. Hull red, with "SOUTH PASS" in white on each side and "No. 43" in white on the stern. A black smokestack and the fog signal are between the masts.		12-inch steam whistle; blasts, 4 seconds; silent intervals, 56 seconds.
105	White, square, pyramidal tower with green blinds, surmounted by black lantern and a flagstaff with gilt ball 23 feet above the lantern; a fog-signal house, painted like the tower, stands alongside. Tower and fog-signal house on brown pile foundation.		Bell struck by machinery every 10 seconds.
106	Black, four-sided pyramidal structure, on wooden pile foundation	15	
107	Red pyramidal wooden framework, on four piles, surmounted by a house from which light is shown.		
108	White pyramidal framework, inclosing cylindrical dwelling and stairway; black lantern.	105	
109	Brown, octagonal, pyramidal skeleton tower, with dwelling in lower part. Low frame building stands 60 feet SE. of tower. Temporary keeper's dwelling, wood, at end of wharf, ½ mile NW.	126	
110	Black lantern on square white dwelling with gable roof. Square, white, pyramidal fog-bell tower, with black foundation, about 100 feet southerly of the lighthouse.	36	Bell struck by machinery; double blow, interval 10 seconds; single blow, interval 20 seconds.

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
111	Mississippi River. Head of Passes West Jetty	29 08 (47) 89 15 (08)	Fixed white	Post lantern.	20	
112	Head of Passes East Jetty		Fixed red	Post lantern.	25	
113	Cubits Gap Post-light	29 11 (30) 89 15 (49)	Fixed red	Lens lantern.	40	
114	The Jump Post-light	29 16 (26) 89 21 (00)	Fixed white	Post lantern.	35	
115	New Canal Post-light	29 20 (26) 89 23 (39)	Fixed white	Post lantern.	35	
116	Fort Jackson Post-light	29 21 (37) 89 26 (44)	Fixed white	Post lantern.	35	
117	St. Philips Bend Post-light	29 22 (02) 89 27 (10)	Fixed red	Post lantern.	30	
118	Bayou Grand Liard Post-light	29 20 (32) 89 28 (50)	Fixed white	Post lantern.	33	
119	Old Quarantine Post-light	29 22 (09) 89 31 (54)	Fixed white	Post lantern.	35	
120	Tropical Bend Post-light	29 24 (00) 89 36 (07)	Fixed white	Post lantern.	35	
121	Harris Bayou Post-light	29 27 (25) 89 36 (39)	Fixed red	Post lantern.	30	
122	Rappelle Canal Post-light	29 28 (21) 89 40 (50)	Fixed white	Post lantern.	35	
123	Socola Post-light	29 32 (03) 89 45 (09)	Fixed white	Post lanfern.	35	
124	Pointe à la Hache Post-light	29 32 (32) 89 45 (19)	Fixed red	Post lantern.	30	
125	Favret Post-light	29 36 (34) 89 51 (00)	Fixed white	Post lantern.	35	
126	Ironton Post-light	29 39 (01) 89 57 (34)	Fixed white	Post lantern.	30	
127	Poverty Point Post-light	29 39 (19) 89 57 (16)	Fixed red	Post lantern.	30	
128	Jesuit Bend Post-light	29 45 (27) 90 01 (25)	Fixed white	Post lantern.	35	
129	McCall Flat Post-light	29 46 (49) 90 01 (00)	Fixed red	Post lantern.	30	
130	English Turn Bend Post-light	29 53 (05) 89 58 (08)	Fixed white	Post lantern	35	
131	Shingle Point Post-light	29 52 (50) 89 57 (44)	Fixed red	Post lantern.	35	
132	Poydras Hall Post-light	29 52 (24) 89 54 (01)	Fixed white	Post lantern.	30	
133	Saxonholm Post-light	29 55 (44) 89 55 (44)	Fixed white	Post lantern.	30	
134	Barataria Bay	29 16 (30) 89 56 (43)	Fixed white	4	76½	14¼
135	Timbalier	29 02 (49) 90 21 (25)	Fixed white	Lens lantern.	30	
136	SHIP SHOAL	28 54 56 91 04 15	Flashing white every 30 seconds	2	105	16
137	SOUTHWEST REEF	29 23 36 91 30 14	Fixed white	4	54¼	12¾
	The lights in Grand Lake and Lake Chicot are omitted as they do not affect the text of this volume.					
138	Mermenteau River					
139	Calcasieu	29 46 55 93 20 43	Fixed white	4	53	12¾
140	Sabine Pass Jetty Beacon		Fixed red	Lens lantern.	24	
141	SABINE PASS	29 43 04 93 51 00	Fixed white, varied by a white flash every 90 seconds.	3	94	14¾

KEY WEST TO THE RIO GRANDE—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
111	Lantern on square, black, pyramidal framework covered with horizontal slats		
112	Black, square, pyramidal structure, covered with horizontal slats, on four piles	25	
113	Lantern on top of square, white, pyramidal, wooden bell tower		Bell struck by machinery every 15 seconds.
114	White post with arm from which lantern is suspended		
115	White post with arm from which lantern is suspended		
116	White post with arm from which lantern is suspended		
117	White post with arm from which lantern is suspended		
118	White post with arm from which lantern is suspended		
119	White post with arm from which lantern is suspended		
120	White post with arm from which lantern is suspended		
121	White post with arm from which lantern is suspended		
122	White post with arm from which lantern is suspended		
123	White post with arm from which lantern is suspended		
124	White post with arm from which lantern is suspended		
125	White post with arm from which lantern is suspended		
126	White post with arm from which lantern is suspended		
127	White post with arm from which lantern is suspended		
128	White post with arm from which lantern is suspended		
129	White post with arm from which lantern is suspended		
130	White post with arm from which lantern is suspended		
131	White post with arm from which lantern is suspended		
132	White post with arm from which lantern is suspended		
133	White post with arm from which lantern is suspended		
134	White, square, pyramidal, wooden skeleton tower; square dwelling with pyramidal roof, near tower; brick oil house between tower and dwelling; boathouse and wharf in rear of station.	66	
135	Black, pyramidal framework structure. White dwelling, 30 feet to westward of tower.		
136	Brown, pyramidal framework, on pile foundation, inclosing cylindrical dwelling and stairway.		Bell struck by hand.
137	Square, pyramidal tower connected to square house, with pyramidal fog-bell tower rising from roof, all black, on screw-pile foundation.		Bell struck by machinery every 20 seconds.
138			
139	Black, pyramidal tower, surmounted by lantern, on screw-pile foundation; white storehouse on wooden piles, on N. side of tower.	53	
140	Pyramidal concrete block on jetty, surmounted by framework with red box carrying lantern.		
141	White, octagonal, pyramidal tower with buttresses. Detached white frame dwelling with green blinds, on pile foundation, near tower.	75	

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
			° ′ ″				
142	Galveston Entrance.	Galveston Jetty					
143	Galveston Entrance.	Galveston North Jetty	29 20 (56) 94 41 (36)	Fixed white	Post lantern.	41½	
		The gas buoys in Galveston entrance are omitted on account of the frequent changes in buoyage.					
144	Galveston Entrance.	*Galveston Light-Vessel, No. 23*	29 20 (50) 94 43 (01)	Fixed red	Refl'r	48	12¼
145	Galveston Entrance.	BOLIVAR POINT	29 22 05 94 46 00	Fixed white	2	117	16¾
146	Galveston Bay.	Fort Point	29 20 16 94 46 00	Fixed white, with three fixed red and two dark sectors. One red sector between SW. by W. ¼ W. and SSW., a dark sector between WSW. and W. ¼ S., a red sector between W. and WNW. ½ W., a dark sector between WNW. ½ W. and NNE. and a red sector between NNE. and NNE. ½ E.	4	47½	12¼
147	Galveston Bay.	Red Fish Bar Cut	29 30 (29) 94 52 (27)	Fixed white	5	39	11½
148	Galveston Bay.	Red Fish Bar	29 30 (48) 94 52 (09)	Fixed red	Lens lantern.	37¼	
149	Galveston Bay.	Trinity River Beacon	29 44 (56) 94 42 (54)	Fixed red	Lens lantern.	15½	
150		Brazos River Jetty	28 55 (59) 95 17 (40)	Fixed white	Lens lantern.	36½	
151		BRAZOS RIVER	28 56 (47) 95 18 (30)	Flashing white every 10 seconds	3	98	15¾
152		MATAGORDA	28 20 18 96 25 28	Flashing white every 90 seconds	3	85¼	14¾
153		ARANSAS PASS	27 51 53 97 03 23	Fixed white	4	65	13½
154		BRAZOS SANTIAGO (Padre Island)	26 04 16 97 10 00	Fixed white	4	60	13¼
155		POINT ISABEL	26 04 36 97 12 28	Fixed white, varied by a white flash every minute.	3	87	15

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 lighthouses, which are uncertain by some seconds, not having yet been very accurately determined, and those of light-vessels, which vary somewhat in position, have the seconds inclosed thus: 35° 45′ (57″).

In the column of "Distance visible, in nautical miles," will be found the distances at which the lights can be seen, under ordinary states of the atmosphere, by observers at elevations of fifteen feet above the level of the sea.

KEY WEST TO THE RIO GRANDE—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
142	*To be built*		
143	Red, square, pyramidal, wooden skeleton structure, covered with horizontal slats, on four piles.		
144	Two masts, schooner-rigged; black hoop-iron day mark at mainmasthead. Hull and spars, straw-color, with "GALVESTON" in black on each side, and "28" on stern.		Bell struck by hand.
145	Conical tower colored with white and black horizontal bands; two white dwellings northeastward.	110	
146	White hexagonal screw-pile structure; piles, red; blinds, green; lantern and dome, black.		
147	Square, brown, screw-pile foundation surmounted by a square white dwelling; lantern, black.		Bell struck by machinery every 30 seconds.
148	Square, white, screw-pile structure; lantern, black		
149	Post, supported by a pyramidal structure of four rails		
150	Square platform, on piles, surmounted by a column, from which the lantern is suspended; two small houses; all black.		Bell struck by machinery every 20 seconds.
151	Square, pyramidal, skeleton, iron tower; brown below the gallery and black above	96½	
152	Black conical tower; two white dwellings, a few yards to NE	84	
153	Brown, octagonal, pyramidal tower; lantern, black; two dwellings, near	55	
154	Hexagonal screw-pile structure; dwelling, slate color; piles, roof, and lantern, black.	61	
155	White conical brick tower; lantern, black; white frame dwelling about 125 feet to northward.	57	

In the column of "Characteristics of light," the time between the flashes is given from beginning of one flash to the beginning of the next succeeding one, and bearings are given from seaward.

Vessels approaching or passing light-vessels of the United States in *foggy* or *thick weather* will be warned of their proximity by the sounding of a *bell, fog horn, or whistle*, on board of the light-vessels, at intervals not exceeding five minutes.

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. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

Dry Tortugas Lighthouse.—The following are bearings and distances from Dry Tortugas Lighthouse:

	Miles.
Sanibel Island Lighthouse, **NNE**	119¾
Charlotte Harbor Entrance buoy (bell), **N.** by **E.** ⅛ **E**	127
Tampa Bay Entrance buoy (whistling), **N.** ⅛ **W**	179
Cedar Keys Lighthouse, **N.** ⅝ **W**	267¾
East Pass, St. George Sound, Outer buoy, **N.** by **W.** ¾ **W**	320½
Cape St. George buoy (whistling), **NNW.** ⅛ **W**	311¾
Pensacola Entrance buoy (whistling), **NW.** ⅝ **N**	411¾
Mobile Outer buoy (whistling), **NW.** ⅛ **N. Northerly**	429¼
Horn Island Pass Bar buoy (whistling), **NW**	447¾
South Pass Light-vessel, **NW.** by **W. Northerly**	423¼
Galveston Bar buoy (whistling), **WNW.** ¼ **W**	691
Brazos Santiago Outer Sea buoy, **W.** ⅛ **N**	779½
Habana, Morro Lighthouse bearing **S.**, distant 2 miles, **SSE**	92

Tampa Bay Entrance buoy (whistling).—The following are bearings and distances from Tampa Bay Entrance buoy:

	Miles.
East Pass, St. George Sound, Outer buoy, **NW.** ½ **N**	159
Cape San Blas, bearing **NNE.**, distant 12 miles, **NW.** ¾ **W**	178
Pensacola Entrance buoy (whistling), **NW.** by **W.** ¼ **W**	283½
Mobile Outer buoy (whistling), **NW.** by **W.** ¾ **W**	312¾
Horn Island Pass Bar buoy (whistling), **NW.** by **W.** ⅛ **W**	336
Galveston Bar buoy (whistling), **W.** ⅝ **N. Northerly**	634¾
Rebecca Shoal Lighthouse, **S.** ⅝ **E**	182½
Key West, Entrance to, **NW.** Channel buoy (bell), **S.** by **E.** ⅝ **E**	185½

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

	Miles.
Cape San Antonio, bearing **E.** distant 5 miles, **SSE.** ¾ **E. Easterly**	481
Habana, Morro Lighthouse bearing **S.**, distant 1½ miles, **SE.** ½ **E. Southerly**	505
Key West, Entrance to, **NW.** Channel buoy (bell), **SE.** by **E.** ¼ **E. Easterly**	467½
Tampa Bay Entrance buoy (whistling), **E.** by **S. Easterly**	342
Cape San Blas, bearing **NNE.**, distant 12 miles, **ENE.** ⅞ **E**	194¼
Cape San Blas Outer Shoal buoy, **ENE.** ¾ **E**	200¾
Pensacola Entrance buoy (whistling), **NE.** ½ **E**	123¼
Mobile Outer buoy (whistling), **NE.** by **N. Easterly**	89¾

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 II:

Key West, Fla.*
Dry Tortugas, Fla.
Punta Gorda, Fla.
Egmont Key, Fla.
Port Tampa, Fla.
St. Petersburg, Fla.
Tampa, Fla.
Cedar Keys Lighthouse, Fla.
Cedar Keys, Fla.
Carrabelle, Fla.
Apalachicola, Fla.
St. Andrews Bay, Fla.
Pensacola, Fla.*
Fort Morgan, Ala.
Mobile, Ala.*
Pascagoula, Miss.
Scranton, Miss.
Moss Point, Miss.
Biloxi, Miss.
Pass Christian, Miss.
Bay St. Louis, Miss.
Mandeville, La.
Port Eads, La.
New Orleans, La.*
Morgan City, La.
Sabine, Tex.
Galveston, Tex.*
Velasco, Tex.
Port Lavaca, Tex.
Aransas Life-saving station, Tex.
Rockport, Tex.
Corpus Christi, Tex.*
Point Isabel, Tex.
Brownsville, Tex.

* 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 January 1, 1901. 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.		
			°	′	″	°	′	″
Santa Rosa	Fla	Santa Rosa Island, 3 miles east of Fort Pickens	30	19	00	87	14	30
Sabine Pass	Tex	West side of pass	29	43	55	93	52	15
Galveston	Tex	East end Galveston Island	29	20	10	94	46	10
San Luis	Tex	West end Galveston Island	29	07	00	95	04	00
Velasco	Tex	2¼ miles northeast of mouth of Brazos River	28	57	45	95	16	30
Saluria	Tex	Northeast end Matagorda Island	28	23	00	96	24	00
Aransas	Tex	Northeast end Mustang Island	27	51	00	97	03	00
Brazos	Tex	North end Brazos Island, entrance to Brazos Santiago	26	04	00	97	08	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.

VARIATION OF THE COMPASS.

The magnetic variations for 1901, and annual decrease at points mentioned, are as follows:

Locality.	Variation.	Annual decrease.
	°	′
Key West, Fla	2⅛ E.	3
Dry Tortugas, Fla	2½	3
Off Cape Romano, Fla	2	3
Off Charlotte Harbor, Fla	2	3
Off Tampa Bay, Fla	2¼	3
Off Cedar Keys, Fla	2½	3½
Off East Pass, Aplachicola Bay, Fla	3	3¾
Off St. Andrews Bay, Fla	3½	4
Pensacola Bay Entrance, Fla	4⅛	4
Mobile Bay Entrance, Ala	4½	4
Horn Island Pass, Miss	4½	4
Ship Island Harbor, Miss	4¾	4
Lake Pontchartrain, La	5¼	4
South Pass, Mississippi River, La	4⅞	4
Atchafalaya Bay Entrance, La	5½	4
Sabine Pass, Tex	6½	4
Galveston, Tex	6¾	4
Brazos River Entrance, Tex	7	4
Pass Cavallo, Tex	7¼	3½
Aransas Pass, Tex	7⅛	3
Brazos Santiago, Tex	7	2½

TIDES.

GENERAL TABLE.*

Note.†—Tropic tides are those which occur near the time of the moon's greatest declination, either north or south. The tropic lunitidal intervals are marked *a* or *b*.

a Indicates that an upper transit goes with a north declination and a lower transit with a south declination.

b Indicates that a lower transit goes with a north declination and an upper transit with a south declination.

The plane of reference referred to in the table is the plane on which the soundings on Coast and Geodetic Survey charts are based, commonly termed the plane of mean low water.

* Tide tables, published annually by the United States 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 $0.50.

† See also the remarks on tides, pages 25, 26.

At places where the tides are chiefly diurnal (only one high and one low water in 24 hours), the interval and range of the semidiurnal tides (the two small high and low waters which occur near the times of the moon's zero declination) at these places are inclosed by brackets.

To find the time of high or low water.—At places on the west coast of Florida to the southward of Apalachee Bay use the Lunitidal Intervals under "Mean Tides" for a period of 2 days before and 4 days after the moon's zero declination and use the Lunitidal Intervals under "Tropic Tides" at other times.

At places to the westward of Apalachee Bay near the time of the moon's zero declination the tides are usually so small that, for practical purposes, during a period of 2 days before and 4 days after zero declination they need not be taken into account. At other times the Lunitidal Intervals under "Tropic Tides" should be used.

LOCALITY.	LUNITIDAL INTERVAL.				RISE AND FALL.		
	MEAN TIDES.		TROPIC TIDES.		Mean tides.	Rise of higher high water above plane of reference.	Fall of lower low water below plane of reference.
	High water.	Low water.	Higher high water.	Lower low water.			
	h. m.	h. m.	h. m.	h. m.	Feet.	Feet.	Feet.
Key West Harbor	9 20	2 36	8 44b	3 22a	1.2	1.6	0.3
Dry Tortugas	9 44	3 21	8 42b	4 14a	1.1	1.6	0.5
Cape Sable	1 05	7 26	0 56a	7 56a	2.9	3.4	0.2
Cape Romano	0 15	6 36	0 05a	7 10a	2.6	3.1	0.2
Punta Rasa, San Carlos Bay	12 19	6 12	12 06b	6 55a	1.6	2.0	0.1
Charlotte Harbor { Boca Grande	0 42	6 19	0 26a	7 11a	1.1	1.4	0.1
Charlotte Harbor { Punta Gorda	2 00	7 40	1 47a	8 25a	1.4	1.8	0.1
Egmont Key, Tampa Bay Entrance	11 32	5 07	10 33b	5 39a	1.4	1.8	0.5
Hillsboro Bay, Tampa Bay	1 20	8 50	0 33a	9 15a	2.2	2.6	0.7
Anclote	11 20	5 05	10 31b	5 32a	2.0	2.3	0.7
Cedar Keys	0 43	7 13	0 03a	7 37a	2.4	2.8	0.7
St. Marks Lighthouse	1 29	7 46	0 30a	8 03a	2.5	3.4	0.2
Apalachicola Bay	[12 10]	[5 35]	10 25b	9 27a	[0.8]	2.3	0.2
St. Andrews Bay	[11 35]	[5 05]	9 48b	9 01a	[0.3]	1.8	0.2
Pensacola	[11 43]	[4 34]	9 51b	8 40a	[0.1]	1.6	0.2
Mobile Bay Entrance	[11 25]	[3 09]	9 19b	8 40a	[0.1]	1.4	0.1
Mobile, City of	[1 35]	[6 50]	12 13b	10 46a	[0.5]	1.9	0.2
Horn Island, Pascagoula Harbor Entrance	[12 00]	[5 40]	10 13b	9 36a	[0.3]	1.8	0.2
Biloxi, Mississippi Sound	[1 01]	[6 00]	9 54b	8 08a	[0.3]	2.0	0.2
Port Eads, Mississippi River	[10 55]	[4 42]	8 15b	7 04a	[0.1]	1.6	0.1
Barataria Bay	[11 00]	[4 47]	8 36b	6 55a	[0.4]	1.9	0.2
Atchafalaya Bay Entrance	[0 40]	[6 56]	2 58a	6 31a	[0.5]	2.0	0.0
Calcasieu Pass	2 17	8 41	3 34b	8 22a	1.5	1.5	0.1
Sabine Pass	3 17	9 36	4 42b	9 17a	0.7	1.1	0.1
Galveston, City of	[4 18]	[10 33]	7 38b	10 23a	[0.5]	1.1	0.3
Brazos River	[4 15]	[10 30]	6 46b	10 03a	[0.7]	1.5	0.1
Pass Cavallo	[4 35]	[10 47]	7 06b	10 20a	[0.7]	1.5	0.1
Aransas Pass	[4 25]	[10 35]	6 56b	10 08a	[0.8]	1.5	0.1
Brazos Santiago	[2 00]	[8 10]	5 07b	7 36a	[0.3]	1.0	0.1
Rio Grande Entrance	[1 55]	[8 03]	4 35b	7 34a	[0.4]	1.3	0.1

GENERAL REMARKS FOR APPROACHING AND SAILING ALONG THE COAST OF THE UNITED STATES IN THE GULF OF MEXICO.

Soundings.—A frequent use of the lead is of the greatest value in giving warning of danger either when approaching or sailing along the coast. Off the west coast of Florida, between Dry Tortugas and Cape St. George, the 100-fathom curve is from 90 to 140 miles offshore and the 10-fathom curve from 10 to 40 miles offshore. Along this stretch of the coast, large vessels, well-found in ground tackle, can anchor in about 7 fathoms of water and ride out a gale from any direction; vessels standing along the coast, in ballast, and

headed by the wind, sometimes find it to their advantage to anchor and wait for a favorable breeze instead of beating to windward.

In the broad bight between Cape San Blas and the Passes of the Mississippi, the 100-fathom curve is from 30 to 60 miles offshore; the 10-fathom curve is only about 1 mile offshore between St. Andrews and Pensacola bays, while from Pensacola Bay to Pascagoula Entrance it averages about 5 miles from the shore. The water inside the 100-fathom curve shoals gradually and regularly when approaching the coast. If approaching in the night, or in thick weather, and not sure of the vessel's position, it is advisable to keep in a depth of at least 15 fathoms until daylight, or until the weather clears.

Off the Passes of the Mississippi the 100-fathom curve approaches South Pass as close as 10 miles, while the 10-fathom curve is in some places less than 1 mile from the mouths of the passes and the shoals between them. Here the discolored water discharged by the Mississippi River is liable to mislead the navigator in his judgment as to his distance from the passes; at times this discolored water may be encountered 12 miles, at other times 50 miles, from the passes.

To the westward of the Passes of the Mississippi and as far a Timbalier Island, the 100-fathom curve is about 40 miles offshore and the 10-fathom curve is at an average distance of 8 miles.

Between Timbalier Island and Galveston Entrance the 100-fathom curve is from 60 to 110 miles, and the 10-fathom curve from 20 to 38 miles, offshore. Along this stretch of the coast are several shoals which lie at distances of 10 to 28 miles offshore; one of these shoals is as close as 5 miles to the 10-fathom curve. Deep-draft vessels should approach the coast in this vicinity with caution and obtain frequent soundings, hauling offshore if, on a clear day, they shoal their water to 5 fathoms without being able to see land. (See the descriptions of Ship Shoal, Trinity Shoal, and Sabine Bank, in another part of this volume.)

From off Galveston Entrance to the mouth of the Rio Grande the 100-fathom curve is from 50 to 90 miles offshore; the 10-fathom curve, off Galveston Entrance, is about 23 miles offshore, but westward, from San Luis Pass to the Rio Grande, it is only from 4 to 8 miles offshore. This stretch of coast has no outlying shoals and in clear weather can safely be approached close enough to make the land.

Tides.—The tides in the Gulf of Mexico differ from those on the Atlantic Coast of the Unites States in being more greatly influenced by the declination of the moon. Along the west coast of Florida, where, as a general rule, the rise and fall of the tide is greater than to the westward of Apalachee Bay, the effect of declination is shown by a marked difference between the heights of consecutive high or low waters. To the westward of Apalachee Bay there is usually only one high and low water in 24 hours.

On the west coast of Florida, from Key West to Apalachee Bay, there are usually two well defined high tides in 24 hours. In this region the relative height of consecutive tides may be ascertained by noting the declination and the transit of the moon, there being four possible cases:

1. With north declination, a high water following the moon's upper transit will be lower than the preceding or following high water.
2. With north declination, a high water following the moon's lower transit will be higher than the preceding or following high water.
3. With south declination, a high water following the moon's upper transit will be higher than the preceding or following high water.
4. With south declination, a high water following the moon's lower transit will be lower than the preceding or following high water.

North or south declination means here that the moon is quite far north or south of the equator. It is here assumed that the period by which a high water follows the moon's transit is never much less than 7 hours nor much more than 13 hours.

On the Gulf Coast, westward of Apalachee Bay, there is generally but one low and one high water in 24 hours. The duration of fall, or interval of time from high to low water, is less by some hours than the duration of rise, except for some limited areas where the reverse occurs. The rise and fall of tide is greater when the moon is far from the equator,

either north or south, and if the moon's greatest declination occurs at full and change the range will be greatest. About the time that the moon's declination is zero the rise and fall is less, and if the moon's zero declination occurs in its first and last quarter the range will be least. When the moon is near the equator there are sometimes four small tides in 24 hours; this may be expected when new or full moon occurs at that time. With north declination a high water generally follows the moon's lower transit, and with south declination it follows the moon's upper transit.

The above remarks apply when there is no disturbing action of the wind. Strong winds will nearly always retard or accelerate the tides, and at times during heavy gales the action of the tides will apparently be suspended or reversed.

Coast and Tidal Currents.—Along the coast of the United States bordering on the gulf, the currents are almost entirely influenced by the force and direction of the winds. The normal tidal currents are weak except in the entrances to the bays and harbors; here, in some cases, they have a velocity of 1½ to 2 knots, but this velocity is decreased or accelerated greatly by the force and direction of the winds. After a norther a strong current will be found setting over the bars and into the harbors and bays. The influence of the Gulf Stream can not usually be felt in the Gulf of Mexico north of the latitude of the Dry Tortugas.

The prevailing winds along the coast of the United States which borders the Gulf of Mexico between Key West and the Passes of the Mississippi, are northerly from October to February, both inclusive, and southerly during the remaining months of the year. Westward of the Passes of the Mississippi, they are northerly from November to February, and southerly during the remaining months.

Northers are violent north winds which blow, mainly during the winter months, over Texas and the Gulf of Mexico. These winds come on after but short warning, and usually follow light southerly breezes and warm, moist weather. The indications of a norther are a thick bank of dark clouds in the north or northwest with lightning, falling barometer, and lowering temperature; it begins with a strong squall, which usually strikes the observer when the bank of clouds is at an altitude of 45 degrees above the horizon. During this squall the temperature may drop 20 degrees in 10 minutes. After the first squall the wind gradually increases but does not reach its maximum velocity until after the barometer has begun to rise; the temperature, however, may drop as low as 18° F. The northers are more frequent and more strongly marked along the coast of Texas than to the eastward, but the general characteristics of these winds are alike all over the Gulf of Mexico; their duration is from one to four days. There are two types of northers, known locally as "Dry Norther" and "Wet Norther"; the indications are practically the same for both, except that a wet norther is usually preceded by rain, perhaps a thunderstorm; the shift of wind to the northward is more sudden and the squall accompanying the shift generally heavy. This type is confined mostly to the eastern part of the gulf and is not as common as the other. Northers are not dangerous for large vessels, but small vessels are sometimes blown offshore; they affect, however, the depth of water in the harbors and on the bars by blowing the water offshore; in some cases the water will be lowered 4 feet. This should be borne in mind by vessels attempting to enter the harbors on the gulf coast during or just after a norther.

Southeast gales are dangerous to shipping along the Gulf Coast of the United States to the westward of Apalachee Bay. They are liable to occur at any time of the year, but are most dangerous in winter and early spring. During a heavy southeaster the bars at the entrances to the harbors are made impassable for deep-draft vessels on account of the heavy sea which breaks in depths of about 4 fathoms. The usual local indication of a southeaster is a breeze freshening at **ENE.** or **E.** and hauling southward, accompanied by a falling barometer, a rising temperature, and an increasing swell. The lowest reading of the barometer is usually reached immediatley after the wind gains its maximum velocity at **SE.** When the wind hauls to the southward of **SE.** it is an indication that the gale is breaking, which is usually followed by heavy squalls; as it hauls westward of **S.** first rain squalls, and then clearing weather, may be expected, unless, as is sometimes the case, the southeaster be

followed by a norther. Southeast gales raise the water in the harbors along the Gulf Coast, in some cases, to a height of 6 feet above the normal. Along the west coast of Florida, from Cape Romano to Apalachee Bay, southeast gales are not so dangerous to shipping; vessels well found in ground tackle can anchor in shoal water under the lee of the land and hold on until the gale abates.

West India Hurricanes.—Occasionally during July, August, September, and October, and at rare intervals in June and November, great whirlwinds, known as hurricanes, may be encountered in the Gulf of Mexico. In addition to a motion around its center, a hurricane has a progressive motion, following a track which, in the part of the Gulf of Mexico treated in this volume, usually has a direction between **N.** and **E.**, although some have been known to travel in a direction to the westward of **N.** This progressive motion varies in velocity, but is said to average about 300 miles in 24 hours; the diameter of a hurricane may vary from 100 to 300 miles, the diameter of its center being also a variable quantity. Shipping and property in the track of a hurricane seldom escape without damage or destruction, as, in addition to the force of the wind, it may be that a wave, moving forward like a tidal wave at the rate of the hurricane's progress, accompanies the hurricane in its track; this causes sudden inundations along the low shores of the Gulf of Mexico lying in the track of the hurricane, and endangers the shipping at anchor. During the hurricane season the mariner should note every change in the weather signs and carefully watch his barometer for indications of a hurricane, so as to take every precaution to avoid it when at sea, or to make preparations for riding it out in safety when at anchor in port. For the indications of the approach of a hurricane and the rules to be followed by vessels when overtaken by one, see Appendix III.

SAILING DIRECTIONS FOR THE COAST OF THE GULF OF MEXICO FROM THE FLORIDA KEYS AND DRY TORTUGAS TO THE RIO GRANDE.

The routes taken by vessels bound along the coast will depend greatly on their port of destination. The directions for coasting are given in sections, as follows:*

Sections 1, 1 A, 1 B, and 1 C include the coast from the Florida Keys and Dry Tortugas to Tampa Bay.

Sections 2 and 2 A include the coast from Tampa Bay to Cape San Blas.

Sections 3, 3 A, and 3 B include the coast from Cape San Blas to the South Pass of the Mississippi River.

Section 4 includes the coast from the South Pass of the Mississippi River to Galveston Entrance.

Section 5 includes the coast from Galveston Entrance to the Rio Grande.

1. ***From the Bell Buoy off Entrance to Northwest Passage into Key West.***—I. ***To the Entrance to Big Marco Pass.***—Make good a **N.** $\frac{1}{8}$ **E.** course for 78 miles.

II. ***To the Entrance buoy off San Carlos Bay.***—Make good a **N.** $\frac{3}{8}$ **W.** course for $105\frac{3}{4}$ miles.

III. ***To the Entrance bell buoy off Boca Grande Entrance to Charlotte Harbor.***—Make good a **N.** by **W.** $\frac{1}{8}$ **W.** course for 124 miles.

IV. ***To the Entrance whistling buoy off North Channel Entrance to Tampa Bay.***—Make good a **N.** by **W.** $\frac{3}{8}$ **W.** course for $185\frac{1}{4}$ miles.

Remarks.—These directions lead well clear of the land and all dangers. When approaching the entrance to any harbor, the sailing directions under the heading of that harbor should be consulted. When approaching the North Channel entrance to Tampa Bay, special care should be taken to avoid Palatine Shoal.

* See the "General remarks for approaching and sailing along the coast of the United States in the Gulf of Mexico," pages 24-27.

1 A. ***From a position 1 3-4 miles W. from Rebecca Shoal Lighthouse.***—I. ***To the Entrance buoy off San Carlos Bay.***—Make good a **N.** by **E.** $\frac{3}{8}$ **E.** course for 115 miles.

II. ***To the Entrance bell buoy off Boca Grande Entrance to Charlotte Harbor.***—Make good a **N.** $\frac{3}{8}$ **E.** course for 126½ miles.

III. ***To the Entrance whistling buoy off the North Channel Entrance to Tampa Bay.***—Make good a **N.** $\frac{5}{8}$ **W.** course for 182 miles.

Remarks.—See the remarks under section 1, preceding.

1 B. ***From a position 3 miles W. of Dry Tortugas Lighthouse.***—I. ***To the Entrance buoy off San Carlos Bay.***—Make good a **NNE.** ¼ **E.** course for 120 miles.

II. ***To the Entrance bell buoy off Boca Grande Entrance to Charlotte Harbor.***—Make good a **N.** by **E.** ¼ **E.** course for 127½ miles.

III. ***To the Entrance whistling buoy off North Channel Entrance to Tampa Bay.***—Make good a **N.** course for 178½ miles.

Remarks.—In passing to the westward of the Dry Tortugas it is advisable to give the lighthouse and Loggerhead Key a berth of at least 3 miles. (See the remarks under section 1, preceding.)

1 C. ***From off Big Marco Pass to the Entrance Whistling Buoy off North Channel Entrance to Tampa Bay.—Along the shore.***—From a position 2½ miles from the beach off Big Marco Pass, steer **N.** by **W.** $\frac{7}{8}$ **W.** for 29½ miles; this will lead to the Entrance buoy off San Carlos Bay. Pass ½ mile southward of this buoy and steer **W.** ¼ **S.** for 11 miles, and then make good a **NNW.** ¾ **W.** course for 82 miles. This should lead to the whistling buoy off the entrance to Tampa Bay.

Remarks and dangers.—The **N.** by **W.** $\frac{7}{8}$ **W.** course from Big Marco Pass leads clear of all dangers; Sanibel Island Lighthouse should be made on the port bow, and the water should not be shoaled to less than 3 fathoms. When the entrance buoy off San Carlos Bay is sighted, steer for it.

On the **W.** ¼ **S.** course, the shore of Sanibel Island should not be approached closer than 1 mile.

On the **NNW.** ¾ **W.** course, the vessel should be about 1¼ miles from the shore when abreast Blind Pass, and this is as close as she should approach it. The course gradually draws offshore and care should be taken to pass at least 4 miles from Gasparilla Lighthouse, when it is abeam, and outside the bell buoy off Boca Grande. From this bell buoy to the North Channel entrance to Tampa Bay, the **NNW.** ¾ **W.** course leads from 4 to 5 miles offshore, but the coast is free from dangers and can be approached as close as 1½ miles carrying a depth of 4 fathoms; this is as close as is safe for a stranger.

When approaching the entrance to Tampa Bay care should be taken to keep outside of the shoals which make offshore for a distance of 5 miles. **Palatine Shoal** lies 5 miles **W.** from Egmont Key Lighthouse and ⅜ mile **SSE.** from the whistling buoy at the entrance to the North Channel.

2. ***From the Whistling Buoy off the Entrance to North Channel into Tampa Bay.***—I. ***To entrance to Cedar Keys.***—Make good a **N.** by **W.** ¾ **W.** course for 16¾ miles, when Highlands Shoal buoy (nun, red, "Highlands" in white letters) should be ½ mile distant on the starboard beam. Then make good a **N.** by **W. Northerly** course for 68 miles; Cedar Keys Lighthouse should then bear **N.** by **E.** and be distant about 5½ miles.

Remarks.—These directions lead clear of all dangers; care should be taken not to approach too close to Seahorse Reef (see sailing directions for Cedar Keys), and as soon as Cedar Keys Lighthouse is made it should be brought to bear **N.** by **E.** and stood for on this bearing.

II. ***To the Sea buoy off St. Marks River Entrance.***—Make good a **NNW.** ½ **W.** course for 161 miles, which will lead to the Sea buoy with St. Marks Lighthouse bearing **N.** ¾ **W.**, distant nearly 3 miles.

III. *To the Outer buoy at the entrance to East Pass, Apalachicola Bay.*—Make good a **NW.** ½ **N.** course for 159½ miles, which will lead to the Outer buoy off the entrance to East Pass and on to the Crooked River Range for entering the pass.

Remarks.—When approaching East Pass, as soon as Crooked River Lighthouse is sighted, bring the lighthouse to bear **NNW.** ½ **W.** and approach the Outer buoy on this bearing.

IV. *To the whistling buoy off Cape St. George.*—Make good a **NW.** ⅜ **W.** course for 161 miles; this will lead to the whistling buoy, with Cape St. George Lighthouse bearing **N.** ½ **W.**, distant 7 miles.

V. *To a position from which Cape San Blas bears NNE., distant 12 miles.*—Make good a **NW.** ¾ **W.** course for 178 miles. Then follow the directions in section 3.

Remarks.—Deep-draft vessels, in a heavy sea, should not, when approaching Cape San Blas, shoal the water to less than 10 fathoms. The shoal which extends for 13 miles in a **SSW.** ½ **W.** direction from the cape has depths of 6 fathoms near its outer end, and 4 fathoms are found 9½ miles from the cape.

2 A. *From the Whistling Buoy off the Entrance to the North Channel into Tampa Bay to the Buoy off Cape San Blas.—Along the shore.*—From the whistling buoy steer **N.** by **W.** ¾ **W.** for 16¾ miles. When Highlands Shoal buoy bears **E.**, distant ½ mile, steer **N.** by **W.** ¼ **W.** for 64½ miles, until up to the bell buoy off Seahorse Reef. From the latter buoy, steer **NW.** ⅛ **W.** for 75 miles, until up to Ocklockonee Shoals Sea buoy; from this buoy steer **SW.** by **W.** ⅜ **W.** for 52 miles, until up to the whistling buoy off Cape St. George: and from the latter steer **WNW.** ¾ **W.** for 17½ miles, to the buoy off Cape San Blas. Then follow the directions in sections 3 A or 3 B.

Remarks.—These directions should not be followed by vessels of over 12 feet draft in a heavy sea. When approaching the bell buoy off Seahorse Reef, spots with as little as 19 feet of water over them may be encountered. After passing Highlands Shoal buoy no land will be sighted until after Ocklockonee Shoal Sea buoy has been passed and the vessel is standing on the **SW.** by **W.** ⅜ **W.** course. Lighthouse Point will be left nearly 7 miles on the starboard hand on this course; on a clear day the point, which is wooded, can be seen. **South Shoal Sea buoy**, which marks the shoal making southward from **Lighthouse Point**, should be left about 1¼ miles on the starboard hand. On a clear day the wooded parts of Dog Island and St. George Island will be seen; Cape St. George Lighthouse should be left 7 miles on the starboard hand. When standing for the buoy off Cape San Blas, spots with 4 fathoms of water over them are liable to be encountered to the southward and westward of the buoy.

3. *From a position, in 8 fathoms of water, 12 miles SSW. from Cape San Blas.*—I. *To the whistling buoy off the entrance to Pensacola Bay.*—Make good a **WNW.** course for 106½ miles.

II. *To the whistling buoy off the entrance to Mobile Bay.*—Make good a **W.** by **N.** course for 140½ miles.

III. *To the whistling buoy off the entrance to Pascagoula Harbor.*—Make good a **W.** ⅞ **N.** course for 164 miles; Horn Island Lighthouse should then bear **NW.** ¼ **N.** and be distant 2½ miles.

IV. *To a position off the entrance to Ship Island Harbor.*—Make good a **W.** ¾ **N.** course for 187 miles; Ship Island Lighthouse will then bear **N.**, distant 3½ miles.

V. *To the light-vessel off the South Pass of the Mississippi River.*—Make good a **WSW.** ¾ **W.** course for 193 miles.

Remarks.—See the remarks under paragraph V in section 3 A, following.

3 A. *From Cape San Blas Outer Shoal Buoy.*—I. *To Entrance buoy off St. Andrews Bay.*—Make good a **NNW.** ¾ **W.** course for 32½ miles.

II. *To the whistling buoy off the entrance to Pensacola Bay.*—Make good a **WNW.** ⅜ **W.** course for 110 miles.

III. *To the whistling buoy off the entrance to Mobile Bay.*—Make good a **W.** $\frac{7}{8}$ **N.** course for 143½ miles.

IV. *To the whistling buoy off the entrance to Pascagoula Harbor.*—Make good a **W.** ¾ **N.** course for 168 miles; Horn Island Lighthouse should then bear **NW.** ¼ **N.** and be distant 2 miles.

V. *To a position off the entrance to Ship Island Harbor.*—Make good a **W.** ½ **N.** course for 193 miles; Ship Island Lighthouse will then bear **N.**, distant 2½ miles.

Remarks.—The courses in paragraphs I to V, preceding, lead clear of all dangers. In approaching the entrance to any harbor, the sailing directions for that harbor should be consulted.

3 B. *From Cape San Blas to the South Pass of the Mississippi.—Along the shore.*—From the buoy off Cape San Blas, steer westward 1 mile and then **N.** by **W.** ½ **W.** for about 18 miles, until St. Josephs Point bears **ENE.** Then steer **NW.** ½ **W.** about 20 miles; the four pines near the western entrance to St. Andrews Bay will then be abeam and the vessel should be about 1¼ miles from the beach. From this position the shore can be followed, giving it a berth of 1¼ miles, or more, until up to Pensacola Bay entrance, where the vessel should be hauled offshore so as to pass close to the whistling buoy. From the whistling buoy off Pensacola Bay entrance, steer **WSW.** ⅜ **W.** for 39¼ miles, to the whistling buoy off Mobile Bay entrance; from the latter steer **W.** ⅛ **S.** for 24 miles, to a position from which Horn Island Lighthouse bears **NW.** by **N.**, distant about 3 miles. From this position steer **S.** by **W.** ⅜ **W.** for 65 miles, taking care to leave Pass a Loutre Lighthouse at least 5 miles on the starboard hand when it is abeam. Having stood 6 miles farther on the **S.** by **W.** ⅜ **W.** course after Pass a Loutre Lighthouse bore abeam, steer **SW.** for the light-vessel off South Pass.

Remarks.—On the **N.** by **W.** ½ **W.** course, the land to the northward of Cape San Blas is left about 1¼ miles on the starboard hand. **St. Josephs Point** is wooded nearly to its end and the northern end of the tree line can be taken for the bearing on which to change the course to **NW.** ½ **W.** On the latter course, the entrances to St. Josephs and St. Andrews bays will be passed; after passing the latter, the curve of the coast can be followed at a distance of 1¼ miles or more, until up to Pensacola Bay entrance. Care should be taken to pass outside the whistling buoy off Mobile Bay entrance.

On the **S.** by **W.** ⅜ **W.** course, from off Pascagoula entrance, the course leads 7½ miles to the eastward of Chandeleur Islands and no land will be sighted until Pass a Loutre Lighthouse is made.

4. *From South Pass Light-vessel.*—I. *To entrance of Barataria Bay.*—Steer **SW.** by **W.** ¾ **W.** until Southwest Pass Lighthouse bears **N.**, distant 5 miles; then steer **NW.** by **W.** ⅛ **W.** for 34 miles. Barataria Bay Lighthouse should then bear about **NW.** by **N.**, distant 3 miles.

II. *To entrance of Atchafalaya Bay.*—Steer **SW.** by **W.** ¾ **W.** until Southwest Pass Lighthouse bears **N.**, distant 5 miles; then steer **W.** ¼ **S.** for 87 miles; Ship Shoal Lighthouse should then bear **S.**, distant 1½ miles. From this position steer **WSW.** for 11 miles and then **NNW.** ½ **W.** for nearly 30 miles with Southwest Reef Lighthouse directly ahead.

Remarks.—The directions in paragraph II are intended only for vessels that can enter Atchafalaya Bay, but vessels of 13 feet draft can pass between Ship Shoal and the shoals to the northward. On the **W.** ¼ **S.** course, care should be taken not to approach the northern edge of Ship Shoal too closely, as it rises abruptly from a depth of 5 fathoms.

III. *To Calcasieu Pass, for vessels of 8 feet or less draft.*—Steer **SW.** by **W.** ¾ **W.** until Southwest Pass Lighthouse bears **N.**, distant 5 miles; then steer **W.** ¼ **S.** for 94 miles, passing **N.** of ship Shoal and leaving Ship Shoal Lighthouse 1½ miles on the port hand. Having continued this course till 6 miles westward of the lighthouse, steer **NW.** by **W.** ⅜ **W.** for 43 miles, to the red can buoy marking Shell Keys; from this buoy, which should be left ¼ mile on the starboard hand, steer **W.** ¼ **S.** for 18 miles, leaving Tiger Shoal buoy (can, black)

about 1 mile on the starboard hand. When the water deepens to 18 feet or more steer **WNW.** $\frac{7}{8}$ **W.** for 63 miles, which will lead to the entrance of Calcasieu Pass.

Remarks.—These directions, if closely followed, will carry a least depth of 12 feet; this depth will be found after passing Tiger Shoal Buoy, while standing on the **W.** $\frac{1}{4}$ **S.** course. Care must be taken to sight the red buoy southward of the Shell Keys, as it is impossible for a stranger to locate the position of his vessel with any degree of accuracy except by the buoys.

On the **WNW.** $\frac{7}{8}$ **W.** course the vessel will approach the shore as close as 3 miles; in a smooth sea the shore along this stretch of the coast can be safely approached as close as 2 miles with a depth of 19 feet.

IV. ***To Sabine Pass, for deep-draft vessels.***—From South Pass Light-vessel steer **SW.** by **W.** $\frac{3}{4}$ **W.** until Southwest Pass Lighthouse bears **N.**, distant 5 miles; then steer **W.** by **S.** for 89½ miles, when Ship Shoal Lighthouse should bear **N.**, distant 10 miles. From this position steer **W.** by **N.** for 75 miles and then **NW.** by **W.** $\frac{3}{4}$ **W.** for 57 miles. Calcasieu Lighthouse should then bear **N.**, distant nearly 9 miles. From this position steer **W.** $\frac{3}{4}$ **S.** for 23½ miles, when the vessel should be 1 mile outside the whistling buoy off Sabine Pass.

Remarks.—After having stood 80 miles on the **W.** by **S.** course from Southwest Pass, soundings should be taken frequently, and if the water shoals to less than 6 fathoms the vessel should be headed to the southward so as to clear the shoal water which makes off some distance southward from Ship Shoal. After having stood about 10 miles on the **W.** by **N.** course the water should deepen to 9 fathoms, and this is the least that should be found during the remainder of the time the vessel is on this course, and soundings should be taken frequently.

On the **NW.** by **W.** $\frac{3}{4}$ **W.** course the water shoals gradually and regularly; when Calcasieu Lighthouse bears **N.** the depth should be about 6 fathoms. The **W.** $\frac{3}{4}$ **S.** course leads about midway between the northern edge of Sabine Bank and the shore, in a depth of 5¾ fathoms.

Dangers.—**Ship Shoal** is about 25 miles long in a general **E.** and **W.** direction with depths of 5 to 18 feet; for 6½ miles of its length the depth is less than 12 feet. It lies between Longitude 90° 44′ W. and 91° 14′ W. and the southernmost part of the shoal is in Latitude 28° 48′ N. The northern end of the shoal is about 7 miles from the coast and rises abruptly from a depth of about 4½ fathoms. Ship Shoal Lighthouse (see table, page 18) is near the northern edge of the shoal and about 17 miles from its eastern end.

Trinity Shoal.—The middle of this shoal lies 37 miles **SW.** by **W.** $\frac{1}{8}$ **W.** from Southwest Reef lighthouse, and 20 miles **S.** by **E.** $\frac{3}{4}$ **E.** from Tigre Point; it is about 17 miles long in a general **ENE.** and **WSW.** direction and its southern edge lies in Latitude 29° 09′ 30″ N. and a little over 5 miles inside the 10-fathom curve. The depths over this shoal range from 11 to 17 feet.

Sabine Bank.—This is a dangerous shoal for deep-draft vessels approaching Sabine Pass or Galveston when not quite sure of their position. It is a broken shoal consisting of a number of lumps, with depths ranging from 16 to 30 feet, which extend in a general **E.** $\frac{1}{2}$ **N.** and **W.** $\frac{1}{2}$ **S.** direction for 38 miles, and it is not safe for deep-draft vessels to attempt to pass between them. The lumps in some places rise abruptly from a depth of 6 fathoms and the lead can not be depended on to keep clear of them. The southernmost of these lumps is in Latitude 29° 22′ N. In heavy weather the sea breaks on the bank and it is then dangerous for small vessels. Southward of the bank and about 6 miles inside the 10-fathom curve the soundings are irregular and several spots, with a depth of 5¾ fathoms, will be found surrounded by deeper water. A spot with 5 fathoms over it has been reported as lying in Latitude 29° 18′ N. and Longitude 93° 22′ 30″ W. a short distance northeastward of the above-mentioned shoal spots. Between Sabine Bank and the coast there is a channel 7½ miles wide with a depth of over 5 fathoms. The eastern end of Sabine Bank proper is 35 miles **SE.** by **E.** $\frac{1}{2}$ **E.** from Sabine Pass Lighthouse and 23½ miles **S.** by **E.** from Calcasieu Lighthouse.

V. ***To Galveston Entrance, for deep-draft vessels.***—From South Pass Light-vessel steer **SW.** by **W.** $\frac{3}{4}$ **W.** until Southwest Pass Lighthouse bears **N.**, distant 5 miles; then steer **W.** by **S.** for 89½ miles, when Ship Shoal Lighthouse should bear **N.**, distant 10 miles. From this position steer **W.** $\frac{1}{8}$ **S.** for 173 miles and then steer **NW.** $\frac{1}{2}$ **N.** for about 24 miles, until in about 6 fathoms of water, off the entrance to Galveston Bay.

Or, follow the directions in paragraph IV, preceding, until nearly up to Sabine Pass Entrance and then steer about **SW.** by **W.** $\frac{1}{2}$ **W.**, giving the shore a berth of about 5 miles, until off the entrance to Galveston Bay.

Remarks.—Having stood about 80 miles on the **W.** by **S.** course, soundings should be taken frequently, and the vessel headed to the southward if the water shoals to less than 6 fathoms. In a heavy sea the vessel should be kept in 9 fathoms of water.

The **W.** $\frac{1}{4}$ **S.** course leads well southward of the 4½-fathom shoal off Galveston Entrance. (See also the remarks and dangers under paragraph IV, preceding.)

Dangers.—About 34 miles **ESE.** ½ **E.** from Bolivar Point Lighthouse is a shoal with 4½ to 5 fathoms over it. The shoal is about 4 miles long in a **NE.** and **SW.** direction; its middle lies in Latitude 29° 08′ 15″ N. and Longitude 94° 10′ 45″ W. and about 16 miles **SSW.** from the western end of Sabine Bank. Depths of 9½ to 10 fathoms are found as close as 1½ to 2 miles southward of the shoal and in heavy weather it is marked by breakers. This shoal is dangerous for deep-draft vessels when approaching Galveston from southeastward and Sabine Pass from southwestward.

5. ***From a position 1 mile E. of the Whistling Buoy off Galveston Entrance.***—I. ***To the buoy off Brazos River.***—Steer **SW.** ⅛ **S.** for 39½ miles.

II. ***To Pass Cavallo Bar buoy.***—Steer **SW.** ⅛ **S.** for 39½ miles; leave Brazos River buoy on the starboard hand and steer **SW.** ⅜ **W.** for 68 miles; Matagorda Lighthouse should then bear about **W.** by **N.** and the whistling buoy should be nearly in range with it.

III. ***To the Outer Bar buoy off Aransas Pass.***—Follow the directions in paragraph II, preceding, until off Pass Cavallo Bar buoy; then steer **SW.** ¼ **S.** for 45 miles, until off the entrance to Aransas Pass.

IV. ***To the Outer Sea buoy off Brazos Santiago.***—Follow the directions in paragraphs II and III, preceding; when up to the Outer Bar buoy off Aransas Pass, steer **S.** ⅝ **E.** for 106 miles; this course should lead to the Outer Sea buoy off Brazos Santiago.

Remarks.—From a point 12 miles to the southward of Galveston Entrance to the mouth of the Rio Grande the deepest draft vessels can stand along the coast at a distance of 3 miles from the beach. The lighthouses are the only features along this stretch of the coast that can be easily recognized.

KEY WEST HARBOR.*

This harbor is large and commodious, and one of the best anchorages for large vessels south of Chesapeake Bay. It lies northward of a broken line of the Florida Reefs, in Latitude 24° 33′ N. and Longitude 81° 49′ 30″ W., and is 16 miles westward of American Shoal Lighthouse and about 90 miles **N.** by **E.** ½ **E.** from Habana. On the eastern side of the harbor is the city of **Key West,** which has a population of about 20,000, and is of considerable commercial importance. It is the only city of any size on the west and north shores of the Straits of Florida, and has steamship communication with New York, Habana, Tampa, New Orleans, and Galveston. A large number of steamers and small sailing vessels enter and clear from the port, over half of which are from or for foreign ports. The greatest draft of vessels coming to the port is 25 feet, and the average draft about 14 feet. Key West Harbor, through its Northwest Channel, affords a short route from the Straits of Florida into the Gulf of Mexico for vessels of less than 10 feet draft.

Prominent features.—When standing along about 6 miles southward of the Florida Keys, as the entrances from the southward are approached, **Key West Lighthouse** (see table, page 10) will be seen near the western end of Key West Island, and **Fort Taylor,** a brick casemated structure, will show prominently a little westward of the island. **Sand Key Lighthouse** (see table, page 10) will be seen about 7 miles southwestward from Key West Lighthouse, and the former will sometimes have the appearance of a sail. There are two brick Martello towers on the south side of Key West Island eastward of the lighthouse; these towers can be seen from some distance outside of the reefs. Eastern Triangle Beacon (painted red, showing a light) is midway between the Entrance buoy of the Main Ship Channel and Key West Lighthouse, and can be readily distinguished from outside the reefs. Northwestward of the harbor, and marking the entrance to the Northwest Channel, is **Northwest Passage Lighthouse** (see table, page 10). On the western end of Key West Island are the **United States Naval Storehouse and Coal Depot** and the **Lazaretto**; the latter, a large yellow building, will show conspicuously.

Channels.—There are eight different channels or approaches to the harbor, leading between the reefs and coral banks which surround it. These channels are easy to follow in a sailing vessel in the daytime with a leading wind, but it not safe for a stranger of more than 14 feet to attempt to beat into the harbor.

1. Southeast Channel is good for a least depth of 25 feet, and is marked by several buoys, and at night by a red sector in Key West Light; but the channel is narrow, and should not be attempted by a sailing vessel of over 14 feet draft, except with a leading wind.

*Shown on chart **169**, scale $\frac{1}{80,000}$, price $0.50; **469**, scale $\frac{1}{50,000}$, price $0.25.

2. **Point of Reef Channel** is good for a least depth of 19 feet, and leads from a point ¾ mile westward of Beacon 5, directly for Key West Lighthouse. This channel is not marked, and as there are spots with 14 feet of water over them lying near the channel, it is not recommended for vessels over that draft.

3. **Main Ship Channel** is good for a least depth of 27 feet; it is quite narrow in places but well marked by buoys and a beacon and at night by a red sector in Key West Light. This is the channel commonly used by the deeper draft steamers. A stranger of over 15 feet draft should not attempt to enter by this channel at night. A range of two beacon lights also marks this channel.

4. **Rock Key Channel** leads between Sand Key Lighthouse and Rock Key; the channel is not marked, and is not safe for vessels of over 15 feet draft.

5. **Sand Key Channel** leads between Sand Key Lighthouse and Western Dry Rocks; it is good in the daytime for vessels of about 18 feet draft. Vessels of less than 14 feet draft can pass through this channel on a straight course for Key West Lighthouse. A stranger should not attempt this channel at night.

6. **Southwest Channel** is convenient for vessels approaching from southward and westward; it has a depth of 30 feet, if closely followed, and is marked by several buoys. Vessels of less than 17 feet draft can make one straight course nearly to the anchorage on a bearing of Key West Lighthouse in the daytime and by standing on the edge of a red sector of that light at night. Vessels of a greater draft than 17 feet should only enter in the daytime, when the buoys can be seen, and, if sailing vessels, they should have a leading wind.

7. **West Channel** is broad and clear, and if marked by buoys would be good for a depth of 30 feet, but it is not now recommended for vessels of over 17 feet draft.

8. **Northwest Channel** is being improved by the United States Government and now has a depth of 10 feet. This channel affords a short cut from Key West Harbor to the Gulf of Mexico, and is well marked by Northwest Passage Lighthouse and several buoys and a beacon.

Anchorages.—The best anchorage is in the Inner or **Man-of-War Harbor**, where the depth is 4 to 4½ fathoms; this anchorage is northward of the city between coral banks, which prevent a heavy sea. Vessels can anchor anywhere off the city northward of Fort Taylor, or in the entrance to the Northwest Channel abreast of the city in from 3½ to 5 fathoms of water, taking care, however, not to get too close to the reefs which in some places rise abruptly at the edge of the channels. The outer anchorage, about 1¼ miles southward and eastward from Fort Taylor, has depths of 4½ to 5½ fathoms and is somewhat exposed, but is safe for vessels with good ground tackle. For the use of naval vessels, three mooring buoys have been placed in Man-of-War Harbor, and one in the channel about midway between buoy No. 6 and Fort Taylor, and another about midway between Fort Taylor and the Naval Storehouse wharf.

Quarantine.—The boarding station is near Fort Taylor; no vessel is permitted to pass above this before obtaining pratique. At night vessels must anchor outside Fort Taylor; in the daytime they may heave-to until boarded. The quarantine anchorage is in Man-of-war Harbor northward of Fleming Key. (See also the quarantine regulations in Appendix I, and National Quarantines in Appendix IV.)

Pilots can always be had by making signal while outside the reefs. Pilot boats are usually cruising outside and a good lookout is kept for approaching vessels. Pilotage is compulsory for certain vessels. (See pilot laws, regulations, and rates in Appendix I.) Pilots for the Hawk Channel can be had at Key West.

Wharves.—The depth of water at the wharves ranges from 10 to 24 feet, according to locality.

Supplies.—A large supply of anthracite and bituminous coal is always kept on hand. Steamers go alongside the wharves and coal is put on board in wheelbarrows. Water can be obtained at the wharves through pipe and hose from cisterns. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—There is a small floating sectional dock. Repairs to the hulls of wooden vessels can be made, but there are no facilities for repairing iron or steel vessels or the machinery of steamers except of the lightest description.

Storm-Warning Displays of the **United States Weather Bureau** are made so as to be visible to the shipping in the harbor. (See Appendix II.)

United States Marine-Hospital Service.—The Marine Hospital or Lazaretto is open to foreign as well as American seamen, but the former must pay at a rate fixed annually by the Secretary of the Treasury. (See Appendix IV.)

Tides.—The mean rise and fall of tides is 1.2 feet. (See also the table on page 24.)

Currents.—The set and velocity of the currents depend much on the Gulf Stream and the prevailing winds, and vary so frequently that no fixed rule can be deduced from observations. Occasionally the ebb and flow

run nearly the whole 12 hours. Sometimes the current of a neap tide runs with great velocity while that of a spring tide is scarcely perceptible. The following statements will give an idea of what may be expected at the localities mentioned: At entrance to Main Channel, flood current **N.** by **W.** and ebb **SE.** by **S.**; at entrance to Southeast Channel flood current **NW.** and ebb **WSW.**; at Triangle buoys, flood current **N.** and ebb **SE.**; at Whitehead Spit buoy, flood current **NW.** and ebb **S.** by **E.**; Outer Harbor, flood current **NNW.** and ebb **SSW.**; Inner Harbor, flood current **NNE.** and ebb **SW.** by **S.**

Winds.—The prevailing winds are easterly, the strongest **N.** in winter and easterly during the hurricane months.

SAILING DIRECTIONS, KEY WEST HARBOR.

The directions for each channel are given in separate sections. (See also the descriptions of the channels on page 33.) In the following directions allowance must be made for the draft if there is a heavy swell or sea.

1. ***Entering by the Southeast Channel.—In the daytime for vessels of less than 24 feet draft.***—Being outside the reefs and with a depth of 15 fathoms, bring Key West Lighthouse to bear **NW. ¼ N.** and steer for it, keeping the lighthouse on the bearing. On this course leave red nun buoys Nos. 2 and 4 about 200 yards on the starboard hand and head directly for Hawk Channel Turn buoy (can, white and black perpendicular stripes). When up to this buoy leave it close-to on either hand and steer **W. ⅞ N.**; pass southward of red buoy No. 6 (see remarks following). Leave this buoy 200 yards on the starboard hand and steer **N.**; on this course black can buoy No. 11 should be left about 150 yards on the port hand, and when it bears abeam, steer **NNE.**, leaving red nun buoy No. 8 on the starboard hand. Anchor about ¼ mile northward of this buoy in 4 to 5 fathoms of water, or continue on to the city wharves, which should be given a berth of 100 yards.

At night for vessels of less than 16 feet draft.—While outside the reefs and in the white rays of Sand Key Light, bring Key West Light to bear **NW. ¼ N.**, which will be on the edge of a red sector in the light. Steer for Key West Light on this bearing and keep on the edge of the red sector. When Sand Key Light changes from red to white haul sharp to port and steer **W. ¾ N.** for 2¼ miles; Key West Light will then show white and bear **NE. ¼ N.**; then change the course to **N.** by **E. ¼ E.** and anchor in 4 to 5 fathoms of water when westward of the Lazaretto.

Remarks.—When standing for Key West Lighthouse on the **NW. ¼ N.** course, care must be taken to keep close on the bearing as there are a number of shoal spots on both sides of the channel. It is not advisable for vessels of over 21 feet draft to go above red buoy No. 6 without a pilot. Vessels of this draft should anchor southeastward of red buoy No. 6 in about 5 fathoms of water. When standing on the **NNE.** course from black buoy No. 11, red buoy No. 8 should be left 150 yards on the starboard hand, and if the vessel is subject to visitation by the health officer she should come-to near this buoy. Two black can buoys (Nos. 15 and 17) mark the edge of the channel abreast the city wharves; they should be left on the port hand when standing along the wharves or if bound into Man-of-War Harbor. When entering at night care must be taken not to foul the buoys. There are two mooring buoys, for the use of naval vessels, between buoy No. 6 and the Naval Storehouse wharf.

Dangers.—**Whitehead Spit** makes off ⅝ mile from the southwestern point of Key West Island. Its extremity is marked by red buoy No. 6, which lies in 30 feet of water, and must be left on the starboard hand by vessels entering the harbor.

Middle Ground Shoal lies westward of the island of Key West, distant about ½ mile. Its southeastern end forms the western boundary of the harbor proper and is marked by two buoys—South Middle Ground buoy (black, No. 11), lying in 21 feet of water off the south end of the shoal, and Inner Middle Ground buoy (black, No. 13), lying in 18 feet of water on the northwest side of the harbor. Both these buoys must be left on the port hand by vessels entering the harbor.

Fort Taylor Shoal extends about 200 yards westward from Fort Taylor; it is part of the same shoal which extends from Whitehead Spit along the western shore of Key West Island. The edge of the shoal is marked by a buoy (red, No. 8).

Frankford Bank is an extensive shoal lying westward of the Inner Harbor or Man-of-War Harbor. Its south point is marked by a black buoy (No. 15), which lies in 20 feet of water, and its eastern edge by black buoy No. 17 in 18 feet of water. These buoys must be left on the port hand by vessels entering the inner harbor.

1 A. ***Entering by the Point of Reef Channel.—In the daytime or night for vessels of 14 feet or less draft.***—Keep Sand Key Lighthouse bearing westward of **W. ⅝ S.** until Key West Lighthouse is brought on the bearing of **N.** by **W. ⅜ W.** Steer for Key West Lighthouse, keeping it on this bearing until Sand Key Lighthouse bears **SW. ¼ W.**, or, at night, when it changes from red to white. Then steer **NW.** by **W.**; pass 200 yards southward of red buoy No. 6, and when Key West Lighthouse bears **NE.**, or the Lazaretto is opened westward of Fort Taylor, change the course to **N.** by **E. ¼ E.** Leave black buoy No. 11 on the port hand and red buoy No. 8 on the starboard hand and anchor westward of the Lazaretto, or stand for the city wharves.

Remarks.—The bearing of Key West Lighthouse, when standing for it, should be kept closely as there are scattered spots with 10 to 17 feet of water over them on both sides of the channel, which has a width of less than ½ mile. (See also the remarks and dangers under section 1 preceding.)

1 B. ***Entering by the Main Ship Channel.—In the daytime for vessels of less than 26 feet draft.***—When over 1½ miles eastward of Sand Key Lighthouse keep it bearing westward of **W. ⅝ S.** until Key West Lighthouse is brought to bear **N. ¼ W.** Steer for Key West Lighthouse on this bearing until up to the Entrance buoy (nun, white and black perpendicular stripes), leave this buoy close-to on either hand and steer **N. ½ W. Westerly,** heading for the Main Ship Channel Range. On this course leave red buoys Nos. 2 and 4 on the starboard hand and black buoys Nos. 1 and 3 on the port hand. Eastern Triangle Beacon Light* should be a little on the starboard bow and be left on the starboard hand. When about ⅜ mile northward of Eastern Triangle Beacon Light,* and Sand Key Lighthouse bears **SW. Southerly,** change the course to **NW.** by **N.** Anchor a little over ¼ mile southward of red buoy No. 6, with Key West Lighthouse bearing about **NNE.**

If of less than 21 feet draft, continue the **NW.** by **N.** course; leave red buoy No. 6 about 200 yards on the starboard hand; from this buoy follow the directions in section 1 preceding.

Remarks.—On the **N. ½ W. Westerly** course, Fort Taylor should be a little on the port bow and the western shore of Key West Island be ahead. The front beacon of the Main Ship Channel Range is a white pyramidal framework on the shore end of the wharf which runs out to Fort Taylor; the rear beacon of the range is a platform, with a white vertical stripe, on the ridge of the buoy shed on the Lighthouse Establishment wharf. Both of these beacons show a red light at night. When the buoys are made the vessel should head fair between them on this course. The channel is very narrow between buoys Nos. 3 and 4. On the **NW.** by **N.** course red buoy No. 6 should be on the starboard bow, and the red and black horizontally striped buoy on Raleigh Rock is left well on the starboard hand.

If bound to the anchorage off the Lazaretto or to the city wharves see the remarks and dangers under section 1 preceding.

At night for vessels of less than 15 feet draft.—Keep in the white rays of Sand Key Light until Key West Light bears about **N. ¼ W.** Steer for Key West Light on this bearing, taking care to keep on the edge of the red sector in the light until the two red lights of the Main Ship Channel Range are in line; then stand in on the range, course **N. ½ W. Westerly,** and keep a sharp lookout also so as not to foul the buoys. When Sand Key Light has changed from red to white and Eastern Triangle Beacon Light* has been passed, steer **NW.** by **N.** until Key West Light changes from white to red. Then change the course to **N.** by **E. ¾ E.** and anchor off the Lazaretto in 4 to 5 fathoms of water.

Remarks.—These directions, while heading for Key West Lighthouse, lead near several spots with 17 feet of water over them. On the **NW.** by **N.** course red buoy No. 6 is left about 250 yards on the starboard hand, and the vessel will be in the white rays of Key West Light. On the **N.** by **E. ¾ E.** course a red sector in Key West Light will be crossed; a part of the time the light may be obscured by Fort Taylor, and just before the light clears the north end of Fort Taylor black buoy No. 11 should be left 100 yards on the port hand. When the light bears **E.** by **N.** red buoy No. 8 should be 150 yards on the starboard beam. Care must be taken not to foul the outer mooring buoy, No. 5.

1 C. ***Entering by the Rock Key Channel.—In the daytime, with a smooth sea, for vessels of less than 15 feet draft.***—When a little over ½ mile eastward of Sand Key Lighthouse with it bearing northward of **W.**, bring Middle Ground beacon "**3**," which is 1¾ miles **N.** by **W.** from the lighthouse, to bear **NNW. ½ W.**; steer for the beacon

* This beacon has not yet been lighted.—(April, 1901.)

on this bearing, and when Sand Key Lighthouse bears **S.** $\frac{3}{8}$ **W.** and the beacon is $\frac{3}{4}$ mile distant ahead, steer **NNE.** $\frac{1}{8}$ **E.** heading for the northwest end of Key West Island. Leave Eighteen-foot Shoal buoy (red, No. 8) about 200 yards on the starboard hand and continue on the course to the anchorage off the Lazaretto, taking care to leave the buoys on the side indicated by their color.

Remarks.—There is a spot with 15 feet and several with 17 feet of water over them lying on both sides of the channel, and as they are not marked great care is necessary while standing on the bearing of the beacon and when the course is changed to **NNE.** $\frac{1}{8}$ **E.**

1 D. ***Entering by the Sand Key Channel.—In the daytime, with a smooth sea, for vessels of less than 18 feet draft.***—Being southwestward of Sand Key Lighthouse, as soon as Western Dry Rocks beacon "**2**," is made bring it to bear **W.** distant $\frac{5}{8}$ mile. From this position steer **N.** by **E.** $\frac{1}{4}$ **E.**, with West Crawfish Key directly ahead. When Key West Lighthouse bears **NE.** $\frac{3}{4}$ **E.**, steer for it on the bearing until the buoy off Whitehead Spit (red, No. 6) is about 2 points forward of the starboard beam, then haul up to **N.** by **E.** $\frac{1}{2}$ **E.** and stand for the anchorage off the Lazaretto, leaving black buoy No. 11 on the port and red buoy No. 8 on the starboard hand.

Remarks.—On the **N.** by **E.** $\frac{1}{4}$ **E.** course red buoy No. 4 and a red and black horizontally striped buoy will be left nearly $\frac{1}{4}$ mile on the port hand. **West Crawfish Key** is the smallest and most southern of the three keys closest westward of Key West Island. When standing for the key East Crawfish Key will be open to the eastward and Snipe Key to the westward; both these keys are more distant than West Crawfish Key. A shoal extends $\frac{1}{8}$ mile to the westward from Middle Ground beacon "**3**"; to avoid it the beacon should be left 1 mile or more on the starboard hand. On the **NE.** $\frac{3}{4}$ **E.** course, with Key West Lighthouse ahead, beacon "**3**" should be $\frac{3}{4}$ mile on the starboard hand when abeam, red buoy No. 6 is left on the starboard hand, and $2\frac{1}{4}$ miles farther on this course black buoy No. 7 is left on the port hand.

In the daytime or at night, with clear weather, for vessels of less than 14 feet draft.—Bring Sand Key Lighthouse to bear **ENE.** $\frac{1}{4}$ **E.** distant about $1\frac{1}{2}$ miles, and if Key West Lighthouse can be seen (it will be distant a little over 8 miles), steer for Key West Lighthouse, course **NE.** $\frac{1}{2}$ **N.** Keep the lighthouse close on this bearing until the buoy off Whitehead Spit (red, No. 6) is about $\frac{5}{8}$ mile distant ahead; then steer **N.** by **E.** $\frac{1}{2}$ **E.** and stand for the anchorage as directed in the first paragraph of this section.

Remarks.—On the **NE.** $\frac{1}{2}$ **N.** course for Key West Lighthouse beacon "**3**," should be $\frac{5}{8}$ miles distant when on the port beam, and the sailing line passes close to a 15-foot spot and two 17-foot spots. Red buoy No. 2 which is about $\frac{1}{4}$ mile northward of Sand Key Lighthouse, should be left nearly $\frac{1}{4}$ mile on the starboard hand, and red buoy No. 8 should be left about 200 yards on the starboard hand when it is passed.

1 E. ***Entering by the Southwest Channel.—In the daytime to carry a depth of 30 feet.***—As soon as Sand Key Lighthouse is sighted bring it to bear **E.** by **N.** and steer for it on this bearing. When the lighthouse is $6\frac{1}{4}$ miles distant ahead on this bearing, Vestal Shoal buoy (can, black, No. 1) should be a little over $\frac{1}{4}$ mile on the port beam. Continue on for the lighthouse $\frac{3}{4}$ mile farther, and then steer **NE.** $\frac{5}{8}$ **E. Easterly.** Leave Satan Shoal buoy (can, red and black horizontal stripes) about 200 yards on the starboard hand and red buoys Nos. 2 and 4 about 400 yards on the starboard hand. Parsonage Shoal buoy (nun, red and black horizontal stripes), which will be made ahead, should be left 100 yards on the starboard hand while heading for Key West Lighthouse. After passing this buoy continue on the **NE.** $\frac{5}{8}$ **E. Easterly** course with Key West Lighthouse ahead and pass red buoy No. 6, leaving it 500 yards on the starboard hand when abeam. When Middle Ground beacon "**3**" is in range with Sand Key Lighthouse bearing **S.** by **E.** steer **NE.** by **E.** $\frac{1}{2}$ **E.** for $3\frac{1}{4}$ miles; the East Martello tower should be ahead on this course. Just before the northwestern corner of Fort Taylor comes in range with the Lazaretto steer **NNE.** $\frac{3}{4}$ **E.** for the Lazaretto, keeping it slightly open northward of Fort Taylor.

If over 21 feet draft, when the buoy off Whitehead Spit (red, No. 6) is about $\frac{1}{2}$ mile distant off the starboard bow, haul eastward and pass a little over $\frac{1}{4}$ mile southward of the buoy, then anchor in 5 fathoms of water.

If less than 21 *feet draft* continue on the **NNE.** $\frac{3}{4}$ **E.** course until a **N.** by **E.** $\frac{1}{4}$ **E.** course will lead about 150 yards eastward of black can buoy No. 11, then steer that course and anchor in 4 to 5 fathoms of water off the Lazaretto.

Remarks.—On the **NE.** $\frac{5}{8}$ **E. Easterly** course two black buoys, marking shoals, will be seen some distance northward of the sailing line. There is 19 feet of water on Parsonage Shoal, and the buoy, which is placed on the middle of it, can be left on either hand, giving it a berth of 100 yards; it is said that the best water is southward of the buoy. There are several 17-foot spots about $\frac{1}{4}$ mile westward of Parsonage Shoal buoy. On the **NE.** by **E.** $\frac{1}{2}$ **E.** course West Crawfish Key Bank buoy (can, black, No. 7) will be left $\frac{1}{2}$ mile on the port hand. (See also the dangers under section 1, on page 34.)

1 F. ***Entering by the West Channel.—In the daytime for vessels of less than 17 feet draft.***—Passing about $3\frac{1}{4}$ miles south of Marquesas Keys steer **E.** $\frac{1}{4}$ **N.** so as to pass about 2 miles southward of Boca Grande and Man Keys. As soon as entrance to West Channel buoy (can, white and black perpendicular stripes) is made steer for it. Leave this buoy close-to on either hand and steer **ENE.** $\frac{5}{8}$ **E.** until up to West Crawfish Key Bank buoy (can, black, No. 7). Pass 400 yards southward of this buoy, and when it is in range with Northwest Passage Lighthouse on a **NNW.** bearing, steer for Key West Lighthouse, course about **NE.** $\frac{1}{2}$ **E.** until a **NNE.** course will lead eastward of black buoy No. 11 and clear the wharves of the city. Then steer **NNE.** and anchor off the Lazaretto in 4 to 5 fathoms of water.

Remarks.—The Marquesas Keys must be given a berth of at least 3 miles while southward of their eastern end. The **E.** $\frac{1}{4}$ **N.** course should lead about $\frac{1}{2}$ mile southward of South buoy (can, white and black perpendicular stripes), which marks the southern entrance of the Boca Grande Channel. When **Boca Grande Key**, the first key eastward of Marquesas Keys, is abeam and about 2 miles distant the entrance to West Channel buoy should be 2 miles distant ahead. The city of Key West is 9 miles distant in a straight line from this buoy. The **ENE.** $\frac{5}{8}$ **E.** course leads about $\frac{3}{4}$ mile southward of the large shoal which lies between Key West Island and Marquesas Keys. When standing for Key West Lighthouse the red buoy off Whitehead Spit will be made on the starboard bow. (See the dangers under section 1, page 34.)

1 G. ***Entering by the Northwest Channel.—In the daytime for vessels of less than 10 feet draft.***—When Northwest Passage Lighthouse is about 5 miles distant bring it to bear **S.** and steer for it on this bearing until up to the entrance bell buoy. Turning Point beacon (red, square, pyramidal structure) will then be in range with Sand Key Lighthouse. Steer for the beacon, keeping it in range with Sand Key Lighthouse, and pass between the red buoys and black buoys which mark the channel over the bar; when the beacon is about 250 yards distant ahead steer **SE.** $\frac{1}{2}$ **E.** with Key West Lighthouse a very little on the starboard bow. Leave Middle Mid-channel buoy (nun, white and black perpendicular stripes) close-to on either hand and from this buoy steer directly for Key West Lighthouse. Leave black can buoy No. 7 about 150 yards on the port hand and from it steer **SSE.** $\frac{7}{8}$ **E.**, leaving black can buoy No. 9 about 300 yards on the port hand and heading directly for Inner Mid-channel buoy (nun, white and black perpendicular stripes). Leave the latter buoy close-to on either hand and steer **SE.** by **E.** so as to pass southward of black can buoy No. 13. Passing southward of this buoy haul up more to the eastward and anchor, or stand for the city wharves, leaving black can buoy No. 15 on the port hand.

Remarks.—The range of Turning Point beacon and Sand Key Lighthouse leads through the dredged channel, which had a depth of about 11 feet in 1900. The range can only be seen on a clear day; at other times the buoys on both sides of the dredged channel must be the guides. From Turning Point beacon, on the **SE.** $\frac{1}{2}$ **E.** course, Key West Lighthouse should be nearly ahead and the Middle Mid-channel buoy should be made directly ahead. Above this buoy it is only necessary to keep a sharp lookout for the buoys and leave them on the proper side. A wreck, marked by a red and black horizontally striped buoy, lies on the Middle Ground about $\frac{3}{4}$ mile **SE.** by **E.** $\frac{1}{2}$ **E.** from Inner Mid-channel buoy, but this wreck buoy should be left well on the port hand. When standing to pass southward of black buoy No. 13, the vessel will cross the southern end of the Middle Ground in about 16 feet of water. (See also the dangers under section 1, page 34.)

SAILING DIRECTIONS, LEAVING KEY WEST HARBOR.

These directions are for vessels bound to the westward or into the gulf, each channel being treated in a separate section (see also the descriptions of the channels on pages 32, 33). The draft for which these directions are written is intended for comparatively smooth water; allowance must, therefore, be made in case there is a heavy swell on the reefs. No stranger should attempt to beat in or out of Key West Harbor without a pilot.

1. ***Leaving by the Main Ship Channel.—In the daytime, for vessels of less than 26 feet draft.***—Bring red buoy No. 6, off Whitehead Spit, to bear **NE.**, distant 300 yards, and steer **SE.** by **S.** for 1¼ miles, leaving a red and black horizontally striped nun buoy about 500 yards on the port hand; when on the Main Channel Range, change course to **S. ½ E. Easterly,** heading so as to pass midway between buoys Nos. 3 and 4, leaving East Triangle beacon on the port hand and pass midway between Nos. 1 and 2. Continue the course, heading directly for the Entrance buoy, which should be left close-to, and when ½ mile southward of this buoy steer **SW.** by **W. ¼ W.** until Sand Key Lighthouse bears **N.** by **W.** and is distant 1½ miles; then—

If desiring to enter the Gulf westward of Rebecca Shoal, make good a **W. ¼ S.** course for 35 miles and then a **NW. ¾ N.** course for 11 miles; this will lead to a point about 2 miles **W.** from Rebecca Shoal Lighthouse (see table, page 10).

If desiring to enter the Gulf westward of Dry Tortugas, make good a **W. ¼ S.** course for 35 miles and then a **WNW. ¾ W.** course for 24¼ miles; Dry Tortugas Lighthouse will then bear **N. ¼ E.**, distant nearly 5 miles. From this position steer **NW. ½ N.** for 6¼ miles; Dry Tortugas Lighthouse will then bear **E.**, distant 4 miles.

Remarks.—In the daytime, with clear weather, no difficulty should be experienced in carrying a depth of 27 feet through this channel. When standing on the **S. ½ E. Easterly** course the vessel should head fair between buoys Nos. 3 and 4 and be on the Main Ship Channel Range (see table, page 10).

The **W. ¼ S.** course leads a little over 1 mile outside the 5-fathom curve which extends along the reefs to the westward of **Vestal Shoal.**

1 A. ***Leaving by the Rock Key Channel.—In the daytime, for vessels of less than 15 feet draft.***—From black buoy No. 11, in the harbor, steer **SSW. ⅞ W.**, keeping the ends of the wharves at the northwestern part of Key West over the stern. Leave red nun buoy No. 8 about 300 yards on the port hand and continue the course until Middle Ground beacon "**3**," which is 1¾ miles **N.** by **W.** from Sand Key Lighthouse, bears **NNW. ½ W.**; then steer **SSE. ½ E.** with beacon "**3**" over the stern, and when the lighthouse bears **W.** steer about **S. ½ W.** until the lighthouse bears **N.** by **W.** and is distant about 1½ miles.

Then, *if bound westward into the Gulf*, follow the directions in either of the last two paragraphs in section 1, preceding.

Remarks.—There are a number of unmarked spots near the sailing line, with 15 to 17 feet of water over them, and the directions must be closely followed to avoid them. (See also remarks for the **W. ¼ S.** course in section 1, preceding.)

1 B. ***Leaving by the Sand Key Channel.—In the daytime, for vessels of 18 feet or less draft.***—Bring Key West Lighthouse to bear **NE. ¾ E.** and steer **SW. ¾ W.**, keeping the lighthouse on the bearing astern. When Sand Key Lighthouse bears abeam, steer **S.** by **W. ¼ W.**, with West Crawfish Key directly astern; pass a little over ½ mile eastward of beacon No. 2. Bring the beacon to bear **N.**, distant 1¼ miles, and follow the directions in either of the last two paragraphs in section 1, preceding, but the **W. ¼ S.** course should be made good only for a distance of 32 miles.

Or, *vessels of less than 14 feet draft* can bring Key West Lighthouse to bear **NE. ½ N.** and steer **SW. ½ S.**, keeping the bearing close over the stern, and leaving red buoy No. 8 about 150 yards on the port hand, beacon No. 3 about ½ mile on the starboard hand, and

Sand Key Lighthouse ¾ mile on the port hand. Beacon No. 2 should be left a little over ¾ mile distant when on the starboard beam. When this beacon bears **N.**, distant about 1¼ miles, follow the directions in either of the last two paragraphs in section 1, preceding, but the **W.** ¼ **S.** course should be made good for a distance of only 32 miles instead of 35 miles.

Remarks.—On the **SW.** ¾ **W.** course, with Key West Lighthouse astern, black can buoy No. 7 should be left ¼ mile on the starboard hand and red can buoy No. 6 about ¼ mile on the port hand. The red and black horizontally striped nun buoy on Parsonage Shoal should be about ¾ mile distant ahead just before the course is changed to **S.** by **W.** ¼ **W.** (See also remarks under section 1 D, page 40.) On the latter course red nun buoy No. 4 and beacon No. 2 are left about ½ mile on the starboard hand when they bear abeam.

On the **SW.** ½ **S.** course, with Key West Lighthouse astern, the sailing line passes over some spots with 17 feet over them and close to a 15-foot spot which lies 800 yards **SSE.** ½ **E.** from beacon No. 3. Red buoy No. 2, which lies about 800 yards **N.** by **W.** ½ **W.** from Sand Key Lighthouse, will be left ⅝ mile on the port hand when abeam.

1 C. ***Leaving by the Southwest Channel.—In the daytime, with clear weather, to carry a depth of 30 feet.***—When near red buoy No. 6, off Whitehead Spit, bring Sand Key Lighthouse to bear **SSW.** ¾ **W.** and steer for the lighthouse on this bearing till nearly 1¼ miles distant from the buoy; then shape a course **SW.** by **W.** ½ **W.** with the East Martello tower over the stern. When beacon No. 3 is in range with Sand Key Lighthouse, and red can buoy No. 6 is 700 yards distant, forward of the port beam, steer **SW.** ⅝ **W.** with Key West Lighthouse astern. Leave Parsonage Shoal buoy 100 yards on the port hand and red nun buoys Nos. 4 and 2 about 400 yards on the port hand. The red and black horizontally striped can buoy on Satan Shoal will be made on the port bow, and, when passing, it should be left over 200 yards on the port hand. Continue the course 2 miles after passing the latter buoy; the black can buoy on Vestal Shoal will then bear **N.**, distant 1 mile. From this position follow the directions in either of the last two paragraphs in section 1, preceding, but the **W.** ¼ **S.** course should be made good only for a distance of 28½ miles.

Or, *to carry a least depth of 24 feet*, bring Key West Lighthouse to bear **NE.** ⅝ **E. Easterly** over the stern and steer **SW.** ⅝ **W. Westerly,** taking care to keep the bearing. Leave black can buoy No. 7 on the starboard hand, distant ¼ mile, and red can buoy No. 6 on the port hand, distant ¼ mile. Parsonage Shoal buoy should be made ahead and left 100 yards on the port hand while passing. Continue the course, leaving the buoys as directed in the preceding paragraph, and when Vestal Shoal buoy bears **N.**, distant 1 mile, follow the directions in either of the last two paragraphs in section 1, preceding, but the **W.** ¼ **S.** course should be made good only for a distance of 28½ miles.

Remarks.—Clear weather and daylight are necessary to carry the above depths through this channel; there are several 17-foot spots northward of and close to the sailing line near Parsonage Shoal. The directions must be followed closely, and care taken to pass the buoys at the given distances. Unless the conditions are favorable, it can hardly be expected that Key West Lighthouse will be seen after passing Parsonage Shoal, or even as far as this.

1 D. ***Leaving by the West Channel.—In the daytime, for vessels of less than 17 feet draft.***—From black buoy No. 11 steer **SW.**; pass 400 yards southward of black can buoy No. 7 and, when this buoy is in range with Northwest Passage Lighthouse, steer **WSW.** ⅝ **W.**; this course continued for 5⅞ miles will lead to the white and black perpendicularly striped can buoy marking the entrance of West Channel; then—

If desiring to enter the Gulf near Rebecca Shoal, make good a **W.** ¼ **S.** course for 29¼ miles; then steer **NNW.** ¼ **W.** for 5 miles. Rebecca Shoal Lighthouse will then bear **W.**, distant about 2¾ miles. Or, after having made good the **W.** ¼ **S.** course for 29¼ miles, steer **NW.** by **W.** for 8¼ miles; Rebecca Shoal Lighthouse will then bear **E.**, distant about 2 miles.

The passage to the eastward of the shoal is not recommended.

If desiring to enter the Gulf westward of Dry Tortugas, make good a **W.** ¼ **S.** course for 29¼ miles; then make good a **W.** ⅝ **N.** course for 26 miles; Dry Tortugas Lighthouse will then bear **NNE.**, distant nearly 5 miles. From this position steer **NW.** ½ **N.** for 5 miles; the lighthhouse will then bear **E.**, distant 4 miles.

Remarks.—Standing on the **W. ¼ S.** course, and when about 6¼ miles westward of the buoy marking the entrance to the West Channel, the black and white perpendicularly striped can buoy marking the entrance to Boca Grande Channel should be left ½ mile on the starboard hand. The sailing line leads 2 to 2¾ miles northward of the buoys marking Coalbin and Marquesas rocks. Having made good the **W. ¼ S.** course for 29¼ miles, Rebecca Shoal Lighthouse should bear **NW.** and be 6¾ miles distant. The lighthouse may be approached as close as ¾ mile with 6 fathoms of water from any direction, but care must be taken to avoid Isaac Shoal. A red sector in Rebecca Shoal Light covers the shoals southward and eastward of Halfmoon Shoal, but there are several spots with 5¼ to 5½ fathoms just southward of the edge of the red sector.

The **W. ⅝ N.** course leads well southward of Dry Tortugas, and about ¾ mile southward of the Entrance buoy off the southwest channel of Tortugas Harbor.

The **NW. ½ N.** course leads 1¼ miles westward of the westernmost shoals and the large red nun buoy which marks them. (See also the general remarks on page 41.)

Dangers.—An unbroken line of reefs and shoals extends for a distance of 36 miles in a **W.** direction from Key West. **Boca Grande Channel**, which has a depth of 11 feet, is the only buoyed channel which leads across these shoals into the gulf. The western part of this line of shoals is known as **The Quicksands** and its extreme western end as **Halfmoon Shoal**; this last has a least depth of 6 feet and is marked off its western end by a red nun buoy marked "Halfmoon."

Isaac Shoal, a small 14-foot spot lies 1⅞ miles **SE. by E. ¾ E.** from Rebecca Shoal Lighthouse. This shoal is not marked except by the southerly edge of the red sector in Rebecca Shoal Light, which cuts its southern edge, and vessels entering or passing out of the gulf eastward of Rebecca Shoal should be careful to avoid it.

Rebecca Shoal extends ½ mile in a northerly and northwesterly direction and nearly ⅝ mile in an easterly direction from the lighthouse.

For the shoals of the Dry Tortugas, see heading Dry Tortugas.

1 E. ***Leaving by the Northwest Channel.—In the daytime, for vessels of less than 10 feet draft.***—Leaving black can buoy No. 13 on the starboard hand steer **NW.** by **W. ¼ W.** for 1¼ miles, heading directly for the Inner Mid-channel buoy (black and white perpendicular stripes). Passing close westward of this buoy steer **NW.** by **N.** for 1⅞ miles, leaving black can buoy No. 9 about ¼ mile on the starboard hand; when up to black can buoy No. 7, which must be left on the starboard hand, change course to **NW. ½ W.**, heading for Middle Mid-channel buoy (black and white perpendicular stripes). Run this course for 1⅝ miles, and when up to the buoy steer **NW. ⅝ W.** for a little over 1¾ miles, heading fairly between Turning Point beacon and black can buoy No. 5. When this buoy is abeam change course to **N. ⅞ W.**, heading for the bell buoy marking the entrance. This course lies about midway between the black can buoys No. 3 and 1, on the starboard hand, and the red nun buoys Nos. 4 and 2, on the port hand.

Remarks.—A wreck, marked by a red and black horizontally striped buoy, lies on the Middle Ground about ¾ mile **SE. by E. ¾ E.** from Inner Mid-channel buoy, and this wreck buoy should be left well on the starboard hand when on the **NW.** by **W. ¼ W.** course. Between black can buoy No. 7 and Turning Point beacon, Key West Lighthouse should be very nearly astern. The range of Turning Point beacon and Sand Key Lighthouse leads through the dredged channel, which has a depth of 10 feet. The range can be seen only on a clear day; at other times the buoys on both sides of the dredged channel must be the guides.

Dangers.—Middle Ground Shoal lies westward of the Island of Key West, distant about ½ mile. Its southeastern end forms the western boundary of the harbor. It is marked by three buoys: Inner Middle Ground buoy (black, No. 13), marking the passage through the Middle Ground; Middle Ground buoy (black, No. 9), on the western edge of shoal; and Northwest Middle Ground buoy (black, No. 7), in 21 feet of water, marking the northwestern end of shoal. These buoys must be left on the starboard hand when passing out of Key West Harbor.

BOCA GRANDE CHANNEL.*

This channel lies eastward of Marquesas Keys and forms a short cut from the Straits of Florida to the Gulf of Mexico. It has a least depth of 11 feet and is marked by 4 buoys, but is seldom used, as the Northwest Channel from Key West Harbor has nearly as deep water and cuts off more distance for vessels coming from or bound northward or eastward.

The buoys are the only aids and must be closely followed, as the channel leads close to the extensive shoals which make eastward from Marquesas Keys.

* Shown on chart 170, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS, BOCA GRANDE CHANNEL.

From the South buoy (can, black and white perpendicular stripes) steer **N.**, leaving Middle buoy (nun, red) about 200 yards on the port hand. Continue the **N.** course, leave Bar buoy (can, black) about 200 yards on the starboard hand and North Entrance buoy (can, black and white perpendicular stripes) about 300 yards on the starboard hand.

Remarks.—Passing through the channel from northward, reverse the directions.

GENERAL REMARKS.—KEYS AND REEFS WESTWARD OF KEY WEST.

Extending in a **W.** ½ **S.** direction for a distance of nearly 18 miles from the Marquesas Keys, are the extensive shoals known as "**The Quicksands.**" The general width of these shoals is about 4½ miles between the 18-foot curve, and in spots depths of from 2 to 6 feet have been found on them. At the western end of "The Quicksands" is Half Moon Shoal, with a depth of 6 feet on it, and marked off its western end by a red nun buoy. This buoy is about 6¼ miles **E.** ¾ **S.** from Rebecca Shoal Lighthouse.

Within a radius of 2¾ miles from the buoy on Half Moon Shoal, and between the bearings of **W.** and **SSW.** from it, are a number of spots with about 32 feet of water over them. This locality should be approached with caution by deep-draft vessels, as there may be other spots of even less depth in this vicinity.

Southward of the reefs and shoals which extend westward from Key West to Rebecca Shoal, are numerous spots with less than 6 fathoms over them. These spots extend in a **W.** ⅜ **S.** direction from Sand Key Lighthouse for a distance of 30 miles, and are the extension of the Florida Reefs westward of Sand Key; of these Satan Shoal, Vestal Shoal, Coalbin Rock, Cosgrove Shoal, and Marquesas Rock are the best known and most dangerous. The average distance that this line of reefs lies southward of the main reefs is about 5½ miles; there may be, and probably are, shoaler spots on or near the line of these reefs. It is advisable for deep-draft vessels, when standing westward of Key West, and if bound into the Gulf of Mexico, to lay a track that will carry them at least 7 miles southward of the Marquesas Keys and "The Quicksands," and not to stand northward until Rebecca Shoal Lighthouse bears northward of **NW.**

Deep-draft vessels should be cautious about passing between Half Moon Shoal and Rebecca Shoal. The channel between Rebecca Shoal and the Dry Tortugas is clear, but irregular soundings of 6½ to 7¾ fathoms, with surrounding depths of 10 and 11 fathoms, are found as far as 8¼ miles southwestward of Rebecca Shoal. A sounding of 6½ fathoms is shown 3¼ miles **SW.** by **W.** ¾ **W.** from Rebecca Shoal Lighthouse, and 6¾ fathoms nearly ½ mile farther on the same bearing; while a sounding of 7¼ fathoms is shown 8¼ miles **SW.** ½ **S.** from the lighthouse. Vessels of the deepest draft should avoid these spots, as there may be others with less water over them in this vicinity.

The part of the Gulf of Mexico lying immediately northward of the keys and reefs which extend westward from Key West, as far as known, has a fairly regular bottom until the keys and reefs are approached. Northward of "The Quicksands" and the Dry Tortugas, the depths inside the 10-fathom curve change abruptly in places.

New Ground is about 5½ miles long in a general **E.** by **N.** and **W.** by **S.** direction and has an average width of ⅝ mile; it has depths of 8 to 16 feet on it and its western end, which is marked by a red buoy, lies 9¼ miles **NE.** ¾ **E.** from Rebecca Shoal Lighthouse. The water shoals abruptly on the north side of this shoal; on the southern side of the New Ground, between it and "The Quicksands," is a channel 2¼ miles wide and having a depth of 4¾ to 7 fathoms.

Spots having 19 to 22 feet of water over them are found 4 and 7 miles eastward of the New Ground, and not far inside the 10-fathom curve. These spots should be looked out for by vessels desiring to pass between "The Quicksands" and the New Ground.

Standing eastward toward the coast of Florida and into Florida Bay, the water shoals gradually and regularly and no shoal spots have been found that vary much from the surrounding depths.

THE DRY TORTUGAS.*

This is a group of reefs and keys about 11 miles long, in a general **NE.** by **E.** and **SW.** by **W.** direction, and about 5 miles wide, lying 58 miles **W.** from Key West. The eastern end of this group is 12 miles northwestward of Rebecca Shoal Lighthouse; in general they rise abruptly from deep water and are irregular in form, with channels between them. The keys, only eight of which now show above high water, are low, but **Fort Jefferson** and **Tortugas Harbor Lighthouse**, on Garden Key, and **Dry Tortugas Lighthouse** (see table, page 10), on Loggerhead Key, form good landmarks which can be seen at a distance of 10 to 12 miles on a clear day and 13 to 18 miles on a clear night.

Tortugas Bank, which has a least depth of 6¼ fathoms over it, lies 7¼ miles westward from Dry Tortugas Lighthouse. This bank has a diameter of about 2¼ miles, and on it there are spots with less than 8 fathoms of water, but between it and the Dry Tortugas the depth ranges from 10 to 19 fathoms.

Prominent Features.—**Fort Jefferson** is a large brick fort on **Garden Key** and 2¼ miles E. from Dry Tortugas Lighthouse; just inside of the southeastern angle of the fort is Tortugas Harbor Lighthouse, and the Naval Coal Depot is at the south side of the fort; this, together with the fort, has the appearance of a bare rocky island when seen from a distance. **Loggerhead Key** is the largest and westernmost of the keys and is marked by **Dry Tortugas Lighthouse.** **East Key** is the easternmost of the group and lies 4 miles **NE.** by **E.** ¼ **E.** from Fort Jefferson; this key shows well when approaching from the eastward. **Bird Key** is a small key lying ¾ mile **SW.** by **W.** from Fort Jefferson. The other keys of the group are small and not readily distinguished from a distance.

When approaching Dry Tortugas from eastward or southeastward the lead will be of but little use to give warning of danger, 10 fathoms being, in many places, found close to the reefs. Approaching from the northwestward or southwestward the water shoals more gradually, but in thick weather a depth of 10 fathoms is as close as any vessel should approach unless sure of her position.

Channels.—There are four buoyed channels leading into the anchorage.

1. **Southeast Channel** leads between the reefs making off eastward from **Garden** and **Bush** keys and those making off westward from **East, Middle,** and **Sand** keys. A least depth of 5¼ fathoms can be taken through this channel, but it is quite narrow. In the daytime, with clear weather and a smooth sea, no difficulty is experienced by vessels of 27 feet draft, as the principal dangers are marked by buoys.

2. **Southwest Channel** leads between the reefs making off southwestward and westward from Garden and Bird keys and those extending southwestward from Loggerhead Key. This channel has a least depth of 6 fathoms, and is marked by several buoys.

3. **Northwest Channel** leads between the detached reefs which lie northward of **Garden Key**; it has a depth of about 7 fathoms, and is marked at its northern entrance by a buoy which is 4⅛ miles distant from Fort Jefferson, but this channel is seldom used.

4. **New Northwest Channel** is just to the westward of the Northwest Channel and separated from the latter by a number of reefs and shoals. It is marked by a number of buoys and has a least depth of 6¼ fathoms. The entrance buoy for this channel bears **N.** by **W.** ¾ **W.**, distant 4¼ miles, from Tortugas Harbor Lighthouse.

Anchorages.—There are numerous places among the reefs where vessels may anchor and find shelter from winds from different quarters, according to circumstances. The anchorage affording best shelter from all winds, although somewhat open northward, is northward and northwestward of Garden Key; it has good holding ground and the depth ranges from 8 to 10 fathoms. This anchorage is reached from three different directions through buoyed channels which can be easily followed in the daytime in clear weather, but should never be attempted by a stranger at night.

Excellent anchorage for small vessels and boats is found in the deep water known as **Bird Key Harbor,** just eastward of Bird Key. **Tortugas Harbor,** the narrow channel through the reefs that surround Garden Key and which leads to the piers of the Naval Coaling Station, has been improved by dredging, and has a channel with a depth of 30 feet. Bird Key Harbor is entered from northward and is used principally by the fishermen who frequent these waters, in which there is an abundance of fish.

Storm-Warning Displays of the **United States Weather Bureau** are made on Garden Key and are visible to the shipping.

Quarantine.—The National Quarantine Station is now (April, 1901) at Key West. (See National Quarantines, Appendix IV.)

Pilots.—Vessels desiring pilots will usually find some competent fisherman near the reefs, or, one of the light keepers will come out to take a vessel to the anchorage.

Tides and currents.—See table, page 24, and remarks, pages 25, 26.

*Shown on charts 171, scale $\frac{1}{80,000}$, price $0.50; 171a, scale $\frac{1}{40,000}$, price $0.50.

SAILING DIRECTIONS, TORTUGAS ANCHORAGE.

The directions in sections 1, 1 A, and 1 B, are good for the deepest draft vessels to an anchorage about ⅝ mile northwestward of Fort Jefferson. The directions in 1 C should not be attempted by vessels of over 17 feet draft. The directions in section 2 are good for large vessels and lead to the coal piers in Tortugas Harbor. Strangers should not attempt to enter at night.

1. *Entering by the Southeast Channel.*—I. *From the Eastward.*—When Tortugas Harbor Lighthouse is made bring it to bear **WNW.** and steer for it on this bearing until it is 2⅛ miles distant ahead, and red nun buoy No. 2 is abaft the starboard beam, distant about ¾ mile; then steer **NW. ¾ N.** and leave red buoys Nos. 2½ and 4 about 150 yards on the starboard hand, and the red and black horizontally striped buoy on Iowa Rock 150 yards on the port hand. Then steer **WSW. ¾ W.**, heading for Dry Tortugas Lighthouse, for about ¾ mile, and when Bird Key (the small key ¾ mile southwestward of Fort Jefferson) bears about **S.**, anchor in about 10 fathoms of water.

Remarks.—The **WNW.** course leads well southward of the shoals on the eastern side of the channel. On a clear day the shoals can be readily distinguished by the discolored water.

On the **NW. ¾ N.** course two red buoys should be a little on the starboard bow; the shoals on the western side of the channel, extending nearly 3 miles southward from black buoy No. 3, rise abruptly from deep water, and are marked by discolored water. The channel, with a greater depth than 36 feet, is about 350 yards wide; but there are two spots in the channel with 5¼ and 5½ fathoms, respectively, over them.

The **WSW. ¾ W.** course heads for Dry Tortugas Lighthouse and leads about 500 yards northward of black can buoy No. 3 and the buoy marking Iowa Rock, and about 500 yards southward of the red and black horizontally striped nun buoy on the Middle Ground; black can buoy No. 5 will be left about 700 yards on the port hand. A detailed description of all the shoals would only be confusing to the navigator; while following the directions in clear weather the shoals closest to the sailing lines can be located and avoided by the discolored water over them, but the shoals with depths of over 18 feet can not be so distinguished. Iowa Rock has 21 feet of water over it.

II. *From the Southward.*—While still over 3 miles southward of Tortugas Harbor Lighthouse bring it to bear **NNW.** and steer for it on this bearing until black can buoy No. 1 bears **W.**, distant ¾ mile; then steer **N.** by **E. ½ E.**, until Dry Tortugas Lighthouse (on Loggerhead Key) is in line with the south bastion of Fort Jefferson; then steer **NW.** by **N.** Leave red buoys Nos. 2½ and 4 about 150 yards on the starboard hand and a red and black horizontally striped buoy about 150 yards on the port hand, and when Dry Tortugas Lighthouse bears **WSW. ¾ W.** steer for it on this bearing; anchor when Bird Key bears **S.**

Remarks.—Steering for Tortugas Harbor Lighthouse on the **NNW.** course black can buoy No. 1 will be made on the port bow; a large red nun buoy lying 1⅝ miles **WSW. ¼ W.** from the black can buoy may possibly be seen nearly off the port beam.

On the **N.** by **E. ¼ E.** course the edge of the shoals which lie eastward and southward of Fort Jefferson will be clearly defined, but the sailing line on this course does not lead closer to them than ¾ mile. (See also the remarks under paragraph I, preceding.)

1 A. *Entering by the Southwest Channel.—From the Southward or Westward.*—From the southward, while Dry Tortugas Lighthouse is still over 5 miles distant, bring it to bear **N.** by **E. ¼ E.** and steer for it. From the westward, while Tortugas Harbor Lighthouse is still over 5 miles distant, bring it to bear **NE.** by **E. ¼ E.** and steer for it.

While steering for one of the lighthouses as directed above, watch the bearing of the other lighthouse, and when it bears four points on the bow change course to **NE. ½ N.**; this course should lead fair for the Channel buoy, which should be left close-to on either hand. Continue the **NE. ½ N.** course, leaving black can buoy No. 3 on the port hand, and red buoy No. 4 on the starboard hand. When Bird Key bears abeam, steer **NE.** by **E. ½ E.**; when Bird Key bears **S.** anchor in about 10 fathoms of water.

Remarks.—Vessels of over 20 feet draft should follow the sailing lines closely, and special care should be taken before coming to the Channel buoy not to approach too closely the shoals on the west side of the channel;

black buoy No. 1 should be given a berth of 600 yards. The narrowest part of the channel is abreast black buoy No. 3, where it is only ¼ mile wide.

Depths of 5 to 6 fathoms are found 5 miles **SW.** by **S.** from Tortugas Harbor Lighthouse and about 2 miles outside of Tortugas Sea buoy; northward of the latter the shoals are clearly defined by discolored water. Shoals with a greatest depth of 10 feet extent for 2½ miles **SW.** by **W.** from Dry Tortugas Lighthouse; a little over ¼ mile outside of these shoals is Loggerhead Reef buoy. On the **NE.** ½ **N.** course, when close to the Channel buoy (nun, white and black perpendicular stripes), the edge of the shoal to the eastward, which has 5 to 8 feet of water over it, will be seen; this shoal is steep-to on its northern end, where the channel is narrowest, and can be approached as close as 100 yards.

1 B. ***Entering by the New Northwest Channel.***—When 6 miles northward of Tortugas Harbor Lighthouse, bring it to bear **S.** by **E.** ⅞ **E.** and steer for it on this bearing. When up to the Entrance buoy (can, white and black perpendicular stripes) leave it close-to on either hand and steer **SE.** by **S.** Leave red nun buoy No. 2 about 400 yards on the starboard hand, black can buoy No. 1 about 200 yards on the port hand, and the red and black horizontally striped buoy on Texas Rock about 150 yards on the starboard hand; when the latter buoy has been passed steer for Tortugas Harbor Lighthouse and leave red nun buoy No. 4 about 400 yards on the starboard hand. When abreast of the latter buoy, and Bird Key bears **S.**, steer for the key on this bearing, leaving the buoys on the hand designated by their color. When Dry Tortugas Lighthouse bears about **W.** by **S.** anchor in about 10 fathoms of water.

Remarks.—The principal shoals on both sides of this channel are marked by buoys; as buoys do not retain their color long in this locality, the shape of a buoy is its most easily distinguished feature. The buoys to be left on the starboard hand when entering are nun-shaped, those on the port hand can-shaped. The Entrance buoy is a large can. On the **SE.** by **S.** course Sand Key, a small low islet, will be on the port bow, and Texas Rock buoy (can, red and black horizontal stripes) should be ahead; this buoy is left about 150 yards on the starboard hand. Bird Key, which lies southwestward of Fort Jefferson, will easily be distinguished by a building on it. On a clear day the larger shoals on both sides of the channel may be readily seen and avoided. Texas Rock has 18 feet of water over it.

1 C. ***Entering by the Northwest Channel.***—While still more than 6 miles northward of Tortugas Harbor Lighthouse bring it to bear **S.** ¾ **E.** and steer for it on this bearing. Keep a sharp lookout ahead for the white and black perpendicularly striped nun buoy marking the entrance, and when the buoy is made steer for it; pass close to the buoy on either side and steer **SE.** nearly 2¼ miles; when Tortugas Harbor Lighthouse bears **S.** by **W.** ¾ **W.** steer for the lighthouse on this bearing. Leave the red and black horizontally striped nun buoy, on the Middle Ground, a little over ¼ mile on the starboard hand, and when this buoy is well on the quarter and Dry Tortugas Lighthouse bears **WSW.** ¾ **W.** steer for the latter on this bearing. When Bird Key bears **S.** anchor in about 9 fathoms of water.

Remarks.—The entrance buoy should be made ahead on the **S.** ¾ **E.** course; on a clear day the shoals will show discolored water. The course leads about midway between two shoal spots having 13 and 15 feet of water on them respectively.

On the **SE.** course Middle Key, a low, bare islet, will be a little on the port bow.

The **S.** by **W.** ¾ **W.** course leads between shoals which will be left a little over ¼ mile on either side of the sailing line. Middle Ground buoy (red and black, horizontal stripes) will be left on the starboard hand and several buoys will be made on the port bow; the channel, with a depth of over 5 fathoms, is nearly ½ mile wide between the buoys.

On the **WSW.** ¾ **W.** course the edge of the shoals and black can buoy No. 5 will be left about ¼ mile on the port hand; these shoals rise abruptly from deep water and their edges can be closely approached.

2. ***To the coal piers in Tortugas Harbor.***—Having followed the directions in either section 1, 1A, 1B, or 1C, bring Tortugas Harbor Lighthouse to bear **S.** by **E.** ¼ **E.**, distant about ¾ mile; then steer for the lighthouse; pass 30 yards westward of black can buoy No. 5; follow the edge of the shoals on the port hand until up to the coal piers.

Or, from the anchorage northwestward of Tortugas Harbor Lighthouse, vessels of less than 12 feet draft can steer about **SE.** by **S.**, heading for the red and black horizontally

striped nun buoy on Eight-foot Shoal. Leave this buoy 75 yards on the starboard hand and follow the edge of the shoal on the port hand, which will show, giving it a berth of 30 to 40 yards until up to the coal piers.

Remarks.—Tortugas Harbor.—The slue separating Garden Key from the shoals eastward, southward, and southwestward, has been improved by dredging and, except at its western end, is 300 feet wide with a depth of 30 feet; it is distinctly marked in clear weather by the shoals on both sides, which have from 1 to 8 feet of water over them. A vessel entering the harbor must be guided entirely by the eye. In entering either from northward or westward the edge of the shoals on the port hand should be followed, and in leaving the anchorage the edge of the shoals on the vessel's starboard hand should be followed.

FLORIDA BAY*

is the large, shallow body of water lying between the south coast of the mainland of Florida and the Florida Keys and extending, in an **E.** and **W.** direction, from Cape Sable to Barnes Sound. The eastern and greater part of this bay is full of ridges and reefs which show bare, or nearly bare, and there are also a large number of small wooded keys; this part is only navigable for small flat-bottomed craft. The western part is comparatively clear, the depth of water ranging from 7 to 13 feet, and vessels of 7 feet draft, bound to the Gulf of Mexico from the Hawk Channel can enter the bay of Florida through **Moser Channel** instead of passing through Key West Harbor, and thus shorten the distance to Cape Romano and Cape Sable by about 45 and 70 miles respectively; but the passage through Moser Channel requires some local knowledge, as there are no aids to assist a stranger. The bay is only frequented by spongers, fishermen, and the inhabitants of the keys, who generally use flat-bottomed craft of 3 to 4 feet draft. There are no towns or villages on the shores of the bay.

COAST FROM CAPE SABLE TO CAPE ROMANO.†

Cape Sable, the southwestern point of the mainland of Florida, is low and wooded, and has three points known, respectively, as **East Cape, Middle Cape**, and **Northwest Cape**. From the latter cape the shore trends about **N.** for 25 miles and then about **NW.** for 26 miles to Cape Romano, and for the greater part of this distance is broken by innumerable low islands and keys between which a net work of rivers and bayous lead to the interior. To a stranger the shore presents no features by which to verify his position, the islands and keys being generally wooded and similar in appearance. The only settlement on this stretch of the coast is the post village of **Chokoloskee**, which is about 2 miles up a bayou the entrance to which is 15½ miles southeastward of Cape Romano. For a distance of 10 miles from the shore the water is shoal; 2½ miles from shore the depth is about 7 feet. The best depths that can be taken into any of the rivers and bayous are from 5 to 7 feet, but this part of the coast is visited only occasionally by small craft from Key West and Marco; these vessels seek shelter from gales by entering the rivers or bayous, or, they run inshore as close as their draft will permit and anchor where they find soft bottom.

Shark River empties into the gulf from the southeastward; its entrance, which is about 7 miles to the northward of Northwest Cape, is obstructed by shoals through which a channel with a depth of 7 feet leads into the river, where there is good anchorage for small vessels.

Cape Romano is the southern point of a large island which lies 40 miles **SSE. ¾ E.** from Sanibel Island Lighthouse and 75 miles **N. ¼ E.** from Northwest Passage Lighthouse; here the coast changes its trend from **NW.** by **W.** to **NNW.** Northward of Cape Romano the deep water approaches the shore much more closely than it does southward of the cape.

Cape Romano Shoals extend 10 miles in a general southerly direction from the cape; they consist of a number of irregular patches with 2 to 11 feet of water over them. These shoals are marked by a large red nun buoy ("Cape Romano," in large white letters) moored off their southern end in about 4 fathoms of water.

Cape Romano Anchorage is to the eastward of Cape Romano Shoal and affords a good anchorage in 12 feet of water; vessels of less draft can stand well up and anchor in 7 to 8 feet of water southeastward of the cape.

*Shown in parts on charts 167, 168, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on charts 172, 173, scale $\frac{1}{80,000}$, price of each $0.50.

CAXIMBA PASS*

is about 4 miles southward of Big Marco Pass; it extends in a general **E.** and **W.** direction and is about 4 miles long. The western entrance is about 3 miles to the southward of Big Marco Pass entrance and is obstructed by a bar, over which the channel depth is about 5 feet; this channel is not marked, and a stranger should not attempt to enter; local knowledge is necessary to keep in the channel. The pass is of little importance and used only by small local craft.

Persons acquainted with Caximba Pass can be found outside the pass, at Key West, or at Punta Rasa.

BIG MARCO PASS†

is 80 miles **N.** ¼ **E.** from Northwest Passage Lighthouse, 33 miles **SSE.** ⅝ **E.** from Sanibel Island Lighthouse, and about 7½ miles **NW.** ⅝ **N.** from the southern point of Cape Romano. It is the approach to the post village of **Marco**, and is about 10 miles long with a narrow and crooked channel in which the depths range from 4 to 30 feet. The northern entrance is obstructed by a shifting bar over which there is a buoyed but narrow channel with a least depth of 6½ feet; this is the entrance used by all except small local craft. The southern entrance bears about **NE.** from the south point of Cape Romano; it is obstructed by a bar with a depth of about 4 feet and, not being marked, is difficult for a stranger to find and enter.

The pass is of little importance; a few spongers and small schooners carrying produce occasionally enter for an anchorage. The village of Marco is on the south shore of the pass, about 2½ miles above the Outer buoy; at high water a draft of 9 feet has been carried over the bar and up to the village, and about 7 feet through the pass to its southern entrance.

Directions of practical use for entering can not be given, the buoys are shifted when practicable, to indicate the channel. Persons acquainted with the pass can be found outside the pass, at Key West, or at Punta Rasa.

SAN CARLOS BAY‡

is 110 miles **N.** ⅝ **W.** from Northwest Passage Lighthouse and about 20 miles southward of Charlotte Harbor, with which it is connected by two shallow bodies of water known as Pine Island Sound and Matlacha Pass. The bay is full of shoals between which there are several channels which form good anchorages for vessels of 9 feet or less draft, this being about as deep a draft as can be taken into the bay. The entrance, which leads into the bay from southward, is obstructed by extensive shoals and is marked at its western point by **Sanibel Island Lighthouse** (see table, page 10). Between the shoals are two channels through which the bay may be entered: the **Main Channel**, which has a least depth (1900) of 7½ feet, is marked by several buoys; the other channel, known locally as "**The Swash**," leads close around the eastern point of **Sanibel Island** and is continually shifting, the depths ranging from 5 to 7 feet.

The deepest draft of the vessels entering the bay is 9 feet; under very favorable conditions a draft of about 10 feet might be taken to either Punta Rasa or St. James City. San Carlos Bay and adjacent waters are the resort of tourist and fishermen during the winter, and are frequented principally by small local vessels and yachts.

Punta Rasa consists of a hotel, containing the post office and telegraph station, and a few houses on a point on the eastern shore of San Carlos Bay near the entrance of Caloosa River. Cattle are shipped in schooners from this point to Key West and Cuba, and it is one of the landings for steamers running between Punta Gorda and the Caloosa River. There is 12 feet of water at the ends of the two wharves and a depth of about 4 fathoms in the channel abreast of the hotel.

St. James City is a post village and winter resort on the south end of Pine Island and 3 miles westward from Punta Rasa. A narrow channel, with a least depth of about 9 feet, leads along the northeast side of Sanibel Island to the long wharf at St. James City. The steamers plying between Punta Gorda and the Caloosa River land at this wharf.

Matlacha Pass is the name of the shallow body of water leading from San Carlos Bay along the east side of Pine Island into Charlotte Harbor. When the water is high a draft of about 4 feet can be taken through the pass, but the channel is very narrow and crooked in places and is only used by small spongers and fishermen.

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*Shown on chart 173, scale $\frac{1}{80,000}$, price $0.50.

†Shown on chart 174, scale $\frac{1}{80,000}$, price $0.50.

‡Shown on charts 175, scale $\frac{1}{80,000}$, price, $0.50; 473, scale $\frac{1}{40,000}$, $0.25.

Pine Island Sound is the large, shallow body of water on the west side of **Pine Island**; it extends to the northward from the western end of San Carlos Bay, nearly 15 miles, to Charlotte Harbor. The sound is full of shoals, through which there is a narrow and crooked channel with a depth of about 7 feet at high water. There are no aids to assist a stranger in Pine Island Sound and a pilot should be employed either at Punta Rasa or in Charlotte Harbor. Vessels of 3 to 4 feet draft may pass through by aid of the chart. There are two passes through which Pine Island Sound can be entered from the Gulf of Mexico: **Blind Pass** has a depth of about 7 feet, but only 2 feet can be taken through into the sound at low water; **Captiva Pass** has a depth of about 5½ feet and this depth can be taken into the sound. Neither of these passes is used except by small local vessels since the bars at their entrances are liable to shift and there are no aids to assists in entering.

Caloosa River empties into the northeastern part of San Carlos Bay from the eastward: its length from **Lake Okeechobee** to the bay is about 71 miles. For the first 18 miles from its mouth the river is broad and, in a narrow and tortuous channel, has a least depth of 6 feet, but above this it is narrow and at its head is connected with Lake Okeechobee by a canal 22 feet wide and 5 feet deep. Light draft steamers (of about 3½ feet) can pass up this river into Lake Okeechobee.

Myers is a town on the south bank of the river 14 miles above its mouth and can be reached by vessels of about 7 feet draft; steamers from Punta Gorda make this the end of their route. The principal villages on the river are **Alva** and **Thompson**, 20 and 38 miles, respectively, above Myers. No stranger should attempt to enter the river without a pilot, as the channel is so narrow and crooked at its entrance that even the small local steamers plying here often run aground.

Prominent features.—Sanibel Island Lighthouse (see table, page 10), on the western side of the entrance to San Carlos Bay, is the most prominent and easily recognized mark anywhere for a distance of 50 or 60 miles along the coast. The hotel at Punta Rasa also forms a good mark for vessels standing into the bay through the Main Channel; on a clear day the hotel can be seen at a distance of 6 or 7 miles when approaching from the southward.

Anchorages.—Good anchorage will be found in 14 to 16 feet of water, sticky bottom, at the entrance to the Main Channel and about 3½ miles **ESE.** from Sanibel Island Lighthouse. Vessels standing up the coast and headed off by northerly winds will find a lee and good anchorage under the southern end of Sanibel Island in 16 to 24 feet of water, with Sanibel Island Lighthouse bearing anywhere between **NE.** and **N.** by **W.** The anchorage off Punta Rasa is good, but the tidal currents are very strong. There is a good anchorage along the shore of Sanibel Island inside the lighthouse; the currents here are strong, but bottom with spots of good holding ground can generally be found. Off St. James City there is an excellent anchorage with 12 to 18 feet of water and good holding ground; at this point the tidal currents are weaker than at any of the other anchorages in San Carlos Bay.

For lines defining limits within which the Inland Rules of the Road and Pilot Rules for Western Rivers apply, see Charlotte Harbor.

Pilots.—There are no licensed pilots and pilotage is not compulsory; strangers of over 7 feet draft, or if bound into the Caloosa River, should lie-to, or anchor, about 1 mile to the northward of black can buoy No. 1 and make the pilot signal; some competent person will come out to pilot the vessel in.

Quarantine.—Vessels subject to visitation by the health officer should not pass above red buoy No. 6 before being boarded. (See the quarantine laws of the State of Florida, Appendix I.)

Supplies.—Provisions can be had at Myers and St. James City.

Tides.—See the table on page 24 and remarks on pages 25, 26.

SAILING DIRECTIONS, SAN CARLOS BAY.

These directions are good, in the daytime, for vessels of 7 feet draft at low water and 8 feet draft at high water; vessels of deeper draft should employ some one with local knowledge, and no stranger should attempt to enter at night.

1. ***Approaching from the Southward.***—When northward of Cape Romano give the shore a berth of 2 miles. A **NNW.** course made good from a position 2 miles off the entrance to Big Marco Pass will lead to the black can buoy off the entrance to San Carlos Bay. Or, when Sanibel Island Lighthouse is sighted, steer so that it will be distant nearly 4 miles when it bears **NW. ½ W.** and pass eastward of the black can buoy off the entrance; then follow the directions in section 2.

Remarks.—In clear weather and when near the buoy off the entrance, the hotel at Punta Rasa will show conspicuously on the end of the point which is 2 miles northward of Sanibel Island Lighthouse. As soon as the hotel is sighted it should be brought to bear **NW. ¼ N.**; standing in on this bearing the course will lead fair in the channel. Until up to the buoy (can, black) off the entrance, unless the hotel bears **NW. ½ N.**, the vessel should be kept in at least 18 feet of water. The shoal which makes to the southeastward from the eastern point of Sanibel Island for a distance of 3 miles has as little as 1½ feet of water over it in places; the black can buoy is about ¾ mile off the **SE.** point of this shoal, in 17 feet of water.

1 A. ***Approaching from the Northward.***—From the Entrance bell buoy off Charlotte Harbor steer **SSE. ¾ E.** for 15 miles, then **SE.** by **E.** for 6 miles, and then **E. ½ N.** for 8 miles, to the buoy off the entrance to San Carlos Bay. Or, when about 6½ miles southward of Gasparilla Island Lighthouse and clear of the shoals off Charlotte Harbor Entrance, follow the shore of Captiva and Sanibel islands, giving it a berth of at least 1¼ miles. When Sanibel Island Lighthouse bears **NE.** steer about **E.** and keep in at least 18 feet of water until the black can buoy off the entrance is made; then follow the directions in section 2.

Remarks.—In standing along the shore of the islands which separate Pine Island Sound from the Gulf of Mexico there are no features easily recognized by a stranger. Captiva Pass, which is 7 miles southward of Gasparilla Island Lighthouse, shows a break in the shore. Blind Pass, 8 miles southward of Captiva Pass, can not be seen unless the vessel is too close inshore.

A vessel headed off by the wind may, when Sanibel Island Lighthouse bears about **NE.**, stand along the shore of the island at a distance of ½ mile and anchor in 15 feet of water, with the lighthouse bearing **NNE.**, distant 1½ miles. (See also the remarks under section 1, preceding.)

2. ***From the Entrance to Punta Rasa.***—When near the black can buoy off the entrance leave it on the port hand; bring the hotel at Punta Rasa to bear **NW. ½ N.** and steer for it on this bearing. When red buoy No. 2 is made leave it about 75 yards on the starboard hand and steer about **NW. ½ W.** for red buoy No. 4; when up to this buoy leave it 35 yards on the starboard hand; then steer for red buoy No. 6, which should be left 30 yards on the starboard hand, and when it is abeam haul northward a little and steer so as to leave red buoy No. 8 about 20 yards on the starboard hand. From red buoy No. 8 steer about **N.** and anchor off the hotel, or just above it, in about 4 fathoms of water.

Remarks.—After red buoy No. 2 has been passed the remaining buoys can be seen one from the other. The shoal along the eastern side of the channel can readily be seen in clear weather, as can also the shoal on the western side of the channel abreast of Punta Rasa. The shoalest water on the bar is abreast of buoy No. 6, and care should be taken not to pass the buoy at too great a distance. The hotel at Punta Rasa is the largest building and close to the end of the point.

2 A. ***From the Entrance to Sanibel Island Anchorage or St. James City.***—Leaving the black can buoy at the entrance on the port hand, bring the hotel at Punta Rasa to bear **NW. ½ N.** and steer for it on that bearing. Leave red buoy No. 2 about 75 yards on the starboard hand and steer about **NW. ½ W.** for ½ mile; then steer **WSW.**, keeping the end of the lighthouse wharf a little on the port bow. Anchor above the wharf and about 200 yards from the beach.

Or, *if bound to St. James City;* From abreast the lighthouse wharf, follow the shore of Sanibel Island, giving it a berth of about 300 yards until abreast the second wharf above the lighthouse wharf and the hotel at Punta Rasa bears about **NE. ½ E.**; then steer **NW.** by **N.** for nearly 1½ miles, when the end of the long wharf at St. James City should bear **WNW. ¾ W.** Steer so as to leave the end of the wharf on the starboard hand, course **W.** by **N.**, and anchor about ⅝ mile from the shore and abreast of, or just above, the wharf.

Remarks.—On the **WSW.** course care should be taken not to be set out of the channel by the tidal currents, which are strong. A shoal spit makes off some distance from the eastern point of Sanibel Island and a short distance to the eastward of the lighthouse wharf, but in clear weather this spit can usually be seen so as to be avoided. Between the first and second wharves above the lighthouse wharf there are several spots with 8 feet of water over them which may be avoided by giving the shore a berth of ¼ mile while between the wharves, hauling in to the beach when approaching the second wharf.

On the **NW.** by **N.** course the wharf and houses at St. James City will be on the port bow. The anchorage abreast of St. James City is the best in this vicinity for the larger vessels that enter San Carlos Bay.

CHARLOTTE HARBOR*

is a large, irregularly shaped, landlocked bay in the west coast of Florida, and one of the best harbors in the state. Its entrance is 125 miles **N.** by **W.** ¼ **W.** from Northwest Passage Lighthouse, at the entrance to Key West Harbor, and 63 miles **SSE.** ¾ **E.** from the North Channel entrance to Tampa Bay. Charlotte Harbor has an average width of about 5 miles; it extends 10 miles in a general **E.** and **W.** direction and then about 10 miles in a general **N.** by **W.** and **S.** by **E.** direction, and is navigable for vessels of 11 feet draft to its head. The deepest draft of the steam vessels that can cross the bar is 21½ feet and sailing vessels 20½ feet; large vessels enter for cargoes of phosphate that is loaded from lighters at the anchorage just inside Gasparilla Island; deep-draft vessels sometimes finish loading from lighters outside the bar. The harbor affords excellent shelter in all winds and is used as a harbor of refuge by coasters and other vessels.

The entrance to the harbor on its northern side is marked by **Gasparilla Island Lighthouse** and **beacon** (see table, page 10); these form a range for entering between the shoals which extend nearly 3½ miles in a general **WSW.** direction from both sides of the entrance. The channel through these shoals is known as **Boca Grande**; it has a depth of 19 feet and, though quite narrow in some places, is well marked by buoys and the above-mentioned range. As great a draft as 15 feet can be taken in through Boca Grande when there is quite a heavy sea on, but vessels drawing more than 12 feet should not attempt to enter at such times except with a pilot on board; it is not advisable for a stranger of over 16 feet draft to enter without a pilot under any circumstances, as the depths in some parts of the channel are liable to change, although the general depth of 19 feet is maintained.

Gasparilla Sound extends, from just inside the entrance to Charlotte Harbor, to the northward about 7½ miles; it is an irregularly shaped, shallow body of water, navigable for vessels of 4 to 5 feet draft. **Gasparilla Pass,** through which the sound is entered from the Gulf of Mexico, has a variable depth of from 3 to 7 feet in the channel over the bar and requires local knowledge for its navigation. There are no towns on the shores of the sound and it is frequented only by small coasters, spongers, and fishermen.

Pine Island Sound and Matlacha Pass, both of which extend southward from Charlotte Harbor to San Carlos Bay, are described under heading San Carlos Bay.

Peace River empties into the northeastern end of Charlotte Harbor from northeastward. The river is navigable for vessels of 6 feet draft a distance of 12 miles above its mouth, and the tugs and lighters engaged in the transportation of phosphate go up the river a distance of about 26 miles. A dredged channel about 200 feet wide and 10 feet deep leads from the deep water of Charlotte Harbor to the wharves at Punta Gorda; along the wharves the channel is 120 to 160 feet wide. **Cleveland** is a post village on the south bank of the river above Punta Gorda, and **Charlotte Harbor** and **Harbor View** are two post villages on the north shore opposite Punta Gorda.

Myacca River empties into the northwestern end of Charlotte Harbor from the northward; a depth of 9 feet can be taken into the mouth of the river. There are no towns on its shores, and only small vessels of 4 to 5 feet draft occasionally enter to carry freight to settlers scattered along its banks.

Punta Gorda, on the south bank of the Peace River, at its mouth, is the most important town reached by vessels through Charlotte Harbor. The town has railroad communication with the interior of the State. A steamer runs regularly between Punta Gorda and Myers, on the Caloosa River, carrying the mail. The deepest draft of the vessels that go to the town is about 12 feet. Vessels loading phosphate clear from Punta Gorda, and the agency for its shipment is located here.

Prominent features.—**Lacosta Island,** southward, and **Gasparilla Island,** northward of the entrance, are low and partly wooded and present no marked natural features that would be of use to a stranger. Gasparilla Island Lighthouse is on the south end of the island and will be recognized in clear weather while in 6 to 7 fathoms of water off Boca Grande. **Charlotte Harbor Lighthouse** (see table, page 10) is in Charlotte Harbor about 8¼ miles **ENE.** ¼ **E.** from Gasparilla Island Lighthouse; it marks the turning point where vessels change their course to the northward to stand up to the head of the harbor and Punta Gorda. The shores inside the entrance are low and wooded, presenting no natural features easily recognized by a stranger.

Channels.—The main channel through the shoals outside the entrance has a depth of 19 feet, but it is quite narrow until the crest of the bar is passed; inside the bar and up to Gasparilla Island Lighthouse the channel is about ⅜ mile wide. From the deep-water anchorage inside Gasparilla Island up to Peace Creek beacon and to Punta Gorda the depth in the dredged channel is now 10 feet, but this depth can only be carried by closely following the buoys and beacons and requires some local knowledge. A stranger should not depend on carrying a depth of over 9 feet in certain parts of the channel between Gasparilla Island Lighthouse and Charlotte Harbor Lighthouse and in the entrance to Peace River up to the wharves at Punta Gorda. Another

* Shown on chart 175, scale $\frac{1}{80,000}$, price $0.50; the entrance is shown on chart 474, scale $\frac{1}{40,000}$, price $0.25.

channel, known as the **Swash Channel**, leads close around the southern end of Gasparilla Island, about 120 yards from the beach. This channel has usually about 7 feet of water and is used in smooth weather, when the shoal water can be seen, by small local craft. Strangers are advised not to use this channel for the reason that it is liable to change both in depth and direction.

Lines defining limits within which the Inland Rules of the Road apply.—Eastward of the Entrance bell buoy off Boca Grande; and in Charlotte Harbor, in Pine Island Sound and Matlacha Pass.

Lines defining limits within which the Pilot Rules for Western Rivers apply.—In Peace and Myacca rivers north of a **WSW.** and **ENE.** line through Mangrove Point beacon light; and in Caloosa River when northward of the steamboat wharf at Punta Gorda.

Anchorages.—The best place for large vessels to anchor is in deep water just inside the entrance; this is the anchorage where vessels load phosphate from lighters brought down to them by towboats. Good anchorage will be found anywhere in Charlotte Harbor where the bottom is soft. Vessels sometimes go to Punta Gorda and load to a draft of 12 feet; they then tow down to the lower anchorage to finish taking in cargo to a draft of 20 to 21½ feet.

Quarantine.—The quarantine station is on Gasparilla Island a short distance to the northward of the lighthouse, and incoming vessels are boarded off the lighthouse by the quarantine officer. (See quarantine, Appendix I, and National Quarantines, Appendix IV.)

Pilots.—Pilotage is compulsory; pilots will come out to vessels outside the bar in answer to signal. Vessels desiring a pilot can, while waiting to be boarded by one, anchor outside the bell buoy off Boca Grande until a pilot comes on board. (See pilot rules, regulations, and rates, Appendix I.)

Harbor Master.—The berthing of vessels and disposal of ballast is under the direction of the harbor master. The State laws for the government of harbor masters are in force in this port. (See Appendix I.)

Wharves.—The depth of water at the end of the wharves at Punta Gorda ranges from 4½ to 12 feet, the latter depth being at the larger wharves.

Supplies.—Limited quantities of bituminous coal can be obtained for steamers at Punta Gorda, or from lighters at the anchorage inside Gasparilla Island. Fresh water can be obtained at the wharves at Punta Gorda and from towboats in the harbor. Provisions and ship chandler's stores can be had at Punta Gorda.

Storm-Warning Displays of the **United States Weather Bureau** are made at Egmont Key and at Punta Gorda.

Tides and currents.—The mean rise and fall of tides is a little more than 1 foot, but the force and direction of the winds influence the tides to a very marked degree. The currents are variable in strength, depending very much on the force and direction of the winds. (See table on page 24 and remarks on pages 25, 26.)

SAILING DIRECTIONS, CHARLOTTE HARBOR.

The following directions are good in the daytime, with clear weather, for a draft of about 16 feet over the bar and to an anchorage inside of Gasparilla Island Lighthouse. From this anchorage to Punta Gorda and the entrance to Myacca River the directions are good for a draft of 10 feet. Vessels of deeper draft should employ a pilot.

1. ***Approaching and Entering from the Southward.***—If standing along the shore, give it a berth of 2 miles or more to insure a depth of 4 fathoms. When 7 miles to the southward of Gasparilla Island Lighthouse and Captiva Pass bears **ENE.**, haul offshore, steering about **NW.**, so as to be over 4 miles westward of the lighthouse when it bears **NE. ½ E.** and is in range with the beacon.

Bring Gasparilla Island Lighthouse and the beacon in range bearing about **NE. ½ E.** and steer in on the range, pass close to the bell buoy and continue the course until up to the Bar buoy (can, white and black perpendicular stripes). From this buoy steer about **NE.**; leave black can buoy No. 1 about 200 yards on the port hand and red nun buoys Nos. 0 and 2 about 100 yards on the starboard hand. When abreast the latter buoy, steer about **NE.** by **E. ¾ E.** for Mid-channel buoy; leave this buoy close-to and continue on the same course, so as to leave Gasparilla Island Lighthouse a little over ¼ mile on the port hand. When the lighthouse bears abeam:

If bound to the anchorage, steer **NE. ¾ N.** and anchor in 4 fathoms of water with the lighthouse bearing **WSW.**, distant from ½ to ¾ mile, or, in 6½ fathoms with the lighthouse bearing **W.**

If bound to Punta Gorda, follow the directions in section 2, following.

Remarks.—Unless the weather is very clear Gasparilla Island Lighthouse and the range beacon (lighted) will not be readily seen. In case of thick weather, and if at all doubtful of the position of the vessel, it is safe to anchor anywhere in 7 fathoms of water and wait for clear weather. A well-found seagoing vessel can ride out any gale on this coast when anchored in 7 to 8 fathoms. When standing for the bell buoy on the **NE. ½ E.** course Gasparilla Range beacon should be in range with the lighthouse. Vessels of less than 13 feet draft can stand in on this range, leaving red nun buoy No. 2 on the port hand, until up to the Mid-channel buoy. The shoals on the north side of the channel rise more abruptly than do those on the south side; the general width of the channel, from the Mid-channel buoy until inside the lighthouse, is about 800 yards. The southeastern end of Gasparilla Island is quite bold-to and can be approached as close as 300 yards.

Dangers.—A shoal extends in a general **SW.** by **W.** direction for a distance of 3½ miles from the southern point of Gasparilla Island, and another shoal extends in the same general direction for a like distance from the northern end of Lacosta Island; these shoals are almost bare in spots, at times, and shift somewhat during heavy gales of wind. Their shoaler parts are usually marked by breakers and their local name is "sand bore." Near their western edge the shoals rise abruptly from 4 to 5 fathoms of water, and it is advisable to give the lighthouse a berth or over 4 miles until the bell buoy is sighted.

Inside Charlotte Harbor there are no dangers; the shoals, as a rule, rise gradually and the lead can be depended on to give sufficient warning to haul out of shoal water.

1A. ***Approaching and Entering from the Northward.***—If standing close along the shore, when Gasparilla Island Lighthouse bears **E.**, haul offshore so as to be over 4 miles from the lighthouse when it bears about **NE. ½ E.** Or, keep offshore in a depth of 7 fathoms.

Bring Gasparilla Island Lighthouse to bear **NE. ½ E.**, and in range with the beacon, and follow the directions in section 1, preceding. (See also the remarks under section 1, preceding.)

2. ***From Gasparilla Island Lighthouse to Punta Gorda, or to the Entrance of Myacca River.***—With Gasparilla Island Lighthouse bearing **NNW.** and distant about 700 yards, steer **ENE. ⅛ E.** with Charlotte Harbor Lighthouse a little on the port bow. Leave red nun buoy No. 4 on the starboard hand and red nun buoy No. 6 close-to on the starboard hand; black can buoys Nos. 3 and 5 should be left 100 yards on the port hand. Round black can buoy No. 5 at a distance of 100 yards (Charlotte Harbor Lighthouse will be left about ⅓ mile on the port hand) and steer **N. ¾ W.** for 8 miles, with Mangrove Point beacon ahead. Continue the **N. ¾ W.** course until the beacon is ¾ mile distant ahead, then:

If bound into Peace River, steer **N.** by **E. ¼ E.** Leave Peace Creek beacon 100 yards on the starboard hand and then steer about **ENE. ¼ E.** for the end of the Long Dock, taking care not to foul the stumps of the old beacons which formerly marked the southern edge of the channel. Anchor just above the end of the dock in 10 feet of water, or, *if bound up the river*, take a pilot.

If bound into Myacca River, continue the **N. ¾ W.** course, heading for Mangrove Point beacon, until the beacon is 600 yards distant ahead; then steer **WNW. ¼ W.** until up to black can buoy No. 7; leave this buoy on the port hand and steer about **NNW. ½ W.**, keeping in the middle of the river. Anchor, or take a pilot, when 2 miles above the buoy.

Remarks.—On the **ENE. ⅛ E.** course, the buoys should be followed closely. A number of pile dolphins will be seen; they have been placed by local parties and should not be considered by a stranger. Charlotte Harbor Lighthouse, which should be visible soon after passing into the entrance, will assist in keeping the course.

After passing Charlotte Harbor Lighthouse, when on the **N. ¾ W.** course, Mangrove Point beacon will hardly be seen before the lighthouse is about 4 miles distant astern; the beacon should be made and kept bearing directly ahead on the course.

On the **N.** by **E. ¼ E.** course when bound into Peace River, a red wooden beacon (Peace Creek lighted beacon) should be kept a little on the starboard bow; after passing this beacon there are no aids.

TAMPA BAY AND TRIBUTARIES.*

Tampa Bay is a large, landlocked body of water in the west coast of Florida forming the best deep-water harbor in the State and one of the most important harbors, commercially, on the Gulf Coast of the United States. The bay, not considering its two tributary bays, is about 20 miles long in a general **NE.** and **SW.** direction and has an average width of about 7 miles; for a distance of 15 miles above its entrance it has a least depth of 22 feet in the channel. It is the approach to the city of Tampa and to Port Tampa, the latter being a railroad terminus and one of the important shipping points for phosphate and produce from this section of Florida. A draft of 22 feet can be taken in over the bar at the entrance at high water, but the deepest draft to which vessels have been loaded at Port Tampa is 21½ feet.

The entrance to the bay is 182 miles **N.** ⅝ **W.** from Rebecca Shoal Lighthouse and 283 miles **SE.** by **E.** ¼ **E.** from the entrance to Pensacola Bay; it is marked by **Egmont Key Lighthouse** (see table, page 10), and has shoals extending about 5 miles from the shore. Between these shoals there are two main channels: The **North Channel**, with a depth of 21 feet; and the **Southwest Channel**, with a depth of 14 feet. Both of these channels are well marked by the lighthouse and bouys and can be easily followed, but in the deeper draft vessels some local knowledge is required to carry the best water. **Egmont Key** lies fair in the entrance, and the shoals making off to the westward from it separate the two channels.

St. Petersburg is a small town and winter resort on the west shore of Tampa Bay 15 miles above Egmont Key Lighthouse; it is the terminus of a railroad, but has no shipping except the small steamers running from Tampa and Port Tampa and occasional fishermen. A long dock is built out from the town, at the end of which there is a depth of 15 feet; this dock and the building back of it can be plainly seen by vessels standing into Hillsboro or Old Tampa bays. A draft of 21 feet can be taken to a point abreast the town by following the East Channel to Port Tampa, and a draft of 12 feet can be taken to the wharf by following the South Channel.

HILLSBORO BAY

enters the northeastern end of Tampa Bay from the northward; it is 7½ miles long in a general **N.** by **W.** and **S.** by **E.** direction and has a width of about 4 miles. The bay is full of shoals, but is good for a channel depth of 10 feet to within 2 miles of its head. **Hillsboro River**, emptying into the northwestern end of Hillsboro Bay, is a narrow stream at the mouth of which is the city of Tampa. The river is entered from the bay through a dredged channel which has (1900) a depth of about 7 feet; this channel is marked by stakes and is easily followed. A channel 12 feet deep and 150 to 200 feet wide is being dredged from the deep water of the bay to the city of Tampa. There are three drawbridges at the city of Tampa, but vessels seldom go above the second bridge. A draft of 5 feet can be taken to the head of navigation 8 miles above the first bridge.

The **city of Tampa** is one of the most thriving cities in the State of Florida: its principal industry is the manufacture of cigars. The city is connected by railroad with the interior of the State and also with Port Tampa, which is about 6½ miles distant in a southwesterly direction. Only small local steamers and small sailing craft are engaged in the trade to Tampa, produce and fish being the principal articles brought here for shipment by rail or for local consumption.

Alafia River empties into Hillsboro Bay from eastward. The river entrance, obstructed by a bar over which the depth is 2½ feet, lies 4¼ miles **NE.** by **E.** ½ **E.** from **Gadsden Point**, the western point at the entrance to Hillsboro Bay. Phosphate is shipped from the phosphate works along the river in lighters, the one farthest up the river being 7 miles above its mouth. The deepest draft of vessels entering is 4 feet, the phosphate lighters usually drawing 3 feet when loaded.

OLD TAMPA BAY

enters the northwestern end of Tampa Bay from northwestward; it is about 12 miles long in a general **NW** by **N.** and **SE.** by **S.** direction and has an average width of about 6 miles. Its narrowest part is where it joins Tampa Bay; here its width is a little less than 2½ miles. The bay is generally shallow but at its southern end has several deep channels; one of these leads along the eastern shore of the bay at a distance of about ¼ mile from the beach and forms the approach to, and harbor of, Port Tampa. Between the deep water in Tampa Bay and the deep channel in Old Tampa Bay are two bars which have been improved by dredging, having (1900) channels about 200 feet wide and 20 feet deep. These dredged channels (or cuts) are marked by beacons which, with the buoys placed to mark the channel, make the approach to Port Tampa from Tampa Bay comparatively easy. Improvements are in progress to dredge a channel 24 feet to Port Tampa.

*Shown on charts **177**, scale $\frac{1}{80,000}$, price $0.50; **477**, scale $\frac{1}{40,000}$, price $0.25.

Port Tampa is situated on the east shore just inside the entrance to Old Tampa Bay; the long docks and buildings owned by the Plant railroad system are conspicuous marks when in the head of Tampa Bay. The deepest draft vessels entering the bay can lie at the docks and load with the best facilities for dispatch; the depth alongside the docks is 25 feet. There are several lines of steamers out of this port; much of the phosphate is shipped in foreign steamers.

TERRACIA BAY

is on the southeastern side of Tampa Bay and just north of the entrance to Manatee River. The bay has a general depth of 7 to 11 feet and is entered from Tampa Bay through a narrow channel marked by six beacons (two of them lighted); the least depth in this channel is 5 feet and is found between beacons Nos. 5 and 7. There is a dredged channel 100 feet wide and 6 feet deep from the southern end of Terracia Bay into Manatee River opposite the village of Palma Sola. To enter Terracia Bay follow the beacons, leaving them on the side indicated by their color.

MANATEE RIVER

empties into the southern part of Tampa Bay from eastward. The river is well settled along its banks but its only commerce is in market produce which is shipped in small steamers to Tampa and Port Tampa. The three principal post towns on the river are **Manatee, Palmetto,** and **Braidentown.** A draft of 8 feet can be taken to Palmetto, but only 7 feet to Manatee. The channel in the river as far as Manatee is well marked by buoys, beacons, and stakes, and is easily followed. There is good anchorage anywhere in the channel above **Shaws Point,** the first prominent point on the south shore above the dredged channel. The dredged channel into Terracia Bay is described under that heading.

BOGA CEIGA BAY

to the northward just inside the entrance of Tampa Bay, is very shallow; it extends along the coast, and just inside of a line of narrow keys, for a distance of 15 miles, to where it joins Clearwater Harbor. These waters are used only by small boats and local fishermen. **Pass a Grille** is the name of a pass into Boca Ceiga Bay from the Gulf of Mexico, about 4 miles north from the southern end of Mullet Key; this pass has a depth of 7 feet and leads to a good anchorage between **Pine** and **Long** keys, but the channel is a shifting one and, as it is not marked, is of no use to a stranger.

SARASOTA PASS AND SARASOTA BAY

extend in a general **SE.** by **S.** direction from just inside the entrance to Tampa Bay for a distance of 18 miles; they stretch along the coast just inside of a line of narrow keys and form an inland passage for vessels of 5 feet or less draft. Several cuts 5 feet deep and 40 to 50 feet wide have been made through the shoaler parts of the bay. The channels are very narrow in many places and local knowledge is necessary for their navigation. There are several inlets to Sarasota Bay from the Gulf of Mexico. **Longboat Inlet,** 10¼ miles to the southeastward of Egmont Key Lighthouse, has a depth of 5 feet in the channel. **New Pass,** about 9 miles to the southeastward of Longboat Inlet, has a depth of 5 feet in the channel. **Big Sarasota Pass,** about 22 miles to the southeastward of Egmont Key Lighthouse, has a depth of 7 feet in the channel. These passes all lead to good anchorages in Sarasota Bay, for vessels that can enter by them, but the channels and passes shift and local knowledge is required to follow them. Strangers of less draft than the depths indicated might enter, in clear weather and with a smooth sea, by taking notice of the shoal water on each side of the channels and following the deeper water by sight. **Sarasota** is a post village on the mainland abreast Big Sarasota Pass; there are several post villages on the east shore of the bay. **Little Sarasota Bay** is a narrow, unimportant, shallow body of water which joins Sarasota Bay; it extends 10 miles to the southward just inside of a line of narrow keys, and is only navigable for small boats.

GENERAL INFORMATION.

Prominent features.—In clear weather Egmont Key Lighthouse is the first object easily recognized by a stranger. **Mullet, Egmont,** and **Anna Maria** keys are all low and wooded; to a vessel in 5 or 6 fathoms of water they present no features that a stranger can recognize. In thick or hazy weather nothing can be seen, and it

is then advisable for vessels to anchor until the weather clears. Inside the bay the aids are so numerous as to make it nearly impossible, in clear weather, to get out of the channels.

Anchorages.—Well-found seagoing vessels, when approaching the entrance to the bay, if headed off by the wind, can anchor anywhere offshore in 6 to 8 fathoms of water and ride out a strong gale from any direction. There is good anchorage in 5 to 6 fathoms of water to the southward of Mullet Key off the quarantine station. Good anchorage is found off **Gadsden Point** southward of black buoy No. 9; vessels of over 8 feet draft, if bound to Tampa, sometimes anchor here to discharge part of their load. There is good anchorage off St. Petersburg in 4 fathoms of water, and a short distance above the docks at Port Tampa in 28 feet of water. A vessel bound up the bay can anchor anywhere in the channel, selecting, if possible, places where the bottom is soft.

Lines defining limits within which the Inland Rules of the Road apply.—From the south end of Long Key **SW. ¾ W.** to the whistling buoy; thence **SE. ¾ S.** to the Bar bell buoy at the entrance to Southwest Channel; thence **E. ¾ S.** to the north end of Anna Maria or Palm Key.

Lines defining limits within which the Pilot Rules for Western Rivers apply.—In Manatee River when inside the black and white perpendicularly striped Entrance buoy; in Hillsboro River when inside Barrel Stake beacon.

Quarantine.—The quarantine boarding station is on the south side of Mullet Key. **The quarantine anchorage** is off the station and is marked by a yellow buoy. (See quarantine laws for the State of Florida, Appendix I, and National Quarantines, Appendix IV.)

Pilots.—A pilot boat will usually be found just outside or inside the bar. There is a pilot's lookout on Egmont Key, and the boat will go out to approaching vessels. The pilot laws for the State of Florida (see Appendix I) govern the pilots for Tampa Bay and the bar; the rates for pilotage are $2.50 per foot of vessel's draft.

Towboats are used only by the deeper draft sailing vessels bound to Port Tampa and by some of the sailing vessels bound to Tampa. Vessels bound to Port Tampa are supplied with towboats by the railroad company when the vessel arrives at the lower cut into Old Tampa Bay. Vessels desiring to tow to Tampa from the entrance to the staked channel will have to arrange with some small steamer bound into the river.

Supplies.—Anthracite and bituminous coal for steamers can be had at Port Tampa, either alongside the wharves or from lighters in the stream. Fresh water can be had through pipes at the wharves at Tampa, Port Tampa, and St. Petersburg. Provisions can be had at Tampa, Port Tampa, and St. Petersburg. The supply store at Port Tampa for the steamers of the Plant system can furnish ship chandler's stores.

Repairs.—There are two marine railways at Tampa, each about 150 feet long and capable of hauling out vessels of 7 to 8 feet draft. Minor repairs to the machinery of steamers can be made at Tampa, and ordinary repairs at the shop in Port Tampa. It is contemplated building at Port Tampa a dry dock capable of floating vessels of 24 feet draft.

Storm-Warning Displays of the **United States Weather Bureau** are made at Tampa, St. Petersburg, and on the docks at Port Tampa; the signals at the latter station can be seen by the shipping in the upper part of Tampa Bay and by vessels at anchor off Port Tampa. (See Appendix II.)

United States Marine-Hospital Service.—Medical attendance is furnished by a medical officer of the service at Port Tampa.

Tides.—For tidal data see table, page 24, and remarks on pages 25, 26.

Currents.—See general remarks on page 26.

SAILING DIRECTIONS, TAMPA BAY.

The directions for entering the bay by the North Channel (section 1) are good for vessels of 18 feet draft. The directions in section 1 A, for entering the bay by the Southwest Channel, are good for a draft of 14 feet. The directions in section 2, for Port Tampa, are good for a draft of 18 feet; and the directions in section 2 A, for Port Tampa by the South Channel, are good for a draft of 10 feet. The directions in section 2 B, for Tampa, are good for a draft of 8 feet to the mouth of Hillsboro River, and for 6 feet up the river to Tampa. These directions are good for the drafts indicated only in the daytime and with clear weather, when the aids can be seen. A stranger of greater draft, or entering at night, should employ a pilot.

1. ***Approaching and Entering by the North Channel and to the Anchorage off Quarantine.—From the Southward.***—Keep in over 6 fathoms of water and at least 5 miles offshore until Egmont Key Lighthouse is sighted. Bring the lighthouse to bear **E. ½ S.**, distant over 5 miles, and steer for the lighthouse on this bearing until close to the whistling

buoy. At night the vessel should then be in the narrow red sector of the light which covers the whistling buoy off the entrance. The red sector is indistinct, showing from the whistling buoy only by a marked dimness.

From the Northward.—Keep in over 5 fathoms of water and at least 6 miles offshore until Egmont Key Lighthouse is made. Bring the lighthouse to bear **E.** ½ **S.** and steer for it until close to the whistling buoy.

From the whistling buoy steer **E.**, heading for the bar buoy (can, white and black perpendicular stripes); leave this buoy close-to and continue the course, heading for the middle buoy (nun, white and black perpendicular stripes), which should be left close-to on either hand. From the latter buoy steer **E.** ¼ **S.**; leave a red nun buoy (No. 2) about 300 yards, and the northern point of Egmont Key about ¼ mile, on the starboard hand. Continue the **E.** ¼ **S.** course; leave Mullet Key Shoal buoy (can, black, No. 0) about 350 yards on the port hand and pass about ⅝ mile to the southward of the southern point of Mullet Key, and anchor off the quarantine station in about 6 fathoms of water.

Or, *if bound up the bay*, follow the directions in section 2, 2 A, or 2 B, according to destination.

Remarks and dangers.—In clear weather Egmont Key Lighthouse will be easily seen and recognized from a distance of 8 miles. The shore southward and northward of the entrance is comparatively low and offers no marked features which would assist the navigator. A vessel approaching at night should keep well offshore and approach the entrance only on the bearing of the red sector until nearly up to the whistling buoy. A well-found seagoing vessel of over 300 tons can ride out a gale while at anchor in 7 to 8 fathoms of water anywhere along the coast.

On the **E.** ¼ **S.** course a red day beacon will be seen on the shoal southward of red buoy No. 2; this beacon is well on the shoal and must be given a berth of ⅝ mile. When past the north end of Egmont Key the quarantine station, consisting of some buildings on the end of a wharf, will be seen on the south side of Mullet Key and on the north side of the channel.

Palatine Shoal consists of several small lumps having 17 to 21 feet of water over them. These lumps lie 5 miles **W.** from Egmont Key Lighthouse and ½ mile **SSE.** from the whistling buoy at the entrance to the North Channel. A red and black horizontally striped buoy marks Palatine Shoal and this buoy should be given a wide berth. The long shoal which makes off to the westward from the northern side of the entrance has only 3 to 5 feet of water over it for a long distance, and is usually marked by breakers. The shoal making off to the westward from Egmont Key has depths of 5 to 17 feet and is very irregular in shape. Both of these shoals are liable to shift during heavy gales, but the general direction and width of the channel between them does not alter so as to necessitate frequent changes in sailing directions for entering. The tidal currents in the North Channel are usually strong and care should be taken not to be set off the course.

1 A. ***Approaching and Entering by the Southwest Channel and to the Anchorage off Quarantine.—From the Southward.****—When approaching the northern end of Anna Maria (Palm) Key, give the shore a berth of over 3 miles, and while in 5 to 6 fathoms of water bring Egmont Key Lighthouse to bear **NNE.** ⅝ **E.**; the lighthouse should be about 5 miles distant. Steer for the lighthouse on this bearing until up to the bell buoy which marks the entrance. At night the vessel should be in the narrow red sector which covers this buoy. The red sector is indistinct, showing from outside the bell buoy only by a marked dimness of light.

From the bell buoy make good a **NE.** ⅞ **E.** course, leaving black buoy No. 1 about 250 yards on the port hand, a red beacon about ⅝ mile on the starboard hand, and black buoy No. 3 about 50 yards on the port hand. When black buoy No. 3 is ½ mile distant astern steer about **NNE.** ½ **E.** and anchor ½ mile from the quarantine station.

Or, *if bound up the bay*, continue the **NE.** ⅞ **E.** course from black buoy No. 3, and follow the directions in section 2, 2 A, or 2 B, according to destination.

Remarks and dangers.—Egmont Key is wooded southward of the lighthouse, but the top of the tower shows over the trees. Anna Maria (Palm) Key is sparsely wooded, and its northern end is low and bare. The opening between the northern end and Anna Maria Key and the small key to the northward, known as **Passage Key**, is called **Passage Key Inlet** and is used by small local vessels; it has a depth of 9 feet in a shifting channel, which is not marked.

*Vessels coming from northward usually enter by the North Channel; the vessels using the Southwest Channel are of 14 feet or less draft and bound to or from southward.

On the north side of Southwest Channel are the shoals which make off from Egmont Key in a southwesterly and easterly direction; two black buoys, Nos. 1 and 3, mark the edge of these shoals; the southern point of the key is bold-to and a depth of 5 fathoms will be found 250 yards from the point. The shoals which make northward and westward from Passage Key, and which form the southern edge of the Southwest Channel, are marked by a red beacon placed 1 mile **WNW.** ½ **W.** from the north end of Passage Key and nearly ¼ mile southward from the edge of the channel.

2. ***From the Quarantine Anchorage to Port Tampa.—By the East Channel, for vessels of 18 feet draft.***—From a position about ½ mile **SSE.** of the quarantine station wharf steer **ENE.** ¾ **E.** with Egmont Key Lighthouse astern so as to bring Mullet Key Shoal beacon (lighted) abeam, distant about ¾ mile. Then steer **NE.** ⅞ **E.** for 6¼ miles, until up with Piney Point buoy (nun, red, No. 6), passing the South Entrance buoy (can, black and white perpendicular stripes) close-to, and keeping Indian Hill beacon (lighted) ahead. Leave buoy No. 6 about 300 yards on the starboard hand and steer **NE.** ⅞ **N.** until up with North Entrance buoy (can, black and white perpendicular stripes), passing about ⅜ mile eastward of black beacon No. 5.

When up to North Entrance buoy change course to about **NNE.** so as to leave a black can buoy on the port hand and red nun buoy No. 2 about 50 yards on the starboard hand. From abreast red nun buoy No. 2 haul more northward and follow the buoys; when up to Turn buoy (black and white perpendicular stripes) which should be left close-to on either hand, steer **NW.** by **W.** ½ **W.**; leave the red and black horizontally striped buoy about 100 yards on the port hand and steer about **W.** so as to pass well southward of South Cut Lower beacon No. 6; then steer **N.** ¼ **W.** so as to leave the two South Cut beacons No. 6 and 8 (which mark the eastern edge of the cut) about 25 yards on the starboard hand. When a short distance above beacon No. 8, steer about **N.** by **E.** ¼ **E.** so as to leave North Cut Lower beacon No. 10 about 25 yards on the starboard hand; from this beacon steer **NNE.** for the end of the railroad wharf, and when 300 yards from the wharf haul a little northward and anchor in the channel above the wharves eastward of black buoy No. 3.

Remarks.—When following the directions care must be taken to leave the beacons and buoys at the indicated distance. There are no natural aids that a stranger could use. When standing about **NNE.** from North Entrance buoy (can, black and white perpendicular stripes) care must be taken when following the buoys as this part of the channel is being improved and the buoys may not always be in position. After having passed through the two cuts the best anchorage is about ¼ mile **N.** from the end of the railroad wharf.

2 A. ***From the Anchorage off the Quarantine Station to St. Petersburg, or, to Port Tampa.—By the South Channel, for vessels of 10 feet or less draft.***—From a position about ½ mile **SSE.** of the quarantine station wharf steer **ENE.** ¾ **E.** so as to bring Mullet Key Shoal beacon (lighted) abeam and distant about ¾ mile. Then steer **NE.** ⅞ **E.** for 4⅞ miles, heading for Indian Hill beacon (lighted) and the South Entrance buoy (can, black and white perpendicular stripes). When up this buoy steer **N.** ¾ **W. Northerly,** leaving black beacon No. 1 (lighted) about 200 yards on the port hand and red buoy No. 2 about 200 yards on the starboard hand. Red beacon No. 4 should be left on the starboard hand about ¼ mile. When up with this beacon the railroad wharf at St. Petersburg will be seen a little on the port bow, and, soon after, the mid-channel buoy off the end off the wharf will be sighted. Head for the latter, and when up to it anchor, in 3¾ fathoms, just eastward of it; or, *if bound to Port Tampa*, change course to **NE.** ⅞ **E.** South Cut lower beacon light (red, No. 6) will be made a very little on the port bow. When nearly up to this beacon light follow the directions for Port Tampa given in section 2, preceding.

Remarks.—The **N.** ¾ **W. Northerly** course is steered nearly 6¼ miles, and care should be taken that the vessel is not set out of the channel by the current. The shoalest part of the channel is between beacon No. 1 and buoy No. 2, where there is about 12 feet at low water. A stranger should keep in the channel and not attempt to cross any of the numerous shoals. Good anchorage in 4 fathoms is found just south of the South Cut beacon.

2 B. ***From the Anchorage off the Quarantine Station to an Anchorage off Tampa.—For vessels of less than 8 feet draft.***—Follow the directions in section 2 until up with the North Entrance buoy. Continue the **NE.** ⅞ **N.** course for about 3 miles farther;

this will bring the vessel up to red buoy No. 8, which should be left close-to on the starboard hand. From this buoy change course to **NE. ¼ N.** and continue it for 3½ miles; two black buoys off Gadsden Point will be made a little on the port bow. Pass about 300 yards eastward of the second one, No. 11, and haul up to **N. ⅜ E.** A white and black perpendicularly striped beacon will be seen on the port bow. Leave the beacon about 200 yards on the port hand and steer **N. ¾ W.**; then keep Long Shoal beacon (lighted) a little on the port bow and pass eastward of the beacon, hauling around it and heading about **WNW.** Ballast Point will be ahead and Middle Ground beacon (lighted) broad off the starboard bow.

When the large house on the shore at Ballast Point is a little over ¼ mile distant ahead haul up to **N.** by **W.** and pass the Middle Ground beacon, leaving it a little over ¼ mile on the starboard hand. When this beacon is abeam haul up a little more to the northward and bring Barrel Stake beacon (lighted) a little on the starboard bow; when about ¼ mile from the beacon anchor in 8 feet of water, soft bottom.

A vessel of less than 6 feet draft can proceed up to the city by leaving the stakes marking the channel about 45 or 50 feet on the port hand.

Remarks.—In following the sailing directions care should be taken to pass at the proper distance from buoys and beacons, as a stranger can not depend on recognizing any of the natural features along the shores of the bay. **Ballast Point** can be recognized by the large boathouse with glass front, which is situated close to the water.

On the **N.** by **W.** course care should be taken to avoid the Middle Ground. The staked channel can be readily followed up to the city, but the river is too narrow for a vessel of over 50 feet length to anchor and swing. Vessels of over 6 feet draft should employ some one with local knowledge to take them through the staked channel, and if a sailing vessel it will be necessary to employ a towboat.

Dangers.—The only danger that requries attention is the **Middle Ground**, which has only 4 feet on it at low water; it extends about 1 mile southward from the Middle Ground beacon, and is about ⅜ mile wide.

SAILING DIRECTIONS, MANATEE RIVER.

The directions are good in the daytime for a stranger of 6 feet draft as far as Palmetto; 8 feet is the deepest draft that can be taken there by those acquainted with the river, and about 7 feet as far as Manatee.

1. ***From Tampa Bay to Palmetto.***—Stand for the entrance to Manatee River, taking care not to approach the shore closer than 1¾ miles until the large, black, lighted beacon at the entrance is sighted. Bring this beacon to bear about **SE. ¾ E.** and steer for it. When up to the perpendicularly striped Entrance Bar buoy steer about **SE.** by **E.**, leaving the beacon and a black buoy on the port hand. From the latter buoy steer for a pile dolphin, which will be seen near a large, red, lighted beacon. Leave the dolphin about 20 yards on the starboard hand and steer so as to leave the second dolphin about 20 yards on the starboard hand.

When the second dolphin is abeam, steer about **ESE. ¾ E.**, heading so as to leave red buoy No. 2 on the starboard hand, and when this buoy is abeam haul a little southward so as to leave black buoy No. 3 on the port hand and red buoy No. 4 on the starboard hand. From the latter buoy haul a little southward and leave black buoy No. 5 on the port hand, and when this buoy is abeam steer **E.**, heading so as to leave two red buoys (Nos. 6 and 8) about 30 yards on the starboard hand. From red buoy No. 8 steer so as to pass about 150 yards southward of the longest dock which makes off from the north shore at Palmetto. Anchor in about 10 feet of water, 150 yards southwestward of the dock.

Remarks.—When approaching the entrance to Manatee River the two beacons and two dolphins will appear a little confusing, but when close to the entrance buoy the channel will be easily followed by taking notice of the aids in the order they are to be passed. At low water a sand ridge, which is on the south side of the dredged cut, between the two dolphins, will show bare; and with clear, smooth water the shoals to be avoided can be plainly seen.

1 A. ***Having entered Tampa Bay by the Southwest Channel.***—*Having followed the directions in section 1 A, page 55, for entering by the Southwest Channel.*—When up to buoy No. 3 (can, black), or when Egmont Key Lighthouse is abeam, steer **SE.** by **E.** ½ **E.** for 4¼ miles, which course leads directly to the Entrance Bar buoy. Then proceed as directed in section 1, preceding.

Remarks.—Light-draft vessels save considerable distance by using Passage Key Inlet, passing to the southward of Passage Key. Strangers are not advised to attempt this channel.

CLEARWATER HARBOR AND ST. JOSEPHS SOUND.*

Clearwater Harbor, about 20 miles to the northward of the entrance to Tampa Bay, is a shallow body of water extending about 7 miles in a general **N.** by **E.** and **S.** by **W.** direction and separated from the Gulf of Mexico by a narrow strip of beach, the southern part of which is known as **Sand Key**; it has an average width of about 1 mile and is full of shoals between which there are a number of narrow, crooked channels. Through these a draft of 5 feet can be taken to **Clearwater**, a village on its western shore. **Big Pass** and **Little Pass** are the entrances to Clearwater Harbor. Big Pass is about 25 miles to the northward of Egmont Key Lighthouse and 9 miles to the southward of Anclote Keys Lighthouse; Little Pass is about 3 miles to the southward of Big Pass. These passes are not marked and the bars at their entrances are subject to change; about 4 feet can be taken into Big Pass and 6 feet into Little Pass. Strangers should not enter Clearwater Harbor without employing some one with local knowledge.

St. Josephs Sound enters the northern end of Clearwater Harbor; it extends northward nearly to Anclote Keys, being separated from the Gulf of Mexico for a part of the distance by a narrow strip of beach known as Hog Island. The sound is shallow and entered only by spongers and small coasters.

Sailing directions that would be of use to a stranger can not be given. In fine weather, when the water is smooth and clear, a stranger of 4 feet or less draft might enter Clearwater Harbor through Big or Little passes by the color of the water, the deeper water of the channel being usually darker than the water on the shoals.

ANCLOTE ANCHORAGE AND RIVER.†

Anclote Anchorage is eastward of Anclote Keys and just westward of the mouth of Anclote River; it is 35 miles northward of Egmont Key Lighthouse and 57 miles **S.** by **E.** ½ **E.** from Cedar Keys Lighthouse. The **Anclote Keys** extend 2¾ miles in a general **N.** and **S.** direction and form a shelter against westerly gales, but the anchorage is good only for vessels of 7 feet or less draft, this being the greatest depth that can be taken in to the eastward of the keys. Vessels of more than 8 feet draft can find good anchorage westward of the keys; here they are exposed to westerly winds but, as the water shoals very gradually, there is never a very heavy sea, and vessels with good ground tackle can ride out anything but a hurricane.

On the southern end of the largest of the keys is **Anclote Keys Lighthouse** (see table, page 12); this is the most prominent and easily recognized mark in this vicinity and the principal guide to the anchorage, or for vessels entering Anclote River. Buoys are placed to mark the best water when passing to the eastward of Anclote Keys, either from the southward or northward.

Anclote River is a short, shallow river and the approach to **Tarpon Springs**, a post village and winter resort. The river entrance is obstructed by a bar which extends to Anclote Anchorage; through this bar there is a narrow, crooked channel which has a depth of about 4 feet up to Tarpon Springs; the deepest draft of the vessels going there is 5 feet, the river being entered only by small craft. Improvements are to be made which include dredging a channel 100 feet wide and 6 feet deep to Sponge Harbor and 4 feet deep to Tarpon Springs. **Sponge Harbor** is a post village on the west bank of the river about 1 mile above its mouth; it is the resort of spongers who come here to prepare their cargoes for shipment. **Anclote** is a post village, on the east shore, about 1¼ miles above the entrance of the river; 5 feet is the deepest draft taken there.

Prominent features.—Anclote Keys Lighthouse is the best and most easily recognized lighthouse on the west coast of Florida between San Carlos Bay and Cape San Blas; the clump of tall trees near the lighthouse forms a conspicuous landmark for vessels standing along the coast and well offshore.

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*Shown on chart 177, scale $\frac{1}{80,000}$, price $0.50.

†Shown on chart 178, scale $\frac{1}{80,000}$, price $0.50.

SAILING DIRECTIONS, ANCLOTE ANCHORAGE, INSIDE OF ANCLOTE KEYS.

The directions in section 1, for entering by the Southwest Channel, are good for a draft of 7 feet, and the directions in section 1 A, for entering by the Northwest Channel, are good for a draft of 6 feet. A stranger should not attempt to pass to the eastward of the keys at night. It must be noted that the buoys in both channels are placed for entering from seaward to the anchorage.

1. ***Entering by the Southwest Channel.***—Keep in not less than 3 fathoms of water and bring Anclote Keys Lighthouse to bear **NNE. ¾ E.** Steer for it on this bearing. South buoy (nun, red, No. 2) will be made ahead and should be left close-to on the starboard hand. Then steer **NE. ¾ E.**, leaving buoy No. 4 (nun, red) close-to on the starboard hand and continue the course for Turn buoy (can, black and white perpendicular stripes), which will be seen ahead. When up with this buoy, or when Anclote Keys Lighthouse bears **N.** by **W. ½ W.**, steer **NNE. ¼ E.** for buoy No. 1 (can, black), which leave close-to on the port hand. From this position, if wishing to anchor for shelter, haul up a little more northward and anchor in 9 feet of water, soft bottom. If desiring to enter the Anclote River take a pilot, as there are no aids to assist a stranger.

If desiring to pass through between the keys and the mainland, when up to black buoy No. 1 and the lighthouse bears about **SW.** by **W. ½ W.**, steer **N.** by **E. ¼ E.** for about 2¼ miles, passing close to Fairway buoy (nun, black and white perpendicular stripes), and until up to black buoy No. 1; leave this buoy close-to on the starboard hand; from it steer **N. ⅜ E.** for Turn bouy (can, black and white perpendicular stripes); from the latter buoy steer **NW. ¼ W.**, and when up to red buoy No. 4, which should be left close-to on the port hand, steer **W.** for North buoy (red, No. 2).

Remarks.—When standing along shore southward of the keys the clump of tall trees on the north end of **Hog Island** will show well offshore. Anclote Keys Lighthouse will be seen above the clump of trees which stands near it on the south end of the key. The shoals are so numerous that a detailed description of them would be confusing; when the water is clear many of them may be seen and avoided. A stranger should closely follow the buoys, which will lead in the best water and clear of all shoals.

1 A. ***Entering by the Northwest Channel.***—Keep in not less than 12 feet of water till about 5½ miles northward of Anclote Keys Lighthouse; then bring the lighthouse to bear **SSE.** When in this position North buoy (nun, red, No. 2) should be close aboard. Leaving this buoy close-to on the starboard hand steer **E.** for buoy No 4 (nun, red) and leave it also close-to on the starboard hand. When abreast this buoy change course to **SE. ¼ E.** for Turn buoy (black and white perpendicular stripes). From this buoy steer **S. ⅜ W.** for buoy No. 1 (can, black), which leave close-to on the port hand. From this position steer **S.** by **W. ¼ W.** and anchor in 9 feet of water, soft bottom. A pilot should be taken if desiring to proceed up the Anclote River.

Remarks.—The shoalest part of the channel is at buoy No. 1, where there is only 6½ feet at low water. There is a very narrow channel leading into the anchorage just northward of **North Anclote Key** and inside of the shoal making out to the northward. This channel has good water, but should not be attempted by strangers.

Shoals extend northward from near North Anclote Key for 1½ miles and eastward for 1 mile. (See also the remarks under section 1, preceding.)

GENERAL DIRECTIONS, ANCHORAGE OUTSIDE ANCLOTE KEYS.

The following directions are for vessels that can not reach the anchorage inside Anclote Keys on account of too great draft. Because of the gradual slope of the bottom the sea is comparatively smooth, even in strong westerly winds, and vessels will find this a safe anchorage.

Bring Anclote Keys Lighthouse on any bearing between **SE.** by **E.** and **SE.** by **S.** and stand in on this bearing. Take careful soundings and anchor as far inshore as the vessel's draft will safely permit.

COAST FROM ANCLOTE KEYS TO CEDAR KEYS.*

This stretch of coast, about 60 miles in length, is low and broken by a number of shallow creeks and rivers which can only be entered by small boats. The approach to the shore is very shoal; a depth of 5 feet is found in some places 7 miles from the beach, while a depth of only 18 feet is found 15 miles offshore. A number of shoal spots and rocks extend along the coast at a distance of 6 miles from the shore; these are known under the general name of **St. Martins Reef.** The vessels standing inshore close enough to sight land are mostly spongers and fishermen; these sometimes anchor in shoal water, in places where the bottom is soft, and ride out the heaviest gales. Strangers should be very careful in approaching the shore as the bottom is very irregular inside a depth of 10 feet; the vessels of deep draft should keep in 5 to 6 fathoms of water. There are a few post villages along this stretch of the coast, of which **Bayport** is the largest; it is situated about 25 miles to the northward of Anclote Keys Lighthouse. **Hudson** is a small town 14½ miles northeastward from Anclote Keys Lighthouse; small schooners occasionally lie off the town and load naval stores.

CEDAR KEYS†

is the name of a harbor formed by a number of keys lying off a point on the west coast of Florida about 90 miles to the northward of the entrance to Tampa Bay and nearly 110 miles **ESE.** ⅞ **E.** from Cape St. George. On **Seahorse Key**, the outer key of the group, is **Cedar Keys Lighthouse** (see table, page 12). Extending in a **SSW.** ¾ **W.** direction from this lighthouse, for a distance of 10¾ miles, is **Seahorse Reef,** which has from 4 to 19 feet of water over it; at its outer end it rises abruptly from a depth of about 4 fathoms. A red bell buoy is moored in 22 feet of water about ½ mile from the outer end of the reef.

The town of **Cedar Keys** is at the head of the harbor and is the terminus of a railroad. It has a little trade in red cedar, sponges, and fish. The depth of water alongside the wharves is about 11 feet and this is the greatest draft that can be taken to the town at high water.

Prominent features.—About 2 miles **NE.** ¼ **N.** from the outer end of Seahorse Reef and in 9 feet of water is **Seahorse Reef Outer beacon**; this is a pyramidal skeleton structure of iron 52½ feet high and painted black. Cedar Keys Lighthouse is 8¾ miles **NNE.** ⅝ **E.** from the beacon and is the guide to the entrance of the buoyed channel.

Channels.—The main channel has a least depth at low water of 9 feet; it is well marked by buoys and, although narrow and crooked, is easily followed in the daytime with clear weather. Opposite the town the channel leads through a dredged cut in the **Middle Ground**; this cut is narrow and the tidal currents set directly across it. There are two channels which enter the harbor from westward and lead northward of the outlying keys; these channels are not marked and the best depth taken in through them is about 4 feet; local knowledge is necessary for their use. There is also a channel, with a depth of about 6 feet, for entering from eastward, but it is not marked.

Supplies.—Provisions and a limited quantity of fresh water may be obtained in the town.

Anchorages.—The best anchorages are between black buoy No. 11 and the wharves on Depot Key, and abreast the wharves of the town. Vessels waiting for a fair wind to enter the Main Channel can anchor in 14 feet of water with the lighthouse bearing **N.** by **E.**, distant 2½ miles.

Quarantine.—Vessels subject to visitation by the health officer must not go above **Grassy Key** before they have been boarded and pratique has been obtained. (See also State quarantine laws, Appendix I, and National Quarantines, Appendix IV.)

Pilots.—Vessels desiring a pilot should stand in for the lighthouse on a **N.** by **E.** bearing and anchor in 15 feet of water, with signal set, until some one comes out. There are no regular licensed pilots and no regular rates for pilotage. (See pilot laws for State of Florida, Appendix I.)

Currents.—The currents follow the channel, except in the Middle Ground Cut, across which the flood sets **E.** and the ebb **W.**, with considerable velocity.

Tides.—See the table on page 24 and remarks on pages 25, 26.

Fogs.—There is considerable fog during the winter months; southerly winds bring it in and northerly winds clear it away.

Storm-Warning Displays of the **United States Weather Bureau** are made at Cedar Keys and at Cedar Keys Lighthouse. (See Appendix II.)

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*Shown on charts 178, 179, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on charts 179, 180, scale $\frac{1}{80,000}$, price of each $0.50; 420, scale $\frac{1}{50,000}$, price $0.20.

SAILING DIRECTIONS, CEDAR KEYS.

The following directions are good in the daytime, with clear weather, for vessels of 8 feet or less draft. Vessels of deeper draft should employ a pilot.

1. ***Approaching from the Southward.***—From St. Martins Outer Shoal buoy make good a **N.** by **W.** ¼ **W.** course for 39¾ miles. Or, when off the entrance and to the eastward of Seahorse Reef, bring Cedar Keys Lighthouse to bear **N.** by **E.** and steer for it on this bearing until up to the Outer Bar buoy. Then follow the directions in section 2, following.

A vessel coming from southward and sighting the bell buoy or the beacon should pass 1¼ miles eastward of them and steer **NNE.** ¾ **E.** until Cedar Keys Lighthouse or the Outer Bar buoy is sighted, or, if the lighthouse and buoy are not seen, until the water shoals to 14 feet.

Remarks.—Cedar Keys Lighthouse is difficult to distinguish in the daytime, and strangers must approach the entrance with caution if not certain of their position. Shoals with 14 to 18 feet over them extend nearly 7 miles southward from Cedar Keys Lighthouse and with less than 12 feet for a distance of 4 miles. Along the coast, for a distance of 30 miles southward of Cedar Keys, the 18-foot curve is 15 miles offshore, so that no land will be sighted by a vessel passing along shore in 3 fathoms or more of water. On the western side of the approach is **Seahorse Reef**, which extends 10¾ miles in a **SSW.** ¾ **W.** direction from Cedar Keys Lighthouse; the depths over this reef range from 1 foot near its inner, to 10 and 11 feet at its outer, end. Nearly 2 miles from the outer end, and on the reef, is an iron, skeleton, pyramidal beacon, 52½ feet high, with a spherical cage-work day-mark on top. Outside the reef and about 2¼ miles **SSW.** ¾ **W.** from the beacon is a red bell buoy.

1 A. ***Approaching from the Northwestward or Westward.***—Vessels approaching Cedar Keys should keep in 5 fathoms of water until either Seahorse Reef Outer beacon or the bell buoy is sighted (the bell buoy is 2¼ miles **SSW.** ¾ **W.** from the beacon). As soon as the bell buoy is made, on any bearing to the eastward of **S.** by **E.**, steer for the buoy; leave it close-to and steer **NE.** by **E.** for 5 miles; then steer **N.** by **E.** Cedar Keys Lighthouse should be made ahead; continue this course for the lighthouse, and when up to the Outer Bar buoy follow the directions in section 2, following.

Remarks.—For a distance of 25 miles northwestward of Cedar Keys the 18-foot curve extends along the coast about 10 miles offshore. The **Northwest Channel** is used by local vessels and those familiar with the local marks for keeping in the best water, but no stranger should attempt it. (See also the remarks under section 1, preceding.)

2. ***From the Outer Bar Buoy to the Anchorage off the Town.***—Leave the Outer Bar buoy about 30 yards on the port hand and steer about **N.** by **E.** ½ **E.**, heading so as to leave black buoys Nos. 3 and 5 about 30 yards on the port hand; from the latter buoy steer about **NE.** ½ **N.**, leaving red buoy No. 2 about 50 yards on the starboard hand. Then steer about **N.**, leaving red buoy No. 4 about 80 yards on the starboard hand, and then head so as to pass midway between black buoy No. 7 and red buoy No. 6; leave Turning Point beacon (lighted) on the starboard hand, giving it a berth of 20 yards. From this beacon steer about **NE.** ½ **E.**, leaving black buoy No. 9 about 16 yards on the port hand; when up to red buoy No. 10, which should be left about 20 yards on the starboard hand, steer about **N.**, passing eastward of a low, grassy key. Leave red buoy No. 12 about 25 yards on the starboard hand and haul up so as to leave black buoy No. 11 about 30 yards on the port hand. From the latter buoy steer about **NE.** by **N.**; leave the black beacon about 30 yards on the port hand and steer **NNE.** through the dredged cut, and when through the latter steer about **NE.** for the end of the railroad wharf. Anchor so as to swing just clear of the wharf.

Remarks.—The courses given are only to assist in finding and locating the buoys, which should be the only guides and which should be closely followed and left at the distance given. The entrance to the Middle Ground Cut is marked by a black beacon; there is a local range for passing through the cut which can not be described so as to be of use to a stranger. There is an anchorage off Depot Key but it is very narrow and only fit for small vessels.

COAST FROM CEDAR KEYS TO APALACHEE BAY.*

From Cedar Keys the coast extends in a general northwesterly direction 75 miles and for that distance is low marsh backed by woods. It is broken by a number of unimportant creeks and rivers, some of which are navigable for vessels of 4 to 5 feet draft. The gulf along this stretch of the coast is the resort of spongers and fishermen during the spring and summer; they and the small vessels carrying cedar from the rivers and creeks are the only vessels frequenting this part of the gulf. Strangers desiring to enter any of the rivers and creeks should employ some fisherman or sponger who is familiar with the approach to the locality bound for.

Suwanee River empties into the gulf from northeastward, its entrance being 12¾ miles **NNW. ¼ W.** from Cedar Keys Lighthouse. The river has some trade in lumber carried in vessels of 5 feet or less draft; it is navigable to **Brandford**, a distance of 69 miles, for vessels of 5 feet draft and about 100 miles for vessels of 3 feet draft. A passage, marked in places by stakes, leads from Cedar Keys to the entrance of the river. The principal entrance is through **East Pass**, which has been dredged.

Steinhatchee River empties into the gulf about 40 miles northwestward of Cedar Keys Lighthouse. The coast here forms a broad, shallow bight known as **Deadmans Bay**. The river is obstructed at its entrance by a bar over which the channel depth is about 4 feet; inside the entrance there is a good depth of water. Strangers seldom enter the river, and local knowledge is necessary for its navigation.

Fenholloway River empties into the gulf about 65 miles to the northwestward of Cedar Keys Lighthouse. The river can be entered by small vessels of 4 to 5 feet draft at high water, but is of little commercial importance. Strangers should not attempt to enter without the aid of some one possessing local knowledge.

In clear weather, while standing along this stretch of the coast, the land will be seen while in 3 fathoms or more water; but it is not possible for a stranger to recognize any feature which might assist him in locating his position. The lead is of the greatest assistance to keep a vessel at a safe distance from shore as the water shoals gradually until inside the 12-foot curve.

The average rise of the tides on the coast between Cedar Keys and Apalachee Bay is 2½ feet.

APALACHEE BAY†

is a shallow indentation in the coast of Florida about 75 miles northwestward of Cedar Keys Lighthouse. The eastern limit of the bay is not well defined but its western limit is marked by **Lighthouse Point**, the southeastern point of **St. James Island**. Emptying into the bay from northward and northwestward are a number of unimportant streams and shallow bays which are sometimes frequented by spongers and fishermen. Shoals with a depth of less than 18 feet almost fill the bay. With the exception of **St. Marks Lighthouse** (see table, page 12) and the buoys in the entrance to St. Marks River, there are no aids that can be used by a stranger.

Aucilla River empties into Apalachee Bay from northward; its entrance, which is obstructed by a mud and oyster bar, is about 10 miles eastward of St. Marks Lighthouse and has a depth of about 3 feet. Small vessels of 5 feet or less draft enter the river.

St. Marks River empties into Apalachee Bay from northward and is the approach to the village of **St. Marks**, about 6 miles above its mouth. The river is crooked and, at its entrance and for a distance of 3 miles above, is full of shoals between which a narrow channel, with a depth of about 7 feet, leads up to the village; a depth of 4 feet can be taken about 10 miles above St. Marks. On the eastern point, at the entrance, is St. Marks Lighthouse, and marking the channel off the entrance are several buoys. The anchorage in the channel bears about **NW.** from the lighthouse and is known as **Spanish Hole**. Spongers and fishermen occasionally anchor here for shelter in heavy gales. St. Marks has railroad communication with the interior of the State.

Ocklockonee Bay is a shallow bay making northwestward from Apalachee Bay about 3¼ miles northward of Lighthouse Point. The **Ocklockonee River**, a stream navigable for a draft of 4 feet a distance of about 40 miles, empties into the head of the bay. The River, about 8 miles above its mouth, connects with **Crooked River**, which enters it from westward and affords a narrow inland passage, with a depth of about 3 feet, to the **Carrabelle River**.

The shore of Apalachee Bay, between the entrances of St. Marks River and Ocklockonee Bay, is broken by a number of shallow bays of no importance whatever.

The mean rise and fall of tides at St. Marks is 2¼ feet. (See table, page 24, and remarks on pages 25, 26.)

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*Shown on charts 180, 181, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on chart 181, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS TO THE ENTRANCE OF ST. MARKS RIVER.

The following directions are good in the daytime, with clear weather, for vessels of 7 feet or less draft, and lead to the anchorage at the mouth of St. Marks River. A stranger bound up the river should take a pilot.

Vessels coming from southeastward, along shore, should keep in a depth of 18 feet. For a distance of 40 miles southeastward of St. Marks River entrance the 18-foot curve extends along the coast at distances of 5 to 9 miles offshore. The white light tower at the entrance can be seen a distance of 8 or 9 miles on a clear day, and a vessel approaching from any direction should not shoal the water to less than 18 feet until the lighthouse is sighted and steered for.

Vessels coming from westward should pass southward of **South Shoal** and **Ocklockonee Shoal**; a red nun buoy is placed southward of each of these shoals. From Ocklockonee Shoal Sea buoy a **N.** ½ **W.** course will lead directly for St. Marks Lighthouse and to the Sea buoy at the river entrance. Ocklockonee Shoal Sea buoy is **E.** by **S.** and distant 9¼ miles from Lighhouse Point, the western point of Apalachee Bay. The shoal is the easternmost of the shoals which make off from the point and has a least depth of 3 feet on it.

As soon as St. Marks Lighthouse is made, and the vessel is to the eastward of Ocklockonee Shoal, bring the lighthouse to bear **N.** ½ **W.** and steer for it on this bearing. When up to the Sea buoy, which is a black and white perpendicularly striped can, leave it on the port hand and steer so as to leave red nun buoy No. 2 on the starboard hand. From the latter buoy steer **NNW.** ⅛ **W.** for red nun buoy No. 4, which is left on the starboard hand. (There is good anchorage in the channel between buoys Nos. 2 and 4.) From red nun buoy No. 4, steer about **N.** by **W.** ¼ **W.** and leave red nun buoy No. 6, on the starboard hand. Anchor to the northward or northeastward of this buoy. If bound farther up the river take a pilot.

ALLIGATOR HARBOR

is a shallow, unimportant body of water 39 miles **NE.** by **E.** from Cape St. George Lighthouse; the harbor is formed by a long, narrow spit of land which extends westward from **Lighthouse Point**, the southeastern point of St. James Island, and the numerous shoals which lie off the south shore of St. James Island. There is a narrow channel with a depth of 7 feet into the harbor, but as it is not marked, a stranger should not attempt to enter. The post village of **St. Teresa** is at the western end of the harbor; it is a summer resort, and during the season small yachts and fishermen frequent the harbor.

ST. GEORGE SOUND AND APALACHICOLA BAY.*

These names are applied to parts of the large body of water which extends about 40 miles along the coast between Apalachee Bay and Cape San Blas, and which is separated from the gulf by a chain of islands and reefs. At the western end of this body of water is another, extending in a general westerly direction and known as **St. Vincent Sound.** The two principal tributaries emptying into the bay and sound are **Carrabelle** and **Apalachicola** rivers; the only towns on their shores are Carrabelle and Apalachicola. These waters are generally shallow and only navigated by tug boats, towing lumber lighters, and oystermen, the deepest draft of these vessels being about 7 feet and the average draft 4 feet. Lumber is the principal article of export; this is carried in foreign and coastwise vessels which load at anchorages inside the islands near East Pass, where there is an excellent harbor into which a draft (extreme) of 19 feet can be taken at high water with a smooth sea.

ST. GEORGE SOUND,

the easternmost of the two bodies of water, is about 26 miles long and has an average width of about 3½ miles. Extensive shoals lie in the sound, but a depth of 12 feet can be carried from its eastern to its western end through the channels which lead between the shoals. This sound can be entered from the gulf through several channels, only one of which is generally used; this is known as **East Pass.** **Duer Channel**, which is the eastern entrance

*Shown on charts 182, 1183, scale, $\frac{1}{80,000}$, price of each $0.50.

to the sound, has an uncertain depth and is not marked; it should not be used by a stranger. Local fishermen sometimes enter the sound through the shoals close to the eastern end of Dog Island.

East Pass is just westward of **Dog Island** and 23 miles eastward of St. George Lighthouse. The channel of this pass leads between shoals which extend 2 miles offshore, but is well marked by buoys and a range of lights—**Crooked River Range** (see table, page 12); this pass is the entrance to the anchorages where the deeper draft vessels load lumber from A alachicola and Carrabelle. A draft of 18½ feet can be taken through the pass at high water, but this requires local knowledge; a stranger of 15 feet draft can easily enter by following the buoys and the range. Inside of East Pass there are several excellent anchorages where vessels can load and ride out any gale in safety. These anchorages are sometimes known as **Apalachicola Harbor**. The **Swash Channel** leads from buoy No. 1 in a **WNW.** direction into the sound; it is good for a draft of 12 feet.

Carrabelle, a small town on the north shore of the sound and on the east shore at the mouth of the Carrabelle River, ships some lumber which is taken to the shipping in lighters towed by the tugs owned by the sawmills. The town is of small importance; it is entered by a railroad and has a daily steamer to Apalachicola. A narrow, crooked channel with a depth of about 5 feet leads from the sound into the river, but it is not safe for strangers. It is proposed to dredge a channel 10 feet deep and 100 feet wide from St. George Sound to the wharves at Carrabelle.

APALACHICOLA BAY

is just westward of St. George Sound and is separated from the latter by a line of shoals, known as the "**Bulkhead,**" which extends in a northerly and southerly direction and through which there is a dredged cut 100 feet wide and 8 feet deep; this channel is marked by beacons and buoys and can be readily followed by a stranger. The bay is generally shallow and has numerous oyster bars which are being worked, but the channels are well marked by buoys, and in daylight, with clear weather, can be readily followed to a good anchorage behind **St. George Island** or to Apalachicola.

West Pass, the principal entrance from the gulf into Apalachicola Bay, is well marked by buoys and has a depth of 16 feet in the dredged channel over the bar. The channel leads through shoals that extend about 3 miles in a southerly direction from **St. Vincent** and **Sand** islands. The buoy marking the entrance is 11¼ miles **ENE.** ¼ **E.** from Cape San Blas buoy and 5½ miles **W.** ⅞ **N.** from **Cape St. George Lighthouse** (see table, page 12). This pass is used by vessels up to 16 feet draft which load at the anchorage behind St. George Island and about **N.** by **E.** from the lighthouse; the larger vessels coming to Apalachicola for lumber enter by the East Pass.

Apalachicola River is the principal tributary entering the bay from the northward; the river is navigable for steamers of 3 to 4 feet draft to Columbus, Ga., a distance of 360 miles *

The town of **Apalachicola,** on the west bank of the river at its mouth, has a larger water-borne trade than any town between Tampa Bay and Pensacola. It ships considerable lumber in foreign and coastwise vessels and fish and oysters by the steamers running on the Apalachicola River. The approach to the town from the bay is through a dredged channel 80 feet wide and, in 1900, about 7 feet deep, but this depth is not permanent. Vessels entering East Pass to load have to enter and clear at the customhouse at Apalachicola and all the shipping business is done here. A steamer runs daily to the shipping at East Pass and to Carrabelle, connecting with the railroad at that point.

ST. VINCENT SOUND

is shallow and fit only for boats; it lies 7¼ miles eastward of Cape San Blas and northward of St. Vincent Island. The sound is full of oyster reefs; it can be entered from Apalachicola Bay from the eastward or through Indian Pass from the westward. **Indian Pass** is not marked and has a narrow, shifting channel; it is used only by small fishing craft and should not be attempted by a stranger.

GENERAL INFORMATION.

Prominent features.—Dog Island, which is wooded at its eastern end, will show before any other land when approaching East Pass. The shipping at anchor will be seen over the western end of the island, which is low and bare. The eastern end of **St. George Island** is low and bare, but the rest of the island is wooded. At night **Crooked River Light** and range beacon (see table, page 12) will be sighted while still outside the bar, but in the daytime the weather must be exceptionally clear to see them; the buoys at the entrance will usually be seen

* Statute miles, estimated by river pilots.

before the lighthouse is distinguished. Approaching the entrance to West Pass, Cape St. George Lighthouse will be seen to the eastward. **St. Vincent Island,** which is on the north side of the pass, is wooded to the point. **Sand Island,** on the south side of the pass, is low and has only a few low, straggling trees. The bar buoy is a large nun and in clear weather can be easily seen 2 miles.

Lines defining limits within which the Inland Rules of the Road apply.—North of a line from Lighthouse Point **SW. by W. ¾ W.** to the southeastern end of Dog Island; to the northward of the black and white perpendicularly striped Outer buoy at the entrance to East Pass and inside the black and white perpendicularly striped buoy at the seaward entrance to West Pass.

Lines defining limits within which the Pilot Rules for Western Rivers apply.—In Carrabelle River and when on the range and crossing the bar at the entrance; in Apalachicola River and northward of Five Foot Lump buoy when crossing the bar.

Anchorages.—The anchorage in St. George Sound, for vessels of over 14 feet draft, is in the cove just inside the western end of Dog Island; vessels discharging ballast anchor about 1 mile eastward of this anchorage. Vessels of 14 feet or less draft usually anchor north of the eastern end of St. George Island in about 16 feet of water. Vessels entering West Pass can anchor anywhere in the channel after passing inside of Sand Island; the usual anchorage for vessels loading lumber is about **N.** by **E.** from Cape St. George Lighthouse in 19 to 21 feet of water. The ballast ground is on the flats off the eastern end of St. Vincent Island. There is good anchorage for vessels of 8 feet draft about 1 mile to the southward of the beacon at the entrance to the dredged channel into Apalachicola River.

Quarantine.—The quarantine laws for the State of Florida govern the port of Apalachicola. (See Appendix I and National Quarantines, Appendix IV.) Vessels subject to visitation by the health officer are boarded inside of Dog Island at East Pass, and on their arrival at West Pass the health officer comes from Apalachicola to board vessels.

Pilots.—Regular licensed pilots will be found on or just inside the bar at East Pass. Pilots for West Pass are on the lookout for vessels and will come out to vessels approaching the entrance. The pilot laws for the State of Florida are in force at this port. (See pilot laws and rates for pilotage, also harbor regulations for Apalachicola, Appendix I.) Vessels headed off by the wind can anchor in about 5 fathoms of water to the southward of the Outer buoy.

Towboats.—Vessels usually enter East Pass under sail, but tow out when loaded. The towboats belonging to the mills from which vessels load usually do the towing, but a towboat can be had by making signal, although a vessel may have to wait until one is disengaged. Sailing vessels, unless of light draft, are advised to take a towboat when entering West Pass.

Supplies.—Provisions and ship chandler's stores can be had at Apalachicola and Carabelle and are brought to vessels at the anchorages by the towboats towing lumber. Fresh water can be taken from the Apalachicola River near the town, at low water, during certain seasons of the year.

Repairs.—There is one marine railway at Apalachicola which can take out a vessel 95 feet long and 7 feet draft, or 150 feet long and 4 feet draft.

Storm-Warning Displays of the **United States Weather Bureau** are made at Carrabelle and Apalachicola.

Tides.—See table, page 24, and remarks on pages 25, 26.

Currents.—The tidal currents are influenced greatly by the force and direction of the winds, the flood and ebb setting in and out of East and West passes, at times, with an estimated velocity of 3 to 4 knots, and ordinarily with a velocity of about 1 knot.

SAILING DIRECTIONS, ST. GEORGE SOUND AND APALACHICOLA BAY.

The directions in sections 1, 1 A, and 2 are good for a draft of 15 feet through East Pass. The directions in section 3 are good for a draft of 7 feet through the Bulkhead at low water. These directions should be used by strangers only in the daytime with clear weather.

1. ***Approaching from the Eastward.***—From a position ½ mile south of the red can buoy ("South Shoal," in white letters) off South Shoal, steer **WSW. ¾ W.** for 16¼ miles, keeping in not less than 4 fathoms of water. The Outer buoy (can, white and black perpendicular stripes), marking the entrance to East Pass, should be made a little on the starboard bow. When up to the buoy follow the directions given in section 2, following.

Remarks.—Deep-draft vessels should approach East Pass with caution when there is any sea on; in a heavy sea a vessel should keep in at least 7 fathoms of water until sure of her position. Strangers should not pass northward of South Shoal Sea buoy.

1A. ***Approaching from the Westward.***—From the whistling buoy ("St. George," in white letters) which marks the shoal making to the southward from Cape St. George, steer **NE.** ½ **E.** for 24½ miles, keeping in not less than 4½ fathoms. The Outer buoy (can, white and black perpendicular stripes) should bear **N.** distant 2 miles; haul up for the buoy and follow the directions in section 2.

Remarks.—Care should be taken not to be set inshore, as shoals make off from St. George Island; there are 11-foot spots nearly 1 mile from the beach, and the soundings in the vicinity of the shoals are very irregular. A stranger should keep southward of Cape St. George Outer Shoal buoy. (See remarks under section 1, preceding.)

2. ***Entering East Pass to an Anchorage in St. George Sound.***—From the Outer buoy, or with Crooked River Lighthouse bearing **NNW.** ⅝ **W.** and in range with the beacon, steer for the lighthouse. Leave buoys Nos. 1 and 3 (can, black) 50 yards on the port hand and continue the course for the lighthouse till buoy No. 3 is about 700 yards astern; then haul eastward and follow the shore of Dog Island, giving it a berth of about 500 yards. Anchor about ¾ mile inside the point in about 3½ fathoms of water.

Or, when 700 yards northward of buoy No. 3, vessels of less than 15 feet draft may steer **N.** by **E.** ¾ **E.** for about 2¼ miles and anchor off the mouth of the Carrabelle River in about 16 feet of water, eastward or southeastward of black can buoy No. 1.

Or, when 700 yards northward of buoy No. 3, vessels of less than 15 feet draft may stand **WSW.** for about 4 miles and anchor, in 13 to 14 feet of water, when the eastern end of St. George Island bears about **E.** by **S.**

Remarks.—The channel of East Pass is narrow; the shoals on either side have as little as 5 feet of water over them in places. The tidal current usually sets across the shoals at an angle with the channel; great care, therefore, should be taken not to be set toward the shoals on either hand. Between buoys Nos. 1 and 3, it may be possible to pick up the white iron post that with Crooked River Lighthouse forms the range for entering East Pass. This range, when it can be seen, will greatly assist in keeping a vessel clear of the shoals.

3. ***From East Pass to the Upper Anchorage off the mouth of Apalachicola River.***—Entering East Pass as directed in section 2, preceding, when about 500 yards northward of buoy No. 1 (can, black), steer **W.** ¾ **N.** and pass about 100 yards northward of buoy No. 5 (can, black). When this buoy is abeam change course to **WSW.** ½ **W.** and leave buoy No. 7 (can, black) about 100 yards on the port hand.

Or, when about 600 yards northward of black buoy No. 3, steer **SW.** by **W.** ¼ **W.**; pass ½ mile northward of black buoy No. 5 and leave buoy No. 7 (can, black) about 100 yards on the port hand.

When buoy No. 7 bears **SE.** *and is distant about 100 yards,* steer **SW.** by **W.** ¼ **W.** heading for First Mid-channel buoy (black and white perpendicular stripes). Leaving this buoy close-to on either hand, continue the course until a black beacon bears **S.** by **E.** ½ **E.** and is distant ⅜ mile and the vessel is close to Second Mid-channel buoy. From this position steer **S.** by **W.** ¾ **W.**; on this course leave the black beacon about 300 yards on the port hand and keep Porter Bar beacon (painted red) directly ahead. Round Porter Bar beacon, leaving it about 100 yards on the starboard hand, and steer **W.** ½ **S.** until the red and black beacons, which form the range for the Bulkhead cut, and which will be seen to the northwestward, are in range. Steer for the beacons, keeping them in range, and when up to red buoy No. 6, steer **SW.** by **W.** ¾ **W.** and leave red buoy No. 8 about 100 yards on the starboard hand. Then steer **W.** by **S.** and anchor in about 9 feet of water southward of black buoy No. 5.

Remarks.—The sound and bay are full of shoals and oyster bars, a description of which would only confuse a stranger. The channel, however, is well marked by buoys and beacons, and with ordinary care a

stranger of 7 feet or less draft should have no difficulty in passing from St. George Sound to Apalachicola Bay when the aids can be seen. The two beacons which form the range through the Bulkhead dredged channel must be kept on a close range, as the dredged channel is quite narrow; a sailing vessel requires a good fair wind to pass through this cut, as the current sometimes sets diagonally across it. The **W. ½ S.** course from **Porter Bar beacon** leads up to the range.

A draft of 7 feet can be taken up to the city of Apalachicola through the dredged channel, but for this local aid should be employed.

SAILING DIRECTIONS, APALACHICOLA BAY.

In the daytime, with clear weather and smooth sea, the following directions are good for a draft of 13 feet at low water through West Pass to the anchorage behind St. George Island, and 10 feet draft to the Upper Anchorage. Vessels of deeper draft should take a pilot. A stranger should not attempt to enter at night.

1. ***Approaching from the Eastward.***—From a position ½ mile westward of the red whistling buoy (marked "St. George") southward of Cape St. George Lighthouse, steer **NW. ½ N.** for about 9 miles, when the northwest end of Sand Island will be abeam. When West Pass Bar buoy (nun, black and white perpendicular stripes) is sighted, keep it a little on the starboard bow until up with it; then follow the directions in section 2.

Remarks and dangers.—**Cape St. George Shoals** extend out to the whistling buoy. The shoals are of varying depths and have as little as 4 feet on them in some places, and they rise abruptly from comparatively deep water. There is a channel inside the shoals close in to the lighthouse, but strangers should not attempt to pass to the northward of the buoy. The sailing line passes within less than 1 mile of a 10-foot spot, and a good lookout should be kept for breakers, as the lead gives little indication of shoal water until almost too late to avoid it.

1 A. ***Approaching from the Westward.***—From the red can buoy (marked "San Blas") to the southward of Cape San Blas, steer **ENE. ¼ E.** for nearly 11¼ miles, when the southeast point of St. Vincent Island will bear **NE.** by **E.** and the vessel should be up to West Pass Bar buoy (nun, black and white perpendicular stripes). Then follow the directions in section 2.

2. ***Entering West Pass to the Upper Anchorage, off the mouth of Apalachicola River.***—Passing close to West Pass Bar buoy (black and white perpendicular stripes), steer so as to leave buoy No. 1 (can, black) about 50 yards on the port hand. When up to this buoy steer about **NE.** by **E. ½ E.**, so as to pass midway between St. Vincent and Sand islands. Buoy No. 3 (can, black) should be made ahead. Leave it 50 yards on the port hand and steer **SE.** by **E. ⅞ E.**, heading for buoy No. 2 (nun, red). When up to this buoy, which should be left on the starboard hand, change course to **NE.** and stand up for buoy No. 4 (nun, red). Leaving this buoy about 50 yards on the starboard hand, steer **NE. ½ N.** for about 2¾ miles and anchor northeastward of Mid-channel buoy (black and white perpendicular stripes) in about 11 feet of water.

Remarks.—A channel with a depth of 16 feet has been dredged across the crest of the bar between the Bar buoy and black buoy No. 1. The channel is liable to change slightly and a bright lookout should be kept when going in. The shoals on the southern side of the channel rise abruptly and in several places are marked by breakers. Breakers are seen in places on the northern shoals also.

On the **SE.** by **E. ⅞ E.** course the lighthouse wharf and boathouse will be seen on the starboard bow some time before buoy No. 2 is sighted. The sailing line passes close to the shoals lying to the northeastward and care should be taken, therefore, not to be set eastward. The anchorage for vessels of over 10 feet draft is westward and northward of red buoy No. 2. (See also remarks under section 3, page 66.)

ST. JOSEPHS BAY*

is the large bay lying north of **Cape San Blas** and separated from the gulf by the long, narrow strip of land which extends northward from the cape. The bay is 11½ miles long in a general **N.** and **S.** direction and varies

*Shown on chart 184, scale $\frac{1}{80,000}$, price $0.50.

in width from 2¼ miles at its entrance to 5½ miles at its widest part; it is one of the best harbors of refuge on the Gulf Coast, and is easily entered in the daytime, in clear weather, but it is not at present marked by any aids that can be used at night. A lighthouse is to be erected on St. Josephs Point. Good anchorage, in 4 to 5½ fathoms, will be found anywhere in the bay except its southern end, which is shoal for a distance of 3½ miles from the head.

The entrance, which lies between the mainland on the north and **St. Josephs Point** on the south, is somewhat obstructed by shoals, between which there are two channels. The **Main Channel** has a depth of 19 feet, and is marked by buoys; it is about ¾ mile wide. The **Swash Channel** has a depth of 15 feet, and leads along St. Josephs Point at a distance of a little over ¼ mile. This channel is not marked, but is easily entered by vessels of less than 12 feet draft, keeping at a distance of a little over ¼ mile from the beach while rounding St. Josephs Point.

There are no settlements on the shores of the bay, and it is entered only for an anchorage. Fishing vessels anchor just eastward and inside of St. Josephs Point in 4½ to 5½ fathoms of water.

Cape San Blas is 17 miles **W.** by **N.** from Cape St. George Lighthouse. The point of the cape is low and wooded, and is washing away. The ruins of an old light tower are now seen in the water over ¼ mile from the beach. The lighthouse erected on the cape in 1885 has been undermined by the sea and will be removed to another site. The narrow strip of land extending to the northward from the cape and terminating at St. Josephs Point is a succession of low sand hills, wooded in places, and showing a white sand beach when seen from seaward. The shoals, which extend southward from Cape San Blas, make it dangerous for deep-draft vessels, especially in a heavy sea, to approach the cape from southward or southwestward closer than 11 miles. A spot with 4 fathoms of water over it lies 9¼ miles **SSW.** from the lighthouse, and there are spots with 5¼ to 5½ fathoms over them from 1 to 1¾ miles outside of this 4-fathom spot. There is a swash channel, with a depth of about 8 feet, about 1 mile from the cape, and local vessels of less than 7 feet draft use this channel for rounding the cape in smooth weather.

GENERAL DIRECTIONS, ST. JOSEPHS BAY.

The Bar buoy is 3 miles **WNW. ½ W.** from the northern end of St. Josephs Point. The shore from Cape San Blas nearly up to St. Josephs Point can be approached to within ½ mile with 4 fathoms of water, but a shoal extends about 2¼ miles in a westerly direction and about 1 mile in a northerly direction from St. Josephs Point. Approaching from the westward, the shore should be given a berth of 3 miles to avoid the shoal off **St. Andrews Point.** This shoal is locally known as **Bell Shoal.**

Vessels of over 12 feet draft should make the Bar buoy, a black and white perpendicularly striped can; leaving this buoy close-to on either hand, steer about **NE. ½ E.** until up to the Turn buoy (red, nun); leave this buoy on the starboard hand and steer about **SE.**; leave Middle Ground buoy (red, nun) about ¼ mile on the starboard hand and steer **S.**; when the northern end of St. Josephs Point bears about **W.** steer **SW.** and anchor in the bight just inside the point. Or, stand into the bay and anchor at discretion.

Vessels of less than 12 feet draft can follow the shore from Cape Sand Blas and round St. Josephs Point at a distance of ¼ mile. This is known as the Swash Channel; on a clear night the white sand beach can easily be followed at the above-mentioned distance.

ST. ANDREWS BAY*

is a large irregularly shaped body of water lying about 32 miles northwestward of Cape San Blas; it is an excellent harbor and anchorage, but is seldom visited by other than local vessels and fishermen. There are two entrances to the bay from the gulf; the easternmost, known locally as the **Main Channel**, or **East Pass**, is marked by ranges of lighted beacons and buoys and is good, it is claimed, for a depth of 12 feet; it lies 27 miles **NW. ¾ N.** from Cape San Blas Lighthouse and 88 miles **E. ⅜ S.** from the whistling buoy off Pensacola. The other entrance, known locally as **West Pass**, is 3 miles northwestward of East Pass and westward of **Hurricane Island**, a low, bare sand island that was formerly part of the peninsula to the westward; in 1896 this island looked as if it were being washed away. West Pass, which, although not marked, is sometimes used by local vessels, is said to have a depth of 10 feet in the channel over the bar. The depths over the bars at East and West passes are liable to change.

*Shown on chart 134, scale $\frac{1}{80,000}$, price $0.50. In 1896 the entrance to St. Andrews Bay had changed so much as not to be recognized by the chart.

Inside the entrances are extensive shoals with channels between them; in one of these the depth is about 12 feet; above these shoals depths of 3¾ to 8 fathoms can be taken in a good, broad channel through the bay and into its three arms. The deepest draft of the vessels now entering is 12 feet, but the usual draft of the vessels trading here is 6 to 7 feet. The aids are two ranges and the buoys in the Main Channel. There are no licensed pilots. As the buoys are liable to be displaced by heavy gales, strangers of 7 feet draft or over should employ some one familiar with the locality to pilot them in.

St. Andrews Bay is a small town on the north shore of the bay and the most important in this vicinity; it has a little trade in fish, and a depth of 8 to 13 feet is found alongside the wharves. The steamer on the route between Mobile and Carrabelle, when she is running, makes a landing at the town. Provisions can be had and water can be obtained, but must be brought down to the wharves in barrels from pumps.

East Bay extends in a general **ESE.** direction for about 18 miles from St. Andrews Bay; it is from ⅝ to 2¼ miles wide and has a channel depth of 3¼ to 7 fathoms for a distance of 9 miles, while a depth of 12 feet can be taken about 15 miles up the bay. There are a number of settlements and post offices on the shores of the bay; **Wetappo,** which is near the head, can be reached by vessels of 6 feet draft.

North Bay extends in a northeastly direction from the northern end of St. Andrews Bay and is from ⅝ to 1⅝ miles wide. A depth of 12 feet can be carried about 5 miles up the bay and about 7 feet to **Bayhead,** a village at the head of the bay.

West Bay extends in a northwesterly direction from the northern end of St. Andrews Bay; it is about 8 miles long and has a general width of 2 miles. A depth of 12 feet can be taken about 5 miles up the bay and 8 feet to near its head. **Westbay** is the name of a post village near the head of the bay.

Prominent features.—Approaching the entrance from seaward, a group of four tall pines, standing about 4¾ miles northwestward of the Main Channel entrance, will show conspicuously; these trees are 70 to 100 feet high and look like tall umbrellas. The range beacons for crossing the bar should be seen when near the Entrance buoy.

Anchorages.—Small vessels and fishermen frequently anchor northward of Hurricane Island, in 8 feet of water, where they are sheltered from the sea in any gale. The best anchorage, in from 4¾ to 6½ fathoms, is abreast the town of St. Andrews Bay, between **Buena Vista** and **Dyers** points: the holding ground here is good and the shelter excellent. The bottom in the bay below the town of St. Andrews Bay is generally hard sand and poor holding ground.

Quarantine.—When found necessary a quarantine is established, and a schooner anchored near the passes from which the health officer boards incoming vessels. (See also quarantine laws, State of Florida, Appendix I, and National Quarantines, Appendix IV.)

Storm-Warning Displays of the **United States Weather Bureau** are made at St. Andrews Bay.

Prevailing Winds.—In summer the breeze is off the land at night and from sea in the daytime; in winter the winds are variable, the strongest gales blowing from northward. Northers are frequent during some months; the only effect they have is to lower the water in the bay and set it out through the passes.

Tides.—Winds affect the tides so greatly that the height and time of tides can not be depended on. (See table, page 24, and remarks on pages 25, 26.)

GENERAL DIRECTIONS, ST. ANDREWS BAY.

These directions are good for vessels of 7 feet draft; a vessel of greater draft should employ a pilot.

To Enter by the Main Channel.—Coming from the Eastward.—A **NNW. ¾ W.** course from Cape San Blas Outer Shoal buoy continued for 32½ miles should lead to St. Andrews Bay Entrance buoy. Vessels approaching from eastward should keep in 4 fathoms of water, so as to avoid a shoal which is about 10 miles eastward of the Entrance buoy; it has 6 feet of water at its outer end and extends 1 mile offshore.

Coming from the Westward.—Keep in 4 fathoms of water, and steer about **SE.** by **E.** until the Entrance buoy is made; then steer for this buoy.

From the Entrance buoy steer about **NE.** by **N.**, keeping the two beacons in range ahead and leaving a black and white perpendicularly striped nun buoy on the starboard hand and a black can buoy on the port hand. Round the latter buoy and steer about **NW.** by **N.**

with two beacons in range ahead; on this course leave a red nun buoy on the starboard hand, and when nearly up to the front beacon of the range leave it on the starboard hand and steer about **NW.** ½ **W.**, leaving a black can buoy on the port hand; head for a black and white perpendicularly striped nun buoy. When close to the latter buoy, steer about **WSW.** ¾ **W.** for a black and white perpendicularly striped can buoy; from the latter buoy, steer about **NW.** by **W.** ½ **W.**, heading for a black and white perpendicularly striped nun buoy. Leave the latter close-to on either hand and steer about **N.** ½ **W.**; on this course two black can buoys should be passed and left on the port hand. The course from black can buoy No. 7 is about **NW.** by **W.** ½ **W.**, care being taken to avoid a long spit which makes southward from the point at the easternmost wharf of the town of St. Andrews Bay. When the end of this wharf bears about **NE.**, steer **N.** and anchor ¼ mile from the beach, in 4 to 6 fathoms of water, soft bottom.

To Enter by West Pass.—Vessels of 7 feet draft may use this pass when the weather is clear and the water smooth. Keep in about 4 fathoms of water, and when the four tall umbrella-shaped pines (which are near the western side of the entrance and form the best landmark for a stranger) are about 2¼ miles distant, bearing **NW.**, look out from aloft for the channel which will show quite plainly among the shoals, the water on the shoals being much lighter in color. Follow the deeper water, taking care that the vessel is not run into a pocket among the shoals; when inside, stand westward, following the buoys; keep a look-out for, and avoid, the discolored shoal water.

Remarks.—There are no prominent landmarks except the four tall, umbrella-shaped pine trees near the western entrance, and a stranger should use the Main Channel if possible. The channels are shifting and the shores changing; a stranger should select smooth water and clear weather for entering, as the channels can then be readily seen. The range beacons (see table, page 14) lead through the Main Channel to an anchorage behind Hurricane Island. Vessels headed by the wind, or in a gale of wind, should run for St. Josephs Bay and anchor there until a favorable opportunity offers for entering St. Andrews Bay.

The currents in the bay and its entrances are very strong at times, and the best pilots will not attempt to beat in against the ebb current in a strong northerly wind.

CHOCTAWHATCHEE BAY*

is 25 miles long in a general **E.** and **W.** direction and has an average width of about 3¼ miles; its entrance from the gulf, known as East Pass, is 72 miles **NW.** by **W.** ¼ **W.** from Cape San Blas Lighthouse and 42 miles eastward of Pensacola entrance. At its western end, the bay is entered from Santa Rosa Sound through **The Narrows**; these waters form an inland passage to Pensacola Bay, through which a draft of about 4 feet can be taken. The western end of Choctawhatchee Bay, for a distance of 15 miles, has a depth of 3 to 7 fathoms, but in the eastern end the depths range from 9 to 18 feet. The shores of the bay and its tributaries are sparsely settled and communication is usually had by small sailboats.

East Pass is obstructed by a shifting bar through which there is a channel having a usual depth of about 5 feet; vessels can only enter when the sea is smooth, and, even then, local knowledge is necessary. A fisherman will come out over the bar to pilot a vessel in if the sea will permit; the vessel will generally have to wait some time outside, and in fine weather may anchor just ouside of the bar. There is considerable lumber and timber shipped from Choctawhatchee Bay to Pensacola through Santa Rosa Sound.

GENERAL DIRECTIONS, EAST PASS, CHOCTAWHATCHEE BAY.

Coming from the eastward or westward, the beach can be followed at a distance of ¼ mile, but when approaching the entrance, which can not easily be distinguished unless it is close-to, a vessel should keep at least ½ mile from the shore. In clear, smooth water the shoals are very distinctly marked and the deeper water of the channel can be easily seen; the channel, in 1896, favored the eastern side of the pass, but, as it is liable to shift during any heavy southerly gale, no certainty can be felt as to its direction, though a depth of from 4 to 6 feet will usually be found in the channel. A vessel of less than 4 feet draft, in the

*Shown on chart 185, scale $\frac{1}{80,000}$, price $0.50.

daytime, with smooth, clear water, can pick her way through the shoals by sight. The tidal currents through East Pass have considerable velocity and a sailing vessel requires a good fair breeze to stem them.

PENSACOLA BAY*

is one of the important harbors on the Gulf Coast of the United States; its entrance lies 106 miles **WNW.** ½ **W.** from Cape San Blas and 39½ miles **ENE.** ½ **E.** from Mobile Bay entrance. The bay is about 12½ miles long in a general **NE.** by **E.** and **SW.** by **W.** direction, and has an average width of about 2½ miles. At its eastern end it is joined by Escambia Bay, a large, shallow body of water which makes northward, and by East Bay, a large, shallow body of water which makes eastward. Santa Rosa Sound is the narrow body of water which extends from the southern part of Pensacola Bay eastward along the coast for a distance of 24 miles, and then, by a narrow, shallow body of water called The Narrows, connects with Choctawhatchee Bay.

These connecting waters and their tributaries form water routes over which large quantities of lumber and timber are brought to Pensacola for shipment. Cotton, and bituminous coal mined in Alabama, are also shipped. One of the important industries of the port is fishing.

The entrance to the bay is about ¾ mile wide and is obstructed by shoals and a bar through which there is a well-marked channel having a depth of 21 feet at low water, but this depth is said to be decreasing. The channel through Caucus Shoal has a depth of 30 feet, which is maintained by dredging. Inside the entrance, Pensacola Bay has a channel depth of 4½ to 6½ fathoms up to the city of Pensacola and 3¼ fathoms to its junction with Escambia Bay and East Bay. The bay affords excellent shelter and anchorage and in the winter is frequently used as a harbor of refuge by coasting vessels.

The city of **Pensacola** is on the north shore of Pensacola Bay about 7½ miles above the entrance; it is one of the important commercial cities on the Gulf Coast and its shipments of lumber in foreign vessels exceed those of any port on the gulf. The depth of water at the wharves ranges from 13 to 22 feet according to locality; the bottom is soft mud. A large number of vessels come here for cargoes of lumber and coal, and steamers occasionally stop at Pensacola for fuel.

Town Point is on the south shore of Pensacola Bay opposite the city of Pensacola; it has a shipyard and marine railway.

Warrington is a small town on the north shore of the bay about 2 miles above the entrance. At the eastern end of the town is the **United States Navy Yard.** The depth alongside the wharf at Warrington is 12 feet; a dredge (in December, 1900) was at work deepening the water near the docks at the navy yard.

EAST BAY.

extends about 8½ miles eastward from the head of Pensacola Bay and is about 5¾ miles wide in a **N.** and **S.** direction; the entrance to the bay, between **Garcon Point** on the north and **Red Fish Point** on the south, is 2¼ miles wide. The bay has a general depth of 8 to 12 feet, but in the entrance the channel depth ranges from 14 to 24 feet; at its northern end it is entered by **Blackwater Bay** and **Blackwater River**, the latter being the approach to the towns of **Milton** and **Bagdad.** Blackwater Bay is nearly 5 miles long in a **N.** by **E.** ½ **E.** direction and has a channel depth of 7 to 9 feet; at its head Blackwater River enters from northwestward. The town of Bagdad is 2½ miles above the mouth of Blackwater River, on its west bank, and the town of Milton about 1½ miles above Bagdad, on the same side of the river. From 7 to 9 feet is the deepest draft that can be taken to Bagdad or Milton, depending on the stage of the tide. The channel through East Bay and into Blackwater Bay is marked by beacons, but a pilot is necessary for a stranger, and a towboat for sailing vessels of 7 feet draft, if bound into Blackwater River. **Magnolia**, about 3 miles above Milton, is considered the head of navigation on the Blackwater River, only rafts and small boats pass above Milton; at the latter place lumber is loaded on lighters and towed to Pensacola for shipment. The railroad bridge at Milton has a draw 80 feet wide. **East Bay River** empties into the eastern end of East Bay; it is a shallow, unimportant stream.

ESCAMBIA BAY

is a large, shallow body of water making into the eastern end of Pensacola Bay from northward; the bay is nearly 9 miles long in a general **NNW.** and **SSE.** direction, and is from 1½ to 3 miles wide. A little over 5 miles above its entrance, the bay is crossed by a railroad bridge with a draw 80 feet wide, and for a distance of 4

*Shown on chart **186**, scale $\frac{1}{80,000}$, price $0.50; the entrance is shown on charts **187**, scale $\frac{1}{80,000}$, price $0.50, and **490**, scale $\frac{1}{30,000}$, price $0.25.

miles below this bridge the channel depth ranges from 7 to 11 feet, while above the bridge a depth of 7 feet can be carried for 2 miles. **Escambia River** empties into the bay from northwestward about 1½ miles above the bridge. This river is navigable only for small craft of 3 feet or less draft; through it and its tributaries, rafts of logs and timber are brought to Escambia and then towed to Pensacola for shipment. **Ferry Pass** is a small settlement about 1½ miles above the mouth of the river. **Escambia** is a village on the west shore of the bay about 1 mile above the railroad bridge; it can be reached by vessels of 6 feet draft. On the east shore, above the bridge, is the post village of **Mulat.**

SANTA ROSA SOUND

is the narrow body of water extending eastward from the southeastern part of Pensacola Bay for a distance of 24 miles, and just back of the narrow strip of beach known as **Santa Rosa Island.** At its eastern end the sound is joined by **The Narrows,** a narrow, shallow body of water about 9 miles long, which leads into Choctawhatchee Bay. A depth of over 15 feet can be taken through the sound for a distance of 13 miles from Pensacola Bay, but eastward of this there are numerous shoals and 5 feet is the deepest draft that can be taken through at high water into Choctawhatchee Bay. **Mary Esther** is a post village on the north shore of The Narrows, about 27 miles from Pensacola Bay. At the western end of the sound, off **Deer Point,** is the quarantine station; vessels entering Pensacola Bay are obliged to come here to obtain pratique. A range of two stakes, with lights, marks the channel through the eastern end of the sound, but it is hardly possible for a stranger of 3 feet draft to pass through the sound without getting aground several times.

BIG LAGOON

is a shallow, unimportant body of water about 5 miles long in an **E.** by **N.** and **W.** by **S.** direction and from ¼ to 1 mile wide. It is entered by a narrow slue, having a depth of 2 feet, northward of **Fort McRee,** and extends westward along the coast behind a low, narrow strip of beach through which the sea occasionally makes breaches, which, however, generally close again.

GENERAL INFORMATION.

Prominent features.—There are no natural landmarks that can be recognized by a stranger standing along the coast. **Pensacola Lighthouse** (see table, page 14) will be the first easily recognized mark. While eastward of the entrance, the masts of the shipping at anchor in the bay will be seen over Santa Rosa Island, and the tall brick chimney and some of the buildings in the navy yard will be seen as the entrance is approached. The ranges can be easily picked up in clear weather, either in the daytime or at night (see table, page 14).

Lines defining limits within which the Inland Rules of the Road apply.—From Pensacola Entrance whistling buoy **N. ¼ W.** a tangent to the east side of Fort Pickens, to the shore of Santa Rosa Island, and from the whistling buoy **NW. 3/16 W.** to Fort McRee Range front light.

Channels.—The **Main Channel,** which is marked by buoys and three ranges, has a depth of 21 feet on the bar at present (1900), but this depth is said to be decreasing, and the channel is not now used by the deeper draft vessels.

The **Caucus Channel,** ½ mile westward of, and parallel with, the range of Pensacola Lighthouse and Bar beacon, is the one used by the deeper draft vessels; it has a depth of 30 feet and width of 200 feet and is well marked by a range of two lighted beacons (see table, page 14) and a number of buoys. The depth and width of this channel is maintained by dredging and is to be widened to 300 feet. If there is any swell on the bar, the deeper draft vessels have to wait for smooth water. After crossing the bar a least depth of 5 fathoms can be taken to abreast the city of Pensacola. The **Swash Channel** has a depth of about 10 feet but is used only by small local vessels; it leads eastward of the Middle Ground in the entrance and close to the western end of Santa Rosa Island.

Anchorages.—The anchorage for vessels is good anywhere in the bay except abreast the navy yard. The usual anchorage is abreast the city of Pensacola, where the holding ground is good and vessels can ride out any gale of wind. (See harbor regulations, Appendix I.)

Quarantine.—The quarantine station is southeastward from Deer Point, at the entrance to Santa Rosa Sound. All vessels entering the bay between May 1 and November 15 are required to stop off the quarantine station until boarded by the quarantine physician. During the remainder of the year certain vessels only are boarded. (See quarantine regulations, Appendix I, and National Quarantines, Appendix IV.)

Pilots.—There are licensed pilots for the port, who cruise just outside or inside the bar in a steam pilot boat and board vessels near the whistling buoy. Pilotage is compulsory (see pilot laws, regulations, and rates.

Appendix I). Vessels desiring a pilot and not having obtained one can anchor near the whistling buoy until boarded. Pilots for East Bay and for Escambia Bay can be had at Pensacola.

Towboats.—Towboats are used by all the deeper draft sailing vessels, but with a strong fair wind vessels of 18 feet draft sometimes sail in through either the Main or Caucus channels. Towboats sometimes cruise outside the bar; they can always be had at Pensacola for towing over the bar or up any of the bays.

Supplies.—Bituminous coal for steamers can be had through chutes or from cars at the wharves in Pensacola, or from lighters in the stream or outside the bar. Water can be had through pipe and hose at the wharves at Pensacola, or from water boats in the bay. Provisions and ship chandler's stores can be obtained at Pensacola, and provisions can be had also at Warrington, Bagdad, and Milton.

Repairs.—At Town Point, opposite Pensacola, there is a marine railway capable of hauling out vessels of 1,400 registered tons; the draft when the cradle is down is 13 feet forward and 18 feet aft. By extending the cradle vessels of 260 to 270 feet in length can be hauled out. There is a sectional dock at Bagdad capable of lifting vessels of 300 tons and about 9 feet draft. There are good facilities for repairing hulls of wooden vessels at Town Point and Bagdad and, for small wooden vessels, at Milton. At Pensacola there are two machine shops where ordinary repairs to machinery of steamers can be made.

Storm-Warning Displays of the **United States Weather Bureau** are made from the post office building, corner of Palafox and Government streets; they show well to the shipping in the harbor.

United States Marine Hospital Service.—Medical attendance is furnished by a medical officer of the service. Seamen requiring long-continued hospital treatment are sent to the Marine Hospital, at Mobile, Ala. (See also Appendix IV.)

Winds.—Northers average one a month during the winter; they, however, have no effect on the shipping at anchor except to lower the water in the bay and on the bar. (See the remarks on pages 26, 27.)

Fogs.—There is considerable fog during February and March. Southerly winds bring it in and northerly winds clear it away.

Tides.—The tides are irregular, being, to a great degree, influenced by the force and direction of the wind. (See table, page 24, and remarks on pages 25, 26.)

Currents.—The currents set with considerable velocity over the bar at the entrance. On the Fort McRee (the western) Range both the flood and ebb set across the Main Channel. Elsewhere, the currents follow the general direction of the channel.

SAILING DIRECTIONS, PENSACOLA BAY.

The directions in sections 1 and 1 A are good for vessels of any draft.

The directions in section 2 through Caucus Channel are good for steam vessels of 21 feet draft in the daytime, or at night when the range lights are visible. Vessels of deeper draft should not attempt to enter without a pilot.

The directions in section 2 A through the Main Channel are good for a draft of 17 feet when the aids can be seen and with a smooth sea.

1. ***Approaching from the Eastward.***—From a position 12 miles **S.** of Cape San Blas, a **WNW.** course made good for 110½ miles will lead to the whistling buoy off the entrance to the Caucus Channel.

Or, *from the buoy off Cape San Blas*, make good a **WNW.** ⅜ **W.** course for 110 miles; this should lead to the whistling buoy off the entrance to the Caucus Channel.

Or, *from the entrance to St. Andrews Bay*, follow the shore, giving it a berth of about 2½ miles until up to the whistling buoy at the entrance to the Caucus Channel.

To approach the entrance to the Main Channel.—Follow the directions in any one of the preceding paragraphs until Pensacola Lighthouse bears **NNW.**, then follow the directions in section 2 A.

Remarks.—Cape San Blas is described on page 68. Deep-draft vessels should give the cape a berth of 12 miles in heavy weather. The shore between Pensacola Bay and St. Andrews Bay is comparatively bold-to and 10 fathoms of water will be found in many places, within 1 mile of the beach. Santa Rosa Island, which extends along the coast for a distance of 41 miles to the eastward of the entrance to Pensacola Bay, shows a white sand beach and sand hills, with scattered clusters of trees and bushes. Eastward of Santa Rosa Island

the shore is generally wooded to within a short distance of the beach. As the entrance to Pensacola Bay is approached, the masts of the ships at anchor at the quarantine station, during the season when quarantine is in force, will be seen over Santa Rosa Island, and next the lighthouse and tall brick chimney at the navy yard will show conspicuously. A vessel approaching the shore at night, or in thick weather, should take frequent soundings, and should not shoal the depth of water to less than 12 fathoms before sighting the lighthouse.

1 A. ***Approaching from the Southward or Southwestward.***—Vessels approaching from southward should, when near Latitude 30° 00′ N., stand **N. ½ W.** on the meridian of 87° 17′ W. until Pensacola Lighthouse is made; then bring the lighthouse on the bearing **N.** by **W. ¼ W.** and steer for it; this course will lead to the whistling buoy off the entrance to the Caucus Channel.

Or, *from the light-vessel off South Pass*, at the entrance to the Mississippi River a **NE. ⅛ E.** course made good for 123¼ miles will lead to the whistling buoy off the entrance to the Caucus Channel.

Or, *from a position 2 miles southward of the whistling buoy off Mobile Bay entrance*, an **ENE. ¼ E.** course made good for 39¼ miles will lead to the whistling buoy off the entrance to the Caucus Channel.

To approach the entrance to the Main Channel.—Follow the directions in any one of the preceding paragraphs until Pensacola Lighthouse bears **NNW.**, then follow the directions in section 2 A.

Remarks.—Standing in for the coast, vessels not sure of their reckoning can easily tell by the appearance of the land, when about 4 miles off, whether they are eastward or westward of the entrance to Pensacola Bay. Eastward of the entrance, for a distance of 40 miles, Santa Rosa Island presents a white sand beach and low, white sand hills with scattered clusters of trees and bushes; back of this, on the mainland, are thick woods. Westward of the entrance, for a distance of 40 miles, the shore is low and thickly wooded nearly to the water, showing no breaks and very few hillocks. The lead, too, will indicate whether a vessel is east or west of the entrance. The 10-fathom curve approaches the coast very much more closely eastward than it does westward of the entrance; so that, if soundings of 10 fathoms or less are obtained while the vessel is more than 3 miles from the beach, it is an indication that she is off the entrance or westward of it. This holds good for a distance of 60 miles on either side of the entrance to Pensacola Bay. To insure a depth of 7 fathoms or more deep-draft vessels should give the shore westward of the entrance a berth of 5 miles; a depth of 4 fathoms will be found 1½ miles from the beach. (See also the remarks under section 1.)

2. ***Entering by the Caucus Channel and to the anchorage off Pensacola.***—From the whistling buoy steer about **NNW.**, keeping the two Caucus Cut Range beacons in line ahead. Continue on the range until the two beacons of the Fort Barrancas Range are in line, then stand on this latter range taking care not to be set eastward of it. When the front beacon of the Caucus Cut Range bears **W. ½ S.** steer **NE.** by **E. ¼ E.** for the tall brick chimney in the Navy Yard. When the front beacon of the Fort Barrancas Range (nearly ⅜ mile eastward of Pensacola Lighthouse) bears one point forward of the port beam steer **E. ½ S.**, keeping the rear range beacon of the Caucus Cut Range astern; continue on this course giving the north shore of Santa Rosa Island a berth of over 300 yards, and when the tall brick chimney in the Navy Yard bears 1 point abaft the port beam, steer **NE.** for 2¾ miles. Then steer **NNE.** and anchor off the city in from 4 to 5½ fathoms, soft bottom.

Remarks.—When standing in through the Caucus Channel there are a number of buoys which can not, however, be depended on while the dredge is working in the channel. The range must be closely kept; when the course is changed to stand in on the Fort Barrancas Range a black buoy No. 5 should be left on the port hand; on this range 3 red buoys should be left well on the starboard hand.

On the **NE.** by **E. ¼ E.** course heading for the chimney in the Navy Yard care must be taken not to be set southward of the course; and when the course is changed to **E. ½ S.** black buoy No. 7 should be nearly in range with the rear beacon of the Caucus Cut when the latter is fair astern on the course.

On the **NE.** course the least depth should be 5½ fathoms; the easternmost wharf at the Navy Yard should be left nearly ⅝ mile on the port hand on this course.

On the **NNE.** course the Louisville and Nashville Railroad wharf and coal pockets will be a little on the port bow. A number of vessels loading timber from rafts are usually anchored off the city in about 4 fathoms of water.

Dangers.—East Bank making southward for 1 mile from Santa Rosa Island is marked off its southwestern end by a red nun buoy.

Caucus Shoal, which makes off southeastward for 1⅛ miles from the western point at the entrance to the harbor, is marked at its eastern end by a black can buoy. Both of these shoals are marked by breakers in a heavy sea.

The **Middle Ground** lying northward from Caucus Shoal is marked at its southern end by a red bell buoy and its western edge is marked by three red nun buoys.

There are a number of spots with less than 18 feet of water over them lying as far as ⅜ mile off the north shore abreast of the town of Warrington.

2 A. ***Entering by the Main Channel and to the Anchorage off Pensacola.***—Steer **NNW.,** keeping a white beacon with black sides in range with Pensacola Lighthouse. When up to the Inner Bar buoy (can, white and black perpendicular stripes) leave it on the starboard hand and steer about **WNW.,** keeping the red beacon and white beacon of the Fort McRee Range ahead. Continue on this course, passing between a red bell buoy on the starboard hand and a black can buoy on the port hand, until nearly up to black can buoy No. 5; leave this buoy on the port hand and steer **N. ½ E.,** keeping the red pyramidal beacon and white pyramidal beacon of the Fort Barrancas Range in line ahead.

Having stood on the **N. ½ E.** course for 1 mile steer **ENE. ½ E.,** with the front beacon of the Caucus Range astern, and giving the northern point of Santa Rosa Island a berth of at least 250 yards; after having stood **ENE. ½ E.** for about ¾ mile, and the small landing on the north shore of Santa Rosa Island bears abeam, steer **E. ½ N.** When the tall brick chimney at the navy yard bears **NNW.,** steer **NE. ¾ N.** and anchor off the city in 4½ to 5 fathoms of water.

At night.—When in 7 fathoms of water bring Pensacola Light to bear **NNW.** and steer for it, keeping the white beacon light directly under and in range with the main light, and continue on the range. Look out for the Fort McRee Range (front light red, rear light white), which will be broad off the port bow. When these two lights are in range, or nearly so, look out for Inner Bar buoy, so as not to strike it. Stand in on the Fort McRee Range, taking care to leave the bell buoy (which can usually be heard) on the starboard hand, and when past the bell buoy look out for the Fort Barrancas Range (front light red, rear light white), which will show eastward of Pensacola Light. Continue on the Fort McRee Range until the vessel is fair on the Fort Barrancas Range (front light red, rear light white); stand on the latter range for 1 mile and then steer **ENE. ½ E.,** taking care not to be set southward and that the northern point of Santa Rosa Island is left at least 250 yards on the starboard hand. Continue on the **ENE. ½ E.** course for about ¾ mile and then steer **E. ½ N.** for 1¼ miles; the vessel should then be in mid-channel between the Navy Yard and Santa Rosa Island. From this position steer **NE. ¾ N.** and anchor when abreast the city in 4½ to 5 fathoms of water.

Remarks.—When there is a strong southerly wind and an ebb current a confused sea, bad for small vessels, makes on the bar. Standing on the **NNW.** course for Pensacola Lighthouse Inner Bar buoy (can, white and black perpendicular stripes) should be ahead. At night care must be taken not to run into any of the buoys, which lie close to the range lines; in the daytime, with clear weather, the buoys are close enough to one another to be readily seen.

The **WNW.** course (on the **Fort McRee Range**) from the Inner Bar buoy will lead so as to pass between a red bell buoy and black can buoy, and a black can buoy should be ahead. The tidal currents set diagonally across the sailing line on the **WNW.** course and care must be taken not to be set off the range. Black can buoy No. 5, which is ahead on this course, should be left 50 yards on the port hand.

On the **N. ½ E.** course three red buoys, marking the western edge of the **Middle Ground,** will be left on the starboard hand; black can buoy No. 7 will be nearly ahead; when this buoy is about 400 yards distant the course should be changed to **ENE. ½ E.**

On the **ENE. ½ E.** course, care should be taken, when the current is running ebb, not to be set southward; the northern point of Santa Rosa Island must be given a good berth to clear the shoals making off westward from it. A small dock (landing) will be seen on the north shore of Santa Rosa Island abreast of Fort Pickens, and the town of Warrington and the United States Navy Yard will be seen on the port bow.

The **E. ½ N.** course heads for the quarantine station, which will be from 5 to 6 miles ahead. The shipping off the city of Pensacola will be seen northeastward and the city will open out from behind the navy yard. The harbor master has control of the anchorage and berthing of vessels (see Appendix I).

2 B. ***To the Quarantine Anchorage.—For vessels of less than 15 feet draft.***—Follow the directions in section 2 A until the large brick chimney at the navy yard bears **NNW.** and is distant ¾ mile. From this position steer **ENE. ½ E.** for 3 miles and then steer **ESE. ¾ E.** Leave Deer Point beacon (lighted) ¼ mile on the port hand and steer about **E. ½ N.** for the quarantine station. Anchor northward or northwestward of the station in about 4 fathoms of water.

Remarks.—On the **ENE. ½ E.** course **Deer Point,** a low, bare, sand spit on the north side of the entrance to Santa Rosa Sound, with a lighted beacon off its southern end, will be on the starboard bow. On the **ESE. ¾ E.** course care must be taken not to approach Deer Point too closely, as a long shoal makes southward from the point. A yellow buoy is usually in place nearly ¼ mile to the southwestward of Deer Point; this buoy can be left close to on either hand.

3. ***From Pensacola to Milton.—In the daytime, for vessels of 6 feet or less draft.***—From a position about ⅜ mile southward of the wharves at Pensacola, steer **ENE. ½ E.** Pass about ¼ mile southward of a black can buoy off Garcon Point and keep a large red beacon (lighted) on the port bow. When this beacon bears **NE.,** steer about **N. ½ E.,** leaving the beacon 250 yards on the starboard hand and keeping a red beacon (Middle beacon, lighted) ahead. When nearly up to the latter beacon leave it 100 yards on the starboard hand and continue **N. ½ E.,** course for a red beacon (lighted) which is nearly 3 miles distant from middle beacon. Leave the lighted beacon about 50 yards on the starboard hand and steer about **N.** by **E. ⅞ E.**; on this course a large sawmill on Bay Point should be a little on the port bow and the course should lead so as to leave the end of the lumber dock at the sawmill about 50 yards on the port hand.

Round the point with a starboard helm, keeping about 50 yards from the lumber docks and log booms, and steer about **NW. ½ W.** for the point which will be on the port bow and a little over ½ mile farther up the river. As this point is approached leave it about 60 yards on the port hand and then steer about **N.** by **W. ½ W.,** keeping the end of the first small wharf which is on the north side of the point, over the stern while on this course. Stand straight in for the entrance between the low marshy islands on both sides and favor the shore on the starboard hand. When fair in the entrance and about 50 yards from the wooded shore on the starboard hand, steer a little more to the westward, so as not to enter the creek which will be right ahead. The course is about **NW.** by **W.,** leaving this creek (which can be recognized by an old dock a short distance above the mouth) on the starboard hand. Follow the bank on the starboard hand, giving it a berth of about 50 yards until nearly up to the sawmill, which will be seen on the port bow; then haul over toward the port bank and when abreast of the log boom, on the port hand, stand up the river, keeping in midstream. Anchor in mid-river below the railroad bridge at Milton, or, if bound to the sawmill above the bridge, pass through the draw and continue a mid-river course, anchoring above the bridge.

PERDIDO BAY*

empties into the Gulf of Mexico through **Bayou St. John** and a narrow pass located 13 miles westward of Pensacola entrance and 26½ miles eastward of Sand Island Lighthouse at Mobile Bay Entrance. The bay is an irregularly shaped, shallow body of water, extending about 12 miles in a northeasterly direction, and at its head is entered by **Perdido River,** the bay and river forming part of the boundary between the States of Florida and Alabama. **Millview,** which is near the head of Perdido Bay, has lumber mills which are supplied by logs from the **Perdido River;** the lumber is shipped from Millview to Pensacola by rail. This is the only industry in this vicinity.

*Shown on chart 137, scale $\frac{1}{80,000}$, price $0.50.

Bay La Launch and **Wolf Bay** extend westward and northward from the western end of Perdido Bay; they are of no importance, but at the head of Wolf Bay is the post village of **Swift**. The post village of **Josephine** is situated on the north shore, at the entrance to Bay La Launch.

The entrance from the gulf, between **Florida Point** on the east and **Alabama Point** on the west, is obstructed by a shifting bar which extends nearly ½ mile to seaward and over which there is a channel varying in depth from 5½ to 12 feet, according to circumstances. In June, 1900, there was 8½ feet in this channel. Occasionally a fisherman of 4 to 5 feet draft will cross the bar, but as there are no aids except local ones it requires a practiced eye to follow the channel among the shoals. In strong southerly winds the sea makes the bar impassable; strangers should never attempt to enter before sounding out the channel. Inside the entrance are numerous shoals, and these are continually shifted by the strong tidal currents which are caused principally by the winds. A vessel that crosses the bar and passes through the shoals in Bayou St. John can easily carry 7 feet of water to Millview and 10 feet to Josephine and, through Bay La Launch, into Wolf Bay.

Sailing directions that would be of use to a stranger can not be given; it is hard to distinguish the entrance at a distance of 1 mile from shore, and the channel over the bar is liable to shift at any time.

MOBILE BAY*

is 39½ miles to the westward of Pensacola Entrance and 91 miles northeastward of the South Pass of the Mississippi River; it is about 27 miles long in a **N.** and **S.** direction and has an average width of about 8 miles for the greater part of its length. The southern part of the bay, extending about 14 miles eastward of the entrance, is known as **Bon Secours Bay.** Mobile Bay is the approach to the city of Mobile and to the Alabama and Tombigbee rivers, the two most important rivers in the State of Alabama. The port of **Mobile** has a large foreign and coastwise trade; the principal articles shipped are cotton, lumber, naval stores, rails, ice, coal, and provisions. The lower part of the bay is a good anchorage and also an excellent harbor of refuge, as it is one of the easiest harbors on the Gulf Coast to enter with a southerly wind when the sea is not breaking on the bar.

The entrance, between **Mobile Point** on the east and the eastern end of **Dauphin Island** on the west, is 2¾ miles wide, but there are a number of islands and extensive shoals lying southward, between which a number of channels lead into the bay. The **Main Ship Channel**, which is marked by Sand Island Lighthouse (see table, page 14), is the one generally used; it leads between **Dixie** and **Sand** islands, is from ⅜ to ½ mile wide, and has a depth of 22 feet on the bar. The deepest draft that has been taken out over the bar is 24½ feet. Inside the bar, the depths range from 5 to 11 fathoms until up to the anchorage, above which the general depth in the bay is about 12 feet; there is, however, a dredged channel from the Lower Fleet to the city of Mobile which at present (1900) has a depth of about 22 feet. There are several summer resorts on the eastern shore between **Great Point Clear** and the head of the bay; they all have steamboat communication with Mobile. A draft of 12 feet can be taken to **Montrose** and 7 feet to **Howard** (post-office name, **Daphne**), **Battles**, and **Point Clear**.

Bon Secours Bay has a general depth of 7 to 15 feet and is of no importance, except for its oysters. **Bon Secours** is a village at the head of the bay. Emptying into Bon Secours Bay from northward is **Weeks Bay**, a shallow body of water navigable for boats of about 3 feet draft. The southwestern part of Mobile Bay is connected with Mississippi Sound by a number of shallow, narrow passes, through the deeper of which a draft of about 6 feet can be taken at high water.

The **city of Mobile** is at the head of the bay, on the western shore of the mouth of the Mobile River; it is one of the important commercial cities on the Gulf Coast. The depth of water alongside the wharves of the city ranges from 12 to 23 feet, and the facilities for loading and unloading vessels are good. The deepest draft of the vessels leaving the city wharves is about 22 feet. Besides the steamers plying on the bay and the rivers leading into it, there are steamers running regularly to coast and foreign ports.

MOBILE RIVER

empties into the head of Mobile Bay near the western shore; it is one of the mouths of the Alabama and Tombigbee rivers and is about 38 miles long. Abreast the city of Mobile and up to **Chickasaw Creek** the channel has a depth of 23 to 24 feet, but above this the depths range to less than 13 feet. There are no towns of importance above Mobile; **Mount Vernon** is a village about 31 miles above the city; a draft of 14½ feet can be taken to the village. The deepest draft of the steamers navigating the river is about 13 feet.

*Shown on chart **188**, scale $\frac{1}{80,000}$, price $0.50; the entrance is shown also on charts **187**, **189**, scale $\frac{1}{80,000}$, price of each $0.50.

APALACHEE RIVER.

empties into the head of the bay near the eastern shore; it is one of the mouths of the Alabama and Tombigbee rivers. Only a draft of 4½ feet can be taken into the river directly from the bay, but by a roundabout route leading up the Mobile River down the **Spanish River**, up the **Tensaw River**, and then into the Apalachee River, 10½ feet can be taken to **Stockton**, a landing on the river. The vessels navigating the river are scow-built steamers of 4 feet draft.

ALABAMA RIVER.

From the city of Mobile to the junction of the **Coosa** and **Talapoosa** rivers, the estimated distance is about 370 statute miles. Steamers run regularly from Mobile to **Montgomery**, an estimated distance of 360 miles (statute), stopping at numerous intermediate landings for passengers and freight; there is also a large rafting business done on the river. The deepest draft of the steamers trading on the river is 6 feet, but during low stages of water only 3 feet can be taken to Montgomery. At very low water in the river steamers do not run higher than Hurricane Bluff, 52 miles below Selma. Four bridges cross the river below Montgomery, the first about 15 miles above Mobile, the second at **Selma** 259 miles above Mobile, the third about 7 miles above Selma, and the fourth 8 miles below Montgomery. The bridge at Selma is built on a bend of the river and during high water steamers have to use lines to pass through the draw. The estimated width of the draws in these bridges is 110 feet. Improvements are in progress by the United States Government to keep the river navigable to Montgomery. Freshets usually occur in the river from March to June.

TOMBIGBEE RIVER.

enters the Mobile River at its junction with the Alabama River, about 38 miles above the city of Mobile. The river and its principle tributary, the **Black Warrior River**, are being improved by the United States Government to obtain a low water depth of 6 feet. At present (1900) the river is navigable for a distance of 229 miles,* to **Demopolis**, for steamers of 4 feet draft during the greater part of the year, and, when the river is high, for a draft of 4 feet to **Pickensville**, about 365 miles* above the city of Mobile; **Columbus**, about 385 miles* above Mobile, can be reached by light-draft boats when the river is high. When the improvements are finished, the river will be the outlet for the coal and iron mined in the region drained by the Black Warrior River. Steamboats of 6 feet (extreme) draft and small vessels carrying cord wood navigate the river. **Fairford**, 3 miles above the mouth of the river, has some trade in lumber, and steam and sailing vessels of 13 feet draft go there for cargoes. Sailing vessels require the assistance of towboats. Freshets usually occur in the river from March to June. Three bridges cross the river: one at **Jackson**, 105 miles,* one at **McDowell**, 225 miles,* above the city of Mobile, and the third at **Jones Buff**; the estimated width of the draws is 75 to 80 feet.

GENERAL INFORMATION.

Prominent features.—There are no prominent natural landmarks at the entrance to Mobile Bay. **Sand Island Lighthouse** is the most conspicuous mark when approaching from seaward, and on the eastern point, at the entrance, is **Mobile Point Lighthouse** (see table, page 14); the latter is on the southwestern lunette of **Fort Morgan** and forms a prominent mark when well up to the entrance. The dredged channel from the **Lower Fleet** to the city of Mobile is marked by cluster pile beacons and two lighthouses; a number of beacons on the starboard hand and a few on the port hand, going up, show lights at night.

Lines defining limits within which the Inland Rules of the Road apply.—From Mobile Bay Outer, or Deep Sea whistling buoy **NE.** by **N.** to the shore of Mobile Point, and from the whistling buoy **NW.** by **W.** to the shore of Dauphin Island.

Lines defining limits within which the Pilot Rules for Western Rivers apply.—In Mobile River above Battery Gladden.

Channels.—The **Main Ship Channel** is the one generally used by all classes of vessels; it has a depth of 22 feet over the bar and is well marked by ranges and buoys. The **Swash Channel** leads from eastward close inshore and has a depth of about 7 feet; this channel is not marked and is used only by small local craft. On the western side of the entrance, between Dauphin Island and **West Sand Island**, are two channels which are sometimes used by small local vessels, but they are constantly shifting and are therefore unreliable. **Pelican Channel**

* These distances are only estimated in statute miles.

is the one nearest Dauphin Island; through it a maximum draft of about 5 feet can be taken into Mobile Bay. **Middle Channel** leads northward of West Sand Island; it has a changing depth of over 7 feet, but the shoals lying on the western side of the Main Ship Channel will not permit a greater draft than 7 feet to enter the bay from this direction. Neither the Pelican nor the Middle Channel is marked, and local knowledge is necessary for their use. Only two of the passes from Mississippi Sound into Mobile Bay are used. **Grants Pass**, which leads close to the southward of **Grants Island**, has a depth of about 6 feet; the pass is lighted in fine weather by private parties, but should not be attempted at night by a stranger. **Pass aux Herons** is just southward of Grants Pass; it has 4 feet at low water and 5½ feet at high water, but it is not marked and requires local knowledge for its passage. **The dredged channel** from the Lower Fleet to the city of Mobile has been dredged to a depth of 23 feet, a width of 200 to 280 feet, and is nearly 24 miles long; but this channel is shoaling and maintained only by constant dredging. It is well marked by cluster pile beacons, lighthouses, and **lighted beacons** (see table, page 14); the bends are marked by additional beacons. Dredges are at work to maintain and to deepen and widen this channel. After freshets in the rivers many floating logs will be met with in the channel just below Mobile.

Anchorages.—The usual anchorage is the **Lower Fleet**, off the southern end of the dredged channel; the depth at this anchorage ranges from 19 to 24 feet and the bottom is soft mud. The best water, with good holding ground, is found northward and northwestward of Fort Morgan, and southward of the **Middle Ground**, the depth here ranging from 5 to 7 fathoms; this is where the deeper-draft vessels anchor. Both the anchorage in the Lower Fleet and that to the southward of the Middle Ground are secure, but in a norther a short, heavy, choppy sea is raised, which makes small vessels uncomfortable. The **harbor master** has control of the mooring of all vessels in the river and the draft to which vessels shall load (see the harbor regulations, Appendix I). The **quarantine anchorage** is northward of the quarantine station on Mobile Point and is usually marked by yellow buoys.

Quarantine.—The quarantine station is on the south shore of Mobile Bay, to the eastward of Fort Morgan; it is marked by a yellow flag during daylight and by a red light at night. Vessels subject to visitation by the quarantine physician are boarded by him near the quarantine station. (See quarantine regulations, Appendix I, and National Quarantines, Appendix IV.)

Pilots.—Pilotage is compulsory; vessels spoken by and not taking a pilot being obliged to pay half pilotage. (See pilot laws, regulations, and rates, Appendix I.) Pilots will be found cruising outside the bar. A vessel desiring a pilot and not having been boarded by one can heave-to, or anchor in 7 to 10 fathoms of water, outside the bar with signal set until boarded.

Towboats are used by all the larger sailing vessels; they will sometimes be found cruising outside the bar in fine weather, or, will be near Sand Island Lighthouse on the lookout for approaching vessels. Towboats can always be had at Mobile.

Supplies.—Bituminous coal for steamers can be had in unlimited quantities at Mobile, either through chutes, from cars alongside the wharves, or from lighters in the stream. The supply of anthracite coal is usually limited to 1,000 tons. Water can be had through pipe and hose alongside the wharves, or from water boats in the stream. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—The facilities for repairs to hulls of vessels and machinery of steamers are good at Mobile. There is one sectional dock 214 feet on keel blocks, 50 feet beam, and 10½ feet draft, on which a vessel of 600 tons can be lifted; also one marine railway capable of hauling out a vessel 230 feet long on keel, 1,400 tons, and 13 feet draft. There are good shears for lifting weights up to 50 tons.

Storm-Warning Displays of the **United States Weather Bureau** are made at Mobile. There is a display station at Fort Morgan which can be seen all over the lower part of the bay. For an explanation of these signals, see Appendix II.

The **United States Marine-Hospital Service** has a hospital at Mobile for the treatment of seamen (see Appendix IV).

Winds.—The prevailing winds are southerly and southeasterly in spring, southerly in summer, northerly in fall, and northerly and easterly in winter. The strongest winds are southerly in summer and northerly in winter. Severe northers occur during the winter; they lower the water in the bay so as to interfere with the deeper draft vessels bound through the dredged channel. During southerly gales the bar can not be crossed by vessels of over 18 feet draft. (See also remarks, pages 26, 27.)

Fogs.—There is considerable fog during the early spring months with southerly breezes; northerly breezes clear it away.

Tides.—See table, page 24, and remarks on pages 25, 26.

Currents.—The currents vary with the force and direction of the wind. The main body of the flood enters the bay through the Main Ship Channel and has a velocity of about 2 knots; it has a tendency to set toward

Sand Island. The ebb has about the same velocity but follows the general direction of the Main Ship Channel. During the ebb current, with a strong southerly breeze, the sea on the bar is dangerous for small craft. In the dredged channel the velocity of the currents is about 1 knot, the flood setting up the bay and the ebb down the bay, but the force and direction of the wind have a very marked effect on the set and drift.

SAILING DIRECTIONS, MOBILE BAY.

The following directions are good, in clear weather and with a smooth sea, for vessels of 18 feet draft, either in the daytime or at night, as far as the anchorage south of Middle Ground; they are also good, in the daytime, up to the city of Mobile. Vessels of deeper draft should employ a pilot and all sailing vessels should employ a towboat from the Lower Bay to the city.

The bar is dangerous for small vessels and boats when the current is setting in an opposite direction to a strong wind, an ugly broken sea will then make on the bar between Southwest Spit buoy and East Bank buoy.

1. ***Approaching from the Eastward.***—From the buoy off Cape San Blas, a **W. ⅞ N.** course made good for 143½ miles will lead to the whistling buoy off Mobile Bay entrance.

Or, *from a position 1 mile* **S.** *of the whistling buoy off Pensacola entrance*, a **WSW. ⅜ W.** course made good for 39¼ miles will lead to the whistling buoy off Mobile Bay Entrance; in a heavy sea deep-draft vessels should keep 1 mile farther offshore to obtain a depth of over 6 fathoms.

Remarks.—The coast between Cape San Blas and Mobile Bay Entrance can be approached with safety by vessels of the deepest draft as close as 5 miles. There are no marked natural features, the lighthouses being the principal aids for the navigator to depend on. Sand Island and Mobile Point lighthouses will be readily distinguished before the whistling buoy at the entrance is sighted.

1 A. ***Approaching from the Southward or Westward.***—Vessels approaching from the southward should stand **N. ½ W.** on the meridian of 88° 02′ W. until Sand Island Lighthouse and the whistling buoy at the entrance are made.

Or, *from a position 3 miles* **SE.** *from the light-vessel off the South Pass of the Mississippi River*, make good a **NNE. ⅞ E.** course for 90½ miles; this should lead to the whistling buoy off the entrance.

Or, *with Ship Island Lighthouse bearing* **NW.**, *distant 5 miles*, make good an **E. ⅜ N.** course for 45 miles, which should lead to the whistling buoy off the entrance.

Remarks.—Vessels approaching Mobile Bay from southward, and not sure of their reckoning, can tell whether they have fallen eastward or westward of the entrance by the general appearance of the land. For a distance of 40 miles eastward of the entrance the shore, although low, is wooded and unbroken. Westward of the entrance, for a distance of 50 miles, extends a chain of islands which, while wooded in places, are generally low and bare. The water shoals gradually while approaching the shore from southward and the lead can be depended on to give warning of too close an approach. A vessel uncertain of her position may stand in until the water shoals to 7 fathoms, and having made the land stand along shore in this depth until Sand Island Lighthouse is sighted.

2. ***Entering and to the Anchorage.***—From the whistling buoy off the entrance, steer about **NNW. ½ W.**, keeping the day beacon on Sand Island (pyramidal structure, half black and half white perpendicularly) well open to the left of the lighthouse and in range with a lone tree at Fort Gaines; leave black can buoy No. 1 on the port hand and the red bell buoy about 200 yards on the starboard hand. When the red beacon, with black vertical stripes, on Mobile Point is in range with the lighthouse on the lunette of Fort Morgan, steer **N. ½ E.** up the channel. Anchor when Fort Morgan bears about **SE.**, distant ½ mile. If bound to the city of Mobile, follow the directions in section 3.

At night.—While still southward of the whistling buoy, bring the low, white range light on Sand Island just open to the left of Sand Island Light; then steer for Sand Island Light, keeping the range light a little to the left of it. Keep a sharp lookout for the Mobile Point Range, and when the fixed white (front) light is in range with the fixed red (rear) light haul up so as to bring the range a very little on the starboard bow; the course should be **N. ½ E.** When the light (fixed red) on Fort Morgan bears about **SE.**, anchor in about 8 fathoms of water, soft bottom.

Remarks.—The range light on Sand Island is on the middle of the roof of the light keeper's dwelling, and this, open a little to the left of the lighthouse, will lead in the deepest water over the bar. The **Mobile Point Range** comes on very slowly, and care should be taken to get the beacon and lighthouse exactly in line. When standing up the channel on the **N. ½ E.** course the Mobile Point Range will gradually open out, the lighthouse showing to the left of the beacon; breakers will usually be seen on the shoal on the east side of the channel; the black buoy and boiler on the west side of the channel should be given a good berth, and care should be taken not to be set over on the shoals by the currents which, at times, have considerable velocity. When Fort Morgan is a little abaft the beam the quarantine station and long quarantine dock and breakwater will be seen on the north shore of Mobile Point, about ¾ mile eastward of Fort Morgan. The lighted beacons on the west end of the Middle Ground and at the entrance to the dredged channel will be seen to the northward.

Dangers.—**Shoals**, which show nearly bare, extend 3½ miles southward from Mobile Point on the east side of the channel into the bay. These shoals are nearly always marked by breakers, and at their southwestern point is a red bell buoy.

Shoals extend southward from Sand Island and are marked at their southern end by a black can buoy, No. 1; this is known as Southwest Spit buoy. The shoals which extend northward and westward from Sand Island are known under the general name of "**West Bank**"; the eastern edge of this bank is marked by two black can buoys and the remains of a boiler which very much resembles a black can buoy.

The shoals on both sides of the channel generally rise very abruptly from deep water and the lead is of but little use to give warning of danger while in the Main Ship Channel between the bar and the anchorage.

3. ***From the Lower Bay to the City of Mobile.***—When about ¾ mile distant from Fort Morgan, bring the fort to bear **SE.** by **S.** and steer **NW.** by **N.**; leave Middle Ground beacon (lighted) on the starboard hand distant 300 yards and steer **N. ¼ E.**, leaving the beacon marking the eastern edge of the dredged channel about 50 yards on the starboard hand. Continue about **N. ¼ E.**, passing westward of, and 50 yards from, the clusters of piles which mark the eastern edge of the channel. When up to Mobile Bay Lighthouse, leave it the same distance on the starboard hand. From the lighthouse steer about **N.** by **W.**, following the row of pile clusters, leaving them 50 yards on the starboard hand, for a distance of 11 miles. A red (lighted) beacon and Upper Channel beacon (painted red) are left on the starboard hand and a cluster of piles, painted black and showing a red light, to the westward of these beacons, on the port hand; the course should then be changed to **N.** by **E.** Two red beacons should be nearly in range ahead, the farther one being open a little to the left of the near one; another red beacon should be seen still farther to the left of the two nearly in range. Leave the clusters of piles 50 yards on the starboard hand and pass 50 yards westward of the front red beacon; a cluster of piles, painted black (lighted), westward of this beacon, should be left on the port hand. From the front red beacon steer about **N. ¼ W.**, keeping Battery Gladden Lighthouse open a little to the left of the red beacon which showed to the left of the range while standing on the **N.** by **E.** course. Leave the red beacon, which is nearly in range with Battery Gladden Lighthouse, about 60 yards on the starboard hand (a cluster of piles to the westward having been left an equal distance on the port hand) and turn, with a starboard helm, so as to bring this red beacon and the one to the southeastward in range over the stern. Stand on this range a little over ¼ mile, and then haul a little northward, fair into the entrance of Mobile River, leaving two clusters of piles on the starboard hand. Stand up the river in midstream and anchor according to the harbor regulations, Appendix I.

Remarks.—There are no extraordinary precautions to be taken except, when in a steamer, to slow down in the dredged channel when vessels are passing each other. The pile clusters are close enough to be seen some distance, and no difficulty should be experienced in following them. At the upper bends in the dredged channel a cluster of piles is placed on the western edge of the channel, but these turning clusters can be readily distinguished, as they are painted black and not in line with those that mark the eastern edge of the channel.

On the **N. ¼ W.** course, with **Battery Gladden Lighthouse** ahead, the red beacon, which is seen to the eastward, should be given a wide berth: this beacon does not mark the edge of the channel but is the rear range beacon for the range through the lower end of Choctaw Pass Channel. On the **N. ¼ W.** course, and when standing into the river, many snags will be seen on both sides of the channel, and at certain seasons the channel will be full of floating logs, trees, and brush, which is brought down the river by the ebb current or freshets.

MISSISSIPPI SOUND *

is the name given to the shallow water extending along the coast, for a distance of about 70 miles, to the westward of Mobile Bay and separated from the Gulf of Mexico by a chain of long, narrow islands and shoals. The sound, which is from 5 to 10 miles wide, affords what might be termed an inland passage along the coast from Mobile Bay to Lake Borgne. The shoalest part of this passage is at its eastern end where the sound joins Mobile Bay; here it is good for a draft of only 6 feet at ordinary high water; the remainder of the passage is good for a depth of 10 feet, except its western part (westward of Cat Island), which has a least depth of about 7½ feet.

Just inside the islands which separate the sound from the Gulf of Mexico are two good harbors; the easternmost, **Pascagoula Harbor,** can be entered by vessels of 20 feet draft through a well-buoyed channel, known as **Horn Island Pass,** which leads between **Petit Bois** and **Horn islands.** The other harbor is known as **Ship Island Harbor,** and can be entered by vessels of 22½ feet draft through a buoyed channel leading just westward of **Ship Island.** These harbors are used for refuge by vessels standing along the coast outside, and with good ground tackle a vessel can ride out any gale. On Ship Island is the **National Quarantine Station** for this part of the Gulf of Mexico. **Cat Island Channel** is an entrance to the western part of Mississippi Sound from the Gulf of Mexico and Chandeleur Sound. A draft of about 14 feet can be taken to an anchorage in the channel, but only 7½ feet can be taken into the part of Mississippi Sound for which the channel is the entrance. Pascagoula and Ship Island harbors and Cat Island Channel are described separately and more fully in another part of this volume.

Besides the three entrances to the sound mentioned above there are several others of lesser importance. There is a narrow channel over the shoals which lie between **Dauphin** and **Petit Bois** islands, but it is not marked, and is only used by local fishermen. **Dog Key Pass,** between Horn Island and Ship Island, is a channel, with a depth of 12 feet, which is sometimes used by fishermen and towboats. It is marked by two buoys, but should not be attempted by a stranger. The channels into the sound from Mobile Bay are described under that heading.

Pass Marianne is the name given to the channel leading through the shoals which extend across the sound near its western end and just westward to Cat Island. It is marked by several buoys and **Merrill Shell Bank Lighthouse.** (See table, page 16.)

Biloxi Bay is a shallow body of water making into the north shore of the sound nearly 15 miles westward of Pascagoula and just eastward and northward of **Biloxi.** The bay has some trade in lumber, wood, charcoal, and oysters, carried in vessels of about 5 feet draft. **Ocean Springs** is a village on the north shore, and just above it the bay is crossed by a railroad bridge. A long, shallow extension of the bay westward is known as the **Back Bay of Biloxi.**

St. Louis Bay is a large, irregularly shaped, shallow body of water making to the northward near the western end of the sound; the entrance of the bay is crossed by a railroad bridge. The bay is of no commercial importance, and is frequented only by small local craft.

With the exception of the vessels that enter Pascagoula and Ship Island harbors, the vessels trading in the sound are generally small sloops and schooners of from 4 to 7 feet draft and towboats and barges, which take lumber and timber to the vessels loading at the anchorages. A steamboat sometimes runs between New Orleans and **Moss Point,** on the Pascagoula River, and makes landings along the route.

On the north shore of Mississippi Sound are the towns of **Pascagoula, Biloxi,** and **Gulfport.** These ship considerable lumber and some naval stores. **Mississippi City, Pass Christian,** and **Bay St. Louis** are summer and winter resorts. Pascagoula and Biloxi are described under separate headings in this volume.

Mississippi City is 7 miles westward of Biloxi; a depth of 7 feet can be taken to within 1 mile of the town, while the depth at the wharves is about 4 feet. Between Biloxi and Mississippi City is a summer resort called **Beauvoir.**

Gulfport is a town about 3 miles west of Mississippi City, and is the terminus of the Gulf and Ship Island Railroad. A dock about ¼ mile long, with excellent facilities for vessels to load lumber and timber, extends

* Shown on charts 189, 190, scale $\frac{1}{80,000}$ price of each $0.50.

from the shore in a general **SE.** by **S.** direction. A channel 8 feet deep has been dredged to the end and for some distance along the west side of the dock, where vessels of 10 feet draft can load. Most of the lumber and timber shipped from Gulfport is towed in scows to the ships at anchor in Ship Island Harbor. Fresh water can be obtained through pipes at the dock, and provisions can be had in the town.

Pass Christian is near the western end of the sound, about 20 miles westward of Biloxi; between Pass Christian and **Gulfport** is the village of **Long Beach**. Pass Christian has a little trade in fish, oysters, coal, and building material; 6 feet is the deepest draft of the vessels trading here, and the depth alongside the wharves is 4½ feet.

Bay St. Louis, a popular summer and winter resort, is about 2 miles westward of Pass Christian and separated from the latter by St. Louis Bay. The town has a little trade in coal, building material, and fish; the deepest draft of vessels trading there is 7½ feet. About 3 and 6 miles, respectively, westward of Bay St. Louis are the villages of **Waveland** and **Gulf View**.

Anchorages.—There is good anchorage anywhere in the sound where the bottom is soft. The principal anchorages used by the larger vessels are Pascagoula Harbor (which includes Horn Island Anchorage) and Ship Island Harbor.

Pilots.—There are licensed pilots for Pascagoula and Ship Island harbors and the passes leading to them, but the pilots for the sound and lakes Borgne and Pontchartrain are mostly fishermen and can be found almost anywhere in the sound.

SAILING DIRECTIONS, MISSISSIPPI SOUND, FROM MOBILE BAY TO GRAND ISLAND PASS' LAKE BORGNE.

The least depth, which is 6 feet, is found in Grants Pass; in the channel through the sound the depths range from 7 to 19 feet. The current sets strongly through Grants Pass, and vessels must have a fair wind to pass through.

1. ***Passing through Mississippi Sound from Mobile Bay.***—*From the Middle Ground beacon in Mobile Bay*, steer **NW.** by **W.** ¾ **W.** for 5¼ miles. Or, *from Lower lighted beacon (red, No. 2)*, near the entrance to the dredged channel, steer **W.** for 4¾ miles. The northern end of Grants Island (small, low island, with a tumble-down shed near its southern side) should then bear about **W.** by **S.** and be distant about ½ mile. From this position steer toward the island and for a cluster of small brush stakes* which marks the edge of the channel; leave these stakes about 20 yards on the starboard hand and steer so as to leave the southern end of the island about 50 yards on the starboard hand. Round the southern end of the island at this distance and steer about **W.**, leaving several brush stakes which mark the edge of the channel, and a cluster of brush stakes which marks the western entrance, on the starboard hand. From the last-mentioned cluster of brush stakes, steer **WSW.** ⅞ **W.** for 20¼ miles and until Horn Island Lighthouse bears abeam, distant about 1½ miles; after having run 15½ miles on this course, a red nun buoy should be left about ¼ mile on the starboard hand.

With Horn Island Lighthouse bearing nearly **S.** *by* **E.**, *distant about* 1½ *miles*, steer **W.** for 3¼ miles, then steer **NW.** by **W.** ½ **W.** for 3 miles, and leave a red nun buoy ¼ mile on the starboard hand. Round Island Lighthouse (see table, page 14) should then bear **ENE.**, distant 3⅛ miles. From this position make good a **W.** ½ **S.** course for 28¼ miles; on this course the northwestern end of Horn Island and northeastern ends of Ship and Cat islands should be given a berth of about 1¼ miles. Having made good the **W.** ½ **S.** course for 28¼ miles, Merrill Shell Bank Lighthouse should bear **SW.** by **W.** ¼ **W.**, distant 4 miles, and a black can buoy, marking Cat Island Shoal, should be ½ mile on the port quarter. Then steer about **SW.** ¾ **W.** so as to pass ¼ mile southward of the lighthouse, and when it bears **N.** steer **W.** ½ **S.** for a little over 1½ miles, leaving a black can buoy (No. 9) on the port hand. From this position steer **SW.** by **W.** ¼ **W.**, keeping Lake Borgne Lighthouse well on the starboard bow, and passing ½ mile southward of the beacon off the south end of St. Joseph Island (the island is now washed away). Pass ⅜ to ½ mile southward of Lake Borgne Lighthouse on a **W.** by **S.** course, which will lead through Grand Island Pass.

* The brush stakes marking the channel through Grants Pass can not be depended on to be in position.

If desiring to pass through Lake Borgne, follow the directions under that heading in another part of this volume.

If bound to Pascagoula or Scranton.—When standing on the **WSW. ⅞ W.** course from Grants Pass and when the red buoy, which is 15½ miles from the pass, bears **N.**, about ¼ mile distant, steer **NW.** by **W. ⅛ W.** for Pascagoula. Or, *if bound to Scranton*, steer **NW.** by **W. ¾ W.** from the red buoy and, when on the range of the two beacons, follow the sailing directions for entering East Pascagoula River, on page 87.

If bound to Horn Island Anchorage.—When standing through the sound, when Horn Island Lighthouse bears southward of **SW. ½ W.**, steer for it and anchor about ½ mile northwestward of the lighthouse.

If bound to Biloxi.—When to the westward of Round Island, and having stood 9 miles on the **W. ½ S.** course, steer **NW.** until Biloxi Lighthouse (see table, page 16) bears **N. ½ W.**; then steer for the lighthouse on this bearing and follow the red lighted beacons which mark the edge of the dredged channel and which should be left about 20 yards on the starboard hand.

Note.—When in the sound, Biloxi Lighthouse can be steered for on any bearing between **NE.** and **NW.**, but the shore should not be approached closer than 1½ miles unless the lighthouse is brought to bear **N. ½ W.**

If bound to Ship Island Anchorage.—When standing through the sound, and Ship Island Lighthouse bears between **SE.** and **SW.**, steer for the lighthouse and anchor off the north side of Ship Island, taking care not to go too close to the shore.

If bound to Bay St. Louis.—Having passed Merrill Shell Bank Lighthouse, and when the lighthouse is 1 mile distant on the starboard quarter, steer **NW.** by **W.** and, leaving a red buoy on the starboard hand, anchor anywhere ½ mile offshore.

PASCAGOULA HARBOR AND PORT OF PASCAGOULA.*

The name of **Pascagoula Harbor, or Pascagoula Bay**, is applied to that part of Mississippi Sound lying southward and southeastward of Pascagoula River and extending from the north shore of the sound to Horn and Petit Bois islands.

Pascagoula is one of the important lumber-shipping ports on the Gulf Coast; many vessels, mostly foreign, clear from this port, and most of the lumber that is loaded at Ship Island Harbor is towed there from the Pascagoula River. The deepest draft taken out of the port is 20½ feet in summer and about 19½ in winter.

The principal entrance from the Gulf of Mexico is **Horn Island Pass**, which lies 24 miles westward of Sand Island Lighthouse, at the entrance of Mobile Bay, and 23½ miles eastward of Ship Island Lighthouse. Between the western point of **Petit Bois Island** and the eastern point of **Horn Island** the pass has a width of 1½ miles, but shoals make out from both sides forming a shifting bar through which there is a narrow, buoyed channel with a depth of 19 feet. A vessel entering Mississippi Sound over Ship Island bar can carry a depth of about 14 feet through the sound to Pascagoula Harbor, but the channel is very narrow in places and, although it is buoyed, some local knowledge is necessary to carry the best water.

Pascagoula River is formed by the junction of the **Chickasahay** and **Leaf** rivers and empties into Mississippi Sound from northward about 23 miles westward of Mobile Bay; it has two mouths, about 2 miles apart, known, respectively, as the **East** and **West Pascagoula** rivers, but the **East Pascagoula River** is the commercial entrance and the only one of importance, and is locally spoken of as the Pascagoula River. Above Moss Point the river is important only as a waterway for logs and timber which is rafted to the sawmills near its mouth; it has a depth of 6 feet for a distance of 44 miles in a narrow, crooked channel. The entrance to the East Pascagoula River is obstructed by shoals through which a channel with a depth of 10 feet has been dredged, and a draft of 9 to 10 feet can be taken in and out of the river and as far as Moss Point. Improvements are in

* Shown on chart 189, scale $\frac{1}{80,000}$, price $0.50.

progress to obtain a channel 12 feet deep and 300 feet wide from the deep water in Mississippi Sound to Scranton and 150 feet wide to Moss Point. The dredged channel is marked by a range of two lighted beacons and a number of day beacons; on the western point, at the entrance of the river, is **East Pascagoula River Lighthouse** (see table, page 14).

The town of **Pascagoula** is on the eastern shore of the mouth of the East Pascagoula River and extends some distance along the shore of Mississippi Sound; the town itself is of no commercial importance, but it is a good summer resort. A number of wharves extend a long distance into the sound, but only one of these wharves has a depth of 7 feet at its end, the depths at the others ranging from 3 to 5 feet.

The town of **Scranton** is on the east bank of the East Pascagoula River about 1½ miles above its mouth. The town has some trade with Mobile, New Orleans, and towns along the sound, and has railroad communication with the two former cities and with Moss Point. There is one large sawmill which ships lumber in small vessels and lighters to the large vessels at the anchorages. A draft of 10 feet can be taken to Scranton and alongside some of the wharves. The railroad bridge which crosses the river at Scranton has a draw about 75 feet wide.

Moss Point is a small town on the east bank of the Pascagoula River about 7 miles above its mouth; it is the most important point on Mississippi Sound for the shipment of lumber, which is here loaded at the sawmills into lighters and towed to the vessels anchored in Pascagoula and Ship Island harbors. A draft of 10 feet can be taken to the sawmills, and vessels of this draft sometimes load at Moss Point. A branch railroad connects the town with Scranton, from which it receives most of its supplies.

Prominent features.—There are no prominent natural landmarks at the entrance to Horn Island Pass. **Horn Island Lighthouse** (see table, page 14) is near the eastern end of the island, but from certain directions the lighthouse is almost hidden by sand hills. A long, shifting sand spit extends eastward from the eastern end of the island. A red beacon, showing a fixed red light, is placed in the entrance about 1⅛ miles eastward from the lighthouse, and is the most prominent mark from outside the bar. Near the middle of Mississippi Sound, and westward of Horn Island Pass, is **Round Island**, a low island covered with tall trees; near the southern end of the island is **Round Island Lighthouse** (see table, page 14).

Anchorage.—There are two principal anchorages where the larger vessels load. Vessels of less than 16 feet draft generally load at the "**Middle Fleet**," which is 3 miles eastward of Round Island. The deeper draft vessels anchor at what is known as the "**Horn Island Fleet**," on the north side of Horn Island and about 2¾ miles westward of the lighthouse. There is good anchorage off the town of Pascagoula and in the river. The **harbor master** has control of the berthing and shifting of vessels at the anchorages.

Quarantine.—The **National Quarantine Station** is at Ship Island, and vessels with infectious or contagious diseases on board, or from a port having such diseases, are ordered there by the pilots. Vessels subject to visitation by the health officer are brought to at the **quarantine anchorage** south of Round Island, where they are boarded and given pratique. (See National Quarantines, Appendix IV.)

Pilots.—Pilotage is compulsory for all vessels spoken outside the bar buoy, except United States vessels of 150 tons or less burden. Pilots are on duty at Horn Island Pass ready to take vessels in. A vessel desiring a pilot should set the signal and stand off and on outside the bar buoy, or anchor about 3 miles S. of Horn Island Lighthouse. (See pilot laws, regulations, and rates in Appendix I.)

Towboats are generally on the lookout for vessels approaching Horn Island Pass. About one-half of the vessels entering the port employ towboats; loaded vessels generally tow out.

Supplies.—A limited quantity of bituminous coal can be delivered to steamers in lighters. Water can be obtained from water boats in the harbor. Provisions and ship chandler's stores can be obtained at Pascagoula and Scranton.

Repairs.—Vessels of 300 to 400 tons and a draft of 9 feet can be hauled out and repaired at Scranton; larger vessels and steamers go to Mobile for repairs.

Storm-Warning Displays of the **United States Weather Bureau** are made at Pascagoula, Scranton, and Moss Point.

Winds.—Northers occur during the winter months; they do not affect vessels at either of the anchorages if provided with good ground tackle. They may, however, prevent vessels from loading during a short period. (See remarks on pages 26, 27.)

Tides.—See table, page 24, and remarks on pages 25, 26.

Currents.—In Horn Island Pass the ebb current generally sets southeastward and the flood northward and westward across the shoals. Winds, however, greatly affect the velocity and direction of the currents, as they do the rise and fall of the tides.

SAILING DIRECTIONS, HORN ISLAND PASS AND PASCAGOULA HARBOR.

The directions in section 1 and 1 A are good for any draft. No stranger of over 12 feet draft should attempt to enter through Horn Island Pass without employing a pilot; the bar shifts continually and the pilots will not bring large vessels in at night; the directions in section 2 are therefore only very general. The directions in section 3 are good for a draft of 8 feet to the town of Scranton.

1. ***Approaching from the Eastward or Southeastward.***—Vessels standing along the coast from the whistling buoy off Mobile Bar should steer **W.** ⅛ **S.** for 25 miles; Horn Island Lighthouse should then bear about **NW.** ½ **N.** and the whistling buoy at the entrance to Horn Island Pass should be in line with the lighthouse.

Vessels from the southeastward should make Sand Island Lighthouse, at the entrance to Mobile Bay, and when it bears **N.**, distant about 8 miles, steer **W.** by **N.**; having made good this course for a distance of 23 miles, Horn Island Lighthouse should bear about **NW.** ½ **N.** and be distant 3¾ miles. Then stand for the whistling buoy until it is ½ mile distant and, if of over 12 feet draft, anchor, or stand off and on, with signal set until boarded by a pilot. If of less than 12 feet draft, follow the directions in section 2.

Remarks.—Sand Island Lighthouse is the best aid and landfall that can be made, as it is visible farther at sea than any other aid eastward of the Mississippi River. On a clear day this lighthouse can be seen over 10 miles, and on a clear night about 17 miles. In thick weather a vessel should keep in over 7 fathoms of water, hauling offshore before the water shoals to that depth. This rule should be followed at night when the vessel is westward of Sand Island Lighthouse, and also when Horn Island Light is sighted. There are no special dangers to be guarded against; a vessel should not approach the shores of the islands too closely, and should keep outside the whistling buoy off Horn Island Pass.

1 A. ***Approaching from the Westward or Southwestward.***—Coming from Ship Island Harbor or Cat Island Channel, vessels should bring Ship Island Lighthouse to bear **N.** by **W.**, distant 3¾ miles, and steer **E.** by **N.** for 22¾ miles; Horn Island Lighthouse should then bear **N.** by **W.** and be about 2 miles distant. Or, if of less than 16 feet draft, bring Ship Island Lighthouse to bear **N.** by **W.** distant 2½ miles, and steer **E.** ¾ **N.** for 22¾ miles, when Horn Island Lighthouse should bear **N.** by **W.** and be nearly 1¾ miles distant.

If coming from the southwestward, vessels should sight the light-vessel off the South Pass of the Mississippi. With this light-vessel bearing **NW.**, distant 5 miles, a **N.** by **E.** ¼ **E.** course, made good for 80 miles, will lead to the whistling buoy off the entrance to Horn Island Pass; when Horn Island Lighthouse bears **N.** by **W.** and is distant 2½ miles, anchor, or stand off and on, until boarded by a pilot.

Remarks.—When standing along shore on the **E.** ¾ **N.** course the least water found will be about 22 feet; care should be taken to give Horn Island a berth of 1¾ miles or more until the whistling buoy is sighted and steered for.

On the **N.** by **E.** ½ **E.** course from off South Pass, care should be taken not to approach Northeast Pass too closely. The Chandeleur Islands will be left at least 7 miles on the port hand, and Horn Island Lighthouse should be made ahead Horn Island Pass beacon (lighted) will show conspicuously inside the bar.

2. ***Entering and to an Anchorage.***—As soon as the whistling buoy is sighted steer for it and leave it close-to on either hand; then steer for the outer of three black and white perpendicularly striped nun buoys, and when it is close aboard stand for the second buoy, and from this to the third. From the latter buoy steer about **N.** by **W.**, keeping black can buoy No. 3, on the port bow. Leave this black can buoy about 100 yards on the port hand and haul westward, leaving black buoy No. 5 on the port hand and red buoy No. 4 on the starboard hand. From abreast this buoy steer about **W.** by **N.** so as to leave black buoy No. 5 A on the port hand; when black buoy No. 7 (lying north of Horn Island Lighthouse) is made, steer so as to leave this buoy about 200 yards on the port hand, and when it bears **S.** steer about **W.**; take care to leave the wreck, which shows just above water,

on the port hand. Continue the **W.** course, leaving the red buoys (marking the dredged cut through the bulkhead) on the starboard hand, and the black buoys on the port hand; anchor when Round Island Lighthouse bears **N. ¾ W.**

Remarks.—The channel shifts frequently and the buoys are moved to indicate the best water. A stranger must be guided entirely by the buoys. When crossing the bar care should be taken not to be set out of the channel by the currents, which at times have considerable velocity. The eastern point of Horn Island has washed away, but a shoal spit extends ¾ mile eastward of the point. No intelligent description of the shoals can be given; during the summer, when the water is clear, they can be seen from aloft, or from the deck of a vessel. The channel along the north side of Horn Island to the anchorage has a depth of 20 feet; it is narrow for this depth, but is marked by buoys through the Bulkhead to the anchorage at the "Horn Island Fleet."

3. ***From Horn Island Pass to the Middle Fleet, or to Pascagoula or Scranton.***—Having followed the directions in section 2 until red nun buoy No. 4 is about 100 yards distant on the starboard beam, steer **NNW.**

If bound to Middle Fleet, anchor in 17 feet of water when Round Island Lighthouse bears about **W.**

If bound to Pascagoula, continue the **NNW.** course and anchor off the wharves in 9 feet of water.

If bound to Scranton, continue the **NNW.** course, and when the two beacons in the entrance to East Pascagoula River are in range stand for them, course about **NW.**; continue on this range and stand in through the dredged cut; leave the beacons about 20 yards on the port hand and follow a mid-channel course up the river. Anchor in midstream below the railroad bridge.

Remarks.—On the **NNW.** course the houses in Pascagoula will be ahead; several vessels will usually be found at anchor at the Middle Fleet. As Round Island Lighthouse draws on the beam the two range beacons and East Pascagoula River Lighthouse should be made well on the port bow. The dredged channel into the river is not very wide, and the range must be closely followed to carry a depth of over 8 feet. Some of the beacons marking the southern edge of the channel have suffered somewhat from collisions, but they are still good marks for entering. In December, 1900, a dredge was at work in the channel.

SHIP ISLAND HARBOR *

is the name applied to an anchorage in Mississippi Sound lying just north of Ship Island. It is one of the best natural harbors on the Gulf Coast and lies about 47 miles to the westward of Sand Island Lighthouse and 11 miles to the northward of the northernmost of the Chandeleur Islands. The principal entrance from the gulf is just westward of Ship Island, over what is known as **Ship Island Bar.** This bar shifts somewhat in heavy gales; in 1900 a channel with a depth of about 25 feet was dredged through the bar; the deepest draft taken in to the anchorage is about 23 feet, but this requires smooth water. A draft of 17 feet can be taken over the bar in a heavy sea, but requires local knowledge. Near the western end of Ship Island is **Ship Island Lighthouse** and two lighted beacons (see table, pages 14, 16) the principal guides to the entrance from the gulf.

The entrance over Ship Island Bar is also one of the principal approaches from the gulf to the western part of Mississippi Sound and the towns along its northern shore from Biloxi to Pass Christian.

Biloxi, on the north shore of the sound and a little over 11 miles **N.** by **E.** from Ship Island Lighthouse, is the post office for the vessels at anchor in Ship Island Harbor. A dredged channel about 150 feet wide and 9 feet deep leads through the shoals which lie off the town; the depth in this channel is said to be decreasing. The deepest draft taken to Biloxi is 9½ feet; there is a depth of 9 feet at some of the wharves.

Prominent features.—Ship Island Lighthouse is easily recognized by a stranger. At the end of the western point of Ship Island is a round brick fort with sodded parapet which forms a conspicuous mark for vessels entering the harbor; the shipping at anchor can also be seen a long distance to seaward. Vessels coming from southward may sight **Chandeleur Lighthouse** (see table, page 16) which is 10¾ miles **SSE. ¼ E.** from Ship Island Lighthouse. About 5 miles westward of Ship Island, near the northeastern end of Cat Island, is a high sand hill which may be seen on a clear day when approaching Ship Island Bar.

* Shown on chart 190, scale $\frac{1}{80,000}$, price $0.50.

Anchorages.—The anchorage for the deeper-draft vessels is northward of Ship Island in from 19 to 25 feet of water. Good anchorage and holding ground may be had almost anywhere in Mississippi Sound between Ship Island and the north shore, wherever the depth is suitable. The **harbor master** has control of the anchorage and berthing of all vessels entering the harbor (see the rules and regulations for Ship Island Harbor, Appendix I). The **quarantine anchorage** is northward of Ship Island and about 2 miles eastward of the regular anchorage.

Quarantine.—The National Quarantine Station is on Ship Island about 3¼ miles eastward of the lighthouse (see National Quarantines, Appendix IV).

Pilots.—Pilots will be found cruising outside of, or anchored off, the bar (see pilot laws, regulations, and rates, Appendix I). Persons competent to pilot vessels in Mississippi Sound, Lake Borgne, and Lake Pontchartrain, can be found at Ship Island or Biloxi.

Towboats.—Vsssels entering seldom use a towboat; laden vessels sometimes tow out over the bar; the towboats bringing lumber to the vessel generally tow her to sea.

Supplies.—Provisions and ship chandler's stores can be obtained at Biloxi or from Scranton. Fresh water can be had from water boats.

Repairs.—The nearest place where repairs to large vessels and machinery of steamers can be made is Mobile (see also Pascagoula Harbor and port of Pascagoula).

Tides.—See table, page 24, and remarks, pages 25, 26.

SAILING DIRECTIONS, SHIP ISLAND HARBOR AND BILOXI.

The directions in sections 1 and 1A are good, as far as the entrance, for any draft that can enter the harbor. Strangers of over 15 feet draft should employ a pilot to enter. In the daytime, with clear weather and a smooth sea, these directions are good for a draft of 15 feet, but at night no stranger of over 12 feet draft should attempt to enter.

1. ***Approaching and Entering from the Eastward.***—From a position ½ mile to the southward of the whistling buoy off Mobile Bay Entrance, a **W. ⅝ S.** course made good for 45 miles should lead to a position from which Ship Island Lighthouse bears **NW.**, distant 5 miles.

Or, *having Sand Island Lighthouse bearing* **N.**, *distant 8 miles*, a **W. ¼ N.** course made good for 44½ miles should lead to a position from which Ship Island Lighthouse bears **NW.**, distant 5 miles. From this position steer **WNW.** until Ship Island South Channel Range beacons are in line, distant about 2 miles, then:

If over 15 feet draft, take a pilot.

If of less than 15 feet draft, stand in on the range, course about **N. ½ W.**; leave the bell buoy well on the starboard hand and pass eastward of black buoy No. 1. After passing the bell buoy and black buoy No. 1, steer about **NW. ½ N.**, leaving red buoy No. 4 about 400 yards on the starboard hand and black buoy No. 3 the same distance on the port hand. When abreast of these buoys haul more northward and eastward and steer about **NE. ¾ E.**; then follow the north shore of the island at a distance of 600 yards; anchor in 3¼ to 4½ fathoms of water, soft bottom, with the lighthouse bearing about **SW.** by **S.**

Remarks.—On the **W. ⅝ S.** course the trees on the islands northward and Horn Island will be sighted; the latter should be 4¼ miles distant when abeam. Ship Island Lighthouse and the fort near the western end of Ship Island should be seen at a distance of 8 miles.

The **W. ¼ N.** course leads 6¾ miles southward of Horn Island Lighthouse. As Ship Island Lighthouse approaches a **NW.** bearing the water will be found to shoal gradually, and when the lighthouse is on that bearing the depth should be between 4 and 5 fathoms.

Vessels headed by the wind can anchor anywhere southwestward of the bell buoy in 4¼ to 4½ fathoms of water and either wait for a shift of wind or take a towboat. Vessels of less than 12 feet draft can beat in if the sea is not heavy, taking care, however, to give the lighthouse a berth of at least ¼ mile and to stand not more than 1¼ miles westward and northwestward from the lighthouse. The shoal spots nearest the channel have 16 to 18 feet of water over them and are marked by buoys. The red buoys along the north shore of Ship Island mark the edge of the shoal which extends off from and along the shore of the island.

1 A. ***Approaching and Entering from the Southward.***—A vessel having sighted the light-vessel off the South Pass of the Mississippi should bring the light-vessel to bear **NW.**, distant 5 miles, and then steer **N.** by **E.** ¼ **E.** for 50 miles. Then steer **N.** ¼ **W.** for 20 miles, and then **NW.** by **W.** ¾ **W.**, until Ship Island Lighthouse bears about **N.**, distant 3¼ miles.

Or, a vessel should stand to the northward in Longitude 88° 30′ W. until Latitude 30° 00′ N. is reached; then steer **W.**, using the lead, and when the water shoals to 7 fathoms the Chandeleur Islands should be sighted (Chandeleur Lighthouse should be sighted while the vessel is in 12 fathoms of water). Follow the shore of the islands, giving them a berth of about 4 miles, and bring the lighthouse to bear **S.**, distant 3¼ miles; then steer **NW.** by **W.** until Ship Island Lighthouse bears **N.**, distant 2¼ miles.

With Ship Island Lighthouse bearing **N.**, *distant about 2¼ miles*, if of more than 15 feet draft, anchor or take a pilot. If of less than 15 feet draft, bring the range beacons in line ahead, and follow the directions in the fourth paragraph of section 1, preceding, until up to the anchorage.

Remarks.—The **N.** by **E.** ¼ **E.** course should lead at least 2 miles to the eastward of the shoal water off the Passes of the Mississippi. On the **N.** ¼ **W.** course the Chandeleur Islands are left nearly 5 miles on the port hand, and the course should not lead in less than 7 fathoms of water. On the **NW.** by **W.** ¾ **W.** course the water shoals gradually as Ship Island Lighthouse is approached.

When standing northward on the meridian of 88° 30′ W. the lead will be a good guide to show whether the vessel is westward of her reckoning. If soundings of less than 13 fathoms are obtained between Latitudes 29° 30′ and 30° 00′ N., it is an indication that the vessel is westward of her reckoning. In no case should a deep-draft stranger shoal the water to less than 7 fathoms before making sure of the vessel's position. The eastern shore of the **Chandeleur Islands** can be approached as close as 2 miles with over 4½ fathoms of water. The northern point of the islands has been gradually washing away and should be given a berth of at least 1½ miles.

CAT ISLAND CHANNEL*

is the name given to the eastern part of the channel which leads from the Gulf of Mexico into the western end of Mississippi Sound through the extensive banks and shoals which make off from, and lie between, **Cat Island** and **Isle au Pitre.** At its western end Cat Island Channel enters **South Pass** and **Shell Bank Channel,** both of which lead into Mississippi Sound. These channels, although marked by buoys and good for a depth of 14 feet, are little used except by small local craft of less than 8 feet draft, since 7½ feet is about the deepest draft that can safely navigate the western end of Mississippi Sound. Occasionally a vessel of more than 8 feet draft will enter Cat Island Channel for anchorage; it is not advisable for a stranger to do this, except in clear weather and in the daytime. No vessel of over 13 feet draft should attempt to enter the channel.

There are several places in Cat Island Channel which afford good anchorage. Vessels of over 8 feet draft can anchor anywhere inside the Inside Bar buoy where the depth and bottom are suitable. Vessels of less than 8 feet draft will find good anchorage in **Spit Cove,** the deep cove just westward of the southeasternmost point of Cat Island. Or, they can anchor a little over ½ mile **SW.** by **W.** from Cat Island Lighthouse. The local vessels passing through Cat Island Channel anchor anywhere when headed by the wind or upon the approach of darkness.

Prominent features.—**Great Sand Hill** is near the northeastern end of Cat Island; it is a high, white sand bluff, and the most conspicuous mark on the island. **Cat Island Lighthouse** (see table, page 16) is near the western point of the island and will hardly be seen until up to the Inside Bar buoy. **Cat Island** is thickly wooded nearly its whole length in an **E.** and **W.** direction; the eastern shore of the island extends in a general **SSW.** direction for 3¼ miles from Great Sand Hill and terminates in a low, narrow sand spit, which forms the northern point at the entrance to Cat Island Channel. **Isle au Pitre,** which is on the south side of Cat Island Channel, is low marsh with clusters of bushes scattered over the island and along the shore.

GENERAL DIRECTIONS, CAT ISLAND CHANNEL.

These directions are good for a draft of 13 feet to an anchorage in the channel, and for a draft of 7½ feet to Lake Borgne. A stranger should not attempt to follow the directions except in the daytime and with clear weather.

* See footnote, page 87.

Approaching the entrance to Cat Island Channel, keep in at least 18 feet of water until Ship Island Lighthouse is brought to bear **NE.** and Great Sand Hill, on Cat Island, bears **NNW.** From this position steer **W.** $\frac{1}{8}$ **N.** until the Inside Bar buoy is sighted, when the latter should be steered for. When up to the Inside Bar buoy leave it close-to on either hand and steer **NW.** by **W.** $\frac{3}{4}$ **W.** for 5 miles; on this course East buoy (nun, black, and white perpendicular stripes) should be made ahead and left close-to, and Turn buoy (nun, black and white perpendicular stripes) should be made ahead. When up to the Turn buoy, leave it close-to and steer **SW.** by **W.** $\frac{1}{4}$ **W.** for about $5\frac{1}{4}$ miles; on this course, First and Second Channel buoys (nun, black and white perpendicular stripes) should be left close-to, and West buoy (nun, red, No. 2) should be made ahead. Leave West buoy on the starboard hand, and then:

If bound to Bay St. Louis, steer **NNW.** $\frac{3}{4}$ **W.**

If bound to Lake Borgne, steer **W.** $\frac{1}{2}$ **S.** for Lake Borgne Lighthouse (see table, page 16.)

Remarks.—When Ship Island Lighthouse bears **NE.**, and Great Sand Hill (see description above) **NNW.**, Inside Bar buoy should be distant about $3\frac{1}{4}$ miles, bearing nearly **W.** $\frac{1}{8}$ **N.**; from this position to the buoy the least water should be about 15 feet. The channel is narrowest at East buoy; Cat Island Lighthouse bears **N.** by **W.** $\frac{1}{2}$ **W.** from this buoy, distant $2\frac{1}{8}$ miles. When standing for Turn buoy, **Merrill Shell Bank Lighthouse** (see table, page 16) should be sighted on the port bow. When standing on the **SW.** by **W.** $\frac{1}{4}$ **W.** course, a sharp lookout should be kept for the buoys, and care taken not to be set on the shoals to the northward.

LAKE BORGNE AND THE RIGOLETS.*

Lake Borgne is the easternmost of the three lakes which lie westward of Mississippi Sound and northward of the lower 150 miles of the Mississippi River; the two eastern of these lakes, Lake Borgne and Lake Pontchartrain, form the approach to the city of New Orleans from Mississippi Sound. Lake Borgne is about 22 miles long in a general **NE.** and **SW.** direction and varies from $5\frac{1}{2}$ to 14 miles in width; its general depth is 7 to 9 feet, and 8 feet is the deepest draft of any vessel entering. The shores of the lake are low and marshy and present no marked features; **Lake Borgne Lighthouse** (see table, page 16) is on the north shore, at the entrance from Mississippi Sound; about 5 miles westward of the lighthouse, on the north shore near the mouth of the East Pearl River, is **English Lookout**, a post village and the only settlement on the shores of the lake. Vessels entering Lake Borgne from eastward generally pass through **Grand Island Pass**, which leads just south of Lake Borgne Lighthouse and north of **Grand** and **Grassy** islands; this pass has a greatest depth of about 7 fathoms, and the tidal currents in it are at times very strong.

Pearl River empties into Lake Borgne from northward, its principal mouth, known as the **East Pearl River**, being about $3\frac{1}{2}$ miles westward of Lake Borgne Lighthouse; two other mouths of the Pearl River empty into The Rigolets. The river is quite narrow and crooked, but is navigable for light-draft steamers a distance of $160\frac{3}{4}$ miles† to Monticello, Miss., and, when the river is high, about 280 miles† farther to **Edinburg**. A draft of 8 feet can be taken 15 miles up the river to Gainsville and this is the deepest draft of the vessels that enter from Lake Borgne; the usual draft is $5\frac{1}{2}$ to 6 feet. **Pearlington** 9 miles, **Logtown** 12 miles, and **Gainsville** 15 miles above the mouth of the river are the principal places from which lumber and naval stores are shipped, mostly to New Orleans. A little over 1 mile above its mouth the East Pearl River is crossed by a railroad bridge—width of draw 60 feet. Strangers should not enter Pearl River without a pilot; persons competent to take vessels of 8 feet draft up the river can be found at English Lookout, at some of the towns on the north shore of Mississippi Sound, and at New Orleans.

The Rigolets is a deep passage, about 7 miles long and from 450 to 1,400 yards wide, connecting Lake Borgne with Lake Pontchartrain; it is the only passage through which masted vessels can pass from one lake to the other. Near its eastern end The Rigolets is crossed by a railroad bridge which has a draw with one opening about 60 feet wide; the passage of this draw is the most difficult navigation in The Rigolets. The tidal currents, which are very irregular and influenced greatly by winds, set very strongly through The Rigolets and especially through the draw of this bridge; the flood sets diagonally through the draw in a **SW.** direction and the ebb diagonally in a **NE.** direction; the direction of the draw is **WNW.** and **ESE.** About 1 mile above the bridge, on the south shore of The Rigolets, are an unused light tower and the **State Quarantine Station**, where vessels entering Lake Pontchartrain are boarded. The shores on both sides are low and marshy; Fort

* Shown on chart 191, scale $\frac{1}{80,000}$, price $0.50; The Rigolets is also shown on chart 503, scale $\frac{1}{20,000}$, price $0.20.

† Distances estimated in statute miles.

Pike, which is a ruin, is on the south shore about 1 mile from the western entrance; and on the south point of the western entrance is **West Rigolets Lighthouse** (see table, page 16). In the north shore just above the bridge is one of the mouths of the Pearl River; this is not used, as there is a bar about 1½ miles up the river over which the depth is only 3½ feet. About 1¼ miles above the bridge, in the north shore, is the other mouth of the Pearl River, known as the **West Pearl River**; this is a narrow, crooked stream, good for any draft that can be taken to the villages on the Pearl River. Vessels can pass from Lake Borgne into the East Pearl River and then through the connecting waters to the West Pearl River, coming out in The Rigolets 1¼ miles above the railroad bridge.

Vessels can not make any headway beating against the currents in The Rigolets when they are at full strength, and it is impossible for a sailing vessel to pass through the draw in the bridge with an adverse current unless with a strong fair wind. When headed off by the wind or current, vessels can anchor anywhere near the shore where the depth is suitable, but should not anchor directly off any point; the southern shore is generally the better side for an anchorage. Although most of the obstructions have been removed from The Rigolets, a few stakes still show above water near the north shore, opposite Fort Pike.

For sailing directions through The Rigolets, see Sailing Directions, Lake Pontchartrain.

LAKE PONTCHARTRAIN AND TRIBUTARIES.*

Lake Pontchartrain is about 36 miles long in a general **E.** and **W.** direction and about 22 miles wide at its widest part; it is entered from eastward through The Rigolets and is connected, at its western end, with Lake Maurepas through a narrow passage called Pass Manchac. The general depths in the lake range from 10 to 16 feet, but at its eastern end, near The Rigolets, and at the entrance to Pass Manchac are bars over which the least depth is about 6 feet. A draft of 8½ feet can be taken into Lake Pontchartrain by a steamer when the water is high, but it requires local knowledge. The lake has considerable commerce; the vessels navigating it are small schooners and steamers of 5½ to 7 feet draft, which trade between New Orleans and the towns on the lake and its tributaries and as far eastward as Mobile. Crossing Lake Pontchartrain, about 5¼ miles westward of The Rigolets, is a railroad bridge 5 miles long, in which there are two draws, one about 1 mile from the northern end of the bridge and the other about 1 mile from the southern end; the width in each of these draws is about 60 feet and their direction about **WNW.** and **ESE.** The southern draw is the one generally used; it bears **NW.** by **W.** ½ **W.** from **Pointe aux Herbes Lighthouse** (see table, page 16).

The city limits of **New Orleans** extend from the Mississippi River to the south shore of lake Pontchartrain, but the business part of the the city, which is near the river, is reached from Lake Pontchartrain through two canals which have their entrances between jetties built out into the lake. The easternmost and older of these canals is known as **Bayou St. John**; it has a depth of about 7½ feet, is narrow and crooked, and is marked by a post-light. A summer resort consisting of several large buildings and known as **Spanish Fort**, is at the entrance to Bayou St. John. **New Canal** is 1⅔ miles westward of Bayou St. John; it is marked at its entrance by a lighthouse (see table, page 16), is comparatively straight, and has a depth of about 7½ feet; at its mouth is a popular summer resort known as **West End**; more vessels enter this canal than Bayou St. John. Both canals are crossed by a number of drawbridges, and sailing vessels usually employ a towboat when passing up and down. A little over 1 mile eastward of the entrance to Bayou St. John is the long railroad pier known as **Port Pontchartrain**; this pier, which is now seldom used, is marked near its end by a lighthouse (see table, page 16). A little over ½ mile northward of the end of this pier, in the lake, are the remains of a line of piles which were intended to serve as a breakwater for vessels lying at the pier. The principal cargoes carried by the vessels trading to New Orleans through Lake Pontchartrain are lumber, cotton, naval stores, charcoal, firewood, garden produce, and oysters.

Mandeville, a post town on the northern shore of Lake Pontchartrain, is about 20 miles **N.** from New Orleans; it is the terminus of a railroad. There is little trade and vessels seldom go to Mandeville, as there is no harbor and they have to lie at the wharf built out into the lake.

There are no other cities, towns, or villages on the shores of Lake Pontchartrain. The shores are low and, except at the eastern end of the lake, are thickly wooded to the water's edge, or to within a short distance of it.

During the summer months the lake is subject to sudden, violent wind squalls from the northward, but vessels with good ground tackle can anchor anywhere in the lake where the bottom is soft and ride out the heaviest squalls.

The rise and fall of tides and the direction of the currents in the lake are influenced almost entirely by winds; the strongest currents will be found at the entrances to the canals, near The Rigolets and Pass

* Shown in part on chart 191, scale $\frac{1}{80,000}$, price $0.50.

Manchac, and in the mouth of Chefuncte River. The currents set diagonally through the southern draw in the bridge across the lake, but not with as great velocity as in The Rigolets.

CHEFUNCTE RIVER

empties into Lake Pontchartrain from the northward; it is the approach to the towns of Madisonville and Covington, and is commercially, the most important tributary emptying into Lake Pontchartrain. The mouth of the river, which is obstructed by a bar having a depth of 6½ feet in the channel over it, is marked by **Chefuncte River Lighthouse** (see table, page 16) on its west side; it lies about **N.** by **W.**, distant about 21½ miles, from the entrance to the New Canal at New Orleans. The river is navigable to Madisonville for vessels of 7 feet draft and this draft can be taken to Covington. A number of schooners and steam barges are engaged in carrying cargoes between New Orleans and Madisonville and Covington; the usual draft of these vessels is 6 feet. **Madisonville** is on the west bank of the Chefuncte River about 3 miles above its mouth. **Covington** is on the west bank of **Bogue Falia**, a tributary of the Chefuncte River, and about 12 miles above Madisonville. There is a shipyard at Madisonville where repairs to wooden vessels can be made.

BONFUCA BAYOU

empties into Lake Pontchartrain from the northward and is marked by a lighted beacon (see table, page 16); the entrance, which is obstructed by a bar that has a depth of about 4 feet over it, lies about 3¼ miles northwestward of the northern end of the long railroad bridge which crosses the eastern end of the lake. The two villages on the bayou and its tributary, **Bayou Vincent**, have some trade in lumber, brick, and tiles; vessels of 5½ feet draft take cargoes from Bayou Bonfuca, but, as there are no aids, local knowledge is necessary for its navigation.

BAYOU LACOMBE

empties into Lake Pontchartrain from northward; its entrance, obstructed by a bar over which the channel depth is about 3 feet, lies 7¼ miles northwestward of the northern end of the long railroad bridge. The bayou is the approach to the village of **Lacombe.** Cargoes of lumber, brick, and charcoal are shipped from the bayou to New Orleans in vessels of about 5 feet draft. There are no aids, and a knowledge of the bayou is necessary for its navigation.

TANGIPAHOA RIVER

empties into Lake Pontchartrain from northward; its entrance, which is obstructed by a bar over which the depth is about 3 feet, lies about 10 miles to the southwestward of Chefuncte River Lighthouse. The river is of little importance; it is occasionally entered by a few vessels of about 4 feet draft which load with shells near the entrance.

PASS MANCHAC, LAKE MAUREPAS, AND TRIBUTARIES.

Pass Manchac is the passage connecting Lake Pontchartrain with Lake Maurepas; the pass is about 5¼ miles long and nearly straight, its general direction being about **WNW.** ½ **W.** The entrance from Lake Pontchartrain is about 18½ miles **NW.** from New Canal at New Orleans and is marked on its northern side by **Pass Manchac Lighthouse** (see table, page 16). Near its western end the pass is crossed by a railroad bridge which has a draw with a width of about 60 feet. At its eastern end, in Lake Pontchartrain, and at its western end, in Lake Maurepas, the pass is obstructed by bars on which logs have lodged, forming obstructions for vessels of over 6½ feet draft; the local pilots state that even with the greatest caution vessels of 7 feet draft, the deepest draft taken through, are liable to strike the logs on the bars. The currents set through the pass, according to the direction of the wind, with considerable velocity.

LAKE MAUREPAS

is about 11¼ miles long in a **NE.** and **SW.** direction and about 7¼ miles wide at its widest part; at its northeastern end it is entered by Pass Manchac. The general depth of water in the lake is about 10 feet, and its shores are low and thickly wooded. There are no cities or towns on the shores of the lake, but its two principal tributaries, the Tickfaw and Amite rivers, have considerable trade to New Orleans passing through the lake.

TICKFAW RIVER

empties into Lake Maurepas from northward; the entrance, which has a depth of 7 feet, is not marked and lies about 5 miles westward of the western entrance to Pass Manchac. The river is crooked, but navigable to the town of **Springfield,** a distance of about 14 miles,* for vessels of 6 feet draft; considerable cotton and lumber is shipped from this town and the other landings on the river.

AMITE RIVER

empties into Lake Maurepas from the westward; the entrance, which is marked by **Amite River Lighthouse** (see table, page 16), lies about 8½ miles* **WSW.** from the western entrance to Pass Manchac.

The river, for vessels of 7 feet draft, is navigable a distance of 36 miles and thence up **Bayou Manchac,** which is a tributary of the Amite, 10 miles* farther, to the village of **Hope Villa.** The principal towns on the river are **Clio,** 8 miles,* and **Port Vincent,** 43 miles,* above the entrance. These towns, and a number of landings between them, ship lumber, cotton, and naval stores to New Orleans in schooners and steamers which load to a draft of 7 feet. Local knowledge is necessary for entering and navigating the river and Bayou Manchac.

SAILING DIRECTIONS, THE RIGOLETS AND LAKE PONTCHARTRAIN TO NEW ORLEANS.

These directions are good in the daytime, with clear weather, for a draft of 6 feet at ordinary stages of the tide, and for a draft of 7 feet when the water is high in Lake Pontchartrain. It is advisable, however, for vessels of 7 feet draft, or more, to employ a pilot.

1. ***From Lake Borgne Lighthouse to West Rigolets Lighthouse.***—Having followed the directions through Mississippi Sound or through Cat Island Channel, bring Lake Borgne Lighthouse to bear **N.,** distant about ½ mile; then steer **W.** by **S.** for nearly 1 mile. Bring the lighthouse to bear **NE.** ¾ **E.** over the stern and steer **SW.** ¾ **W.** for 4½ miles, until up to black can buoy No. 1, which should be left well on the starboard hand. From this buoy steer **WNW.** ⅜ **W.,** heading fair for the entrance of The Rigolets, and leave Long Point lighted beacon a little over ¼ mile on the starboard hand. When between the points at the entrance to The Rigolets, the draw in the bridge will be opened; if there is any delay, give several blasts of steam whistle or fog horn. Pass through the draw (see the remarks following) and follow a midstream course until up to West Rigolets Lighthouse; then follow the directions in section 2.

Remarks.—On the **SW.** ¾ **W.** course, Grassy Island is left about ⅜ mile on the port hand. The houses and long wharf at English Lookout will be left 2¾ miles on the starboard beam. The black can buoy, No. 1, should be left well on the starboard hand (it marks a wreck).

When on the **WNW.** ⅜ **W.** course the bridge crossing The Rigolets should be directly ahead In a sailing vessel with a light breeze great care is necessary when passing through the draw of the bridge, if the current is running strong. The draw (a single one) has a **WNW.** and **ESE.** direction and is protected by a fender of piles and timber on both sides; the westerly current sets in a **WSW.** direction on to the fender on the south side of the draw, and the easterly current sets in an **E.** by **N.** direction on to the fender on the north side of the draw. No sailing vessel can pass through the draw with an adverse current unless with a strong fair wind. Vessels waiting for a favorable opportunity to pass through the draw should anchor in Lake Borgne, just outside and southward of the entrance to the Rigolets; the depth in the Rigolets to the eastward of the bridge is too great for a vessel to anchor in.

After passing the bridge, the **old light tower** and **quarantine station** are left on the south shore; after they have been passed, the general direction is about **NW.** by **W.** ¾ **W.** for nearly 2 miles, then **SW.** by **W.** nearly 2¼ miles, when the entrance to Lake St. Catherine will be left on the port hand, the direction of the channel changing to **NW.** Abreast of Fort Pike the port hand shore should be slightly favored. When rounding West Rigolets Lighthouse the port hand shore can be approached close-to.

2. ***From West Rigolets Lighthouse to the New Canal at New Orleans.***—After rounding West Rigolets Lighthouse steer **SW.** ¾ **S.,** pass close to the Channel buoy, and leave red buoy No. 2 on the starboard hand; then steer **NW.** ½ **W.** until Pointe aux Herbes Lighthouse is well open to the left of the draw in the railroad bridge; then steer

* Distances estimated by pilots.

about **W.** ½ **N.** for the draw and pass through either opening. From the draw in the bridge, a **SW.** ¾ **W.** course made good for 15 miles will lead off the entrance of the New Canal. To enter the New Canal, follow the directions in section 3.

Remarks.—The shoalest water will be found near red nun buoy No. 2. Care must be taken when passing through the draw of the bridge, as the currents set diagonally through it, and at times have considerably velocity (estimated 4½ miles). Standing on the **SW.** ⅝ **W.** course, when New Canal Lighthouse is about 2¾ miles distant on port bow, the remains of the breakwater off Port Pontchartrain should be seen on the port beam, distant about ¾ mile.

3. *Entering New Canal.*—Stand for the lighthouse, and when it is about ¼ mile distant bring it to bear **WSW.**; steer for it on this bearing and pass into the entrance of the canal; leave the lighthouse on the port hand, and turn sharply southward when abreast of it. Vessels may make fast to the eastern bank of the canal inside the lighthouse, but the western bank must be kept clear for entering vessels to haul along.

Remarks.—The lighthouse is built on the end of the eastern jetty; the western jetty takes a sharp turn eastward outside of the eastern jetty and forms a breakwater for the entrance. The distance between the jetties is about 100 feet, and the canal bank and jetties are protected by a timber revetment. At times there is a strong current setting in or out of the canal; in either case, it has a tendency to set vessels against the western bank of the canal in the turn abreast the lighthouse. A towboat will tow vessels up or down the canal at intervals during the day.

CHANDELEUR AND BRETON SOUNDS.*

Chandeleur and Breton sounds are the names applied to a shallow body of water lying northward of the Mississippi River delta and just southward of Mississippi Sound at Cat and Ship islands. The northern part is known as **Chandeleur Sound** and lies westward of the **Chandeleur Islands**, a chain of narrow, low islands beginning 10 miles southward of Ship Island and extending in a general **S.** by **W.** direction for a distance of 23 miles; on the **NW.** extremity of the most northerly of the Chandeleur Islands is **Chandeleur Lighthouse** (see table, page 16). The western shore of the sound is low marsh broken by numerous islands and bayous. Southward of Chandeleur Sound is **Breton Sound**; the line of demarcation between the sounds has never been closely defined, but Breton Sound comprises the water lying westward of **Errol** and **Breton** islands, its western shore being low marsh, broken by islands and bayous. These sounds are of little commercial importance, although a least depth of 11 feet can be taken through by following a track marked by several buoys. Small vessels bound from the Passes of the Mississippi River to Mississippi Sound, or Lake Borgne, will find smoother water by using the route through the sounds than if passing eastward of the Chandeleur Islands.

SAILING DIRECTIONS, CHANDELEUR AND BRETON SOUNDS.

These directions are good in the daytime, with clear weather, for a draft of 10 feet.

Passing through from the Northward.—With Chandeleur Lighthouse bearing **E.** by **N.**, distant 3 miles, make good a **S.** by **W.** ⅝ **W.** course for 17¾ miles. Or, bring Chandeleur Lighthouse to bear **NNE.** ¼ **E.**, distant 1½ miles, over the stern and make good a **SSW.** ¼ **W.** course for 17¾ miles. These courses lead to the black and white perpendicularly striped nun buoy which lies 1¼ miles westward of Old Harbor Islands. From this buoy, which should be left close-to, make good a **S.** ⅝ **W.** course for 17 miles, which will lead to the black and white perpendicularly striped buoy which lies about 1¼ miles eastward of the north point of Breton Island. From this buoy steer **S.** by **W.** for 5¼ miles, leaving Middle buoy (nun, black and white perpendicular stripes), close-to; when up to South buoy (1st class nun, black and white perpendicular stripes), which should be left close-to, make good a **SE.** ¼ **S.** course for 15 miles; Pass a Loutre Lighthouse should then bear **SW.** ¾ **W.** and be distant about 3 miles.

Remarks.—The buoys are the only reliable guides for a stranger. On the **SSW.** ¼ **W.** course, the northernmost of the **Freemason Islands** and the westernmost of the **Old Harbor Islands** should be left 1¼ miles on the port hand; these islands are low and offer no distinguishing marks.

*Shown on charts **190, 192**, scale $\frac{1}{80,000}$, price of each $0.50.

On the **S.** by **W.** ⅛ **W.** course, the northernmost of the Freemason Islands should be left 2 miles on the port hand.

On the **S.** ⅝ **W.** course, Breton Island will be made on the starboard bow and should be left 1¼ miles on the starboard hand. There are three black and white perpendicular striped nun buoys which mark the channel eastward of Breton Island.

On the **SE.** ¼ **S.** course, **Pass a Loutre Lighthouse** should be made well on the starboard bow; this lighthouse should in no case be approached closer than 2¾ miles on any bearing. When approaching the delta of the Mississippi River, it is a good rule not to shoal the water to less than 10 fathoms.

To pass through Chandeleur and Breton sounds from the southward, reverse the directions given above, first bringing Pass a Loutre Lighthouse to bear **SW.** ¾ **W.**, distant 3 miles.

THE PASSES OF THE MISSISSIPPI RIVER AND PORT OF NEW ORLEANS.*

The **Mississippi River** empties into the northern part of the Gulf of Mexico through several mouths, or passes, which begin to diverge at a point about 11½ to 15 miles from where they empty into the gulf, and which form what is known as the **delta of the Mississippi**; this delta is included between Longitudes 89° W. and 89° 25′ W. and Latitudes 28° 55′ N. and 29° 14′ N. The delta is nearly fan-shaped, covering about 127° of arc from the Head of the Passes; the length of the arc is about 33 miles, with its least radius near the middle.

Pass a Loutre, the northeasternmost of the passes, has two mouths separated from each other by the **Middle Ground**, on the southern end of which is **Pass a Loutre Lighthouse** (see table, page 16), marking the principal entrance to the pass. This entrance is obstructed by a shifting bar across which there is a depth of about 7 feet in the channel. The outer buoy at the entrance merely indicates the vicinity of the bar and no stranger should attempt to enter before having sounded out the channel. Only local vessels of less than 7 feet draft use this pass. **North Pass**, the other mouth of Pass a Loutre, is not navigable. About 5 miles below the Head of the Passes, **Southeast Pass** branches off southeastward from Pass a Loutre. Southeast Pass has a branch called **Northeast Pass**, both emptying into the gulf, but, as the shifting bars at their entrances are not marked, they are used only by small local craft. These passes all have good water for a distance of more than 10 miles below the Head of the Passes.

Southwest Pass is the westernmost of the passes; it is marked by **Southwest Pass Lighthouse** (see table, page 16) and an old light tower; ½ mile northward, on its western bank; these serve to mark the pass so that it can not be mistaken in clear weather when approached from any direction. The pass, at its entrance, is obstructed by a shifting mud bar which has a depth of 9 feet in a narrow unmarked channel. Only small coasting schooners enter the pass; from the lighthouse up to the Head of the Passes the channel depth ranges from 3½ to 12 fathoms.

South Pass, the entrance to which is in Latitude 28° 59′ 25″ N., Longitude 89° 08′ W., is the commercial entrance to the Mississippi River from the Gulf of Mexico. It has been improved by the construction of jetties, and a least depth of 26 feet is supposed to be maintained through the whole length of the pass in a channel at least 200 feet wide. The entrance between the jetties is marked by lighthouses and a lighted range, and, for 9½ months of the year, a light-vessel is moored 1¼ miles southeastward of the entrance. **South Pass Lighthouse** (see table, page 16) is on the west bank of the pass 2¼ miles above the ends of the jetties, and opposite, on the east bank, is **Port Eads**, a post office and headquarters for the construction force employed in the improvement of the pass. From the ends of the jetties to the Head of the Passes the distance is 11½ miles and the least width between banks is about 500 feet. The depth of water just outside the entrance is continually changing and "mud lumps" forming, but a depth of over 10 fathoms can be taken within 1¼ miles of the ends of the jetties with the lighthouse on the east jetty bearing anywhere between **NE.** and **W.**, through **N.** The deepest draft of vessels entering South Pass is 26 feet; all sailing vessels require the assistance of a towboat for entering. Only the most violent gales prevent vessels from entering when a pilot is on board, but it is not safe for a stranger to attempt to enter when the sea is breaking outside the jetties.

From the Head of the Passes to the city of New Orleans, a distance of 84 miles, the river has a least width of 600 yards and a clear, unobstructed channel with depths of from 6 to 39 fathoms. The land on both sides of the river is low and generally marshy; below forts **Jackson** and **St. Philip**, which are 17 miles above the Head of the Passes, willows have been planted on both banks to assist in preserving them; above the forks the bank on both sides of the river is protected by dikes (called levees) to prevent floods when the river is high. The land back of the levees is laid out in sugar and rice plantations and is considered one of the richest agricultural

*Shown on charts 194, 195, scale $\frac{1}{80,000}$, price of each $0.50.

districts in the United States. A sailing vessel bound up the river should employ a towboat, as the river is crooked and the current too strong to make any headway against it, except with a strong fair wind. Freshets which occur from April to July, do not interfere with the navigation of the river.

New Orleans is on the north bank of the river, 95½ miles above the ends of the jetties; it has a large foreign and coastwise trade and also a large river trade. The deepest draft of the vessels leaving the port is 26 feet and the general draft about 23 feet. New Orleans has also a large trade through the canals which enter it from Lake Pontchartrain (see page 91).

Abreast New Orleans, on the opposite bank of the river, are the towns of **Gretna** and **Algiers**; the latter is the terminus of two important railroads, and all the principal shipyards and docks for hauling out vessels are located there. Both Gretna and Algiers are connected with New Orleans by ferries.

Canals.—There are two canals near the city of New Orleans, and one about 45 miles below the city, which connect the Mississippi River with the bayous and interior waters lying westward, of which the principal outlet to the Gulf of Mexico is through Barataria Bay. **Tagliaferro (Socola)** Canal, which is 45 miles below New Orleans, has one lock about 60 feet long at its river entrance and a depth of about 5 feet. **Harveys Canal,** which is opposite New Orleans and at the upper part of Gretna, has no locks; the depth in the canal is 5 to 6 feet. **Company Canal** is about 3½ miles above Harveys Canal; it has no locks; the depth is 5 to 6 feet. These canals are used only by small, light-draft steamers and luggers, the principal articles carried being general merchandise to the fishermen's settlements, and game, fish, and oysters for market in New Orleans on the return trip.

GENERAL INFORMATION.

Prominent features.—The lighthouses are the most prominent and easily recognized marks on shore at the entrances to the passes. The land is low marsh covered with tall, coarse grass and reeds. **South Pass Light-vessel** (see table, page 16), during nine and one-half months of the year (middle of October to July inclusive), and the smoke from steamers in and near the mouth of South Pass, should prevent a stranger from mistaking this pass for any other. The discolored water discharged from the Mississippi River is one of the first intimations of the proximity of land to mariners approaching the passes; this, however, can not be depended on to indicate distance, for with a high river and northerly winds discolored water will be met in some directions from 40 to 60 miles, and even farther, from land, and the water will appear broken from 15 to 20 miles from the passes.

Anchorages.—Vessels desiring to anchor in South Pass will conform to the "Rules for the navigation of South Pass" in Appendix I. Between the Head of the Passes and the city of New Orleans vessels can anchor anywhere, on either side of the river, where the depth of water and character of the bottom are favorable; the best anchorage is on the west side of the river off **Slaughter-house Point.** Merchant vessels seldom anchor above Slaughter-house Point except when taking in grain from barges off the elevator above the city. Naval vessels usually anchor above Canal Street, favoring the western bank.

Quarantine.—The quarantine station is on the east bank of the river about 3 miles above the Head of the Passes. All vessels subject to visitation by the health officer are boarded when off the station (see Appendix I, and National Quarantines, Appendix IV).

Pilots.—There are two kinds—bar pilots and river pilots. The bar pilots are always on the lookout and will come out from between the jetties in a steam pilot boat to board approaching vessels as soon as they are sighted. The river pilot is taken on board at the **Head of the Passes,** where the bar pilot leaves the vessel. The rates for river pilotage are $15 to $20 each way and do not depend on the draft of the vessel. Pilotage is compulsory (see pilot laws, and rates, Appendix I).

Towboats are used by all sailing vessels entering South Pass; they will usually be found cruising outside, or, will come out from the jetties on sighting an approaching vessel. Towboats can always be had at New Orleans.

Lines defining limits within which the Inland Rules of the Road apply.—From South Pass east jetty **N.** by **E.** ½ **E.** to Pass a Loutre Lighthouse; thence **N.** to Errol Island and from South Pass East Jetty Lighthouse **W.** ¼ **S.** to Southwest Pass Lighthouse; thence **N.** to shore.

Lines defining limits within which the Pilot Rules for Western Rivers apply.—In the Mississippi River above the lower limits of the city of New Orleans.

Wharves.—The whole system of wharves and embankments at the city of New Orleans is known as **"The Levee."** There is a sufficient depth at the principal wharves for any vessel that can come up the river to New Orleans.

Supplies.—Coal, bituminous or anthracite, can be had for steamers anywhere alongside the levee in wheelbarrows, and in the stream from coal barges. A limited quantity of coal is usually kept near Port Eads.

Water is taken from the river abreast of New Orleans. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—The facilities for repairs to hulls of vessels and machinery of steamers are excellent. There are four floating docks; the largest is 250 feet in length, has a capacity of 1,500 tons, and can take on a vessel of 14 feet draft.

A **branch** of the **United States Hydrographic Office**, subordinate to the Navy Department, is located in the customhouse. Bulletins are posted here giving information of value to seamen, who are also enabled to avail themselves of publications pertaining to navigation, as well as to get chronometer comparisons, and to correct their charts by standards. No charge is made for this service.

A **time ball** is dropped daily, except Sundays, exactly at noon of the 75th meridian, or one hour before noon of the 90th meridian, that is, at 5h. 00m. 00s. of Greenwich mean time. This instant of time is marked by the beginning of the fall of the ball. It is hoisted five minutes before 11 o'clock, standard time; in case of no signal the ball is lowered after 11h. 05m. 00s. a. m., standard time.

Storm-Warning Displays of the **United States Weather Bureau** are made at the special wind-signal display station at Port Eads, and on the customhouse at the city of New Orleans. The former can be seen by vessels entering or leaving the jetties, and the latter when abreast of the city near Canal street.

The **United States Marine-Hospital Service** has a hospital at New Orleans for the treatment of seamen (see Appendix IV).

Fogs.—There is considerable fog both inside and off the mouth of the river from March to June; southerly and easterly winds bring it in and northerly and westerly winds clear it away.

Tides and currents.—There is no noticeable tide at New Orleans. In the passes there is generally but one high and low water in 24 hours (see table, page 24, and remarks on page 25). The condition of the river whether high or low, also affects the tides; so that, for purposes of navigation, they are rarely taken into account. The extreme difference of level at New Orleans between high and low stages of the river is 17¾ feet and the mean difference from 10 to 12 feet, the river usually being high from April to July. The tides do not affect the current of the river, its strength in the river and through the passes depending on the height of the river. At times counter currents are met with in the lower part of the river, near the banks, and these are taken advantage of by the boats and small vessels trading on the river.

GENERAL DIRECTIONS, SOUTH PASS TO NEW ORLEANS.

The following directions are good for steamers up to 18 feet draft. Steamers of deeper draft should take a pilot, and all sailing vessels should employ a towboat.

Approaching the Entrance to South Pass, a vessel should not shoal her water to less than 30 fathoms unless sure of her position. As soon as South Pass Lighthouse, or South Pass Light-vessel, is made, bring the former to bear **NW. ½ W.** and steer for it, or, steer for the latter on any bearing northward of **NE.** and **SW.** When about 1 mile from the ends of the jetties, bring the red beacon, which is on the west jetty and about 575 yards inside of West Jetty Lighthouse, in range with South Pass Lighthouse. Stand in on this range, course **NW. ¾ W.**; leave the inside corner of the east jetty about 150 feet on the starboard hand and keep on the range until midway between the east and west jetties; then follow a mid-channel course through South Pass and up the Mississippi River to New Orleans.

Remarks.—If it is clear no difficulty should be experienced in entering and passing up to New Orleans at night. (For a list of aids see table, pages 16, 18.) The front beacon shows a fixed white light; the easiest way to find this light is to first get the fixed red light on the end of the east jetty in range with South Pass Lighthouse; the front range light will then show a little to the left of east Jetty Light, and West Jetty Light will be still farther to the left. At times the current sets very strongly through the ends of the jetties and a vessel should keep head to it so as not to sheer out of the channel. When in the pass the banks are a sufficient guide, care being taken to keep about midway between them.

COAST BETWEEN SOUTHWEST PASS AND ATCHAFALAYA BAY.*

The distance in a straight line from Southwest Pass Lighthouse to **Southwest Reef Lighthouse**, at the entrance to Atchafalaya Bay, is 113 miles, but following the curves of the coast the distance is about 140 miles. This stretch of coast is low and broken by numerous passes which lead from the gulf to the network of bays and bayous which traverse the country westward of the Mississippi River. These inland waters are navigable

*Shown on charts **197, 198, 199**, scale $\frac{1}{80,000}$, price of each $0.50.

only for a small, light-draft vessels. There are no towns along the coast, and no harbors that can be used by vessels of over 8 feet draft, even under favorable conditions. The only anchorage for vessels of 18 feet draft is northward of **Ship Shoal**; this shoal, including several detached spots, is about 25 miles long in a general **E.** and **W.** direction, with depths ranging from 5 to 18 feet; for 6½ miles of its length it has a depth of less than 12 feet. Its northern edge is about 7 miles from the shore and rises abruptly from a depth of about 4½ fathoms; **Ship Shoal Lighthouse** (see table, page 18), near the northern edge of the shoal and about 17 miles from its eastern end, bears **W. ⅝ S.**, distant 88 miles, from Southwest Pass Lighthouse and **SE.**, distant 36½ miles, from Southwest Reef Lighthouse. The best anchorage in southerly gales is near the edge of the bank northward of the lighthouse; here the depth is from 4 to 5 fathoms and the holding ground good, the shoal breaking the sea so that vessels with good ground tackle can ride out a gale. In northerly gales ships can anchor northward of Ship Shoal and as close, as their draft will permit, to the extensive shoals that make off from the shore near **Caillou Bay**; the holding ground is good and the shoals prevent a heavy sea.

The coast between Southwest Pass and **Grand Pass**, into Barataria Bay, is low and marshy with soft mud shoals making off from the shore; there are no settlements, and it is never approached by seagoing vessels unless by mistake. Vessels bound to New Orleans sometimes fall westward of the Mississippi River delta, but this fact can be quickly discovered by using the lead, as the water shoals much more gradually along this part of the coast than off the delta.

Barataria Bay is described under a separate heading.

Caminada Pass, the entrance from the gulf to **Caminada Bay**, is 36½ miles **WNW. ⅝ W.** from Southwest Pass Lighthouse and about 7 miles southwestward of Barataria Bay Lighthouse. The pass has a depth of 5 feet on the bar and about 4 feet inside.

Pass Fourchon and **Raccoon Pass**, which lie 16 and 20½ miles, respectively, southwestward of Barataria Bay Lighthouse, have depths of 2 to 3 feet only on the bars at their entrances.

Grand Pass Timbalier is 50 miles **W.** from Southwest Pass Lighthouse and 39 miles **ENE. ½ E.** from Ship Shoal Lighthouse; this pass is the principal entrance from the gulf to **Timbalier Bay** and its tributaries, and has a depth of 8 feet in the channel over the bar. There is a good anchorage with a depth of 8 to 10 feet just inside the entrance, but the ruling depths in the bay are 4 to 8 feet. A lighted beacon (see table, page 18), on the western side of the entrance, is the only aid for entering.

Caillou Pass is 8 miles westward of Grand Pass Timbalier; it has 6½ feet of water in the channel over the bar and good anchorage inside the pass in 14 to 23 feet of water.

Cat Island Pass is about 3½ miles westward of Caillou Pass; it has 12 feet on the bar but there is only 8 feet of water at the anchorage and only from 4 to 8 feet in Terrebonne Bay, to which this pass is the principal entrance.

Wine Island Pass is about 4½ miles westward of Cat Island Pass and 24 miles **NE.** by **E. ½ E.** from Ship Shoal Lighthouse; the pass has about 9 feet of water on the bar and 8 feet at the anchorage inside.

Caillou Bay is a large, shallow bight having depths of 5 to 6 feet and lying northward of the western end of **Derniere Island**. There is a good anchorage in 10 feet of water just inside of and close to **Raccoon Point**, the western point of Derniere Island, which can be used by vessels of about 7 feet draft, this being the deepest draft that can be taken in over the shoals southwestward of the point. **Caillou Bayou** empties into the gulf due north from Raccoon Point; it has a depth of about 5 feet on the bar at its entrance.

The above passes and anchorages are entirely useless to a stranger; the depths are changeable and there are no aids that would be of use to anyone except those familiar with the changes which are taking place along the coast.

BARATARIA BAY*

is a large, shallow body of water lying 35 miles northwestward of Southwest Pass Lighthouse; its entrance, known as **Grand Pass**, is marked on its eastern side by **Barataria Bay Lighthouse** (see table, page 18). The bay has a general depth of 4 to 5 feet and is frequented only by fishermen and oystermen; the carrying is done in steamers and luggers of 3 to 4 feet draft, which trade to New Orleans through the bayous and canals connecting the bay with the Mississippi. The only post office in this vicinity is **Grand Isle**, nearly 3 miles westward of Grand Pass. Near the lighthouse, on the east side of the pass, is **Fort Livingston**, which shows prominently when approaching the entrance from the gulf.

A bar, through which the best water is about 7 feet, extends about 2½ miles off the entrance; at high water there is about 8 feet, but it is not safe for a vessel of over 5 feet draft to attempt entering if there is any swell.

* The entrance and lower part of the bay are shown on chart 512, scale $\frac{1}{40,000}$, price $0.30.

Between the points at the entrance and just inside there is good anchorage with depths of from 2 to 8 fathoms. No stranger should attempt to enter Barataria Bay, as the bar shifts and there are none but local aids.

GENERAL DIRECTIONS, ENTRANCE TO BARATARIA BAY.

The following directions lead to the bar off the entrance, but no stranger should attempt to enter without a pilot, or without first sounding out the channel. The deepest draft that can be safely taken in under the most favorable conditions is 7 feet.

With Southwest Pass Lighthouse bearing **NNE.**, *distant* 3¼ *miles*, steer **NW.**, by **W.** ⅜ **W.** for 32 miles; Barataria Bay Lighthouse should then bear **NW.**, distant 3 miles, and the depth should be 4 fathoms.

Coming from the westward alongshore, follow the beach, giving it a berth of 2½ miles until Barataria Bay Lighthouse is made bearing a little to the eastward of **N.**; then haul offshore and bring the light to bear **NW.**, distant 3 miles.

Remarks.—The bar at the entrance is hard sand and when there is any swell it is dangerous for a vessel to attempt to enter.

ATCHAFALAYA BAY AND RIVER.*

Atchafalaya Bay is a large, shallow bight in the coast of Louisiana about 112 miles westward of Southwest Pass Lighthouse and about 37 miles northwestward of Ship Shoal Lighthouse; the entrance is marked by **Southwest Reef Lighthouse** (see table, page 18). The bay is of no importance except as an approach to the Atchafalaya River and the town of Morgan City; it is full of shoals and oyster reefs through which the Morgan Steamship Company's dredged channel in 1900 had a depth of 7 feet in places; at the entrance, where it leads through **White Shell Reef**, it has shoaled so as not to be navigable for strangers; the least depth outside of this channel is about 6½ feet, and local knowledge is necessary to carry it through the bay and into Atchafalaya River. The approach to the bay from the Gulf of Mexico is shoal, the 10-fathom curve being nearly 30 miles from the shore, and shoals with 13 to 18 feet of water over them are found 23 miles offshore southwestward of Southwest Reef Lighthouse. The deepest draft vessels entering the bay have a draft of 7 feet, and with this draft it is often necessary to employ a towboat to pull the vessel through the soft mud when she runs aground.

Atchafalaya River empties into the head of Atchafalaya Bay from northward; it is the outlet of numerous bayous and several lakes; when there are freshets in the rivers the water in Atchafalaya Bay is quite fresh and that in Cote Blanche bays nearly so. The bayous and lakes emptying into the river form a passage to the Mississippi River and to New Orleans which is good for steamers of 3 feet draft all the year; during high water 8 feet can be taken through. The river from the bay to Morgan City, a distance of 16 miles, has a crooked but deep channel, the depth in places being 20 fathoms and more.

Morgan City, a small town on the east bank of the river, is about 31 miles from Southwest Reef Lighthouse; it has some trade in lumber and oysters. Steamers run irregularly up the river to landings on the bayous and to the Mississippi River and down the river to Cote Blanche and Vermilion bays; these steamers, however, are only 3 to 6 feet draft. A railroad drawbridge crosses the river at Morgan City.

Berwick is a village opposite Morgan City; it has a shipyard, where minor repairs to the hulls of vessels can be made.

Prominent features.—Southwest Reef Lighthouse is the only aid easily recognized by a stranger. The coast eastward and westward is low and marshy and presents no natural features that can be recognized by a stranger. On the north shore of the bay and bearing **NNE.** ¼ **E.** from the lighthouse is **Belle Isle**; this is said to be the highest land on the coast of Louisiana, but the lighthouse will be sighted as soon as this land by vessels approaching the entrance.

Channels.—The channel usually followed by vessels leads eastward of the lighthouse and is marked by several buoys to its junction with the **dredged channel** of the **Morgan Steamship Company**; the navigable portion of the dredged channel begins 3¼ miles **NE.** from the lighthouse; it extends in a straight line about **ENE.** ¼ **E.** for a distance of 7¾ miles and is marked by a few stakes. A depth of 9 feet can be taken as far as the dredged channel, but the latter, which originally had a depth of 9 feet has shoaled to 7 feet in places. The channel

*Shown on charts 199, scale $\frac{1}{80,000}$, price $0.50; 516, scale $\frac{1}{50,000}$, price $0.25.

above the dredged channel has widths varying from ⅛ to ⅝ mile up to Morgan City; it follows a general mid-river course and is very deep. During freshets, when the banks of the river are covered and the current is strong, it is a difficult matter to keep in the channel. There are no aids of use to a stranger.

Anchorages.—There is good anchorage anywhere in the bay where the depth is suitable. Vessels seldom anchor in the river, unless obliged to do so, on account of the depth of current, though the bottom is good holding ground.

Quarantine.—The boarding station is about 1 mile below Morgan City; all vessels are obliged to stop here until given pratique. (See quarantine, Appendix I, and National Quarantines, Appendix IV.)

Pilots and towboats.—There are no regular pilots; a vessel desiring a pilot should anchor near the lighthouse and send a boat up to Morgan City for some one acquainted with the channel to take her in. Sailing vessels should employ a towboat; one may be had at Morgan City.

Supplies.—A limited amount of bituminous coal, and fresh water through pipe and hose, can be obtained alongside the wharf at Morgan City. Provisions can be had in the town.

Wharves.—The Morgan Steamship Company has a good wharf at Morgan City at which the depth of water is 20 feet.

Freshets are frequent in May and June but they do not affect the vessels moored at the wharf at Morgan City.

Fogs are most frequent in January and February; southerly winds bring it in and northerly winds clear it away.

Tides and currents.—The rise and fall of tides depend greatly on the force and direction of the winds which influence the current also to a marked degree. During freshets the current in the river is very strong and the current in the bay is influenced by it; the discolored water coming out of the river will be encountered well offshore, the distance depending much upon the direction of the wind. (See table, page 24, and remarks on tides, pages 25, 26).

SAILING DIRECTIONS, ATCHAFALAYA BAY AND RIVER TO MORGAN CITY.

The following directions are good in the daytime, with clear weather and when there are no freshets, for steamers of about 6 feet draft. No sailing vessel or steamer of over 6 feet draft should attempt to enter without a pilot. No vessel should attempt to enter at night.

1. ***Approaching from the Eastward.***—With Southwest Pass Lighthouse bearing **NNE.**, distant 4 miles, make good a **W.** ¼ **S.** course for 92 miles, passing 2½ miles northward of Ship Shoal Lighthouse. When this lighthouse bears **ESE.** ½ **E.**, distant 6½ miles, steer **NW.** ½ **N.**, which course should lead directly for Southwest Reef Lighthouse at the entrance to Atchafalaya Bay. When Southwest Reef Lighthouse is about 1 mile distant and bearing anywhere between **NE.** and **NW.**, follow the directions in section 2.

Remarks.—The **W.** ¼ **S.** course from off Southwest Pass leads 6 miles southward of Timbalier Light 4¼ miles southward of Isle Derniere, and a little over 2 miles northward of the northern edge of Ship Shoal.

The **NW.** ½ **N.** course leads in 12 to 18 feet of water across the extensive shoals which make out from the shore between Caillou and Atchafalaya bays. Southwest Reef Lighthouse should be made when it is 7 miles distant.

1 A. ***Approaching from the Westward.***—Standing along the coast eastward of Galveston Entrance, give the beach a berth of 2½ miles. Follow the beach at this distance until 66 miles eastward of Calcasieu Lighthouse; Southwest Pass, the entrance to Vermilion Bay, will then bear **NE.**, distant about 4 miles. From this position steer **SE.** by **E.** for 16½ miles and leave a red can buoy on the port hand. From this buoy make good an **E.** ¾ **N.** course for 19 miles, until Southwest Reef Lighthouse bears **NW.**, distant 1 mile; then follow the directions in section 2.

Remarks.—The coast between Galveston Entrance and Atchafalaya Bay presents no marked natural features. The shoals which commence at Tigre Point and extend alongshore to the entrance of Atchafalaya Bay are generally soft; in crossing these shoals the lead should be used frequently, as there are spots with

from 4 to 8 feet of water over them lying from 4½ to 11½ miles offshore, just westward of Vermilion Bay entrance. The **Shell Keys**, which extend southward 5 miles from the southern point of **Marsh Island**, should be given a wide berth. The entrance to East Cote Blanche and Atchafalaya bays is full of shoals and oyster shell reefs and a vessel should not shoal her water to less than 11 feet until Southwest Reef Lighthouse is made and stood for.

2. ***From Southwest Reef Lighthouse to Atchafalaya River Entrance.***—Bring Southwest Reef Lighthouse to bear **NW.**, distant 1 mile, and steer **NNW. ¾ W.**, leaving the lighthouse ¼ mile on the port hand. After passing the lighthouse red nun buoys Nos. 2 and 4 should be left on the starboard hand on this course. From red buoy No 4 steer about **ENE.**, heading for a black and white perpendicularly striped can buoy. Leave this buoy close-to on either hand and steer about **E. ½ S.** for 1 mile. The vessel should then be in the dredged channel and the depth should be 9 to 10 feet; then steer about **ENE. ⅝ E.** for 7½ miles, leaving stakes marked with boards on the starboard hand and the stakes marked with bushes on the port hand. Two beacons should be left on the starboard hand and the remains of another on the port hand. When the beacon at the eastern end of the dredged channel, which should be left on the port hand, is abeam, steer **NE.** by **E.** for 1⅜ miles and then steer **NNE. ¼ E.** for the entrance to the river. When fair between the shores at the entrance, follow the directions in section 3.

Remarks and dangers.—While to the southward of the lighthouse care should be taken to avoid a 5-foot spot which lies ¼ mile **SSE. ¾ E.** from the lighthouse. The courses and buoys should be followed closely as there are several lumps on both sides of the channel. The stakes and beacons were close to the edge of the dredged channel, and should be given a berth of about 80 feet; some of them have disappeared. After passing through the dredged channel, the natural channel is nearly ⅜ mile wide until up to the entrance of the river; the shoals on the south side of this natural channel rise abruptly, and during freshets, or with a strong ebb current, vessels should be careful not to be set on them. There is good anchorage anywhere in the channel between the dredged channel and the entrance to the river.

The **NNE. ¼ E.** course should lead fair into the entrance of the river, and a small wooded hummock should be on the starboard bow while standing on this course.

3. ***From the Entrance of Atchafalaya River to Morgan City.***—When in mid-river and abreast of the small wooded hummock on the eastern shore of the entrance, follow a mid-river course for about 7 miles, keeping out of the bights making in on both shores. The vessel should now be at the southern entrance to Sweet Bay Lake, and a **N.** by **W. ¾ W.** course should lead in the channel until the river which empties into the lake opens out, when a **NW. ¼ N.** course will lead straight up the next reach of the river. Above Sweet Bay Lake follow a mid-river course except where the river broadens out and is known as Bateman Lake; here, the western shore should be followed, giving it a berth of about 225 yards. After entering the river above Bateman Lake a mid-river course should be followed until up to Morgan City.

Remarks.—The river channel is deep and the current is usually strong but it generally sets in the direction of the channel. All the bights are shallow and should be avoided. **Sweet Bay Lake** is the name given to a part of the river where it widens to 1½ miles; one large and two small bayous empty into the lake from eastward and northeastward. Abreast Morgan City the depths range from 36 to 100 feet and the bottom is sticky mud; vessels usually make fast to the wharf.

COAST FROM ATCHAFALAYA BAY TO GALVESTON ENTRANCE.*

From Southwest Reef Lighthouse to Sabine Pass Lighthouse, a distance of 123 miles in a straight line, the general trend of the coast is about **E.** and **W.**; between these points there are no important harbors, and vessels of over 6 feet draft are rarely seen standing close inshore along this stretch of coast. Lying offshore, at distances ranging from 15 to 28 miles, are a number of shoals which are dangerous to deep-draft vessels at all times, and to light-draft vessels in a heavy sea. Lying from 11 to 22½ miles southwestward of Southwest Reef Lighthouse are two large shoals with least depths of 13 and 15 feet, respectively, over them; these shoals are about 10 miles long in a general **WSW. ¼ W.** and **ENE. ¼ E.** direction, and the offshore edge of the outer shoal is about 7 miles inside the 10-fathom curve.

*Shown on charts 199, 200, 201, 202, 203, 204, scale $\frac{1}{80,000}$, price of each $0.50.

Trinity Shoal.—The middle of this shoal lies 37 miles **SW.** by **W.** ⅞ **W.** from Southwest Reef Lighthouse and 20 miles **S.** by **E.** ¾ **E.** from **Tigre Point;** it is about 17½ miles long in a general **WSW.** and **ENE.** direction, and its southwestern edge is about 5 miles inside of the 10-fathom curve. The depths over this shoal range from 11 to 17 feet. Between Trinity Shoal and **Tigre Shoal,** which lies to the northward, there is a channel with a least depth of 17 feet.

Between the western end of Trinity Shoal and the eastern end of Sabine Bank, a distance of 51 miles, the coast is clear of dangers, and the water shoals gradually and regularly toward the shore.

Sabine Bank is 38 miles long in a general **W.** ½ **S.** and **E.** ½ **N.** direction, about 3½ miles wide at its widest part, and lies from 13 to 23 miles from the shore. The depth over the bank ranges from 16 to 30 feet, and it is dangerous for light-draft vessels when there is any sea on; in a heavy sea it is marked by breakers. Inshore of this bank, and about 9 miles from the shore, a depth of 6 fathoms can be carried. Southward of this bank, and about 6 miles inshore of the 10-fathom curve, the soundings are somewhat irregular and several spots with 5¾ fathoms of water over them are found surrounded by depths of 7½ to 9½ fathoms, and a spot is reported as having 5 fathoms over it and lying near these spots.

Lying 34 miles **ESE.** ½ **E.** from Bolivar Point Lighthouse, directly in the track of vessels approaching Galveston from southeastward, is a shoal nearly 4 miles long in a **NE.** and **SW.** direction with 4½ to 5 fathoms of water over it. The middle of this shoal is in Latitude 29° 08′ 15″ N., Longitude 94° 10′ 45″ W., and about 16 miles **SSW.** from the western end of Sabine Bank; 9½ to 10 fathoms of water will be found as close as 1½ to 2 miles southeastward of this shoal, and in a heavy sea it should be avoided by vessels of moderate draft which could pass over it in smooth water.

High Islands is about 23½ miles eastward of Galveston Entrance; it is a broad hill about 40 feet high and, being so much higher than any other land along the coast, forms a landmark which can readily be distinguished at a distance of 6 to 8 miles when standing along the coast in this vicinity.

COTE BLANCHE AND VERMILION BAYS*

lie just westward of Atchafalaya Bay and are formed by an irregular indentation in the coast, with **Marsh Island** lying southward and separating them from the Gulf of Mexico. These bays are shallow and of little commercial importance and are seldom entered by strangers; a draft of 5 feet can, under favorable conditions, be taken from Atchafalaya Bay through Cote Blanche and Vermilion bays, but it requires local knowledge to avoid the numerous shoals and oyster reefs which lie in and between the bays.

East Cote Blanche Bay is the name given to the part lying directly east of Marsh Island and just westward of Atchafalaya Bay; it is full of shoals and reefs and has no settlements on its shores.

Vessels passing from Atchafalaya Bay into East Cote Blanche Bay generally use **Morrison's Cutoff,** which lies between **Point Chevreuil** on the east and **Rabbit Island** on the west.

West Cote Blanche Bay lies northward of the eastern half of Marsh Island; its eastern and western ends are full of shoals, but there is a large area of the bay in which there is a depth of 7 feet. **Cote Blanche** is a plantation on the north shore of the bay; it is the highest land in this vicinity and on the bay side presents a reddish yellow, steep bluff about 70 feet high. There is a landing at Cote Blanche at which the occasional steamboat from Morgan City lands to deliver freight or passengers.

Sailing directions for Cote Blanche bays that would be of use to a stranger can not be given. There are no aids, and local knowledge is necessary for entering and navigating the bays.

Vermilion Bay lies north of the western end of Marsh Island and west of West Cote Blanche Bay, it is entered from the gulf through **Southwest Pass,** which leads between the western end of Marsh Island and the mainland and has a narrow and very deep channel; however, the shoals which make off from Marsh Island and the mainland have depths of only 8 feet and this is the deepest draft that can be taken into Southwest Pass. The greater part of Vermilion Bay has depths of 7 to 9 feet, but a draft of 3 to 5 feet is all that can be taken to any of the landings or into the tributaries of the bay. The principal tributary of the bay is **Vermilion River** which empties into its western end from northward. A draft of 3 to 5 feet can be taken up the river to **Abbeville,** a town of about 2,000 inhabitants. **Petite Anse Bayou** empties into the bay from northward and is the approach to the salt mines at **Averys Island;** a draft of about 4 feet can be taken to Averys Island, but the salt is now shipped by rail. **Grand Cote** is the only post office near the shore of the bay; it is situated at the northeast end of the bay and can be reached by vessels of 4 feet draft.

The shores of these bays and Marsh Island are low and marshy, with one exception, and that is Cote Blanche plantation; there are no natural marks that can be used by a stranger, and anyone bound into the

*Shown on charts 199, 200, scale $\frac{1}{80,000}$, price of each $0.50.

bays should first obtain a pilot at Morgan City. A draft of 5 feet can be taken from Atchafalaya River through the Cote Blanche bays into Vermilion Bay but it requires local knowledge of high water.

DIRECTIONS TO SOUTHWEST PASS AT ENTRANCE TO VERMILION BAY.

These directions are good for a draft of 6 feet, which is the deepest draft that can be safely taken into the bay.

1. ***Approaching from the Eastward.***—Passing northward of Ship Shoal, bring Ship Shoal Lighthouse to bear **S.**, distant about 2 miles, and steer **NW.** by **W.** $\frac{7}{8}$ **W.** for 48½ miles; Shell Keys buoy (can, red, No. 2) should then be close aboard on the starboard hand. From this buoy steer **NW.** ¼ **W. Westerly** for 15 miles; the eastern point at the entrance to the pass will then bear **NNE.** and be distant 1¾ miles. Anchor here in 8 to 11 feet of water.

Remarks.—When standing on the **NW.** by **W.** $\frac{7}{8}$ **W.** course and approaching Shell Keys buoy, the water should not be shoaled to less than 15 feet until the buoy has been sighted. On a clear day the dry part of Shell Keys, about 3½ miles northward from the buoy, may be seen from aloft.

On the **NW.** ¼ **W. Westerly** course, the lead should be used frequently, and when standing on the last 5 miles of this course the depth at mean low water will be 7 feet. In case of low water a vessel can lie anywhere in the soft mud and wait for a rising tide. The eastern point at the entrance is low and grassy with a sandy beach.

Dangers.—**Shell Keys**, which are dry in places, lie off **South Point**, the southernmost point of Marsh Island; the southern end of the irregularly shaped shoal which surrounds these keys lies 5 miles from the shore of Marsh Island; Shell Keys buoy lies 1¾ miles southward of the southern end of this shoal.

Shoals with a depth of less than 6 feet over them extend from 1 to 3 miles from the south shore of Marsh Island, westward of Shell Keys. There are also several lumps with 5 and 6 feet of water over them lying directly off the entrance to Southwest Pass; the outer of these lumps lies 2½ miles **SSW.** from the eastern point at the entrance. Chart No. 200 should be examined before approaching the entrance to Southwest Pass.

1 A. ***Approaching from the Westward.***—Standing eastward along the coast, follow the beach, giving it a berth of about 1¾ miles until the eastern point at the entrance to Southwest Pass bears **NNE.**; then anchor in 8 to 11 feet of water.

Remarks.—Eastward of Mermentau and until up to Tigre Point the shore is low and marshy; near Tigre Point are several ridges of a little higher land on which there is a growth of bushes and trees. Standing past Tigre Point and eastward of it the lead should be used; the bottom is generally soft and if the water is low a vessel can lie in the mud and wait for higher water. The western point at the entrance to Southwest Pass is low and marshy. (See also the remarks and dangers under section 1.)

MERMENTAU RIVER*

empties into the Gulf of Mexico from northeastward about 86 miles westward of Atchafalaya Bay entrance and 90 miles eastward of Bolivar Point Lighthouse. The river and its principal tributary (**Nezpique Bayou**) are navigable for small steamers of 4 feet draft for a distance of about 76 miles. The entrance is obstructed by a shifting bar through which there is a channel with a depth of 5 feet at mean low water. Only small schooners and barges, with a greatest draft of 5¾ feet, engaged in the local coasting trade, enter the river from the gulf. There are no aids except a buoy on the 12-foot curve outside the bar, and strangers should not attempt to enter.

Grand Chenier is a small post village about 7 miles above the mouth of the river, and any vessel able to cross the bar can be taken to the village. The depth alongside the wharves at the village is about 12 feet.

There are no regular **Pilots** for the bar.

Sailing directions for entering the Mermentau River can not be given

*Shown on chart 201, scale $\frac{1}{80,000}$, price $0.50.

CALCASIEU PASS*

is the outlet of Calcasieu river and lake into the Gulf of Mexico, and is marked on its western side by **Calcasieu Lighthouse** (see table, page 18). The pass is about 98 miles westward of Atchafalaya Bay entrance and about 78 miles eastward of Galveston Entrance; it is obstructed by a shifting bar, which is being improved by the United States Government; a jetty about 7,000 feet long has been constructed from the eastern shore of the pass across the bar in a southerly direction. The depth in the channel over the bar is about 7 feet at mean low water, in a channel 50 feet wide. Inside the entrance, the pass, for a distance of 5½ miles, has an average width of about 200 yards with depths ranging from 11 to 30 feet, and is an excellent anchorage for any vessel that can cross the bar. The vessels entering from the gulf are usually small schooners in the lumber trade with a draft of 5½ to 7½ feet when loaded.

Cameron is a post village on the eastern shore of the pass about 2½ miles above its entrance; the village is of no importance; its mail is brought down the Calcasieu River from Lake Charles, about 50 miles distant.

Calcasieu Lake empties into the pass from northward about 6 miles above the lighthouse; the lake is 13 miles long in a **N.** and **S.** direction and has an average depth of about 8 feet, but there are shoals in several places; attempts are being made to maintain a channnel depth of 7 feet by dredging through these shoals.

Calcasieu River empties into the northern end of Calcasieu Lake. On the eastern bank of the river, where it widens into a small lake and about 50 miles above the entrance to the pass, is **Lake Charles,** the most important town on the river. The town has railroad communication with the interior and ships considerable lumber by rail and in small schooners. The deepest draft of the vessels loading here is about 6½ feet, which is about as deep a draft as can be taken through Calcasieu Lake. Above the town the river navigation is confined to light draft steamers and towboats, the latter being engaged in towing logs to the sawmills at Lake Charles.

A stranger desiring to enter Calcasieu Pass should employ a pilot, as the channel across the bar can not yet be depended on for depth or position. Pilots will come out to a vessel making signal near the Bar buoy.

GENERAL DIRECTIONS TO THE ENTRANCE OF CALCASIEU PASS.

These directions are good for vessels of 7 feet or less draft. Vessels of over 5 feet draft can not enter the pass except with smooth water, a high tide, and the assistance of a pilot.

Approaching the entrance either from the eastward or westward, follow the trend of the shore, giving it a berth of about 2 miles. When Calcasieu Lighthouse bears about **N. ½ W.**, stand in for the entrance buoy and wait for a pilot; if a pilot does not come out send a boat up to Cameron for one.

Remarks.—With an offshore wind and smooth sea, vessels of 7 feet draft can follow the shore eastward and westward of the pass at a distance of 1 mile. There are no natural landmarks; private parties maintain ranges for entering the pass, but these can not be described so as to assist a stranger in entering.

SABINE PASS.†

Sabine Pass is the outlet into the Gulf of Mexico of Sabine Lake and its two important tributaries, the Sabine and Neches rivers. It forms part of the boundary between Louisiana and Texas, and lies about 52 miles eastward of Galveston Entrance. The entrance is marked on its eastern side by **Sabine Pass Lighthouse** (see table, page 18), and the bar and pass is being improved by the United States Government; two jetties have been constructed which extend from either side of the entrance nearly 3 miles across the bar and into the gulf. A dredged channel between the jetties has a width of 100 feet and a depth of about 22 feet. From its entrance the pass extends in a general northwesterly direction abont 6 miles to Sabine Lake and has a least width of over ¼ mile, but there are numerous shoals which contract the navigable channel, in one place to a width of about 250 feet; however, a least depth of 24 feet can be taken the whole length of the pass to the entrance to the Port Arthur Ship Canal. The pass affords excellent anchorage for small vessels and is used as a harbor of refuge by small coasting vessels during the winter months.

Sabine is a small town on the west shore of the pass about 2½ miles above the entrance; it has railroad communication with Beaumont, and ships lumber, cotton, and cotton-seed products to foreign and domestic

* Shown on charts **202**, scale $\frac{1}{80,000}$, price $0.50; **518**, scale $\frac{1}{20,000}$, price, $0.20.

† Shown on chart **203**, scale $\frac{1}{80,000}$, price $0.50; **517**, scale $\frac{1}{20,000}$, price $0.50.

ports. The deepest draft that has been taken to or from Sabine is 23 feet. There is 22 feet of water at the end of the wharves, and the facilities for handling cargoes are excellent.

Sabine Pass, a village on the west shore of the pass about 1½ miles above the town of Sabine, is of no commercial importance.

Sabine Lake is about 15 miles long in a general **NE.** by **N.** and **SW.** by **S.** direction and has an average depth of about 6 feet. At the southern end, where it empties into Sabine Pass, there is a bar with a depth of 4 feet. The lake is of no importance except as an approach to Sabine Pass from the two rivers which empty into its northern end.

Port Arthur is a town on the west shore of Sabine Lake at the head of the **Port Arthur Ship Canal**; it is about 12 miles from the town of Sabine. The canal is about 7 miles long with a depth of 25 feet and top width of about 250 feet; it leads along the western shore of Sabine Lake and is separated from the latter by a narrow strip of land. Port Arthur is the terminus of a railroad and ships lumber, cotton, and cotton-seed products; the deepest draft taken from the port is 23 feet. The facilities for handling cargoes are excellent.

Sabine River empties into the northeastern end of Sabine Lake, and, for a length of two degrees of latitude, forms the boundary between the states of Louisiana and Texas. Lumber and cotton are shipped on the river, which is navigable during 3 months of the year for a distance of about 200 miles to **East Hamilton**, the lumber being shipped to Sabine Pass and the cotton to **Orange**. The latter town, the largest on the river, is situated about 27 miles above its mouth and on the line of the Texas and New Orleans railroad. The deepest draft of the steamers running on the river is 6 feet, which is about as deep a draft as can be taken to Sabine Pass under favorable conditions. The river is crossed by a railroad drawbridge about 7 miles above Orange.

Neches River empties into the northwestern end of Sabine Lake; it is navigable for steamers of 3 feet draft for about 3 months in the year to **Bevilport**, a distance of about 135 miles. **Beaumont**, the largest city on the river and one of the most important in eastern Texas, is situated about 27 miles above the mouth and has railroad communication; it ships lumber, cotton, and rice by rail, and considerable lumber is shipped also to Sabine Pass in vessels of 6 feet or less draft. The river is crossed at Beaumont and Bushy Bluff by railroad bridges, which have draws of 30 and 40 feet, respectively.

Prominent features.—Sabine Pass Lighthouse is the most conspicuous feature by which the pass may be recognized. The land along this stretch of coast is low, and during the freshet season much of it is covered with water. The jetties at the entrance show out of water for a part of their length, and on the eastern jetty, near its outer end, is a beacon.

Channel.—In 1900 the dredged channel between the jetties was 100 feet wide and 22 feet deep, through a mud bottom on which vessels can touch without injury: it is marked by a bell buoy at the entrance and by a whistling buoy just outside. This channel is maintained by dredging, and while the dredge is at work the buoys may be out of position between the jetties. Above the lighthouse the channel leads along the west shore of the pass and is very narrow abreast the life-saving station, but the most dangerous shoals are marked by buoys.

Anchorages.—There are two good anchorages in the pass, one to the southward of the lighthouse in 18 to 27 feet of water, and the other abreast of the northern end of the town in about 36 feet. These anchorages, however, will permit only small vessels to swing clear of the shoals; vessels 200 feet long and drawing 15 feet would have to anchor with a short scope of chain. Vessels provided with good ground tackle can, if they do not desire to enter the pass, ride out any gale by anchoring to the westward of the jetties, as close to the beach as their draft permits; the bottom for a distance of about 6 miles is soft mud or ooze. Small coasting vessels often anchor close in to the beach where the soft ooze of the bottom, stirred by the action of the water, prevents the seas from breaking; in some places alongshore the sea, in southerly gales, has the appearance of being covered with oil.

Pilot Rules for Western Rivers apply to Sabine Pass northward of Sabine Pass whistling buoy and in Sabine Lake and its tributaries. Outside this buoy the **International Rules** apply.

Quarantine.—The quarantine boarding station is on the west shore of the pass about 1 mile below the lighthouse. (See Appendix I and National Quarantines, Appendix IV.)

Pilots.—There are licensed pilots for the pass who will come out to a vessel making signal. An additional charge of $10 is made for piloting vessels from inside the pass through the canal to Port Arthur. Pilots for Sabine Lake and Sabine and Neches rivers, as far as Orange or Beaumont, can be had at Sabine Pass. (See pilot laws and rates, Appendix I.)

Towboats will come outside the bar to vessels approaching the entrance. All sailing vessels bound into the pass above the lighthouse, especially strangers, should take a towboat on account of the narrow channel and strong tidal currents.

Supplies.—Bituminous coal for steamers can be had alongside the wharves at Sabine. Water can be obtained from water boat or alongside the wharves. Provisions can be had at Sabine and Port Arthur.

Repairs.—The nearest places for extensive repairs to hulls of vessels or machinery of steamers are Galveston and New Orleans.

Tides and currents.—The tides and currents are irregular and depend greatly on the direction and force of the wind. During freshets in the Sabine and Neches rivers there is a strong flow out of the pass and occasionally the low land around Sabine Lake and the pass is covered with water. There is usually a strong ebb or flood current setting through the pass between its entrance and Sabine Lake. (See table, page 24, and remarks on pages 25, 26.)

SAILING DIRECTIONS, SABINE PASS.

The directions in sections 1 and 1 A are good for vessels of any draft that can enter. The directions in section 2 are good in daytime for vessels of 12 feet draft; vessels of deeper draft should take a pilot, and no stranger should attempt to enter at night.

1. ***Approaching from the Eastward or Southeastward.***—The coast for a distance of 60 miles eastward of Sabine Pass can be approached as close as 5 miles with 4¾ to 6 fathoms of water. Care should be taken to avoid Sabine Bank, which is 38 miles long in a general **E. ½ N.** and **W. ½ S.** direction and is from 13 to 23 miles offshore (for a full description of this bank see page 102). Deep-draft vessels should keep in at least 10 fathoms of water until between longitudes 92° 30′ W. and 93° 15′ W.; they can then stand northward, gradually shoaling the water to 5 fathoms; the shore should then be sighted and the vessel steered westward, keeping in about 5 fathoms of water. When Calcasieu Lighthouse is made bring it to bear **N.**, distant 6 miles, and steer **WSW. ¾ W.** for 24 miles; this should lead to a position 1 mile outside the whistling buoy off Sabine Pass, and Sabine Pass Lighthouse should bear **NNW.**, distant 5½ miles.

Light-draft vessels can follow the coast, giving it a berth of about 2 miles, or keeping in 3 fathoms of water, until the whistling buoy off the entrance is sighted; then stand for the buoy and follow the directions in section 2.

Remarks.—Deep-draft vessels should avoid Trinity Shoal and also the extensive shoals off the entrance to Atchafalaya, Cote Blanche, and Vermilion bays; by keeping in a depth of about 10 fathoms these shoals will be given a good berth. The eastern end of Sabine Bank is in Longitude 93° 18′ W., and deep-draft vessels should avoid it. The lead should be used regularly when approaching the coast; the water should shoal gradually and regularly. There are no marked natural features by which to recognize the land; Calcasieu Lighthouse is the first aid and should be made by vessels approaching from the eastward or southeastward.

1 A. ***Approaching from the Westward or Southwestward.***—From the whistling buoy off Galveston Entrance steer **NE.** by **E. ½ E.** for 48 miles. The vessel should then be about 1 mile outside the whistling buoy off the entrance to Sabine Pass.

Deep-draft vessels coming from southwestward should make the land at Galveston Entrance, or, stand in for the coast between Longitudes 94° 15′ W. and 94° 30′ W. This will avoid a 4½-fathom shoal lying about 27 miles from the coast and 34 miles **ESE. ½ E.** from Bolivar Point Lighthouse. As soon as the land is made, stand eastward in about 5 fathoms of water until Sabine Pass Lighthouse bears **NNW.**, distant 5½ miles.

Light-draft vessels, when eastward of Bolivar Point Lighthouse, can follow the shore, giving it a berth of 1 to 2 miles, until the whistling buoy off the entrance to Sabine Pass is made; then stand for the buoy and follow the directions in section 2.

Remarks.—High Islands, about 23½ miles eastward of Bolivar Point Lighthouse, is a knoll about 1 mile in diameter and about 40 feet high; this is the highest land on the coast eastward of Galveston, and it is quite a landmark for vessels making, or standing along, the coast. There is a good anchorage in 3 to 6 fathoms of water for a distance of 15 miles westward of the entrance to Sabine Pass where vessels, if supplied with good ground tackle, can ride out a severe gale.

2. *Entering, and to an anchorage.*—From the whistling buoy off the entrance, steer **N.** by **W.** ¾ **W.**, heading fair between the jetties. Leave the red bell buoy on the starboard hand and steer so as to pass about midway between the jetties, which will partly show above water, and continue in the middle of the pass, leaving the red buoys on the starboard hand, until abreast the lighthouse; here, anchor in 4 to 5 fathoms water.

Or, *if bound up to the town* and, in case of a sailing vessel, the wind is favorable, continue past the lighthouse; leave red nun buoy No. 18 on the starboard hand and haul in gradually for the western shore so that when abreast the docks at Sabine the vessel should be 50 yards from the shore. Follow the western shore at a distance of 70 yards, leaving the buoys on the hand indicated by their color, and, when a little over ¼ mile above the upper buoy, anchor in 5 to 6 fathoms of water, about 150 yards from the water front of the village of Sabine Pass.

Remarks.—At low water parts of the jetties, excepting their unfinished outer ends, can be seen; at high water a small part of the eastern jetty will be seen. The dredged channel leads fair between the jetties, and a depth of 10 to 11 feet will be found on both sides of it. The channel above the docks at Sabine is very narrow and the reef on its eastern side is principally oyster shells; a vessel striking this reef is liable to have trouble in getting off, as the currents will tend to set her on harder. Sailing vessels, if bound farther up the pass, are advised to take a pilot or towboat from abreast the lighthouse.

GALVESTON BAY*

is a large, irregularly shaped, shallow bay in the coast of Texas about 300 miles, in a straight line, to the westward of the South Pass of the Mississippi River; it is the approach by water to the city of Houston and a number of towns situated on its tributaries. The southern part of the bay and its entrance form what is commonly known as **Galveston Harbor**; this, the most important port in the State of Texas, is treated under a separate heading in this volume. The bay is about 30 miles long in a general **NNE.** and **SSW.** direction, about 17 miles wide at its widest part, and has a general depth of 7 to 11 feet. There are a number of small post villages on the shores of the bay, the most important of which are: **Texas City,** on the west shore about 1 mile to the southward of Shoal Point; **North Galveston,** on the west shore at Edwards Point; **Laporte,** on the west shore near Morgan Point; and **Anahuac,** on the eastern shore opposite the mouth of Trinity River. None of these are of commercial importance. **Redfish Bar** crosses the middle of the bay in a general **ENE.** and **WSW.** direction; a dredged channel, marked by beacons and stakes, permits vessels of 8 feet draft to pass from the southern to the northern part of the bay.

Improvements are in progress to obtain a channel 12 feet deep and 100 feet wide through Galveston Bay into the San Jacinto River and up Buffalo Bayou to the city of Houston, but at present (1900) the deepest draft of the vessels navigating the bay is 8 feet.

East Bay is a large, shallow bay making to the eastward about 16 miles from the southern end of Galveston Bay and lying to the northward of **Bolivar Peninsula.** The depths in this bay range from 3 to 8 feet, and there is a reef known as **Hanna Reef** extending nearly the whole distance across its western end.

West Bay is a long, shallow body of water extending from the southwestern part of Galveston Bay for 19 miles, in a general **SW.** direction, between Galveston Island and the mainland. Near its eastern end it is crossed by railroad drawbridges.† Only small boats and steamers of about 3 feet draft pass through the bay, which forms part of the inside passage to Brazos River. At its western end, West Bay is entered from the gulf through **San Luis Pass** which has a depth of about 7 feet on the bar. This pass is not safe for a stranger.

TRINITY RIVER

empties into the northeastern end of Galveston Bay; this is one of the largest rivers in the State of Texas and drains one of the richest sections of the State. The river is navigable at certain seasons of the year for a distance of about 120 miles by light-draft steamers. The three principal towns which have any trade by water, and their approximate distances from the mouth of the river, are: **Wallisville,** 5 miles; **Moss Bluff,** 17 miles; **Liberty,** 35 miles. The trade from these places is in cotton, cattle, lumber, and wood, carried in vessels of 5 feet or less draft. The entrance of the river has been improved by the construction of two jetties which

*Shown on chart **204**, scale $\frac{1}{80,000}$, price $0.50.

†The storm of September, 1900, destroyed all the bridges from Galveston Island to the mainland and blocked the navigation of West Bay. The bridges are to be rebuilt; in December, 1900, a temporary wooden railroad bridge was the only one crossing West Bay.

extend into the bay from each side of one of the mouths of the river known as **Middle Pass**. Between these jetties a channel 100 feet wide and 5 feet deep has been dredged across the bar which obstructs the entrance. Pilots for Galveston Bay and Trinity River can be found at Galveston; a stranger should not attempt to enter the river without one.

CEDAR BAYOU

empties into the northwestern end of Galveston Bay from northeastward, about 1½ miles below the mouth of the San Jacinto River. The entrance of the bayou is obstructed by shoals which form a bar with a depth of 2 feet; this bar has been improved by the construction of two jetties which extend from the entrance of the bayou into the bay; between these jetties a dredged channel 90 feet wide and 5 feet deep leads into the bayon, which has a general depth of 7 feet in the channel.

SAN JACINTO RIVER

empties into the northwestern end of Galveston Bay from northwestward. The entrance of the river is obstructed by shoals over which the least depths are 2 to 3 feet; the river, however, is now entered through what is known as the **Morgan Cut and Canal**; this consists of a dredged cut in the northwestern part of Galveston Bay, about 4½ miles long, extending in a **NNW. ⅝ W.** direction toward **Morgan Point**, the western point at the entrance to San Jacinto River, and a canal nearly ½ mile long which has been cut through Morgan Point and which connects with the deep water inside the mouth of the river. The cut and canal (1900) have a least depth of 9 feet and a width of 100 feet; the former is marked by a large day beacon at its southern end and row of piles on its western side from the beacon to the canal. From the canal to Lynchburg, a distance of about 6 miles, the San Jacinto has a least channel depth of about 12 feet.

Buffalo Bayou is a narrow tidal stream which empties into San Jacinto River from the westward at **Lynchburg**; it is important as the approach by water to the city of **Houston**, to which place a draft of 6 feet can now be taken. Improvements are in progress to maintain a navigable channel for the commerce of the city of Houston, which is mostly carried in barges of 5 feet draft and towboats of less than 7 feet draft; large shipments of cotton are made from Houston to Galveston. The city of Houston is about 21 miles above **Lynchburg**; at and below the city the bayou is crossed by 5 bridges which have draws ranging from 60 to 110 feet in width. Strangers should not attempt to enter the San Jacinto River or Buffalo Bayou. Pilots for these waters can be obtained at Galveston.

GENERAL INFORMATION.

Anchorages.—The bottom, in a depth of 6 to 10 feet, is generally soft and good holding ground, so that vessels can anchor almost anywhere in this depth of water. During a norther, however, the water is blown out of the bay and vessels of 5 feet draft will lie on the bottom where at ordinary stages there is a depth of 8 feet.

Pilots and towboats.—Pilots and towboats for Galveston Bay and its tributaries can be had at Galveston, and it is advisable for strangers to employ either one or the other.

Supplies.—Provisions and ship chandler's stores can be had at Lynchburg and Houston (see also Galveston Harbor).

Repairs.—There is a small marine railway at Lynchburg, but Galveston is the nearest place where extensive repairs can be made.

Tides and currents.—The tides are irregular and depend mostly on the force and direction of the winds. A northerly wind makes low water, and a southerly wind high water, in the bay. The currents also depend on the winds; they are strongest in the entrance of the bay and across Redfish Bar. (See table, page 24, and remarks, pages 25, 26.)

GALVESTON HARBOR*

is the name generally applied to the southern part of Galveston Bay bordering on the city of Galveston; the entrance to the bay and harbor from the Gulf of Mexico, between **Bolivar Peninsula** lying northeastward and **Galveston Island** lying southwestward, is known as **Galveston Entrance**. Galveston is the principal port in the

*Shown on charts **204, 205**, scale $\frac{1}{80,000}$, price of each $0.50; **520**, scale $\frac{1}{40,000}$, price $0.15.

State of Texas and one of the most important on the Gulf Coast of the United States. The entrance, in Latitude 29° 21′ N. and Longitude 94° 45′ W., is obstructed by a bar which extends nearly 4 miles into the gulf; this bar has been improved by the construction of jetties and dredging, so that in 1900 a depth of 25 feet could be taken in over it; this depth, however, is maintained by dredging. The harbor may be properly divided into an outer and inner harbor; the former includes the deep water between the inner parts of the jetties and between **Boliver** and **Fort** points; the latter is a narrow, deep slue, about 200 yards wide, which leads from the outer harbor (Galveston Entrance) along the north shore of Galveston Island and northern front of the city of Galveston for a distance of about 3½ miles. Both harbors afford good anchorage and during the winter months furnish refuge for coasting vessels; the inner harbor, however, is too narrow for long vessels to swing without striking either the wharves or the bank on its western or northern side; this bank has an average depth of 3 feet and prevents a heavy sea in the harbor during northers.

The **city of Galveston**, situated near the eastern end of Galveston Island, has a large foreign trade in cotton, cotton-seed products, and grain, and a coastwise trade in cotton and coal. Several lines of coasting steamers make regular trips to ports on the Atlantic and Gulf coasts. Galveston is also a railroad terminus for several lines running through the interior of the State and does a large wholesale business in supplies for the adjacent country.

Prominent features and aids.—Approaching the entrance from seaward, **Bolivar Point Lighthouse** (see table, page 20) will show conspicuously on the northern point at the entrance. On the southern side of the entrance, **Fort Point Lighthouse** and the large grain elevators and buildings in the city of Galveston show prominently, the tall grain elevator being often sighted before Bolivar Point Lighthouse. The ends of the jetties are not permanently marked, but between the jetties, inside the bar, is **Galveston light-vessel.** A whistling buoy is in place outside the bar, and the channel is well marked by buoys which are shifted to indicate the best water.

Channels.—The channel over the bar, leading about midway between the jetties, has been obtained by dredging; in 1900 it had a depth of 25 feet, but the depth and width of this channel are liable to change. Inside the bar, the channel is ½ mile wide with a depth greater than 24 feet, and extends to Fort Point, where it branches, the main part leading in a **NW.** direction between shoals into Galveston Bay, the other, a narrow slue, with a least depth of 25 feet, running along the north shore of Galveston Island and northern front of the city of Galveston. The channel into Galveston Bay is known as **Bolivar Channel.**

Anchorages.—The best anchorage for large vessels is in Bolivar Channel between **Bolivar** and **Fort** points; the depths here range from 3½ to 8 fathoms and the bottom is good holding ground. The anchorage off the wharves of the city is too narrow for long vessels to swing at anchor, and, besides, they would interfere with incoming and outgoing vessels. The **harbor master** of Galveston has control of the anchorage and berthing of vessels within the corporate limits of the city (see harbor regulations for the port of Galveston, Appendix I). Vessels outside the bar and prevented from entering by a norther can anchor in about 5 fathoms of water with Bolivar Point Lighthouse bearing about **NW.**; the holding ground is good and there will be but little sea.

Quarantine.—Every vessel arriving at the port is subject to inspection by the local quarantine officer. The quarantine station is on the east side of the channel inside of Fort Point, but no vessel will be permitted to pass inside of the black buoy off Port Point until boarded, inspected, and given pratique; vessels will be boarded and inspected anywhere between the light-vessel and the black buoy off Fort Point between sunrise and sunset, exception only being made for vessels in distress. (See quarantine, Appendix I, and National Quarantines, Appendix IV.)

Lines defining limits within which the Inland Rules of the Road apply.—From Galveston Bar whistling buoy **N.** by **W. ¼ W.** through the beacon marking the outer extremity of the north jetty* and **WSW.** to the Tremont House, Galveston City.

Pilots will be found cruising just outside the bar in a steam pilot boat, or will come out to a vessel making the signal. A vessel desiring a pilot, and not having been boarded outside, should stand off and on outside the jetties, keeping in at least 5 fathoms of water, until a pilot is obtained. Pilotage is compulsory (see pilot laws and rates, Appendix I).

Towboats.—Sailing vessels are advised to take a towboat, especially in the channel from Fort Point to the wharves. Towboats will come to vessels outside the bar, or they may be had at the city for towing over the bar or in the bay.

Wharves.—The depth of water alongside the wharves ranges from 20 to 30 feet, according to location. The facilities for loading and discharging cargoes are very good. The **harbor master** has control of the berthing and moving of vessels and the removal of cargo from the wharves. (See also harbor regulations, Appendix I.)

* This beacon was destroyed in the gale of September, 1900, and in December, 1900, had not been rebuilt.

Supplies.—Coal for steamers, either anthracite or bituminous, can be had at the wharves or from lighters in the stream. Fresh water can be had alongside the wharves or from water boats in the stream. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—There is one marine railway with cradle 190 feet long, 40 feet wide, and a capacity of about 1,000 tons. The facilities for repairs to hulls of vessels are fair, and a number of machine shops in the city have facilities for ordinary repairs to the machinery of steamers, large castings and forgings can be made at Houston and be brought to Galveston by rail in a few hours.

Storm-Warning Displays of the **United States Weather Bureau** are made in the city and are visible to the shipping at anchor in the harbor.

A branch of the **United States Hydrographic Office** is located in the Levy Building, Galveston. This office is supplied with publications pertaining to navigation; the latest information regarding charts, lights, and dangers to navigation; and barometers, thermometers, and other instruments can be compared, with standards, free of cost.

Marine-Hospital Service.—Medical attendance is furnished by a medical officer of the service. Seamen requiring long-continued hospital treatment are sent to the Marine Hospital at New Orleans, La; for short terms of hospital treatment they are sent to one of the hospitals in the city.

Tides and currents.—The tides are irregular, depending almost entirely upon the force and direction of the winds (see table, page 24, and remarks, page 25). The tidal currents, when not influenced by winds, are weak, but strong currents are caused by northerly and southerly winds; the former lower the water in the entire bay and its tributaries and cause a strong current out over the bar; the latter raise the level of the water in the bay and cause a strong set in over the bar.

Winds.—The prevailing winds are northerly from November to February and southerly the remaining months, northers are frequent from December to March. These gales, although occasionally blowing with a velocity of over 40 miles, are not dangerous to vessels anywhere close to the coast, as they blow directly offshore and the sea is not heavy; the Weather Bureau warning of their approach gives vessels ample time for preparation. (See remarks on northers, page 26.)

SAILING DIRECTIONS, GALVESTON HARBOR.

The directions up to the entrance over the bar are good for vessels of any draft. The directions for entering are good in the daytime with smooth water for vessels of 20 feet draft to the outer anchorage and 15 feet draft to the wharves of the city. Vessels of over 20 feet draft should take a pilot outside the bar; when there is a heavy sea or swell all strangers should take a pilot before crossing the bar. At night a stranger of over 15 feet draft should not attempt to enter without a pilot.

1. ***Approaching from the Eastward.***—Deep-draft vessels should not approach the coast in less than 13 fathoms of water until to the westward of Longitude 94° 15′ W. Then stand northwestward, using the lead and not approaching the shore closer than in 5 fathoms of water until a landfall is made. As soon as Bolivar Point Lighthouse is made, bring it to bear **WNW. ½ W.** and stand in on this bearing until it is 5½ miles distant; then take a pilot.

Coasting vessels which have made the land eastward of Galveston Entrance and are running alongshore, should haul offshore before Bolivar Point Lighthouse bears **W.** by **S.**, so as to avoid the shoals which extend out from the entrance for a distance of 3¾ miles. If drawing 15 feet or less, follow the directions in section 2.

Remarks and dangers.—Sabine Bank, which is described on page 102, should be avoided by all deep-draft vessels. The shoal with 4½ fathoms of water over it, which lies 34 miles **ESE. ½ E.** from Bolivar Point Lighthouse and 27 miles from the coast, is avoided by standing in for the shore westward of Longitude 94° 15′ W. When approaching the entrance a large elevator will be a conspicuous landmark and in hazy weather will probably be seen before Bolivar Point Lighthouse; the latter is the principal aid at night. A stranger approaching the coast at night and not being sure of his position should not shoal his water to less than 7 fathoms; in this depth daylight should be waited for.

1 A. ***Approaching from the Southward or Southwestward.***—Deep-draft vessels making the land westward of Galveston Entrance should follow the coast, giving it a berth of 5 miles until abreast of the city, to insure a depth of over 6 fathoms, and so as to keep well outside of the jetties and the whistling buoy. A **NE.** course made good from Brazos River buoy will lead parallel to the coast and off the entrance to Galveston Harbor.

Light-draft vessels can follow the coast at a distance of about 2 miles until nearly abreast the city of Galveston; then haul offshore and pass well eastward of the South Jetty, and the buoys at the entrance to Galveston Harbor.

Remarks and Dangers.—There are several spots with less than 6 fathoms over them lying just inside of 5 miles from the beach; these spots might be dangerous for deep-draft vessels in a heavy sea. Galveston Island is low and, westward of the city of Galveston, bare of trees. The large elevator near the eastern end of the city is a conspicuous mark, and can be recognized from a distance of 10 miles in clear weather. Vessels waiting to be boarded by a pilot can, in ordinary weather, anchor outside the bar in 6 fathoms of water. (See also remarks and dangers under section 1.)

2. ***Entering and to the wharves at Galveston.***—*These directions led in the best water on the bar in December, 1900.*—When in about 6 fathoms of water and outside of the whistling buoy, leave it close-to on either hand and steer for the red gas buoy (Outer Entrance buoy) which should be left 100 yards on the starboard hand. When the latter buoy is abeam steer about **NNW.** so as to leave black gas buoy (Entrance Inner buoy) about 150 yards on the port hand and when this buoy is abeam steer about **NW.** so as to leave black gas buoy (Inner buoy) about 150 yards on the port hand. When the latter buoy is abeam steer about **WNW.** ½ **W.** for Bolivar Point Lighthouse. Leave the black buoys on the port hand and pass on either side and close to the light-vessel; from the latter steer about **W.** heading for mid-channel buoy (nun, black and white perpendicular stripes); leave this buoy close-to on either hand and steer about **WSW.** keeping Fort Point Lighthouse and the large black can buoy (No. 5.) on the port bow; leave the latter buoy 80 yards on the port hand and the red gas buoy (Second Turn buoy) about 80 yards on the starboard hand. The course should then be changed to southward so as to steer **S.** ¾ **W.** by the time Fort Point Lighthouse bears **E.** by **N.** Continue the **S.** ¾ **W.** course leaving the Quarantine Station wharf about 75 yards on the port hand. When about ⅓ mile above the Quarantine Station haul a little more westward and follow the wharves, giving them a berth of 80 yards on the port hand.

Remarks.—The channel over the bar is liable to shift, but the buoys are usually moved to indicate the best water. Vessels should be guided by the buoys, some of which are gas lighted, rather than the given courses. Black buoys are placed to mark the southern edge of the channel between the jetties; these buoys should be left on the port hand. Two red buoys are placed to mark the eastern point of **Pelican Spit**; these must be left on the starboard hand when standing into the channel which runs along the north side of Galveston Island. The **Quarantine Station** is built on piles on the eastern edge of the channel; above the station, and on the west side of the channel, are a red beacon and a red buoy. The bank on the western side of the channel rises abruptly and has only 1 to 5 feet of water over it. (See harbor regulations, Appendix I.)

SAN LUIS PASS*

is 27 miles southwestward from the jetties at Galveston Entrance and affords an entrance from the gulf to the western end of West Bay. The pass leads past the western end of Galveston Island and has a least width of ¼ mile but it is obstructed by a shifting bar which extends about 1 mile into the gulf and which usually has a channel depth of 7 to 8 feet. The channel over the bar is not marked, and a stranger should not attempt to enter the pass. Making westward from San Luis Pass is a narrow channel which communicates with a shallow body of water called **Oyster Bay**; the latter is the approach to the canal, controlled by the Columbia Transportation Company, which leads into the Brazos River. Steamers of 3 feet draft could pass from Galveston to the

*Shown on chart 205, scale $\frac{1}{80,000}$, price $0.50.

Brazos River, before the hurricane of September, 1900, without going outside, but navigation of the inland waters requires local knowledge; toll is collected from vessels passing through the canal.

Sailing directions for the pass or Oyster Bay, that would be of use to a stranger, can not be given.

BRAZOS RIVER *

empties into the Gulf of Mexico about 36½ miles southwestward of Galveston Entrance. It is one of the largest rivers in the State of Texas, and during high stages of water has been ascended by light-draft steamboats to the town of **Washington**, a distance of about 218 miles. At ordinary stages of water in the river, it is navigable for steamers of 3 feet draft to **Bolivar Landing**, 42 miles above its mouth. Cotton and cotton-seed products are shipped from the Brazos River; vessels can load to a draft of 14 to 15 feet, The entrance, which is marked by Brazos River Lighthouse, is obstructed by a bar: it has been improved by jetties at the entrance of the river; between these jetties the channel depth is 15 feet at mean low water.

The width of the river below the town of Velasco is 500 to 600 feet; this part of the river is a good anchorage and harbor of refuge for small vessels, but there is not room for large vessels to swing at anchor. The **Brazos and Galveston Canal** enters the river about ¾ mile from its mouth.

Quintana is a small town on the western shore just inside the entrance to the river.

Velasco is a town on the north bank of the river, 5 miles above its mouth; the town is a railroad terminus and has good facilities for loading and discharging vessels. The depth of water at the wharves is 15 feet and the deepest draft taken to the town is 15 feet at high water.

Brazoria is 25 miles above the mouth of the river; there is a depth of 12 feet at the wharves but the deepest draft that can be taken to Brazoria at high water is 9 feet.

Columbia, 32 miles, and **Bolivar Landing**, 42 miles, above the mouth of the river, ship cotton, cotton-seed products, and lumber in light-draft steamers to Velasco and Galveston.

Prominent features and aids.—Brazos River Lighthouse (see table, page 20) is on the north bank of the river about 1 mile inside the entrance and on a line with the axis of the south jetty. There is a lighted beacon on the south jetty which, with the lighthouse, forms a range for approaching the entrance. Several buoys are placed to indicate the channel to the entrance between the jetties.

Quarantine.—See Appendix I and National Quarantines, Appendix IV.

Pilots will come out to vessels making signal off the bar. (See pilot laws, Appendix I.)

Towboats.—All sailing vessels of 12 feet draft are advised to take a towboat unless with a strong fair wind; no sailing vessel of over 12 feet draft should attempt to go above Quintana without a towboat. Towboats can be had outside the bar, by signal, or at Quintana.

Supplies.—By giving due notice, coal for steamers can be had at Velasco. Fresh water and provisions can also be obtained at Velasco.

Repairs.—The nearest place where repairs to vessels and machinery of steamers can be made is Galveston.

Storm-Warning Displays of the **United States Weather Bureau** are made at Velasco.

Tides.—For tides see table on page 24 and general remarks on the tides in the Gulf of Mexico on page 25.

SAILING DIRECTIONS, BRAZOS RIVER.

The directions for entering are good in the daytime, with clear weather and smooth sea, for vessels of 11 feet or less draft. Vessels of deeper draft should employ a pilot.

1. ***Approaching the Entrance.***—The shore northeastward and southwestward of the entrance to Brazos River can be approached as close as 1½ miles carrying a depth of 20 feet or more. As the entrance is approached care should be taken not to shoal the water to less than 20 feet. Bring Brazos River Lighthouse to bear **NW. ¾ W.** when still in 22 feet of water and then follow the directions in section 2.

Remarks.—The perpendicularly striped nun buoy is a little over 1½ miles outside of the jetties in about 5 fathoms of water. A red buoy and a black buoy will be seen off the ends of the jetties; these buoys mark the entrance.

* Shown on charts 206, scale $\frac{1}{80,000}$, price $0.50; 525, scale $\frac{1}{10,000}$, price $0.25.

2. *Entering and to an Anchorage.*—With Brazos River Lighthouse bearing **NW. ¾ W.** stand for it, taking care not to be set westward. Leave the black buoy about 250 yards on the port hand and the red buoy about 100 yards on the starboard hand and then stand fair in between the jetties, course **NW. ⅝ W.** Continue up the river, keeping in mid-stream; anchor to the southward of the lighthouse in about 25 feet of water.

Remarks.—In November, 1900, a lump with 11 feet over it had formed on the west side of the channel at the entrance between the jetties; vessels entering should favor the end of the east jetty until this lump has been removed. The beacon on the south jetty should be kept open to the left of the lighthouse when standing for the entrance and when between the jetties. A number of wing dams have been built out from the banks of the river to protect them from scour. In the bend, where the river changes its direction southwestward, the channel slightly favors the southern shore. A stranger should take a pilot to pass up the river above the lighthouse.

PASS CAVALLO AND MATAGORDA BAY.*

Pass Cavallo is about 103 miles southwestward of Galveston Entrance; it is one of the approaches from the gulf to the long chain of bays and lagoons which stretch along and just inside of the coast of Texas for a distance of about 210 miles, from near the Rio Grande to Latitude 28° 46′ N. The entrance of the pass, between **Matagorda Peninsula** on the east and **Matagorda Island** on the west, is about 1¼ miles wide, but the shifting nature of the shoals which obstruct the entrance renders likely a change of width during any heavy gale or hurricane. On the western side of the entrance is **Matagorda Lighthouse** (see table, page 20), the most prominent mark by which this locality may be recognized.

The bar which obstructs the entrance of the pass shifts frequently and the channel depth over it varies from 8½ to 11 feet; in 1900 there was a depth of 8 feet and the channel favored the western side of the entrance. The buoys marking this channel are shifted, when practicable, to indicate the best water, but no stranger should attempt to enter without the assistance of a pilot. In northerly winds or in smooth sea vessels can anchor in 6 to 7 fathoms of water with the lighthouse bearing between **WNW.** and **NW.** and wait for a pilot; when there is a heavy sea vessels can not cross the bar. The deepest draft of vessels entering under favorable conditions is 9 feet, but few vessels of over 5 to 6 feet enter, as this is the deepest draft that can be taken to the towns on Matagorda Bay. The anchorage near the head of the pass, in 19 to 21 feet of water, is good, and it is sometimes used by small coasting schooners which seek shelter from southerly or easterly gales.

Matagorda Bay, the principal body of water entered through Pass Cavallo, is very irregular in shape and depth; it is about 45 miles long in a general northeasterly and southwesterly direction, its width ranging from 1 mile at its eastern end to 10 miles at its western end, and its depths from 3 to 13½ feet. For its whole length it is separated from the gulf by only a narrow strip of beach called **Matagorda Peninsula,** which is, properly speaking, an island, as there is a narrow passage through it with a depth of 4 feet and several cuts with about 1 foot of water, which were scoured out in the hurricane of 1875.

Colorado River, which empties into Matagorda Bay near the town of Matagorda, can not be entered from the bay, as there is only 1 foot of water on the bar.

A number of shallow bays are tributary to Matagorda Bay, but with the exception of **Lavaca Bay,** which makes northwestward from the western end of Matagorda Bay and is the approach to the town of **Port Lavaca,** they are of no importance and are entered only by local fishermen and oystermen.

Port Lavaca, a town on the western shore of Lavaca Bay and about 23 miles above the entrance to Pass Cavallo, has some trade in lumber and general merchandise carried in small schooners of about 5 feet draft. It is the only town in this vicinity which has railroad communication with the interior of the State.

Matagorda is a small town on the northern shore of Matagorda Bay and about 32 miles northeastward of the entrance to Pass Cavallo. A draft of 3 feet can be taken to the town and 6 feet can be taken to an anchorage 5 miles from the town.

At present there is no commissioned pilot for Pass Cavallo, but the keeper of the life-saving station will bring vessels over the bar; the old rate for pilotage was $4 per foot each way. Local fishermen can be found to pilot vessels in Matagorda Bay and its tributaries. There are no towboats; the buoys marking the channel over the bar are the only aids that can be used by a stranger and these can not always be depended on to indicate the best water.

Storm-Warning Displays of the **United States Weather Bureau** are made at Port Lavaca. (See also pages 23 to 27 for general information regarding winds, tides, etc.)

* Shown on charts 207, 208, scale $\frac{1}{80,000}$, price of each $0.50.

The **quarantine station** is on Matagorda Peninsula, about 2 miles from **Decros Point.** Vessels subject to visitation by the quarantine officer are boarded in the channel off Decros Point. (See quarantine, Appendix I, and National Quarantines, Appendix IV.)

GENERAL DIRECTIONS TO THE ENTRANCE TO PASS CAVALLO.

These directions are good for vessels of any draft, but only vessels of about 8 feet draft can enter with smooth water and the assistance of a pilot.

Approaching from the Eastward.—From the buoy off the entrance to Brazos River, a **SW. ½ W.** course made good for 68 miles should lead to the buoy off the entrance to Pass Cavallo.

Remarks.—On the **SW. ½ W.** course the beach should nowhere be approached closer than 2 miles and the depth should not be less than 5 fathoms. There are no natural landmarks that can be recognized by a stranger; Matagorda Lighthouse will show conspicuously, and the life-saving station northeastward of the lighthouse will be plainly seen from outside the bar. There will usually be some current setting in the direction of the wind and care should be taken not to be set too close to the beach.

Approaching from the Southwestward.—From the Outer Bar buoy at Aransas Pass, a **NE. ¼ N.** course made good for 45 miles should lead to the buoy off the entrance to Pass Cavallo.

Remarks.—The beach for a distance of 5 miles westward of Pass Cavallo should be given a berth of at least 1¼ miles. (See the remarks under section 1, preceding.)

SAN ANTONIO BAY*

is a large, irregularly shaped, shallow body of water nearly midway between Pass Cavallo and Aransas Pass; it is entered from Pass Cavallo through **Espiritu Santo Bay,** and from Aransas Pass through Aransas and Mezquit bays, but by neither of these routes can a draft of more than 3 feet be taken into the bay, and it requires local knowledge to carry this draft. These waters are used by small flat-bottomed schooners and sloops which carry lumber, cordwood, and cotton, the latter for shipment by rail to Port Lavaca or Rockport. **Long Mott,** a post village at the northeastern end of the bay and the principal settlement on its shores, can be reached by vessels of 3 feet draft.

Pilots for Espiritu Santo and San Antonio bays can be had from among the fishermen and flatboatmen in Matagorda or Aransas bays.

ARANSAS PASS†

is the principal approach from the gulf to Aransas and Corpus Christi bays and their numerous tributaries; it lies 45 miles **SW.** from Pass Cavallo and about 150 miles **SW.** from Galveston Bay entrance, in Latitude 27° 50′ N. and Longitude 97° 03′ W. **Aransas Pass Lighthouse** (see table, page 20), inside the entrance on **Harbor Islands** and the clubhouse on the east side of the entrance, are easily recognized marks in the vicinity of the pass. The entrance is obstructed by a shifting bar which extends nearly 1 mile into the gulf and has two unfinished and partly submerged jetties. The channel has a depth of about 13 feet and, with its extension into Aransas Bay, is marked by a number of buoys which are shifted, when practicable, to indicate the best water, but a stranger should not attempt to enter the pass without a pilot; when there is a heavy sea running the bar is impassable for any kind of vessel.

The deepest draft of the vessels entering the pass is about 9 feet, and 7 feet is the deepest draft that can be taken to Rockport and Corpus Christi, the two most important towns, each of which has railroad communication with the interior of the State.

Aransas Bay empties into Aransas Pass from northward; it is about 15 miles long in a general **NNE.** and **SSW.** direction, and in the middle and near its southern end has depths ranging from 8 to 12½ feet; near it, northern end, where it joins **Mezquit Bay,** it is very shallow; only vessels of 3 feet draft can pass into and through Mezquit Bay and thence into San Antonio Bay. **Tarpon** is a post village on the south side of the entrance to the pass, on the north end of **Mustang Island.** **Rockport,** a small town on the west shore of Aransas Bay, has railroad communication with the interior of the State; a depth of 10 feet is found close to the town.

*Shown on chart 208, scale $\frac{1}{80,000}$, price $0.50.

†Shown on chart 209 and in part on chart 210, scale $\frac{1}{80,000}$, price of each $0.50.

Copano Bay joins Aransas Bay at its northwestern end; this bay is full of shoals between which are several narrow slues or channels with a depth of about 7 feet. The town of **St. Mary**, on the north shore of Copano Bay near its western end, can be reached by vessels of about 6 feet draft; following the channel, the town is about 33 miles from Aransas Pass Lighthouse.

Corpus Christi Bay is entered from the southern end of Aransas Bay through a narrow channel between two islands; this channel at its northern end is known as **Corpus Christi Bayou**, and at its southern end, where it has been improved by dredging, as "**Morris and Cummings Cut.**" The bayou and cut have a combined length of about 5 miles and a depth of about 6½ feet, but are narrow and crooked, necessitating a leading wind for sailing vessels to pass through. The bay is 14 miles long in an **E.** and **W.** direction and has a greatest width of about 10 miles; its general depth ranges from 8 to 15½ feet and there are few shoals to obstruct its free navigation. **Corpus Christi** is situated on the west shore of the bay. Although the terminus of a railroad from the interior, it has little commerce.

Gregory is a post village on the north shore of the bay. Entering Corpus Christi Bay from southward, and extending along and just inside a narrow strip of beach known as **Padre Island** for a distance of nearly 100 miles, is a narrow, shallow lagoon called **Laguna Madre**; this lagoon has only a few inches of water in some places and, so far as known, is not navigable through its whole length, even for boats, except during high stages of water.

Pilots for Aransas Pass will come out to a vessel making signal off the bar. The rate for pilotage is $4 per foot each way. (See pilot laws, Appendix I.)

The **quarantine station** is on the northern end of Harbor Island. During the season when quarantine is in force vessels are boarded by the quarantine officer.

GENERAL DIRECTIONS, ENTRANCE TO ARANSAS PASS.

The following directions will lead to the Outer Bar buoy. No stranger should attempt to enter without a pilot.

Vessels standing along the coast southward of Pass Cavallo, and approaching Aransas Pass either from southward or from northward, can follow the beach, giving it a berth of about 1 mile. As the entrance to Aransas Pass is approached the lighthouse will be seen and the life-saving station and houses in the village of Tarpon, at the south side of the entrance, will be recognized. The Outer Bar buoy should be made about 1¼ miles from the shore; farther inshore, marking the end of a submerged jetty, is a red nun buoy marked "J." In ordinary weather there is fair anchorage just outside the Outer Bar buoy in about 7 fathoms of water.

BRAZOS SANTIAGO*

is 236 miles **SSW. ¼ W.** from Galveston Entrance and 106 miles **S. ⅝ E.** from Aransas Pass; it is a narrow pass (less than ¼ mile wide) between **Padre Island** on the north and **Brazos Island** on the south, and is the approach to Laguna Madre from the southward and to the town of **Isabel**, the latter being 2¼ miles from the entrance. **Brazos Santiago Lighthouse** (see table, page 20), just inside of the north point at the entrance, and **Point Isabel Lighthouse**, 2¼ miles **W. ⅛ N.** from the former, are the principal guides to the entrance. The shifting bar at Brazos Santiago extends a little over ½ mile into the gulf and has a changing depth ranging from 6 to 9 feet in the channel over it. In 1900 the depth was about 7 feet. Usually the bar is impassable for all vessels from August to December, and during the rest of the year it is only when there is no sea or swell that vessels of 6 feet draft can enter. The steamers which make trips to Brazos Santiago, usually lighter their freight, outside the bar, into a shallow stern-wheel steamer which lands at Isabel.

The depth of water inside the bar and to an anchorage between Padre and Brazos islands is 10 to 25 feet, but only 5½ feet can be taken to a point near Isabel, and there is a depth of 3 feet alongside the wharf at that town. Isabel has railroad communication with the interior; provisions and fresh water (in casks) can be obtained.

Pilots.—All vessels entering Brazos Santiago should take a pilot, who, if the sea on the bar permits, will come out to any vessel making signal. In case the pilot can not come out, and he thinks it practicable for the

*Shown on chart 212, scale $\frac{1}{80,000}$, price $0.50.

vessel to cross the bar, he will set up ranges on shore for the vessel to steer on while entering. Pilotage is compulsory for foreign vessels (see pilot laws, Appendix I). The rate for pilotage is $4 per foot each way.

All vessels entering are obliged to stop at the anchorage, in 10 feet water, abreast the **quarantine station** on Padre Island, until boarded by the quarantine physician.

Northers are frequent during the winter months; they are dangerous for vessels outside, but the anchorage inside is secure in gales from any direction. (See also remarks on winds, page 26).

GENERAL DIRECTIONS TO THE ENTRANCE OF BRAZOS SANTIAGO.

These directions are good up to the Outer Sea buoy. No stranger should attempt to enter without a pilot.

Vessels standing along the coast should give the beach a berth of 1 mile. As Brazos Santiago Entrance is approached the lighthouse on the north side (see table, page 20), and the life-saving station and a few houses on the south side, of the entrance will assist a stranger to recognize the locality. In ordinary weather, but when there is too much swell to cross the bar, vessels can anchor southeastward of the Outer Sea buoy in 5 to 6 fathoms of water, soft bottom.

RIO GRANDE.*

The mouth of the Rio Grande is 6¾ miles southward of Brazos Santiago; it is obstructed by a shifting bar over which the depth in the channel varies from 3 to 5 feet; inside the bar the river has a least navigable depth of about 4 feet to the city of Brownsville, a distance of about 50 miles, but the channel is narrow and tortuous. An occasional pleasure boat is the only craft entering the river from the gulf, but a steamer runs regularly between **Brownsville** and **Rio Grande City** farther up the river.

Strangers entering the river should take a pilot. When the bar is passable a customhouse boatman, from the Mexican side of the river, will come out to vessels and pilot them in.

Sailing directions which would be of use to a stranger can not be given.

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* Shown on chart 212, scale $\frac{1}{80,000}$, price $0.50.

APPENDIX I.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

FLORIDA.

PILOTS AND PILOTAGE.

Extracts from the Revised Statutes of Florida, 1892.

945. *Penalty for acting as pilot without license.*—Any person who shall act as pilot for any of the ports in this State without a license from said board of commissioners, shall be guilty of a misdemeanor, and shall be fined one hundred dollars for each offense.

946. *Per diem to pilots in quarantine.*—In all cases where a pilot shall be detained in quarantine by reason of having boarded any vessel in the discharge of his duty as such pilot, the said vessel or owners shall be required to pay such pilot $4 per day during the time of his necessary detention in quarantine.

947. *Pilot bringing vessel in entitled to take her out.*—Any licensed pilot who shall take or bring a steamer or vessel into port shall be entitled to take her out, * * *

948. *Rates of pilotage.*—The board of pilot commissioners of each port may fix the rate of pilotage which shall be paid by any vessel entering their port; but in no case shall they fix the rates greater than the rates now provided by law, as follows: All steamers or vessels entering any port or leaving the same shall be subject to pay to any licensed pilot performing duty on board, or to the pilot who shall first speak to such steamer or vessel, the following rates of pilotage: For steamers or vessels drawing 6 feet or less than the same, $2 per foot; for steamers or vessels drawing from 6 to 10 feet, $3 per foot; for steamers or vessels drawing from 10 to 14 feet, $4 per foot; for steamers or vessels drawing from 14 to 20 feet, $5 per foot; for steamers or vessels drawing over 20 feet, $6 per foot. These rates shall apply to all steamers or vessels, whether owned wholly by citizens of this State or not; *Provided*, That all steamers or vessels carrying the regular United States mails shall pay half pilotage only: *Provided further*, That all steamers or vessel drawing less than 6 feet of water, and having a coastwise license, shall be exempt from paying whole or half pilotage, unless they employ a pilot.

HARBOR CONTROL.

Sec. 937. *Deposit on wharf, etc., regulated.*—It shall not be lawful for any person to deposit or cause to be deposited on any wharf or quay, any ballast, stone, earth, or like material, except such wharf or quay be so secured as to prevent such ballast or other material from washing into the waters of the harbor.

Sec. 949. *Pilot commissioners may make regulations for port.*—Every steamer or vessel of any description, of the tonnage of twenty tons and upwards, while lying at anchor in any of the bays, ports, harbors, or rivers of this state, where there is a board of pilot commissioners, shall during the night show such light as may be required by the port regulations established for the port; * * * and any person violating any such rule or regulation shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding one hundred dollars or be imprisoned in the county jail not exceeding sixty days, one or both, at the discretion of the court.

HARBOR MASTERS IN GENERAL.

950. *Duties and fees.*—It shall be the duty of said harbor masters to board either in person or by deputy, every vessel coming into their respective ports, and to demand of the

master of every vessel arriving from sea, the permit of the port physician,† and to deliver the same to the president of the board of health of said port; it shall be the duty of every master of any vessel arriving at the ports in this State to report to the harbor master for a station or for a berth at the wharves, and the harbor master shall regulate and station or assign berths at the wharves to said vessel; and it shall be their duty to remove or cause to be removed, from time to time, all vessels not employed in receiving and discharging their cargoes, to make room for such others as require to be more immediately accommodated, for the purpose of receiving or discharging their cargoes, and to facilitate their dispatch. It shall be the duty of said harbor masters to be present at all times either in person or by deputy, to facilitate by stationing or assigning berths at the wharves to vessels arriving at the ports, and to facilitate them in the discharging and receiving their cargoes and to prevent confusion and delay. And the said harbor masters shall have full and absolute power to determine how far and in what instance it is the duty of masters and others having charge of vessels to accommodate each other in their respective situations, and if any master or wharf owner or lessee of a wharf or wharves, or other person, shall oppose or resist the harbor master or his deputy or deputies in the execution of his or their duties, he shall be deemed guilty of a misdemeanor and shall be fined in a sum not exceeding fifty dollars for each offense, or imprisoned not exceeding thirty days, one or both, at the discretion of the court trying the same. Harbor masters, respectively, shall receive a compensation for the duties required of them by this article from the owners, masters, or consignees, or either of them, of every vessel arriving at the port to receive or discharge cargoes, the following fees, viz: For any vessel drawing ten feet or less the sum of five dollars, and for any vessel drawing more than ten feet, the sum of one dollar for every additional foot of draft.

2746. *Obstructing harbor master in certain ports.*—If any person shall oppose or resist a harbor master * * * or his deputy, in the execution of his duties, or shall disobey any order given by either of them as to the manner of removing or adjusting the rigging of any vessel under the control of such person, he shall be punished by imprisonment not exceeding one year, or by fine not exceeding five hundred dollars.

QUARANTINE.

Extracts from the Maritime Regulations of the State Board of Health of Florida, 1897. In force, 1900.

Rule 2.—*Penalty for violating rules.*—Any person who violates, disobeys, omits, neglects, or refuses to comply with any quarantine regulations which may be established by the State health officer or any of the rules and regulations which may be adopted by the State Board of Health * * * shall be guilty of a misdemeanor, and upon upon conviction thereof shall be fined in a sum not less than $100 nor more than $1,000, or be imprisoned in the county jail for not less than one nor more than six months. (*Rev. Stat., Sec. 779.*)

Rule 15.—*Control of quarantine and power to arrest.*—The State Health Officer, under the direction of the State Board of Health, shall have the general administrative and executive control of all the maritime and domestic quarantine systems of the State. * * *

Rule 65. *The quarantine season.*— * * * the active quarantine season is hereby declared to extend from the first day of April to the first day of November; except as may be otherwise ordered.

Rule 66. *Vessels not to enter except in accordance with Rules. Penalty for violation.*—No vessel shall be permitted to enter any of the ports, harbors, or inlets of the State of Florida, except under such restrictions and regulations as to medical and sanitary inspection as the State Board of Health may hereinafter and from time to time prescribe; and every master or person in charge of any such vessel violating the regulations of this Board shall be subject to the penalties of Rule 2.

INSPECTION.

Rule 69. *Vessels must lie-to for inspection.*—Vessels subject to inspection as prescribed in Rules 70 and 71 arriving at any of the ports of the State of Florida, must "lie-to" or anchor, at a point to be designated in each harbor as the inspecting point, and marked by a buoy or a yellow flag, and there remain until inspected by the Sanitary Inspector of the port, acting under authority of the State Board of Health.

Rule 70. *Vessels subject to inspection at all seasons of the year.*—Vessels which arrive and seek entrance at any of the ports of the State of Florida, of the following classes, are subject to inspection at all seasons of the year:

(*a*) All vessels with sickness on board at arrival or upon which sickness shall appear while in port;

†See National Quarantines.

(*b*) All vessels from foreign ports which have not been inspected and disinfected and which have not discharged passengers and crew at a domestic port, free from infection;

(*c*) All vessels from a domestic port suspected of infection with yellow fever, smallpox or cholera.

Rule 71. *Vessels subject to inspection during quarantine season.*—All vessels, whether from foreign or domestic ports, which arrive and seek entrance at any of the ports of the State of Florida, during the quarantine season as specified in Rule 65 are subject to inspection.

Rule 72. *Time of inspection.*—The inspection of vessels required by these regulations shall be made, as far as possible, between sunrise and sunset, except in cases of vessels in distress.

Rule 73. *No person to board vessel.*—No person except the State Health Officer, the Port Sanitary Inspector and his employees, shall be permitted to board or leave any vessel subject to inspection until after the vessel has been inspected by the Port Sanitary Inspector (quarantine officer) and if vessel is ordered into quarantine for detension or disinfection, until after the period of detension or completion of disinfection, and the discharge of said vessel; * * *

Rule 77. *Vessels calling but not entering.*—A vessel from a foreign port calling at any port in the State of Florida for orders, supplies, or coal, *only*, may be allowed to proceed, unless there is a quarantinable disease on board at the time, or such disease has been on board at ports *en route* or at ports of departure, or she is believed to be infected, in which case coal or supplies by barge can be towed to her, and she can take coal and supplies from barge with her own crew; but the Port Sanitary Inspector at the port shall allow no person or dunnage from such vessel to go on shore.

Rule 78. *Fruit vessels.*—Vessels engaged in the fruit trade, not carrying passengers nor having carried passengers from one infected port to another and having held no communication with any other vessel, carrying only fruit, unwrapped rubber, or specie from ports known to be healthy: *Provided*, They have complied in every respect with the rules and regulations made by the Secretary of the Treasury for such ports and with the regulations of this board.

Rule 79. *Quarantinable diseases defined.*—For the purpose of these regulations quarantinable diseases are cholera, (cholerine), yellow fever, smallpox, typhus fever, leprosy; and "suspicious ports" or places suspected of being infected, are all ports in the West Indies on the east coast of America between 23° 30′ north and 32° south latitude, and on the west coast of Africa between 23° 30′ north and 10° south.

Rule 80. *Vessels subject to disinfection to be sent to station.*—After inspection the State Sanitary Inspectors will direct all vessels found subject to quarantine or disinfection to the nearest quarantine station, viz: Vessels destined to ports on the west coast of the State between Key West and Cedar Keys, including both of these ports, to report at the Tampa Bay Quarantine Station, Mullet Key, Tampa Bay, or the U. S. Quarantine Station, Mullet Key, Key West, Florida; for points beyond and west of Cedar Keys, to the Santa Rosa Island Quarantine Station, entrance to Pensacola Harbor, or the U. S. Quarantine Station on Ship Island; for ports on the east coast to the Cumberland Sound Quarantine Station, Fernandina Harbor or the U. S. Quarantine Station on Blackbeard Island, Sapelo Sound.

Rule 82. *Vessels subject to quarantine detention at all seasons of the year.*—The following classes of vessels are subject to quarantine and disinfection at all seasons of the year:

(a) All vessels in an unsanitary condition when inspected, or upon which there shall be sickness of an infectious or contagious nature;

(b) All vessels in port at any season of the year upon which yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease developed after arrival;

(c) All vessels without the required bill of health; *Provided, however*, That permission may be given to enter harbor and proceed to an anchorage at the discretion of the State Sanitary Inspector, when in good sanitary condition and free from sickness, and having a certificate from the medical officer in charge of the nearest quarantine or refuge station that said vessel and cargo and effects of passengers and crew have been thoroughly cleansed and disinfected according to the rules and regulations of this board; that said vessel has been detained at said quarantine or refuge station for a term of not less than five days after such disinfection, that no case of yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease has within that time developed among any of the crew or passengers; that the ballast of said vessel was discharged at said quarantine or refuge station before disinfection, and clean ballast, if necessary, taken at said station in lieu of the ballast discharged, which certificate shall be of a date subsequent to the leaving of said vessel from any foreign or domestic port infected with any contagious or infectious disease.

(d) All vessels from a port where infectious or epidemic disease prevails to such an extent that, in the opinion of the State Health Officer, communication with such port without disinfection or detention will endanger the health of the State.

Rule 88. *Vessels subject to quarantine detention during active quarantine season.*—In addition to the provisions of Rule 82, all vessels directly or indirectly from foreign or

domestic ports where yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease may prevail, shall be subject to quarantine and disinfection during the quarantine season, as specified in Rule 65.

Rule 84. *Crews must be acclimated in all seasons.*—All vessels plying between foreign ports and the ports, harbors or inlets of the State of Florida must be provided with crews acclimated to yellow fever at all seasons of the year.

Rule 85. *Vessels in foreign trade must be clean in all seasons.*—Steamships or other vessels plying between the ports of the State of Florida and any West Indian, South American or other foreign port, must be kept in a cleanly and sanitary state at all times, and be subject to inspection by this Board of Health. * * *

Rule 86. *Household effects not admitted.*—No bedding or household effects shall be brought from any port of the West Indies, South America or other foreign port that may be infected with an epidemic contagious or infectious disease, or from any infected port or place in the United States, to any port or place in the State of Florida, at any season of the year; and the master of any steamship or other vessel, or any transportation company who disobeys this regulation shall be deemed guilty of violating this rule, and shall be dealt with as contemplated by Rule 2.

Rule 88. *Passengers on foreign vessels during quarantine season.*—Steamships or other vessels plying between any West Indian, South American, or other foreign port and any ports in the State of Florida, during the quarantine season as specified in Rule 65 shall not bring as passengers from any such port where endemic or epidemic contagious or infectious diseases exist, to any port of the State of Florida, any person who is not acclimated to yellow fever by having had an attack of the disease, or by continuous residence in cities and towns where such disease is endemic for a period of ten years or over, and has not had smallpox or been successfully vaccinated; and masters of steamships or vessels shall not receive for transportation any passenger without a certificate from an agent of this board or an accredited medical officer of the United States in said port, stating the exemption of said passenger from contracting or developing yellow fever, cholera or smallpox, which certificate, together with another setting forth the freedom of baggage from infection, must be produced to the Port Sanitary Inspector at the port of arrival in this State before *pratique* can be given to said vessel or passenger. And the master of any steamship or vessel who shall attempt to transport passengers in defiance of this rule will subject himself, ship or vessel, crew or passengers, to quarantine and to such requirements of detention and disinfection as this State Board may direct and to prosecution in the courts of the State, as specified in Rule 2.

Rule 90. *Vessels from infected ports must carry water or clean stone ballast.*—All vessels in regular trade between foreign ports and any of the ports, harbors or inlets of the State of Florida, must carry as ballast either water, clean rock or stone. If water ballast is used it must not be changed either in any foreign port or any port in the State of Florida, but in the open sea. If rock or stone ballast is used it must be procured from some noninfected port or place.

Rule 91. *Discharge of ballast.*—The State Health Officer shall have the right and it shall be his duty to require the ballast of any vessel to be discharged at the place indicated by him or at the nearest quarantine station, whenever the public health of the State, shall, in the opinion of such officer require such action. The charge for the disinfection and discharge of ballast shall be at the actual cost of the service performed and at no cost to the vessel if done by her own employees.

Rule 105. *Classification of inspection and disinfection fees to be charged at all ports in the State of Florida.*

1. INSPECTION:

Steamships and ships	$10.00
Tugs, brigs, barks, barkentines, and three and four masted schooners	7.50
Two-masted schooners and other vessels, except sloops	5.00
All vessels making regular trips from noninfected domestic ports, except sloops	5.00
Sloops	3.00

2. DISINFECTION:

(By steam sterilization, sulphur fumigation and mercuric washing).

Steamships and ships	$60.00
Barks and four-masted schooners	50.00
Tugs, brigs, and two and three masted schooners	40.00
Smacks and all other vessels	25.00

3. DISINFECTION:

(By pot sulphur fumigation and mercuric washing, for vessels from "suspicious" ports only, and at ports at which no steam disinfecting plant is located):

Steamships and ships	$45.00
Barks and four-masted schooners	35.00
Brigs and two and three masted schooners	25.00
Smacks and all other vessels	20.00
Tug boats	20.00

Discharge of ballast at actual cost and at no cost if performed by crew. (See Rule 91.)

4. EXCEPTIONS:

(*a*) All vessels, in regular trade with foreign ports making at least one regular trip per week, shall pay twelve hundred dollars ($1,200) per annum in lieu of all other charges for inspection and disinfection.

(*b*) No fees shall be charged at any port in this State for inspection of vessels from any ports of the State of Florida unless such port or ports shall have been first declared infected by this State Board of Health.

PORT OF KEY WEST.

Rules and Regulations for the Government of Pilots of Key West, Florida.

Adopted August 17, 1893.

(*Extracts.*)

Sec. 1. The master of any vessel entering the port of Key West, who does not accept the services of a pilot shall be compelled to pay the full legal rates of pilotage, provided the vessel be spoken outside the following limits:

If she be entering by the Main Ship Channel she must be spoken outside the Western Head Buoy, or No. 1. If by Hawk Channel, she must be spoken east of Mid-channel buoy, intersecting Southeast Channel and Hawk Channel, Key West Light bearing NW. ¼ N.

If entering by Southwest Channel or Sand Key, she shall be spoken SW. of a line of No. 7 black buoy, and No. 8 red buoy in Southwest Channel. If entering Northwest Channel she must be spoken outside of No. 1 or Bar buoy.

If entering by Southeast Channel, she must be spoken outside of No. 4 red buoy, Sand Key bearing SW. by W. ¾ W.

Should a vessel entering the port of Key West without being spoken by a licensed pilot outside the foregoing limits, the first pilot speaking her thereafter shall be entitled to full outward pilotage.

Sec. 7. Any pilot who shall bring a vessel into this port shall be entitled to carry her out, unless the master of said vessel can show good and sufficient reason to the contrary.

Sec. 8. Any pilot detained on board of any vessel by the master or quarantine officer, shall receive for each and every day's service the sum of five dollars per day over and above his pilotage.

Sec. 13. The rates of pilotage as now established by law are as follows:†

And all vessels drawing 14 feet or less shall pay the sum of five dollars for dropping from one anchorage to another and those drawing over 14 feet shall pay the sum of ten dollars.

Extracts from a Resolution adopted by the Board of Pilot Commissioners, March 10, 1897.

* * * all vessels owned or appointed by regularly established lines calling at Port of Key West, Fla., or who have their orders delivered to them by any of the pilots off the Port of Key West, Fla., outside the bar shall be charged only one full pilotage fee.

† See the rates of pilotage in section 948, on page 117.

CHARLOTTE HARBOR AND PUNTA GORDA.

Extracts from the rules and regulations for the government of Pilots, April 1, 1891.

Sec. 1. The master of any vessel entering the bay of Charlotte Harbor through Boca Grande Pass, who does not require the services of a pilot, shall be compelled to pay half the legal rate of pilotage, providing the vessel be spoken outside of Bar Buoy, or on leaving the master who does not require a pilot, shall be compelled to pay one-half the legal rate of pilotage, providing he be spoken twenty-four hours previous to his time of sailing.

Sec. 2. Any pilot who shall bring a vessel into this port shall be entitled to carry her out, unless the master of said vessel can show good and sufficient reason to the contrary.

Sec. 3. Any pilot detained on board of any vessel by the master, or quarantine officer, shall receive for each and every day's service the sum of three dollars per day over and above his pilotage.

Sec. 4. All fees and rates of pilotage on vessels entering or leaving this harbor shall be due forty-eight hours previous to day of sailing, * * *

Sec. 8. The rates of pilotage now established by law are as follows from Gulf to Punta Gorda:

Draft.	Rate per foot.
Any draft in or out	$2.50
Rate of pilotage Boca Grande to Punta Gorda	2.00
Rate of changing anchorage:	
14 feet draft	5.00
Over 14 feet draft	10.00

Sec. 11. Pilots, speaking vessels, ordered to other ports by quarantine authorities, will be entitled to half inward pilotage for such service, same to be collected of vessel.

Sec. 12. For delivery of letters and orders directing vessels to other ports, Pilots shall be entitled to half inward pilotage for such service, same to be collected from party sending such orders.

See State laws for quarantine, page 118, also National Quarantines, Appendix IV.

APALACHICOLA.

Extracts from harbor rules and regulations.

Any vessel or lighter allowing ballast to be discharged or go overboard in bay, except at such place designated by the Board of Pilot Commissioners, the owners of such lighters shall be fined according to law.

The pilots shall also be notified that they will have to attend to West Pass, in case of any vessel calling there for a pilot, as they frequently do, and order such vessel, if she can not enter and load at West Pass, to proceed to East Pass. This must be done immediately on pilots hearing of any vessel at West Pass.

All vessels requiring a pilot in harbor, or when ready for sea, should fly his jack on the fore-topgallant mast.

It is the duty of pilots to be close to the Outer Bar at least from sunrise to sunset, then it would be impossible for vessels to come in without pilots.

Tug boats and river steamers are requested to slow down when passing wharves opposite the city of Apalachicola, either coming in or going out.

All masters and consignees of vessels will take notice, and after that from this date all masters will report to the harbor master for a berth on Ballast Grounds so as vessels will be in a proper berth before discharging any ballast. Masters of vessels will also report to harbor master for loading berth, and all vessels loading in Dog Island Cove, twenty-four hours after vessel is loaded, must move out of said cove so as to give light vessels a proper berth * * *

See the State law for Harbor Masters in general, page 117; also the State law for Pilots and Pilotage on page 117.

Extracts from the Rules and Regulations of the Board of Health.

Sec. 2. All boats and vessels arriving at the port of Apalachicola on and after May 1, 1891, upon which any contagious, infectious or pestilential diseases have occurred or existed during the voyage to said city, or within thirty days next preceding the arrival of said boat

or vessel at said port or city of Apalachicola, is forbidden to approach the city nearer than is specified in the rules and regulations of the Board of Health herein promulgated. * * *

The stations for vessels entering East Pass shall be at Pilot Cove on the west side of East Pass, at or near St. George's Island, and at a point about 2 miles east of the west end of Dog Island. No pilot shall leave any vessel at the ballast grounds coming from an infected or suspicious port under a penalty of a fine.

The station for vessels entering West Pass shall be at the buoy on Higgins Flat.

Sec. 6. The quarantine physician or inspector shall be at all times between sunrise and sunset ready to visit and board all vessels as soon as apprised of their arrival in the bay, at the points hereafter designated by a flagstaff showing a yellow flag. * * *

Sec. 9. The quarantine physician shall charge a visiting fee of $5 in all cases where he attends patients on board vessels, and charge for all medicines, cost of boat hire, and supplies furnished to the respective vessels. Such fees and charges to be collected from master or owners of vessels to which such patients belong, * * *

Should any vessel be permitted to discharge ballast while performing quarantine, such vessel or owners shall pay the Board of Health not exceeding 75 cents per ton, * * *

Sec. 11. All vessels at quarantine station shall keep a flag at half mast at the fore during the day, and a lantern at the same position at night.

Sec. 24. * * * These rules and regulations are subordinate to but adjunct to the rules and regulations of the State Board of Health of Florida. * * *

N. B.—The fees for inspection and disinfection are given in the rules and regulations of the State Board of Health on page 120.

PENSACOLA.

Note.—Extracts from the State laws, for pilots and pilotage, are given on page 117. The rates of pilotage for the port of Pensacola are given in the State laws, except that each additional half foot of draft is also charged for at one-half the rate per foot.

Extract from rules and regulations prescribed by the Board of Pilot Commissioners for the port of Pensacola.

Sec. 3. It shall be the duty of every master of vessels arriving at this port to report to the Harbor Master for a station in the stream or for a berth at the wharves, and the Harbor Master shall regulate and station or assign berths at the wharves to said vessels; and it shall be their duty to remove or cause to be removed, from time to time, all vessels not employed in receiving or discharging their cargoes to make room for such others as require to be more immediately accommodated for the purpose of receiving or discharging their cargoes, and to facilitate their dispatch. * * *

Sec. 4. The Harbor Master shall see that all vessels of any kind will leave a space of about four hundred (400) yards from the end of the wharves, for the purpose of having a road open for steamers and the towing of rafts. * * * If any vessel is an obstruction it will be moved at the expense of the captain of the said vessel. When taking out ballast at the wharves or elsewhere, tarpaulins must be used under the chute. At the wharves jib booms and spanker booms will be rigged in so as to take up as little room as possible. * * *

Sec. 5. All vessels loading at anchorage in stream must so secure their timber as to allow passage for vessels and rafts to and from the wharves.

Sec. 6. No vessel at anchor in stream or at wharf shall be allowed to use warps, hawsers, or chain to each other, or across slips, except in moving vessels.

Sec. 7. It shall not be lawful for any steamer or vessels of any description, or for any barge or lighter used in unloading such steamer or vessel, or for any person, to discharge any rock, sand, gravel, ballast, or other material, or place or cause to be placed any obstruction to navigation or commerce, in the waters of any harbor, port, bay, or river of this State, except in accordance with these regulations.

Sec. 10. Any steamer or vessel of any description of the tonnage of twenty tons and upward, while lying at anchor in this port shall, during the night, show an anchor light.

Sec. 13. All vessels after being loaded forty-eight hours must move to the outside of the fleet.

See the State laws for Harbor Masters in general on page 117.

Extracts from the rules and regulations of the Board of Health of Escambia County, Florida.

Sec. 5. The Quarantine Station shall be on Santa Rosa Island, just west of Little Sabine Inlet. The boundaries of the quarantine ground shall be as follows:

Beginning at the point on the low tide line of the gulf shore of Santa Rosa Island three-quarters of a mile east of the eastern limit of the Little Sabine Inlet; thence across Santa Rosa Island and into Santa Rosa Sound on a line bearing north by west from the point of beginning to the middle of the channel of Santa Rosa Sound; thence westerly on the middle

line of said channel to a point in said channel bearing southwest by south, one-half south from Deer Point to the north shore of Santa Rosa Island, thence on a line bearing south by east to a point on the low tide line of gulf shore of Santa Rosa Island; thence along the low tide line of said gulf shore of Santa Rosa Island to the point of beginning. The points above described as being in the water to be designated by buoys bearing yellow flags, and those on land to be designated by yellow flags fixed on substantial poles.

Sec. 7. The Quarantine Physician shall charge a visiting fee in all cases where he attends patients, either on board ship or in the quarantine hospital, and for all medicines and supplies furnished, such fees to be collected from the master of the vessel to which said patient belongs, * * *

Sec. 9. The master or other person in command of any vessel entering the bay of Pensacola between the above dates,† shall proceed with her directly to the Quarantine Station above designated.

Sec. 12. All vessels at Quarantine shall keep a flag at half-mast at the fore during the day, and a lantern in the same position at night.

Sec. 21. All tugs (except when taking vessels into Quarantine Station) and all crafts, of every character, going into, coming out of, or passing through quarantine lines, shall lay to off and as near the guard station as practicable, designated by a yellow flag, and remain there until visited by the officer in charge of the guard, and permitted by him to pass.

See the State laws for quarantine on page 118, also National Quarantines in Appendix IV.

ALABAMA.

PILOTS AND PILOTAGE.

Extract from laws relating to pilots and pilotage.

RATES OF PILOTAGE.

	Per foot.
Up to and including 9 feet draft	$2.50
9½ feet and up to and including 10½ feet	3.00
11 feet and up to and including 12 feet	3.25
12½ feet and up to and including 14 feet	3.50
14½ feet and up to and including 20 feet	5.00
20½ feet and all over that draft	6.00

Extracts from Code of Alabama, 1896.

Sec. 3003. * * * That all vessels trading between any domestic port on the Gulf of Mexico and the Port of Mobile, drawing seven feet or less of water, shall not be required to employ a pilot, but if they do, their pilotage shall be paid. * * *

Sec. 3004. * * * A pilot who has brought a vessel into port is entitled to his fees before her departure from port, to be paid in advance, or security given for the payment, and, on failure thereof, may refuse to carry the vessel out.

Sec. 3005. * * * Every pilot boat cruising or standing out to sea must offer the services of a pilot boat to the vessel nearest the bar, unless a vessel more distant is in distress, * * * to aid her if required, or to aid a vessel in sight showing signals of distress.

Sec. 3006. * * * It is the duty of every outer bar pilot to deliver to the master of any and every vessel approaching the bay or harbor of Mobile as soon as he can board such vessel, all letters that may be sent to him for that purpose, on the person who requires the delivery of such letters paying or securing to the pilot twenty dollars for such services, unless the pilot so employed to deliver letters is engaged as pilot for the vessel, in which event he is entitled to five dollars for the service.

Sec. 3008. * * * Whenever a vessel entering into the bay or harbor of Mobile is crossing over, or is within the outer bar, before a pilot offers, he may, at his option, take or refuse a pilot. If he requires a pilot, he must indicate it by a signal, and the nearest pilot boat must furnish a pilot at half the rate of pilotage of a vessel at that draft. * * *

† 1st day of May and 15th day of November.

QUARANTINE.

Extracts from the Act entitled "An Act to establish and provide for the maintenance of a Quarantine by improved methods, against the introduction of yellow fever and other infectious and contagious diseases in the State of Alabama."

Sec. 5. Be it further enacted that the said Board (Quarantine Board of Mobile Bay) may, from time to time, prescribe the observance of quarantine by all vessels arriving within the bay or harbor of Mobile, or the vicinity thereof, and make regulations therefor, which may be necessary or desirable to insure the preservation of the public health and not contrary to law; such regulations to extend to all persons, goods or effects arriving in such vessels, and to all persons going on board same, as well as the vessels themselves; * * *

Extracts from the Criminal Code of 1886.

4089 (4224). Refusal of information to Health Officer—Penalty.—Any master, seaman or passenger belonging to any vessel supposed to have any infection on board, or from any port where any dangerous infectious disease prevails, who refuses to answer on oath such inquiries as are made by any Health Officer relating to any infection or disease, must, on conviction, be fined not less than one hundred dollars.

4090 (4225). Breach of Quarantine—Penalty.—The master of any vessel, ordered to perform quarantine, must deliver to the officer appointed to see it performed his bill of health, and manifest, log-book and journal; and if he fail to do so, or to repair in proper time after notice, to the Quarantine ground, or departs thence without authority, he must, on conviction, be fined not less than two hundred dollars.

Extracts from the Rules and Regulations of the Quarantine Board.

The Quarantine Physician shall attend at the station and not depart thence except by permission of the Quarantine Board. He shall board all vessels entering the bay or harbor of Mobile, as soon as practicable after their arrival, *between the hours of sunrise and sunset*, and examine into the condition of vessels and cargoes and the health of all persons therein, including the examination of as many of such persons under oath as he may deem necessary.

The inspection fees for all vessels entering Lower Mobile Bay shall be as follows:

Steamships	$15.00
Sailing ships	15.00
Barks and four-masted schooners	10.00
Brigs and three-masted schooners	7.50
Tugs and two-masted schooners	5.00
Other vessels	3.00

The fees for the disinfection of vessels shall be as follows:

Steamships	$75.00
Sailing ships	50.00
Barks and four-masted schooners	40.00
Brigs and three-masted schooners	20.00
Two-masted schooners	15.00
Other vessels	10.00

In addition to these charges there shall also be charged and collected for the treatment of the sick either in hospital or on board vessels, at the rate of one dollar ($1.00) per day for each person so treated, and the handling of cargoes and ballast shall in all instances be done at the expense of the vessels interested.

Pilots and captains and crews of towboats are required not to board infected vessels but to speak them off the bar, and direct them to the Gulf Quarantine Station on North Chandeleur Island.† They will furnish all other vessels, that is to say those entering Lower Mobile Bay, with a copy of these regulations. During the existence of Quarantine all pilots or other persons having charge of vessels entering Mobile Bay shall cause such vessels to heave-to, or come to anchor, at or near the Quarantine Station, and such vessels shall there remain until they shall have been boarded by the Quarantine Physician, and shall have received permission from him to proceed, and no pilots or other persons boarding such vessels will be allowed to leave the same until permission to do so shall have been given by the Quarantine Physician. It shall also be the duty of pilots or other persons bringing a vessel into the Bay of Mobile to hoist a flag at half-mast at the fore, until the vessel has been visited by the Quarantine Physician; and all vessels required to perform quarantine shall keep a flag at half-mast at the fore during the day, and a lighted lantern in the same position at night, and no person shall leave a vessel nor visit a vessel at Quarantine without a written permit to do so from the Quarantine Physician.

† The National Quarantine Station is on Ship Island.

Extracts from Laws, Rules, and Regulations for Mobile Harbor, May 1, 1895.

Act approved February 28, 1889.

Sec. 6. The harbor master shall on the request of the owner, master, or consignee of any vessel arriving within the corporate limits of the City of Mobile, regulate and station such vessel, * * *

Sec. 7. Be it further enacted, That any person in charge of a vessel who resists or opposes the "harbor master" or "acting harbor master" in the lawful execution of his duties, shall be fined by the Mayor of Mobile, not exceeding fifty dollars, to be collected, enforced, and applied, as are fines for violation of municipal corporations.

Sec. 13. * * * That any person, in any manner by his negligence or wantonly shall damage any ship, channel, natural or artificial, in the river or bay of Mobile, or if any person shall damage any beacon, stake, piling or other thing, or channel mark used in connection with the navigation thereof, he shall be required by the harbor master to repair such damage, and on failure to do so within ten days after such notice the offender forfeits five hundred dollars to be recovered with costs in any court of competent jurisdiction. * * *

Act approved December 10, 1892.

Sec. 1. * * * That it shall be the duty of all vessels coming in the channel of Mobile Bay or Mobile River, to so anchor that the vessels shall be and remain parallel to the fairway of the stream or the channel, and for that purpose sufficient anchors shall be placed fore and aft to hold the vessel in position.

Sec. 2. * * * That any vessel so anchoring in the channel of Mobile Bay or Mobile River, which shall fail to promptly comply with the requirements of the foregoing section, shall forfeit the sum of not exceeding fifty dollars for each twelve hours or fraction thereof that said vessel shall fail so to comply. * * *

Rule 2. Vessels entering the port of Mobile, must on arrival in the river rig in their jib booms and other outriggers, cockbill their yards, and take their anchors in on deck when not in use. When permission is given a vessel to keep her jib boom and other outriggers out, the vessel having such permission will be held responsible for any damage done to other vessels by them.

Rule 3. When a vessel arrives up in the river, in charge of a pilot, the pilot in charge thereof must see that she is anchored clear of the main channel, and he will be held responsible for a violation of this rule. When a vessel arrives up in the river, without a pilot, and anchors in the main channel she must when so directed to do by the harbor master or acting harbor master remove immediately.

Rule 4. When a vessel is directed to move by the harbor master or acting harbor master, to make room for another vessel or to enable another vessel to enter or leave a slip or berth, she is expected to, and must comply with such direction immediately.

Rule 7. All vessels loading or discharging in the stream are required to moor at both ends with anchors sufficiently heavy to hold them straight up and down the stream.

Rule 10. Vessels will not be allowed to receive or discharge cargoes while anchored or moored in the river below One-Mile Creek without special and written permission from the President of the Mobile River Commission.

Rule 11. Masters wanting anchor berths to lay their vessels up will apply to the harbor master, who will designate a berth where a vessel can be put. * * *

Under the laws of the State the dredged channel is under the management and control of the harbor master, and a violation of any of the laws governing the channel will be vigorously prosecuted by him. It is also his duty to give to masters of vessels the maximum draught to which vessels shall draw to pass up and down the channel, and they are directed to get from him said draught before entering the channel.

MISSISSIPPI.

PILOTS AND PILOTAGE.

Extracts from Annotated Code of Mississippi, 1892.

Sec. 3259. * * * The fees allowed pilots for compulsory pilotage * * * shall not in any case exceed four dollars per foot; and all United States vessels of one hundred and fifty tons burden or less shall not be subject to compulsory pilotage.

Sec. 2263. In all cases where any pilot shall be detained in quarantine * * * the vessel and her owners shall be required to pay him three dollars per day during the time of his necessary detention in quarantine; * * * If the master of any vessel carry off a pilot from any seaport, he shall pay such pilot the sum of five dollars per day for every day the pilot is absent, and he shall further supply the pilot with provisions and accommodations as is usual for the maintenance of masters of vessels, and the master as well as the owner, shall be liable for the same; but if such vessel have laid to for the space of four hours, after crossing the bar, and a pilot boat did not appear to receive the pilot, the claim shall not be allowed.

HARBOR CONTROL.

Extract from Annotated Code of Mississippi, 1892.

Sec. 2257. * * * The harbor master shall have general supervision of the harbor and port under the direction of the pilot commissioners, and shall be entitled to charge the following fees, payable by the ship, steamship, or sailing vessel to which service is rendered, viz: Boarding fee, five dollars; moving fee, five dollars; superintending the discharge of ballast, not exceeding three dollars and fifty cents a day for each day actually engaged.

QUARANTINE.

See National Quarantines in Appendix, IV.

PASCAGOULA HARBOR.

Extracts from rules and regulations for Pascagoula Harbor, adopted by the board of Pilot Commissioners of Jackson County, July 18, 1893.

Art. 2. Any pilot speaking a ship or other vessel entering the bay of Pascagoula to seaward of the sea bouy and tendering his services as pilot thereto, such ship or other vessel declining or refusing to accept the services thus tendered, shall be liable to and shall pay such pilot one-half the pilotage fees which would have been due had his services been accepted and the ship or other vessel been piloted in by him; but any vessel not spoken for inward pilotage shall not be exempt for outward pilotage.

Art. 3. The master or owner shall be liable to the pilot for services rendered in conducting a vessel in or out of the bay of Pascagoula, over which said master or owner may exercise control and authority.

Art. 4. For any service rendered by a pilot in piloting a vessel into or out of Pascagoula Harbor, of three hundred tons register or over, such pilot shall be authorized to collect four dollars per foot, actual draught of water, for such service; and for all vessels under three hundred tons register, subject to pilotage, he shall be authorized to charge and collect three dollars per foot.

Art. 5. If the master of a vessel detains a pilot on board of his vessel, the wind and weather permitting such vessel to proceed, he shall pay such pilot five dollars for every day of such detention; and all disputes between masters of vessels and pilots or harbor-master shall be decided by the port wardens.

Art. 6. Every pilot cruising or standing out to sea must offer the services of a pilot to the vessel nearest the bar, unless a vessel more distant is in distress, under a penalty of fifty dollars, for each and every neglect or refusal to approach the nearest vessel or to aid a vessel in distress, or to aid any vessel in sight and showing signals of distress, * * *

Art. 8. All fees for harbor-masters or pilots must be paid or secured to the proper parties before the vessel shall leave the port.

Art. 9. Any vessel passing a line drawn from the mouth of West Pascagoula River to the west end of Horn Island or the east point of Petit Bois Island and the boundary line of the State of Mississippi, which shall not have been spoken by a licensed pilot shall not be liable for or required to pay inward pilotage fees.

Art. 10. The pilot who brings a vessel into port has a right to take her out, and the master shall give such pilot notice of his intended departure, and when personal notice can not be given, the master of the vessel about to depart shall hoist a "Jack" at the foremast head for twenty-four hours previous to his departure.

Art. 12. All vessels entering the bay of Pascagoula, after having been spoken by a pilot to seaward of the sea bouy (such pilot having been licensed by the Board of Pilot Commissioners of the bay of Pascagoula), shall pay the pilot so speaking her the full pilotage fees which would be due such pilot had he performed the service of piloting such vessel into the bay and harbor of Pascagoula, notwithstanding the master may have accepted and used the services of a pilot not licensed by said Board of Pilot Commissioners.

Art. 13. All vessels entering the port of Pascagoula seeking freight and going to another port to load cargo, shall pay only one pilotage.

Art. 14. It is ordered that it shall be the duty of the harbor-master to move all vessels that are to be moved in the harbor of Pascagoula, and the pilots are not to move any vessel at anchor in the harbor of Pascagoula, except to take them to sea or in case of distress, unless requested by the harbor-master. That the harbor-master's fee shall be five dollars for each time he moves or moors a vessel, * * *

Art. 15. It shall be the duty of the master of every vessel arriving at the bay of Pascagoula in ballast to report the same immediately to the harbor-master, * * *

Art. 16. Any owner, master, or person in charge of any vessel who shall permit, allow, or cause any ballast to be discharged or thrown overboard from such vessel into the waters of the bay of Pascagoula or its tributaries shall be liable to a fine of one thousand dollars for the first offense and to a fine of two thousand dollars for the second and each subsequent like offense, * * *

Art. 17. It shall be the duty of the harbor-master to visit all vessels upon their arrival at this port and to designate their anchorage ground and berth, * * * for which he shall receive a fee of five dollars from each vessel; * * * and to render such other and further services as may be necessary in the execution of his office, * * *

SHIP ISLAND HARBOR.

At a meeting of the Board of Pilot Commissioners for Ship Island Harbor, it was ordered by the Board that the following rules and regulations for the government of pilots, and protection of commerce for Ship Island Harbor, Mississippi, be and are hereby made and adopted.

Extracts.

Rule 1. That any licensed pilot who shall take or bring a steamer or vessel into port shall be entitled to take her out, and any other pilot taking out such steamer or vessel shall forfeit the full amount of pilotage to the pilot rejected, and the captain and owners thereof shall be bound to pay to the pilot rejected the fees as established by law, unless the master aforesaid shall show good cause to the contrary, which shall be satisfactory to the Board of Pilot Commissioners. That all vessels on being ready for sea are required to pay their pilotage on shore at Biloxi.

Rule 2. That all steamers or vessels entering said harbor, or leaving the same, shall be subject to pay to any licensed pilot performing duty on board, at the rate of three dollars per foot, or to the pilot who shall first speak to any steamer or vessel entering or leaving said harbor shall, if the vessel draws more than seven (7) feet of water, be entitled to half pilotage, and any vessel going out of said harbor drawing more than eight (8) feet of water, shall pay half pilotage, if any pilot offers to take her out. This rule shall apply to all steamers and vessels, whether owned by citizens of this State or not. That all steamers or vessels carrying the regular United States mail shall pay half pilotage only. That all steamers or vessels drawing less than seven (7) feet of water, and having a coastwise license, shall be exempt from paying whole or half pilotage, unless they employ a pilot.

Rule 5. That whenever any vessel is ready for the sea the pilot who brought her in shall have notice, and if such notice can not be given personally it shall be given by hoisting a jack at the foremast head twenty-four hours before leaving; when, if the pilot signalized does not come on board, the master may take the first pilot that may offer.

Rule 10. Any pilot who shall be detained at quarantine station on board of any vessel, shall be entitled to receive three dollars per day for every day so detained, which amount must be paid by the vessel he piloted into quarantine.

Rule 11. * * * It is hereby ordered by the Board of Commissioners that all vessels drawing eighteen feet or more shall pay for pilotage four dollars per foot and all vessels of less draught than eighteen feet shall pay three dollars per foot.

Extract from Rules and Regulations for Harbor Master.

Sec. 2. It shall be the duty of the master of every vessel arriving at Ship Island Harbor in ballast, to report the same immediately to the Harbor Master, whose duty it shall be to cause the said vessel to be discharged and the said ballast to be deposited at such place as the board of pilot commissioners may designate in water not more than six feet deep at low water.

Sec. 3. Any owner, master, or person in charge of any vessel who shall permit, allow, or cause any ballast to be discharged or thrown overboard from such vessel into the waters of Ship Island Harbor shall be liable to a fine of one hundred and fifty dollars for the first offense and a fine of one thousand dollars for the second and each subsequent like offense, to

be recovered before a court of competent jurisdiction; and the vessel from which said ballast may have been discharged and thrown overboard shall be liable to be proceeded against to recover the payment of said fines.

Sec. 5. The Harbor Master shall be entitled to a fee of five dollars on boarding each vessel and directing the disposition of ballast, and three dollars per day while superintending the discharge of said ballast, and for each service rendered at the request of the master a like fee of five dollars, and a fee of two dollars and fifty cents for each dispute or disagreement between masters of vessels settled by him.

ANCHORAGE FOR VESSELS.

Anchorage for vessels discharging ballast to embrace the following limits and rules governing same: East of a range of two beacons placed on the neck or flats on Ship Island to the eastward of the sand hills on the west end of said island and south of the buoy.

All vessels entering Ship Island Harbor having ballast to be discharged, it shall be the duty of the pilot having such vessel in charge to anchor her in a safe position within the above described limits, and for failure therein, unless he can show good and satisfactory cause to the pilot commissioners, he shall be fined in the sum of ten dollars for each offense.

If any vessel shall arrive in said harbor and not having a pilot on board, and such vessel should anchor outside the aforesaid anchorage, if she have ballast to be discharged, it shall be the duty of the Harbor Master before discharging any ballast to move said vessel to the ballast ground anchorage, and for such services he shall be entitled to collect from said vessel five dollars.

In case any vessel should be left anchored outside of the afore described limits of the ballast ground anchorge, by any pilot having her in charge, said pilot shall be notified twenty-four hours before the vessel is ready to discharge ballast, and if he then fail to move the vessel to the proper anchorage immediately it shall be the duty of the Harbor Master to move her, for which service he shall collect five dollars from the vessel and the captain of said vessel may deduct the amount from the pilotage due, the pilot having failed to comply with these rules.

That any vessel having discharged ballast and wishing to move to the loading anchorage, if application is made to the Harbor Master to move the vessel, it shall be his duty to do so and secure her a good, free and safe berth for loading, and he shall be entitled to collect five dollars from the vessel for such service.

LOUISIANA.

PILOTS AND PILOTAGE.

Extracts from the revised laws of Louisiana, 1897.

Sec. 2690. The master or owner of any ship or vessel, appearing in distress and in want of a pilot on the coast, shall pay unto any such branch pilot who shall have exerted himself for the preservation of such ship or vessel, such sum for extra service as the said owner or master and pilot can agree upon, provided said pilot boards said ship or vesssel off pilot ground. In case no such agreement can be made the master and wardens, or any three of them, shall determine what is a reasonable reward which the pilot shall be entitled to collect.

Sec. 2692. If any vessel outward bound shall carry off to sea, through the default of the master or owner of such vessel, any pilot, when a boat is attending to receive him, shall pay, besides the pilotage, the pilot the same monthly wages during the passage of such vessel as the chief mate is receiving; and said master or owners shall likewise pay said pilot's passage home on the first vessel clearing for this port or convenient to it.

RELATIVE TO THE PILOTS OF NEW ORLEANS.

Sec. 2703, as amended by Act 11, of 1890. The pilots of the port of New Orleans shall be entitled to ask and receive pilotage at the rate of three dollars and fifty cents for every foot of water drawn by any ship, or vessel, piloted by them, drawing ten feet of water or less and four dollars and fifty cents per foot for all vessels over ten feet of water up to eighteen feet of water, all vessels drawing over eighteen feet of water to pay same rate as vessels drawing eighteen feet and no more. Vessels of one hundred tons and under, lawfully engaged in the coasting trade of the United States shall not be required to take a pilot unless the master of such vessels demands pilot service.

Sec. 2706. All vessels inward or outward bound to or from the port of New Orleans, except those mentioned in section two thousand seven hundred and three of this act, refusing

to take a branch pilot when one offers, shall be liable to the branch pilot thus offering for half pilotage, * * *

Sec. 2709. Any branch pilot piloting any vessel safe from sea, and giving satisfaction, shall have a preference in piloting her out to sea again * * *

CALCASIEU.

Act 109 of 1894. Rates to be established by a board which will be in force after being published thirty days in any newspaper in the parishes of Calcasieu or Cameron. The board can make rules and regulations—but no pilotage shall be compulsory.

QUARANTINE.

The Governor of the State of Louisiana, by proclamation, declares when quarantine shall be established and prescribes rules and regulations for the government of State Quarantine. (See also National Quarantines in Appendix IV.)

The following rules for the navigation of South Pass are issued by the Secretary of War:

War Department, Washington City, December 14, 1881.

The following regulations relating to the navigation of the South Pass of the Mississippi River are hereby established for the protection of said Pass and the works for its improvement:

1. Steam vessels navigating the South Pass are required to reduce their speed to not exceeding 6 miles per hour between a point 500 yards above the South Pass Lighthouse and the headquarters building; and a similar reduction shall be made in other parts of the Pass when passing the boats, barges, floating mattresses, etc., that are being used in the construction of the jetties or the improvement of the channel, or in passing any other vessels, and after dark all vessels must slow down to 6 miles per hour throughout the entire Pass.

The South Pass is considered as embracing the entire extent of the channel between the upper ends of the works at the head of the Pass and the outer or sea end of the jetties at the entrance from the Gulf of Mexico.

The point referred to at 500 yards above the lighthouse, between which and the headquarters building vessels are required to reduce their speed, is marked by a post, painted white, on the western bank of the Pass.

2. All vessels anchoring in the Pass shall take position near the eastern bank of the Pass, not less than 500 yards above the lighthouse and below the island at the head of the Pass; and vessels so anchoring shall put out such extra moorings as may be necessary to prevent their being blown athwart the channel, and thus endangering the navigation of the Pass, whenever required to do so by the United States inspecting officer of the works for the improvement of the Pass.

3. No master or other person in command of a vessel drawing more than 12 feet of water shall enter the Jetty Channel from sea with such vessel until after a descending vessel, which has previously entered said channel from above, has passed to sea; and likewise no such vessel descending the river shall enter the channel at the head of the Pass until after an ascending vessel, which shall have passed the head of Goat Island, has passed through the entrance at the head of the Pass.

4. All upward-bound vessels must keep to the right or nearest the east bank of the Pass, giving the right of way to those bound in the opposite direction.

5. All vessels discharging or waiting to discharge ballast at Port Eads must be moored to the bank by lines, and no vessels shall discharge ballast into the Gulf of Mexico within a distance of 5 miles from the sea ends of the jetties; nor shall ashes or other refuse matter which may be liable to cause a shoaling or filling up of the South Pass be dumped therein.

6. The dredge boat *G. W. R. Bayley* shall have the exclusive right of way over all vessels navigating South Pass while she is at work therein, and all vessels in passing her must be governed by her signals. She shall give the usual steam-whistle signal for passing to her port or starboard, and this shall be responded to and obeyed by the passing vessel on the order of its master or pilot.

7. Towboats with tows are not permitted to go down the Pass after dark, but must anchor above the head of the Passes until after daylight.

ROBERT T. LINCOLN,
Secretary of War.

TEXAS.

PILOTS AND PILOTAGE.

Extracts from the Texas Annotated Civil Statutes, 1895.

Art. 3800. Rates of pilotage, etc. The rate of pilotage on any class of vessels shall not in any port of this State exceed four dollars for each foot of water which the vessel at the time of piloting draws, and whenever a vessel, except of the classes below excepted, shall decline the service of a pilot offered outside the bar, and shall enter the port without the aid of one, she shall be liable to the first pilot whose services she so declined for the payment of half-pilotage; and any vessel which after being brought in by a pilot shall go out without employing one shall be liable to the payment of half-pilotage to the pilot who brought her in, or if she has come in without the aid of a pilot, though offered outside, she shall in so going out be liable for the payment of half-pilotage to the pilot who had first offered his services before she came in; but if she has come in without the aid of a pilot, or the offer of it outside, she shall in case of going out without a pilot not be liable to half-pilotage. At any port where vessels shall receive or discharge their cargoes at an anchorage outside the bar, such vessel shall be liable for pilotage at the above rate to such anchorage, but shall not be liable for or compelled to pay pilotage from such anchorage to the open sea; and if any vessel bound from the open sea to such anchorage while under way shall decline the services of a pilot, and shall afterwards receive or discharge any portion of her cargo at such anchorage on the lighters or otherwise, she shall be liable for the payment of half-pilotage at the above rates to such anchorage to the first pilot whose services shall have been tendered to and declined by her, but not liable for any pilotage from such anchorage to the open sea; and when a pilot takes charge of a vessel 20 miles outside of the bar and brings her to it, he shall be entitled to one-fourth pilotage for such offshore service, in addition to what he is entitled to recover for bringing her in; but if such offshore service be declined no portion of such compensation shall be recovered.

Art. 3801. Exemption from extra pilotage. The following classes of vessels shall be free from any charge for pilotage, unless for actual service, to wit: All vessels of twenty tons and under; all vessels of whatsoever burthen, owned in the State of Texas and registered and licensed in the district of Texas, when arriving from or departing to any port in the State of Texas; all vessels of seventy-five tons and under, owned and licensed for the coasting trade in any part of the United States, when arriving from or departing to any port in the State of Texas; all vessels of seventy-five tons and under, owned in the State of Texas and licensed for the coasting trade in the district of Texas, when arriving from or departing to any port in the United States.

Art. 3802. Consignee responsible for pilotage. The consignee of any vessel shall be held responsible for the pilotage of said vessel.

Art. 3806. Pilots for Matagorda and Lavaca bays. * * *

Art. 3808. Pilotage for said bays. The rate of pilotage for said bays shall be two dollars and fifty cents for each foot of water the vessel may draw at the time of piloting; and all vessels that may draw five feet or more, shall be subject to pay any licensed pilot for said bays, whose services are tendered and declined, one-half the pilotage herein prescribed.

Art. 3809. All the provisions of this chapter relating to branch pilots at ports, in so far as the same are applicable and not expressly qualified, shall apply to and govern pilots appointed for the mouth of the Brazos River and for Matagorda and Lavaca bays.

QUARANTINE.

The Governor of the State of Texas, by proclamation, declares when quarantine shall be established and prescribes rules for the government of State Quarantine. (See also National Quarantines in Appendix IV.)

GALVESTON HARBOR.

Extracts from an ordinance prescribing rules and regulations for the government of the harbor and port of Galveston.

Sec. 1. That no vessel or steamer coming into the harbor of Galveston shall be allowed to lay in stream in front of the wharves, north, for a longer time than twenty-four hours preparatory to hauling into a berth at the wharves; and that no vessel preparing to go to sea shall be allowed to lay in the stream, in front of the wharves, for a longer time than twenty-four hours after leaving her berth at the wharf.

Sec. 2. That all vessels lying in the stream shall keep their small boats hauled up alongside, or hoisted up to the davits, and during the night shall show a proper light.

Sec. 3. That all vessels hauling into the wharves shall have their yards topped, anchor flukes taken inboard or stoppered at the hawse pipes; cables bent and clear with ten fathoms range of chain overhauled; jib and flying jib boom rigged in; stern and quarter davits and bumpkins turned in or unshipped. And that all vessels of seventy-five tons and upward, on arriving in the stream of the port of Galveston, shall, before hauling into berth, and within twenty-four hours after such arrival, report at the harbor master's office and book for berth.

Sec. 4. That no vessel or steamer shall be allowed, while anchored in the stream in front of the wharves, between lines running north from the shore at the foot of Twenty-third street, across the channel, in the west, and from the foot of Sixteenth street in the east, to receive or deliver ballast or cargo of any description, except as may be hereinafter provided.

Sec. 6. That all vessels, steamers, and barges shall keep a good and proper ship keeper at all times on board.

Sec. 10. That no person shall cast or deposit or suffer to be cast or deposited in the harbor of said city any stone, gravel, earth, ashes, or other like substance, or any filth, logs or like floating things, or create any obstruction therein, under a penalty of a fine of not more than twenty-five nor less than ten dollars for each and every offense.

Sec. 11. That said harbor master shall have power to regulate and station all ships or other vessels in the harbor, within the port and corporate limits of the city of Galveston, and at the wharves thereof or moored or anchored near thereto, and in such proximity to other shipping as to affect the same in case of fires, * * *

Sec. 13. That no vessel shall be allowed to moor within a cable length of any wharf, and no vessel whatever between the wharves of said city and outer bar shall throw overboard any stone or other ballast below high-water mark; and all ballast shall be landed fairly on the shore, and at the time of landing or discharging care must be taken not to drop any part thereof overboard, nor shall any ballast be unloaded at night. That no pitch, tar, or other combustible shall be heated on board of any vessel, but such heating must be done on stages and boats removable in case of accident.

Sec. 14. That any vessel or steamer containing gun or other explosive powder shall discharge the same upon the dock west of Twenty-ninth (29th) street by small boats or lighters, and that it shall be the duty of the consignee to remove the same as fast as it may be landed. That vessels containing or having on board less than one-half ton of such powder shall be exempt from the provisions hereof.†

RATES OF PILOTAGE, PORT OF GALVESTON.

Vessels under 500 tons	$3.00 per foot draft.
Vessels from 500 to 1,000 tons	3.50 per foot draft.
Vessels from 1,000 to 1,500 tons	3.75 per foot draft.
Vessels over 1,500 tons	4.00 per foot draft.

SABINE PASS.

Extracts from rules and regulations for governing Sabine Pass pilots.

1. That the rates of pilotage shall be as follows:

On all vessels from 75 tons to 200 tons inclusive, net register, two dollars and fifty cents on each foot of water vessels draw both in and out; from 200 tons to 300 tons inclusive, three dollars per foot; from 300 tons to 400 tons inclusive, three dollars fifty cents per foot; and all vessels over 400 tons pay four dollars per foot.

4. That vessels piloted in which have to go into quarantine, shall also be piloted from quarantine to berth without extra charge.

5. That after vessels coming in get inside of the red light without being spoken by a pilot, they shall not be liable for pilotage and may refuse a pilot both in and out.

† The harbor master now designates the wharf at which explosives may be landed.

APPENDIX II.

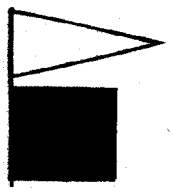
STORM-WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

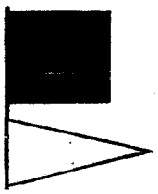
A red flag with a black center indicates that the storm is expected to be of marked violence.

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 III.

WEST INDIA HURRICANES IN THE GULF OF MEXICO.*

These are cyclonic storms with a center of lowest barometer around which the wind blows in a more or less circular course (spirally) in a direction contrary to the hands of a watch; at the same time the storm field advances on a straight or curved track, sometimes with great velocity, and sometimes not more than a few miles in an hour, occasionally, in appearance, coming to a pause in its onward movement; the estimated average velocity in the Gulf of Mexico is about 17 miles per hour. Hurricanes form to the eastward of the Windward Islands and take a northwesterly course; some curve gradually to the northward passing north of the island of Cuba and along the Atlantic Coast of the United States; others pass over or to the southward of Cuba and enter the Gulf of Mexico, and while in the gulf curve to the northward or northeastward so as to strike the coast somewhere between Tampa, Fla., and the Rio Grande. The months during which hurricanes are encountered in the Gulf of Mexico are July, August, September, and October, while they have been known to occur in June and November. During these months mariners should be on the watch for indications of a hurricane, and should frequently and carefully observe and record the barometer.

Indications of the approach of a hurricane.—Hurricanes entering the east gulf have a widespread influence, and, as the storm moves westward in the lower gulf, easterly winds prevail along the upper Gulf Coast, becoming stronger with a rapidly falling barometer, as the storm curves to the northward. In the east gulf a persistent northeasterly wind, with a falling barometer, is almost a positive indication of a disturbance to the southward, and great vigilance should be exercised. The approach of a hurricane is usually indicated by the ugly, threatening appearance of the weather, the increasing number and severity of the squalls, and the increasing force of the winds. These signs are sometimes preceded by a long, heavy swell and confused sea, which comes from the direction of the hurricane's approach and travels more rapidly than the storm center. The best and surest warning, however, is given by the barometer; during the hurricane season a decided fall and also sharp and irregular oscillations of the mercury, accompanied by any of the above signs, are indications of an approaching storm. As the storm center approaches, unless the vessel is on the line of its advance, the force of the wind increases and the changes in its direction become more rapid; and when in or near the center the wind flies round at once to opposite points of the compass, the sea breaking in confused, mountainous heaps. A vessel on the line of the storm's advance will experience the above indications, except that, as the storm center approaches, the wind will remain steady, or nearly so, from one direction until the vessel is close-to, or in, the center.

The distance from the center of a hurricane can only be guessed at by watching the increase in the violence of the wind, the rapidity of its changes, and the falling of the barometer. If the barometer falls slowly, and the wind increases gradually, it may reasonably be supposed that the center is distant; with a rapidly falling barometer and increasing bad weather the center may be supposed to be approaching dangerously near. The following table, from Piddington's Sailor's Horn-book, may be of some use to the mariner at the approach of a hurricane to estimate his distance (approximately) from the center:

Average fall of the barometer per hour.	Distance from the center, in miles.
From 0.02 to 0.06	250 to 150
From 0.06 to 0.08	150 to 100
From 0.08 to 0.12	100 to 80
From 0.12 to 0.15	80 to 50

Consult also the diagrams on page 136.

Few vessels have passed through the center of a hurricane without the loss of masts or rudder, or meeting with some worse disaster, and, at whatever cost, the center of the storm field should be avoided.

*Compiled from Piddington's Sailor's Horn-book; American Practical Navigator; Barometer Manual for the use of Seamen; Publications of the United States Hydrographic Office, Navy Department; and remarks of officials of the United States Weather Bureau stationed on the Gulf Coast of the United States.

WEST INDIAN HURRICANES.

(From the Pilot Chart of the North Atlantic Ocean, September, 1887.)

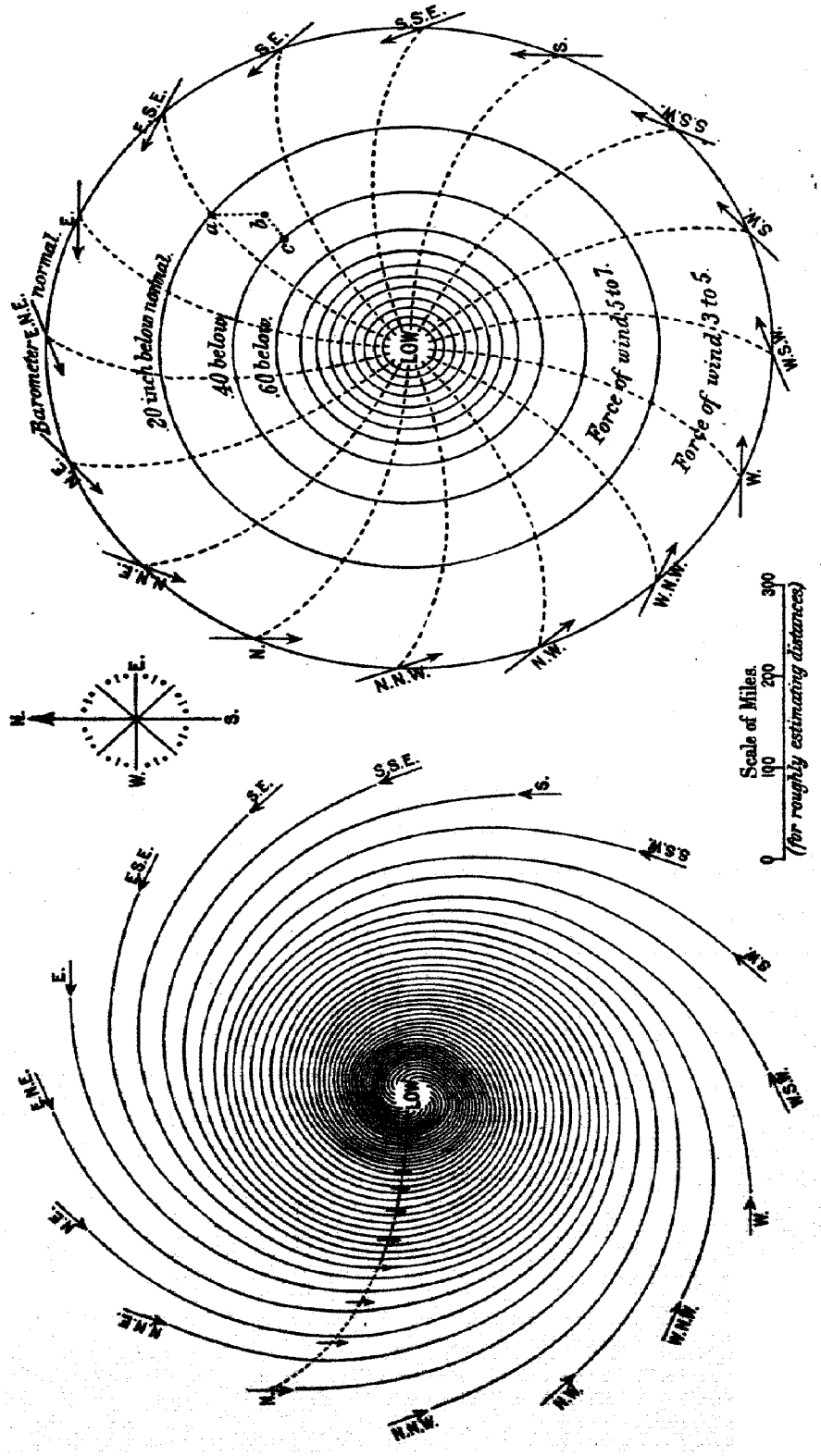

DIAGRAM A.—Illustrating the circulation of the wind towards and around the center of low barometer in a tropical cyclone, northern hemisphere. The dangerous winds occur in the inner whirls.

DIAGRAM B.—For practical use in finding a ship's position relative to the center of a tropical hurricane, northern hemisphere, by means of the direction of the wind and fall of the barometer.

DIAGRAM A.

The spiral lines illustrate the circulation of the wind in a tropical cyclone, northern hemisphere. The diameter of the area represented may vary in different storms and in different latitudes from about 100 to about 800 miles, and is generally least in low latitudes. The air is drawn in toward the center of low barometer, gradually takes up a more and more nearly circular path as its velocity increases, and finally whirls around the center with hurricane force. At the center is a calm spot from 10 to 30 miles in diameter; this is marked LOW, and here the lowest barometer reading is obtained. It will be noticed how similar the motion is to that of water in a whirlpool or eddy, and very naturally, as this is nothing but a gigantic whirlpool in the atmosphere, with the suction or draft at the center upward instead of downward. The direction of the wind at any point on this diagram is the same as the direction of the curve at that point, and the arrows show this direction at the points where they are plotted. By plotting arrows at all points having the wind from the same direction, north, for example, and joining them by a dotted line, we find that this dotted line curves toward the center, as shown. The angle of bearing of the center therefore gradually decreases from about 10 points to about 8 points in the inner whirls, where the well-known "8-point rule" becomes true.

DIAGRAM B.

Here dotted lines are drawn from each wind-arrow at the margin to the center, in the way shown above, so that to find a direction of the wind at any point follow the dotted line out to the margin and read it there. The circles are ISOBARS, and the barometer falls .20 inch as you go from one of these circles to the next inner one. This illustrates very clearly the rate at which the barometer falls as you approach the center—at first slowly, as the broad outer ring is traversed, then more and more rapidly. Near the center, where the isobars are very close together, it has been known to fall an inch in 50 miles. Of course as you recede from the center the barometer rises .20 inch as you pass from one isobar to the next outer one, just as it fell on entering the hurricane. This diagram involves as much of our latest knowledge of cyclones as can be safely used as a general guide, and extends out beyond the regions where the barometer is falling rapidly and the wind and sea have become violent. No attempt will be made to draw up a set of rules for action, but only to indicate how to plot your position on the diagram and obtain from it the probable bearing and distance of the center and the track and velocity of the storm, leaving it to yourself to decide what action to take, having proper regard to the strength and speed of your ship, the lay of the land, and the passage you are making.

PRACTICAL USE OF DIAGRAM B.

Suppose that at 4 p. m., for instance, the wind is ESE. and the barometer .20 inch below the normal: Find at the margin of the diagram the wind-arrow marked "ESE.," and follow the dotted line in toward the center as far as the isobar marked ".20 inch below normal"; this intersection (marked *a*) is your position on the diagram; for, by the method of construction just explained, this is the place, and the only place, where the wind is ESE. and, at the same time, the barometer .20 inch below the normal. Referring to the compass and scale which accompany the diagram, you will find that the center (LOW) bears SW. by S., distant 250 miles. Plot this 4 p. m. position of the center on your track chart, from the 4 p. m. position of your vessel.

Later in the day, say 8 p. m., suppose that the wind is SE. by E., and the barometer is .30 inch below the normal (having fallen .10 during the interval): With this wind your position must be halfway between the dotted lines leading in toward the center from the arrows marked "SE." and "ESE.," and with this barometer reading it must be halfway between the isobars marked ".20 inch below normal" and ".40 below"; it is therefore at the point marked *b*, and the center bears SW., distant 200 miles. Plot this 8 p. m. position of the cyclone center on your track chart, from the 8 p. m. position of your vessel.

You thus have the position of the cyclone center at 4 p. m. and at 8 p. m. plotted on your chart, and the line joining the two positions is the track of the center and distance it has moved in four hours.

Suppose, again, that at 10 p. m. the wind is still from SE. by E., but the barometer stands .40 inch below normal, having fallen .10 in two hours. Your position is now at the point marked *c* on the diagram, found by exactly the same course of reasoning as before, and the center now bears SW., distant about 175 miles. Plot this 10 p. m. position of the cyclone center on your track chart, from the 10 p. m. position of your vessel. If you have been lying-to, this will evidently indicate that the storm's track has recurved, and that you are directly in front of the center. But no matter whether you have been lying to or not, your vessel's track and position at any time, and the track and position of the cyclone center, are both plotted on your chart, and you can closely watch every change of relative position in order to avoid the center and dangerous semicircle of the hurricane.

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Bearing of center and rules for avoiding it.—When the weather and the barometer indicate the approach of a hurricane, face the wind; the center will then bear 8 points to the right from the direction of the wind (at a considerable distance from the center, and before the barometer has fallen much below the normal, the center may bear 10 or 12 points to the right of the wind direction). Having the bearing of the center, shorten sail, or heave-to, and closely watch the barometer and the direction in which the wind shifts. In speaking of the shift of wind, such a shift is meant as would be observed on a vessel hove-to; for, if the vessel be moving faster than the storm (which is easily possible), and in the same direction, the observed shift may be contrary to what it would be if the vessel were hove-to.

If the wind shifts with the hands of a watch, the vessel is in the right semicircle of the hurricane. The vessel should then be hauled by the wind on the starboard tack and sail carried as long as possible; if obliged to heave-to, do so on the starboard tack.

If the wind shifts against the hands of a watch, the vessel is in the left semicircle of the hurricane; the wind should be brought on the starboard quarter, the direction of the vessel's head noted, and that course steered. If obliged to heave-to, do so on the port tack.

If there is no perceptible change in the direction of the wind but it increases in violence, with a falling barometer, the vessel is directly in front, and on the track, of the storm. The vessel should be put before the wind, the direction of her head noted, and that course steered, trimming sail as the wind shifts to the starboard quarter. If obliged to heave-to, do so on the port tack.

If there is no perceptible change in the direction of the wind and it is moderating, with a rising barometer, the vessel is on the storm track but in rear of the center. In this case the safest rule is to run out with wind on the starboard quarter, or heave-to on starboard tack. Advantage can be taken of favorable wind, but the greatest care must be exercised to avoid running into the storm. (See also remarks following.)

Remarks.—In the Gulf of Mexico, when looking in the direction in which the storm is traveling, the dangerous semicircle is on the right-hand side of the storm track; in other words, the semicircle in which the wind shifts with the hands of a watch is the more dangerous part of the storm, and for the following reasons: Because the progressive movement of the storm increases the velocity of the wind in the right semicircle (the velocity of the wind in the left semicircle being correspondingly decreased); because both wind and current tend to carry the vessel in front of the storm, and if obliged to scud she will drive into greater danger; and because the right side is the one toward which the storm track is liable to recurve at any time.

In some cases vessels may, if the storm be traveling slowly, sail from the dangerous semicircle across the front of the storm and out of its influence. But, as the rate at which the storm travels along its track is uncertain, this is an extremely hazardous undertaking; the mariner should carefully consider all the circumstances, particularly the rate at which the barometer is falling, before he attempts to cross.

Vessels at anchor in any of the harbors, at the approach of a hurricane, should send down their spars and take every precaution, watching the wind as it shifts, and, if possible, lay their anchors so as to lie with an open hawse.

APPENDIX IV.

REGULATIONS U. S. MARINE-HOSPITAL SERVICE.

APPROVED NOVEMBER 27, 1897.

(*Extracts.*)

GENERAL DUTIES OF COMMISSIONED OFFICERS.

PROFESSIONAL DUTIES.

111. 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.

112. 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 (Form 1928) 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.

To examine seamen, cadets, enlisted men, etc., as to their physical condition.

113. 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.

114. No fee will be charged by any officer of the Marine-Hospital Service for the medical examination of seamen of the United States merchant marine or for making a certificate as to their physical condition.

No fee to be charged.

SANITARY DUTIES.

117. It shall be the duty of commissioned officers to enforce the national quarantine rules 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.

121. 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.

353. A relief station of the Marine-Hospital Service is a port situated on any navigable water of the United States where an officer of the Marine-Hospital Service is on duty to extend relief to seamen or where an officer of the customs service is specifically authorized to extend said relief.

Definition.

Classes.

354. 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.

355. At all relief stations where the number of patients warrants, an officer of the Marine-Hospital 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. At places where Congress has made no provision for the erection of a marine hospital, buildings or rooms suitable for hospital purposes, or separate wards in State, municipal, or private hospitals, may be leased or rented, for the exclusive benefit of the patients of the Service, or contracts may be made for the care and treatment of patients with local hospitals, subject to the approval of the Secretary of the Treasury.

Supervision of relief.

356. The medical and surgical treatment of the patients of the Marine-Hospital Service will be under the supervision of the commissioned and non-commissioned officers of the Service, at all relief stations where such officers are on duty, and they will be required to take direct professional charge of the patients.

Provision for marine-hospital dispensaries.

357. 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 Marine-Hospital 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.

358. 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.

Districts.

359. The relief stations of the Marine-Hospital Service are grouped into eight districts, as follows:

The district of the North Atlantic; the district of the Middle Atlantic; the district of the South Atlantic; the district of the Gulf; the district of the Ohio; the district of the Mississippi; the district of the Great Lakes, and the district of the Pacific.

South Atlantic.

362. The district of the South Atlantic embraces the following-named relief stations: Beaufort, N. C.; Beaufort, S. C.; Brunswick, Ga.; Charleston, S. C.; Darien, Ga.; Edenton, N. C.; Elizabeth City, N. C.; Fernandina, Fla.; Georgetown, S. C.; Jacksonville, Fla.; Key West, Fla.; Newbern, N. C.; Savannah; Ga., and Wilmington, N. C.

BENEFICIARIES.

Persons entitled to relief.

368. The persons entitled to the benefits of the 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 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. Officers and seamen employed on vessels of the Coast and Geodetic Survey who are not enlisted men from the Navy, are entitled to the benefits of the Marine-Hospital Service.

Yachtsmen entitled.

369. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

Exceptions, R. S., s. 4804.

370. 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 marine-hospital fund.

Wrecked seamen entitled.

372. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Marine-Hospital 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.

373. 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 Marine-Hospital Service without reference to length of service.

Seamen must make application for relief.

374. A sick or disabled seaman, in order to obtain the benefits of the Marine-Hospital Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the Marine-Hospital Service at stations where no Marine-Hospital officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant.

375. Masters 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.

Certificates from owners or agents as evidence.

376. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seamen on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Masters must furnish certificate of service.

377. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1914) 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 refusing to give certificate. Secs. 5438 and 5440, R. S.

378. In case the master of any vessel shall fail or refuse to furnish a master's certificate to any seaman who may have been employed on board said vessel within sixty days, the collector of customs shall cause said master, if he be in port, to appear at the marine-hospital office and produce the ship's books.

False certificates.

379. 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.

Exceptions.

380. 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.

Closure of navigation.

381. 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 375, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and it must be satisfactorily shown that the disease or injury was also acquired during the time of their service.

Period of treatment not to be reckoned as absence from vessel.

382. The time during which a seaman has been under treatment in hospital as a patient of the Marine-Hospital Service shall not be reckoned as absence from vessel in respect to debarring him from further relief.

Affidavits may be accepted as evidence.

383. 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 on account of the absence of the vessel or its master from the port, 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 Marine-Hospital Service.

Brief service on last vessel not a bar to relief.

384. When the period of the seaman's service as shown by his certificate on last vessel is less than 60 days, his affidavit as to previous service may be accepted if supported by satisfactory evidence.

Applications for relief after sixty days' absence from vessel.

387. 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 to the Supervising Surgeon-General for decision.

Seamen to sign certificates.

388. 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. * * *

Out-patients to furnish new service certificates.

390. 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.

Expenses for sickness during voyage.

391. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid by the Marine-Hospital Service.

Seamen admitted to local quarantine hospitals.

392. The expenses for the care and treatment of seamen suffering from contagious diseases entitled to the benefits of the Marine-Hospital Service, 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 from the Marine-Hospital fund unless such seamen were admitted at the time by the request of an officer of the Service.

Money not to be paid to seamen for expenses of sickness.

393. In no case shall money be paid to a seaman or to his family or friends by the Marine-Hospital Service as reimbursement for expenses incurred during sickness or disability.

Seamen injured in brawls not to receive treatment.

395. Seamen who may be injured during 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 Marine-Hospital fund.

Seamen taken ill on vessel entitled.

396. Seamen taken seriously 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.

397. 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.

398. 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.

RELIEF.

OUT-PATIENT RELIEF.

Cases to be treated as out-patients.

399. Sick and disabled seamen entitled under these regulations to the benefits of the Marine-Hospital 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.

No relief furnished at homes of patients.

400. Seamen will not be furnished relief at their own homes, except by special authority from the Supervising Surgeon-General, and then only an allowance for medical attendance and medicines will be made at the rates fixed by the Treasury Department.

HOSPITAL RELIEF.

Cases for hospital treatment.

413. A sick or disabled seaman entitled to the benefits of the Marine-Hospital 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.

STATIONS OF THE FIRST CLASS.

To be valid only for day of issue.

416. A bed ticket (Form 1917) 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.

STATIONS OF THE SECOND CLASS.

To be valid only for day of issue.

424. A bed ticket (Form 1917) 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.

STATIONS OF THE THIRD CLASS.

432. 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 be based upon the certificate of the acting assistant surgeon or attending physician, as given in the relief certificates, but should in no case exceed twenty days.

Permits for hospital relief. Form 1916.

STATIONS OF THE FOURTH CLASS.

445. 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 be based upon the certificate of the acting assistant surgeon or attending physician, as given in the relief certificates, but should in no case exceed twenty days.

Permits for hospital relief. Form 1916.

448. 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.

Permits valid only on day of issue.

410. Out-patient relief will not be furnished except in cases of emergency, such as acute illness or injury, requiring not more than one or two visits.

Not more than two visits allowed.

412. Foreign seamen or employees of the various Government services, not beneficiaries, shall not be treated.

Foreign seamen et al. not treated.

INSANE SEAMEN.

462. Insane seamen entitled to the benefits of the Marine-Hospital Service may be admitted to the Government Hospital for the Insane, Washington, D. C., upon the order of the Secretary of the Treasury.

Relief for insane seamen. Mar. 3, 1875.

DECEASED SEAMEN.

468. On the death of a patient while under the charge of the Marine-Hospital Service, notice to receive his effects shall be given by letter, or otherwise, to his nearest known relative. * * *

Relatives to be notified.

469. 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.

Burial expenses.

SEAMEN OF THE GOVERNMENT SERVICES AND FOREIGN SEAMEN.

UNITED STATES NAVY AND COAST SURVEY.

470. Officers and seamen employed on vessels of the United States Navy and the Coast Survey may be admitted for care and treatment as patients of the Marine-Hospital Service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Supervising Surgeon-General by the officer in charge of the station, on a daily report (Form 1942) or relief certificate (Form 1915), accompanied by a copy of the request upon which such officer or seaman 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 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." The above class of patients are not subject to the provisions requiring transportation to marine hospitals.

Officers and seamen of various Government services may be admitted.

FOREIGN SEAMEN.

471. The accommodations provided for the care and treatment of the patients of the Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of

Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

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 Secretary of the Treasury. When treatment is furnished a foreign seaman, the fact will be immediately reported to the Supervising Surgeon-General, on a daily report (Form 1942) or relief certificate (Form 1915), accompanied by a copy of the application upon which he was admitted.

Bills for care and treatment, Form 1926.

472. A bill (Form 1926) in duplicate must be rendered by the officer of the Marine-Hospital Service in command for the care of each foreign seaman or other seaman admitted (not entitled to treatment free), said bill to be rendered upon the termination of treatment in each case. One copy of this bill shall be delivered to the collector of customs, who shall at once collect the amount; the other copy shall be forwarded by the officer rendering the bill to the Supervising Surgeon-General.

Monthly accounts to be rendered.

473. Customs officers acting as agents of the Marine-Hospital Service shall collect all bills for the care and treatment of seamen of the classes enumerated in paragraphs 470 and 471 when rendered by the proper Marine-Hospital officer, and will render monthly accounts for all moneys collected on account of the care and treatment of such seamen; said accounts to be accompanied by abstracts giving the name and nationality of the patient, date of admission and date of discharge, period of treatment, and amount collected in each case.

Notification of amount of bill.

474. Collectors of customs will notify the commanding officer of the vessel of the class enumerated in paragraphs 470 and 471, upon whose request the seaman was admitted, of the amount of the bill, and when paid will give a receipt therefor. The money will be deposited as a repayment to the Marine-Hospital fund in the manner provided for moneys received for the care of foreign seamen.

Charges for care and treatment.

475. 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 426 and 434 requiring transportation to marine hospitals.

THE REVENUE-CUTTER SERVICE.

Admitted without regard to length of service.

476. 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.

Admitted to stations of class 1 and to contract hospitals.

477. Any such officer or seaman whose condition absolutely requires treatment in hospital will be admitted to hospitals at stations of the first class and to all contract hospitals enumerated in the annual circular entitled "Contracts for care of seamen," subject to the provisions of the said circular with regard to the transfer of patients from a contract to the nearest marine hospital. No admission to hospital will be granted at any port not mentioned in said circular. At all ports mentioned in the circular, where no specific arrangements for treatment in hospitals are made, the regulations governing admission at fourth-class (emergency) stations will be enforced.

Out-patient treatment—where and how furnished.

478. Out-patient treatment will be furnished at all stations where an officer of the Marine-Hospital Service is on duty. At all other stations out-patient relief will be granted only in case of emergency and under the provisions of the regulations relative to fourth-class (emergency) stations. No out-patient relief will be granted at any station not mentioned in the annual circular entitled "Contracts for care of seamen," and in all other respects the regulations of the Marine-Hospital Service must be complied with.

THE LIGHT-HOUSE SERVICE.

Officers and crews of the Light-House Establishment entitled.

487. Officers and crews of the several vessels belonging to the Light-House Establishment may be admitted to the benefits of the Marine-Hospital Service upon the application of their respective commanding officers. No charge will be made for care and treatment.

THE ENGINEER CORPS, UNITED STATES ARMY.

480. 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.

Seamen employed on vessels of the Engineer Corps, U. S. A., entitled.

NATIONAL QUARANTINES.

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine-Hospital Service.

(*Extracts.*)

[Approved February 15, 1893.]

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 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 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 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.

REVISED STATUTES.

[Extract from act August 1, 1888.]

Whenever any person shall trespass upon the grounds belonging to any quarantine reservation, * * * such person, trespassing, * * * shall, upon conviction thereof, pay a fine of not more than three hundred dollars, or be sentenced to imprisonment for a period of not more than thirty days, or shall be punished by both fine and imprisonment, at the discretion of the court. And it shall be the duty of the United States attorney in the district where the misdemeanor shall have been committed to take immediate cognizance of the offense, upon report made to him by any medical officer of the Marine-Hospital Service, or by any officer of the customs service, or by any State officer acting under authority of section five of said act.

QUARANTINE REGULATIONS TO BE OBSERVED AT FOREIGN PORTS AND AT SEA.

ARTICLE V.—PASSENGERS AND CREW.

PAR. 15. In a port where cholera prevails, or where yellow fever prevails in epidemic form, the crews of passenger ships should remain on board during their stay. Should additional men be shipped, the same precautions should be observed with them as in the case of steerage passengers. If it is considered necessary, the crews of freight ships may be similarly treated at the discretion of the medical officer.

PAR. 17. American vessels bound for the United States, or for Porto Rico, or for Cuba, shall not ship men in ports of Cuba or Porto Rico where smallpox or yellow fever prevails, unless such men have been inspected and passed by the quarantine officer.

ARTICLE VI.—REQUIREMENTS AT SEA.

PAR. 1. The master of the vessel should cause the following rules (which comprise those recommended by the International Conference at Rome, 1885) to be observed during the voyage.

(*a*) The soiled body linen of passengers and crew suffering from infectious disease should be at once immersed in boiling water or in a disinfecting solution.

(*b*) The water-closets should be washed and disinfected twice a day.

(c) Rigorous cleanliness and free ventilation should be maintained during the voyage on board all ships.

PAR. 2. An inspection of the vessel, including the steerage, should be made by the ship's physician once each day.

PAR. 3. Should cholera (or cholerine), yellow fever, typhus fever, or smallpox appear on board a ship while at sea, those who first show symptoms of these diseases will be immediately sent to the hospital; the ship's physician will then immediately notify the captain, and all of the effects liable to convey infection which have been in use will be destroyed or disinfected.

PAR. 4. The compartments occupied by those who fall sick with infectious disease should be disinfected, and, as far as possible, the compartments thus disinfected should be freely exposed to the air. If the vessel is an iron steamer and the compartments suitable, the entire compartment should be disinfected by steam. The articles liable to convey infection should remain in the compartments during the disinfection. After disinfection of the compartments the bedding and clothing may be removed and dried.

PAR. 5. Patients with infectious disease should be isolated.

PAR. 6. The hospital should be disinfected as soon as it becomes vacant.

PAR. 7. The dead should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing of the body, and at once placed in a coffin hermetically sealed or buried at sea.

PAR. 8. A clinical record should be kept on the prescribed form, by the ship's surgeon, of all cases of sickness on board, and delivered to the quarantine officer at the port of arrival.

PAR. 9. Under the foregoing paragraphs disinfecting solutions are limited to the following: Strong: acid solution of bichloride of mercury (1 to 500); a 1 to 20 solution of pure carbolic acid. Weak: acid solution of bichloride of mercury (1 to 1,000); pure carbolic acid, 1 to 40.

QUARANTINE REGULATIONS TO BE OBSERVED AT PORTS AND ON THE FRONTIERS OF THE UNITED STATES.

(*Extracts.*)

ARTICLE I.—INSPECTION.

1. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry.

A. Any vessel with sickness on board.

B. All vessels from foreign ports.

C. Vessels from domestic ports where cholera or yellow fever prevails or where smallpox or typus fever prevails in epidemic form.

EXCEPTIONS.—Vessels not carrying passengers on inland waters of the United States. Vessels from the Pacific and Atlantic coasts of British America, provided they do not carry persons or effects of persons nonresident in America for the sixty days next preceding arrival, and provided always that the port of departure be free from quarantinable disease. Vessels from other foreign ports via these excepted ports shall be inspected.

D. Vessels from foreign ports carrying passengers having entered a port of the United States without complete discharge of passengers and cargo. Such vessels shall be subject to a second inspection before entering any other port. 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 port south of said latitude during the quarantine season of such port.

2. The inspections of vessels required by these regulations shall be made by daylight, except in case of vessels in distress.

3. In making the inspection of a vessel, the bill of health and clinical record of all cases treated during the voyage, crew and passengers' lists and manifests, and, when necessary, the ship's log shall be examined. The crew and passengers shall be mustered and examined and compared with the lists and manifests, and any discrepancies investigated.

4. No person except the quarantine officer, his employés, United States customs officers, or agents of the vessel, shall be permitted to board any vessel subject to quarantine inspection, until after the vessel has been inspected by the quarantine officer and given its discharge.

5. Tugboats or any other vessels having had communication with vessels subject to inspection, shall be themselves subject to inspection.

ARTICLE II.—QUARANTINE.

1. For the purpose of these regulations, the quarantinable diseases are cholera (cholerine), yellow fever, smallpox, typus fever, and leprosy.

2. Vessels arriving under the following conditions shall be placed in quarantine:

A. With quarantinable disease on board.

B. Having had such on board during the voyage or within thirty days next preceding arrival; or, if arriving in the quarantine season, having had yellow fever on board after March 1 of the current year, unless satisfactorily disinfected thereafter.

C. From ports infected with cholera, or where typhus fever prevails in epidemic form, coming directly or via another foreign port, or via United States ports, unless they have complied with the United States quarantine regulations for foreign ports, also vessels from noninfected ports but bringing persons or cargo from places infected with cholera, yellow fever, or where typhus fever prevails in epidemic form, except as subsequently noted.

D. From ports where yellow fever prevails, unless disinfected in accordance with these regulations, and not less than five days have elapsed since such disinfection.

E. Tugboats and other vessels having had communication with vessels subject to quarantine, shall be quarantined if they have been exposed to infection.

EXCEPTIONS.—The following exceptions may be made to Rules C and D with regard to vessels from ports quarantined against on account of yellow fever:

(1) Vessels arriving during certain seasons of the year, to wit, from November 15 to April 1, may be admitted to entry.

(2) Vessels 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, may be allowed entry at port of destination. But if said vessels carry passengers destined for places south of this latitude the baggage of said passengers shall be disinfected.

(3) Vessels engaged in the fruit trade from ports declared safe for this purpose by the supervising surgeon-general M. H. S. may be admitted to entry without detention, provided that they carry no passengers and have carried no passengers from one port to another, and have no household effects or personal baggage in cargo, and have complied with the special rules and regulations made by the Secretary of the Treasury with regard to vessels engaged in said trade.

ARTICLE III.—GENERAL REQUIREMENTS AT QUARANTINES.

1. Pilots bringing infected vessels will be detained in quarantine a sufficient time to cover the period of incubation of the disease for which the vessel is quarantined, if, in the opinion of the quarantine officer, such pilots have been exposed to infection. The dunnage of pilots shall be disinfected when necessary.

2. No direct communication shall be allowed between quarantine, or any vessel in quarantine, and any person or place outside, and no communication except under the supervision of the quarantine officer.

3. No ballast shall be allowed to leave the quarantine station unless disinfected.

4. Where it is impossible to disinfect cargo *in situ*, it shall be removed and disinfected in the manner provided for articles of their class in these regulations; such articles to be unpacked and so arranged as to allow the disinfectant used to reach every part of all surfaces of said articles.

5. Vessels arriving at any port of the United States, having cholera or yellow fever aboard during the quarantine season, shall be remanded to an anchorage set apart for infected vessels, and there to remain until after the discharge of the passengers and purification of the vessel.

6. All passenger baggage disinfected under the requirements of these regulations shall be labeled.

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, crew, 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 this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel having way upon her shall sound, at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam-vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, 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 involve risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is 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. 149.]

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 fore part 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 head 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, 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*) 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 registered and published.

STEAM VESSELS UNDER SAIL BY DAY.

ART. 14. A steam-vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS 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.

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* *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 collison is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collison can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is 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 whisle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE III. If, when steam-vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam-whistle.

RULE V. Whenever a steam-vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam-vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam-vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam-whistle, which signal shall be answered by a similar blast, given by any approaching steam-vessel that may be within hearing. Should such signal be so answered by a steam-vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam-vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VIII. When steam-vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam-whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam-whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

RULE IX. The whistle signals provided in the rules under this article for steam-vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow, or heavy 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 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 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 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 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 156.]

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.

PILOT RULES FOR WESTERN RIVERS.

Rules and regulations for the government of pilots of vessels propelled by steam, gas, fluid, naphtha, or electric motors, navigating the Red River of the North, and rivers whose waters flow into the Gulf of Mexico, and their tributaries. Adopted by the Board of Supervising Inspectors of Steam Vessels under the authority of section 4412, Revised Statutes of the United States, and amended February 3, 1897, under the authority of an act of Congress approved January 18, 1897; these rules taking effect since March 1, 1897.

All the rules relating to steam vessels in passing each other, and fog signals, contained in the Pilot Rules for Western Rivers shall also apply to all vessels propelled by gas, fluid, naphtha, or electric motors, and between any of such vessels and steam vessels, navigating these waters.

RULE I. When steamers are approaching each other from opposite directions, the signals for passing shall be one blast of the whistle to pass to the right, and two blasts of the whistle to pass to the left.

The pilot on the ascending steamer shall be the first to indicate the side on which he desires to pass; but if the pilot on the descending steamer shall deem it dangerous to take the side indicated by the pilot of the ascending steamer, he shall at once signify that fact by sounding the alarm or danger signal of three or more short blasts of the whistle, and it shall be the duty of the pilot of the ascending steamer to answer by a similar signal of three or more blasts of the whistle, after which the pilot of the descending steamer may indicate by his whistle the side on which he desires to pass, and the pilot of the ascending steamer shall govern himself accordingly, the descending steamer being entitled to the right of way. The signals for passing must be made, answered, and understood before the steamers have arrived at a distance of 800 yards of each other: *Provided, however*, That when a steamer on the Mississippi is about to enter the Ohio River at the same time that a steamer on the Ohio River is about to enter the Mississippi River, at Cairo Point, the steamer on the Mississippi River shall give the first signal. But in no case shall pilots on steamers attempt to pass each other until there has been a thorough understanding as to the side each steamer shall take.

RULE II. If from any cause the signals for passing are not made at the proper time, *as provided in Rule I;* or, should the signals be given and not properly understood, from any cause whatever, and either boat become imperiled thereby, the pilot on either steamer may be the first to sound the alarm or danger signal, which shall consist of *three or more* short blasts of the whistle in quick succession. Whenever the danger signal is given, the engines of *both steamers must be stopped* and backed until their headway has been fully checked; nor shall the engines of either steamer be again started ahead until the steamers can safely pass each other. Vessels approaching each other from opposite directions are forbidden to use what has become technically known among pilots as "cross signals"—that is, answering one whistle with two, and answering two whistles with one. In all cases, and under all circumstances, a pilot receiving either of the whistle signals provided in the rules, which for any reason he deems injudicious to comply with, instead of answering it with a cross signal, must at once observe the provisions of this rule.

RULE III. When two boats are about to enter a narrow channel at the same time, the ascending boat shall be stopped, below such channel until the descending boat shall have passed through it; but should two boats unavoidably meet in such channel, then it shall be the duty of the pilot of the ascending boat to make the proper signals, and when answered, the ascending boat shall lie as close as possible to the side of the channel the exchange of signals may have determined, as provided by Rule I, and either stop the engines or move them so as only to give the boat steerageway, and the pilot of the descending boat shall cause his boat to be worked slowly until he has passed the ascending boat.

When two steamers are approaching a bridge span or draw from opposite directions and the passing signals as provided in Rule I have been given and understood, should the pilot of the descending steamer deem it dangerous for the steamers to pass each other between the piers of such span or draw, he shall sound the alarm or danger signal, and it shall then be the duty of the pilot of the ascending steamer to answer with a similar alarm signal, and to slow or stop his engines below such span or draw until the descending steamer shall have passed.

RULE IV. When a steamer is ascending and running close on a bar or shore, the pilot shall in no case attempt to cross the river when a descending boat shall be so near that it would be possible for a collision to ensue therefrom.

RULE V. When any steamer, whether ascending or descending, is nearing a short bend or point where, from any cause, a steamer approaching in an opposite direction can not be seen at a distance of 600 yards, the pilot of such steamer, when he shall have arrived within 600 yards of that bend or point, shall give a signal of one long sound of his whistle, as a notice to any steamer that may be approaching; and should there be any approaching steamer within hearing of such signal, it shall be the duty of the pilot thereof to answer such signal by one long sound of his whistle, when both boats shall be navigated with the proper precautions, as required by preceding rules.

RULE VI. When a steamer is running in a fog or thick weather, it shall be the duty of the pilot to sound his whistle at intervals not exceeding one minute.

Steamers on rivers whose waters flow into the Gulf of Mexico, lying to during fog or thick weather, when the fog whistles or any sound is heard indicating the approach of another steamer, shall, if lying on the right shore, or right bank, give one tap of the bell; if lying on the left shore, or left bank, give two taps of the bell, at intervals of not more than one minute, to indicate their presence, which signals shall continue until the approaching steamer has passed. Right and left shore or bank is understood by facing downstream, or with the flow of the current.

RULE VII. When steamers are running in the same direction, and the pilot of the boat astern shall desire to pass either side of the boat ahead, he shall give the signal as in Rule I, and the pilot of the boat ahead shall answer by the same signal; or, if he prefer to keep on his course, he shall make the necessary signals, and the boat wishing to pass must govern herself accordingly; but the boat ahead shall in no case attempt to cross her bow or crowd upon her course. 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 vessels 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 vessels a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaking vessel until she is finally past and clear.

RULE VIII. When boats 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 case of boats meeting at a bend; but immediately after clearing the berths, so as to be fully in sight, they shall be governed by Rule I.

RULE IX. The lights for barges and canal boats when towed ahead or alongside of the steamer, as is customary upon rivers whose waters flow into the Gulf of Mexico, shall be as follows:

When one barge is towed by a steamer and such barge is towed ahead, such barge shall have a green light on the starboard bow and a red light on port bow. When such barge is towed alongside of the steamer, on the starboard side, such barge shall have a green light on the starboard bow; when such barge is towed alongside of a steamer, on the port side, such barge shall have a red light on the port bow. When two barges are towed alongside of a steamer, one on the starboard and one on the port side, the starboard barge shall carry a green light on the starboard bow and the port barge shall carry a red light on the port bow. When two or more barges are towed ahead, the green light shall be placed on the starboard bow of the starboard barge, and a red light on the port bow of the port barge, and at a distance of not less than 10 feet above the surface of the water.

The colored side lights referred to in the foregoing rules must be fitted with inboard screens, so as to prevent them from being seen across the bow, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least 2 miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of 10 points of the compass, and so fixed as to throw the light from right ahead to 2 points abaft the beam on either side. The minimum size of glass globes used shall not be less than 6 inches in diameter and 5½ inches high in the clear.

All scows without rudders or other means of guidance being towed by hawser behind steam vessels on any navigable waters of the United States shall carry a regulation white light at each end of each scow (such light to be carried not less than 6 feet above the deck), as shown in diagrams No. 4, Department Circular No. 27, dated February 13, 1894. When scows are towed two or more abreast, they shall carry the regulation white lights, as shown in diagrams No. 7, Department Circular No. 27, 1894.

RULE X. Signal lights for steamers under way are provided by law as follows, the same to be carried between sunset and sunrise:

For ocean steamers and steamers carrying sail, a bright white light at the foremast head, to throw the light through 10 points of the compass on each side of the ship, viz, from right ahead to 2 points abaft the beam, and to be visible at least 5 miles. On the starboard side a green light, and on the port side a red light, each to throw the light through 10 points of

the compass on their respective sides, viz, from right ahead to 2 points abaft the beam, and to be visible at least 2 miles. These colored lights are to be fitted with inboard screens projecting at least 3 feet forward from the light, to prevent them being seen across the bow.

For steamers navigating waters flowing into the Gulf of Mexico, and the Red River of the North, a red light on the outboard side of the port smoke pipe, and a green light on the outboard side of the starboard smoke pipe—these lights to show both forward and abeam on their respective sides.

For coasting steamers and those navigating bays, lakes, or other inland waters, other than ferryboats and those above provided for, the red and green side lights as prescribed for ocean steamers, and a central range of two white lights, the after light being carried at an elevation of at least 15 feet above the light at the head of the vessel; the headlight to show through 20 points of the compass, namely, from right ahead to 2 points abaft the beam on either side of the vessel; and the after light to show all around the horizon.

For steamers towing other vessels, the colored lights will be the same as prescribed for ocean steamers; and two white mast lights shall also be carried vertically, to distinguish them from other steamers; the white lights to show through 20 points of the compass, viz, from right ahead to two points abaft the beam on either side of the vessel.

RESOLUTION ADOPTED BY THE BOARD OF SUPERVISING INSPECTORS OF STEAM VESSELS, JANUARY 25, 1889, RECOMMENDING LIGHTS FOR TOWBOATS.

Resolved, That it is the sense of this Board that where towboats navigating rivers whose waters flow into the Gulf of Mexico find it necessary to use a signal light or lights on the stern of their boats, they are advised to use, uniformly, two white lights one above the other, 3 feet apart, the upper light not to be less than 15 feet above the roof of the upper deck, on the after part of the stern of the steamer.

RULE XI. A bright white light, not exceeding 20 feet above the hull, shall be exhibited by all steamers when at anchor between sunset and sunrise, in a globular lantern of 8 inches in diameter, so placed as to throw a good light all around the horizon.

RULE XII. The signal lights on ferryboats on waters flowing into the Gulf of Mexico and their tributaries shall be the same as those on all other steamboats on the same waters, except double-ended ferryboats shall carry a central range of clear, bright, white lights, showing all around the horizon, placed at equal altitudes forward and aft; also such side lights as specified in section 4233 of the Revised Statutes, rule three, paragraphs B and C.

RULE XIII. All other steamers, ferry or otherwise, having but one chimney, shall have brackets securely fastened to each side of the same, so as to carry the red and green lights the same as passenger steamers.

RULE XIV. The line dividing jurisdiction between the pilot rules on Western rivers and harbors, rivers, and inland waters, at New Orleans, shall be the lower limits of the city.

All the rules relating to lights [rule six], fog signals, steering and sailing, contained in section 4233, Revised Statutes, and applying to steam vessels, shall also apply to all vessels propelled by gas, fluid, naphtha, or electric motors, and between any of such vessels and steam vessels, on the Red River of the North and rivers whose waters flow into the Gulf of Mexico, and their tributaries; with the exception that the red and green lights on open vessels of 10 gross tons and under propelled by gas, fluid, naphtha, or electric motors, may be exhibited from a combined lantern showing a red light and a green light, as decribed in rule thirteen of said section 4233, in lieu of all other lights required for vessels under way. Such vessels of 10 gross tons and under, if provided with a bell of 6 inches in diameter, of good tone and quality, to be rung by hand in fog or thick weather, shall be deemed to be properly equipped in that respect.

DISTRESS SIGNALS RECOMMENDED BY THE BOARD OF SUPERVISING INSPECTORS.

ARTICLE 31. (Prescribed by International Marine Conference, 1889.)

In the daytime.

1. A gun fired at intervals of about a minute.
2. The International Code signal of distress indicated by N. C.
3. The distant signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.
4. Rockets or shells as prescribed below for use at night.
5. A continuous sounding with a steam whistle or any fog-signal apparatus.

At night.

1. A gun fired at intervals of about a minute.
2. Flames on the vessel (as from a burning tar barrel, oil barrel, etc.).
3. Rockets or shells, bursting in the air with a loud report and throwing stars of any color or description, fired one at a time at short intervals.
4. A continuous sounding with a steam whistle or any fog-signal apparatus.

EXTRACTS FROM REVISED STATUTES.

SEC. 4233. The following rules for preventing collisions on the water shall be followed in the navigation of vessels of the Navy and of the mercantile marine of the United States:

* * * * * * *

Rule six. River steamers navigating waters flowing into the Gulf of Mexico, and their tributaries, shall carry the following lights, namely: One red light on the outboard side of the port smoke pipe, and one green light on the outboard side of the starboard smoke pipe. Such lights shall show both forward and abeam on their respective sides.

Rule seven. * * * The lights of ferryboats, barges, and canal boats when in tow of steam vessels, shall be regulated by such rules as the board of supervising inspectors of steam vessels shall prescribe.

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Rule twelve. Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts or other water-craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or which shall be anchored or moored in or near the channel or fairway of any bay, harbor, or 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. †

* * * * * * *

FOG SIGNALS.

Rule fifteen. Whenever there is a fog or thick weather, whether by day or night, fog signals shall be used, as follows: * * *

(*D*) Coal-boats, trading-boots, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts, or other water-craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or anchored or moored in or near the channel or fairway of any bay, harbor, or river, and not in any port, shall sound a fog horn, or equivalent signal, which shall make a sound equal to a steam whistle, at intervals of not more than two minutes.

* * * * * * *

Rule twenty-one. Every steam vessel, when approaching another vessel, so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steam vessel shall, when in a fog, go at a moderate speed.

Rule twenty-two. Every vessel overtaking any other vessel shall keep out of the way of the last-mentioned vessel.

Rule twenty-three. Where, by Rules seventeen, nineteen, twenty, and twenty-two, one of two vessels shall keep out of the way, the other shall keep her course, subject to the qualifications of Rule twenty-four.

Rule twenty-four. In construing and obeying these rules, due regard must be had to all dangers of navigation, and to any special circumstances which may exist in any particular case rendering a departure from them necessary in order to avoid immediate danger.

SEC. 4412. The board of supervising inspectors shall establish such regulations to be observed by all steam vessels in passing each other, as they shall from time to time deem necessary for safety; two printed copies of such regulations, signed by them, shall be furnished to each of such vessels, and shall at all times be kept posted up in conspicuous places in such vessels.

SEC. 4413. Every pilot, engineer, mate, or master of any steam vessel who neglects or willfully refuses to observe 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.

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† *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 six 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 *four 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. Amended February 8, 1899.

A. B. NETTLETON,
Acting Secretary.

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