(Built at Wyandotte, Mich. in 1890-'91. Tonnage 453.53.)

"Built for the L.H.B'd, by the Detroit Dry Dock Co., at
1891. Wyandotte, Mich., in 1890-'91.
Description: A single screw iron vessel.
Dimensions, length 150', to 159' 6",
breadth 27', depth 12' 4",
tonnage 453.53. Draft loaded, 9' 6"; & 10' 3".
Engine, triple-expansion, inverted-cylinder, jet-condensing, cylinders 14½", 22", and 36",--indicating 550 horse-power.
Boilers, two cylindrical, each 10' 6" diameter, 10' 10" long, fitted with two Fox's corrugated furnaces, Scotch type, designed for a working pressure of 150 lbs. per square inch by gauge.
Contract $77,000 was approved 4 March, 1890.
Hoisting engine furnished by Copeland & Bacon, $765.
Appropriation $85,000. Act approved 2 March 1889--"A
1889. Steam-tender for the Great Lakes.""

Designs are being made at the Board's draughting rooms, at the general light-house depot in this district, for— (3d District.)
A steam-tender for the Great Lakes,
A steam-tender for the Second district,
Bush's Bluff light-ship, Virginia, (No. 49.)
Sandy Hook light-ship, New Jersey, (" 48.)
Columbia River light-ship, Oregon, (" 50.)
Great Round Shoal light-ship, Massachusetts. (" 47.)
The necessary appropriations for the construction of these vessels having been made by the last Congress, the Light-House Board convened at the light-house depot, Staten Island, special boards to consider and recommend the type of vessel, materials, speed, and general features and machinery best adapted to the needs of the service in each case, and upon approval of their reports, to have prepared the necessary detailed specifications, plans, and outline drawings. For this purpose and by direction of the Light-House Board, a temporary draughting office was established at the general depot on Staten Island. The work on the plans on June 30, stood as follows:

An. Rep. 1889. *Steam-tender for the Great Lakes.*—She is to be called the *Marigold*, and to be used in the eleventh light-house district. The plans, specifications, and calculations for this vessel were made in the Board's draughting room at the Staten Island depot. She is to be 150 feet on the water-line, 27 feet beam, molded, and to draw 10 feet 3 inches aft and 9 feet 3 inches forward with cargo and full equipments. She is designed for a speed of fully 11 knots; engine, triple-expansion; boilers, two cylindrical tubular, to carry 150 pounds pressure. She is to have eight water-tight compartments with a trimming-tank forward.

An. Rep, 1889.

A new steam-tender.—Attention is urgently requested to the need of providing for the light house engineers adequate and convenient means of transportation to and communication with the numerous stations of the ninth and eleventh light-house districts, both on the Great Lakes.

There are in these districts 175 light-houses and steam fog signals to be looked after, with 21 new ones to be erected under recent appropriation, and the requirements of commerce are still far from being adequately met.

Taking account only of the American shores, there are in the eleventh light-house district about 1,500 miles of coast and in the ninth light-house district 1,000 more, making a total of 2,500 miles. This equals in extent the entire Atlantic coast of the United States and half that of the Gulf of Mexico in addition.

Many of the stations are remote from land communication, and many others are isolated and can only be reached by water. The season of navigation is brief during which anything can be done in the way of repairs and construction. It averages yearly between seven and eight months, and the stations are exposed to extreme vicissitudes of climate and excessive action by frost, ice, and sea.

With so much coast to cover in so short a time, and with the ordinary facilities of transportation so meager and costly, it is evident that for the proper service of these districts, the construction of new lights and fog-signals, the maintenance and repair of those now existing, the delivery of materials and workmen, the examination and overhauling of illuminating apparatus and steam machinery, and the work of inspection, a steamer adapted to the special conditions is the only practicable means. Prior to December, 1886, the engineer of these districts had at his disposal a tender for the purpose. But the work had so increased that it became necessary to cut the district in two, and Lake Michigan was separated from the rest of the group, and constituted the ninth district. In order to furnish the inspector with a vessel, which was needed for the buoyage and supply of the district, the steam-barge *Warrington*, which the engineer had heretofore used, was transferred to the inspector, and the engineer, who still had charge of both districts and whose duties had increased in the same ratio, was left without the means of transportation which for sixteen or seventeen years had been regarded as indispensable to his proper work.

At present the buoy-tenders in the two districts are kept fully occupied by the light-house inspectors with their own work, and are seldom available to the engineer for more than incidental service, subject to the necessity of constant urging to attend to the buoyage and to inspect and supply the light-stations between spring and fall.

In this connection it may not be improper to note the enormous extent and value of the lake commerce and its rapid development from year to year. In the commercial statistics appended to the Annual Report of the Corps of Engineers for 1888, the arrivals and departures of vessels from the port of Chicago alone aggregated 20,000, and those from the port of New York 23,000. Allowing seven and one-half months in the year as the period of lake navigation, the average daily movement of vessels at Chicago was 89, as compared with 63 at New York.

The records at the St. Mary's Falls Canal, which is the outlet of Lake Superior, show during the last fiscal year the passage of 8,832 vessels of nearly 6,250,000 registered tonnage and 7,000,000 freight tonnage.

11th Dist.

See next page.

1889 cont'd

During the navigation season of 1888 31,404 vessels, with a registered tonnage of over 19,000,000, passed the Lime-Kiln Crossing of the Detroit River, the outlet for lakes Huron, Michigan, and Superior. This indicates an average daily movement of one hundred and forty vessels—a number believed to be unexampled elsewhere in the world.

A compliation of official data was submitted to the recent Waterways Convention at West Superior, Wis., which showed that the lake commerce aggregated over $1,000,000,000 in value, with a tributary territory of over 1,000,000 square miles and 17,000,000 of population.

A point that strikes one conversant with seaboard requirements, but unfamiliar with the lake region, is the character of the navigation. Lake Superior, in round numbers, is 400 miles in length; Michigan, 350 miles; and Huron and Erie 250 miles each; but the average width does not exceed 50 miles. The total area of water surface is large and the distances great. For example, the distance from Chicago to Duluth is 800 miles, and from Chicago to Buffalo is 900 miles. From Buffalo to Duluth it is 1,000 miles—equal to the distance from Sandy Hook to Cape Canaveral, or the longer axis of the Gulf of Mexico. Therefore the voyages are made in constant proximity to the land, which, in fact, is seldom out of sight. For long stretches the navigation, from the numerous islands and shoals, is exceedingly complicated and difficult, and the entrances to nearly all the ports are comparatively shallow and barely sufficient to admit loaded vessels. The lakes in the spring and fall are infested with fogs, which often shut in suddenly and last for several days. Owing to the frequent voyages and changes of cargo—much of it metal and iron ore—the compass is much less reliable than at sea, while the comparative shallowness of the lakes and the variations in depth reduce the value of the lead line as a guide. In other words, the lake navigator is engaged in a coasting trade with land on both sides of him, which makes his voyages exceptionally difficult.

A commerce of this extent is entitled to every assistance that can be given in the form of aids to navigation. These should be of the most improved types, and adapted as fully as possible to the special needs of the service, as determined by local and general circumstances.

A vessel of the general type and dimensions of the steam-barge *Warrington*, now condemned as worn out in the service and unworthy of repair, is best adapted to the peculiarities of lake navigation and the special needs of the light-house service on the lakes. But it should be built with steel frames on which oak planking should be bolted. Such a vessel would have great elasticity, endurance, and carrying capacity upon a relatively light draught, and an occasional rub on the bottom even would not involve serious expense for repairs. It could be built in one season, at a cost not to exceed $75,000, completely equipped; and it is recommended that appropriation therefor be made.

1890

The Marigold.—The new tender, *Marigold*, being built by contract at Wyandotte, Mich., is well under way, and it is expected that she will be ready for duty this fall. She is figured and described in an appendix at the end of this volume.

1890

The Marigold.—The plans and specifications for this vessel were completed in the draughting-room of the Board at the general light-house depot in this district. She is a single screw iron vessel, with a triple-expansion engine, cylinders 14½, 22, and 36 inches, and a stroke of 24 inches. There are two boilers, each 10 feet 6 inches in diameter and 10 feet 10 inches long, and fitted with two Fox's corrugated furnaces. The boilers are Scotch type, and designed for a working pressure of 150 pounds per square inch by gauge. The engine is calculated to indicate 550 horse-power, with a coal consumption of 1⅞ pounds per hour per indicated horse-power. The dimensions of the vessel are as follows:

	Ft.	In.
Length between perpendiculars	150	0
Beam, molded	27	0
Depth of hold from top of beam to top of floor	12	4

She is now being built by contract in Wyandotte, Mich.

11th Dist.

1891

The Marigold.—The new steamer *Marigold* was completed, and after two satisfactory trial trips was accepted. The results of the trial showed: Steam, 140; revolutions, 140; vacuum, 24½; and speed, 13 knots. The light-house inspector made two trips in her, one for the purpose of setting buoys and one for inspecting and supplying lights, and he found her suitable for her work and satisfactory as to speed and accommodations. Until the completion of the *Marigold* the steam-tender *Warrington* was under the inspector's orders, and both tenders were continuously and usefully employed in doing the work of the district.

The following is a synopsis of the work performed by the two vessels: Some 402 tons of coal and 18 cords of wood were delivered to fog-signal stations; the 96 lights in the district were furnished with 10,010 gallons of mineral oil, besides all the other articles of annual supply, including the rations and fuel allowed keepers of isolated stations; the lights were visited and inspected quarterly during the season of navigation, and 123 buoys were removed, repainted, and replaced; the number of miles steamed while doing this work was 11,058, the coal consumed 602 gross tons. The tender *Warrington*, on March 10, 1891, was turned over to the light-house engineer of the district for his temporary use.

Do. do.

1892

The Marigold.—This steamer is in good condition. No repairs have been required and no changes were made except as to the enlarging of her rudder, which has improved her steering qualities. She was constantly and usefully employed during the season of navigation, on inspection trips, supplying light-stations, coaling fog-signal stations, and delivering the fuel and rations allowed to light keepers. In doing this work she steamed some 11,200 miles, and consumed about 687 gross tons of bituminous coal.

Do. do.

1893

The Marigold.—This steamer is in good condition, and was constantly and usefully employed during the season of navigation on inspection trips, supplying light-stations and delivering the fuel and rations allowed to light-keepers. In doing this work she traversed about 10,794 miles, and consumed some 563 gross tons of coal.

Do. do.

Marigold,--steam-tender.

11th Dist.

1894

The Marigold.—This steamer is in good condition, with slight exception. She was almost constantly employed, during the season of navigation, on inspection and supply trips, coaling fog-signal stations, and in the care of buoys. In doing this work she steamed about 13,160 miles and consumed about 667 tons of coal.

1895

The Marigold.—This iron screw steamer was placed in dry dock in April, 1894, for the examination of her stern bearings. These were found to be in good condition, but the rudder needed some repairs, which were made; her bottom was cleaned and painted, and she is now in good condition. She was almost constantly employed during the season of navigation on inspection and supply trips, coaling fog-signal stations, and in caring for buoys. In doing this she steamed 11,217 miles and consumed 586 tons of coal.

1896

The Marigold.—This iron screw steamer was employed from the opening of navigation. She steamed about 14,233 miles, and consumed some 717 tons of coal. She is in excellent condition as regards hull, boiler, and machinery.

1897

The Marigold.—This iron-screw steamer was actively employed from the opening of navigation, 1897. She steamed about 12,314 miles, and consumed some 860 tons of coal. In addition to her usual work she was employed in delivering coal to fog-signal stations. The vessel was docked and thoroughly cleaned and painted in March, 1897. An electric-lighting plant and a steam-steering apparatus were installed with satisfactory results. A new propeller was shipped on May 10, 1897, she having lost a blade of the old one in service. The hull, boiler, and machinery generally are at present in good condition.

1898

The Marigold.—This iron screw steamer was built in 1890 and is of about 450 tons burden. She was actively employed after the opening of navigation, 1898. She steamed about 16,275 miles and consumed some 860 tons of coal. In addition to carrying the regular supplies, coal has been delivered at the fog-signal stations, and wood at several of them, when driftwood could not be obtained. A new propeller was purchased and is carried on board, so that no time may be lost in docking and placing it should the one in use be injured in any way. The hull, boiler, and machinery generally are at present in good condition. It is recommended that this vessel be docked and painted, and the stern-bearing and outboard under-water valves overhauled, after the close of the present season. Some slight alterations and additions are also recommended, viz, a bathroom for the crew, a larger ice box and meat chest, and the enlarging of the chart room on deck. This could be extended aft to the cabin skylight without in any way interfering with the useful deck space. The tender was thoroughly cleaned and painted throughout during the winter months.

1899

Marigold.—This iron screw steamer was built in 1890, and is of about 450 tons burden. She was employed during the past year in inspecting lights and delivering supplies and fuel to the stations and fog signals, during which time she steamed some 10,715 miles and consumed about 706 tons of coal. At the opening of navigation the *Marigold* was placed in the dry dock, painted, and her stern bearings and outboard underwater valves were overhauled. Alterations and additions were made to the chart room on upper deck. A larger ice box was built on starboard side of main deck and a wash and bath room fitted for use of the crew.

1900

Marigold.—This iron screw steamer which was built in 1890 is of about 454 tons gross burden. A main deck was laid. Hawse pipes and stockless anchors were provided and fitted. A smokestack was provided and minor repairs were made. Extensive alterations were made for the installation of a gas-carrying plant of 15,000 cubic feet capacity, which was installed on the after part of the main deck. The gas-carrying plant is satisfactory and enables the tender to care for about 30 gas buoys. These alterations and new distribution of weights increases the carrying capacity of the tender and improves her seagoing qualities. She steamed about 12,023 miles and consumed some 754 tons of coal, delivering supplies to 224 lights and 31 steam fog-signal stations, and inspecting the light-stations.

1901

Marigold.—This iron screw steamer was built in 1890, and has a displacement of 587.43 tons. She received repairs to the main and auxiliary engines, including new piston rods, valves, valve seats, piston

rings, steam connection, and water tank. The vessel was docked, the propellers were changed, and the rudder bearings were repaired. The flanges around the hawse pipes were calked, and the lignum vitæ was renewed in the stern bearings. The main-deck gangway gates and rails were renewed and the deadlight was repaired. The bottom of the tender was cleaned and painted. The *Marigold* was employed in inspecting light-houses and delivering supplies and fuel to light stations and fog signals. She steamed some 12,742 miles and consumed about 733 tons of bituminous coal, delivering supplies to 234 lights and 31 steam fog-signal stations.

1902

Marigold.—This iron screw steamer, built in 1890, has a displacement of 587.43 tons. She received two propeller wheels to replace two which were lost by striking submerged logs. Slight repairs were made to main and auxiliary engines; muffler was placed on the boiler escape pipe. She was docked, her bottom was cleaned and painted, and slight repairs made to the rail on the upper deck. She was employed in caring for buoys, inspecting light-houses, and delivering

supplies and fuel to light-stations and fog-signals. In the performance of this duty she steamed 15,330 miles and consumed about 965 tons of bituminous coal, delivering supplies to 241 lights, 31 fog-signals, and 30 gas buoys charged with gas.

LIGHT-HOUSE TENDERS.

1903 See Ivy

Marigold.—This iron screw steamer was built in 1890, and has a displacement of 587.43 tons. She was employed in caring for buoys, inspecting light-houses, and delivering supplies and fuel to light-stations and fog-signals. She steamed some 14,649 miles and consumed about 983 tons of bituminous coal, delivering supplies to 249 lights, 31 fog-signals, and keeping charged with gas 34 gas buoys. She received various repairs and the usual stores and fitments.

1904

Marigold.—This iron screw steamer which was built in 1890 has a displacement of 587.43 tons. She was employed in caring for buoys, inspecting light-houses, and delivering supplies and fuel to light-stations and fog-signals. In so doing she steamed some 15,853 miles and consumed about 1,070 tons of bituminous coal. She delivered supplies to 252 lights and 33 fog-signals, and kept 37 gas buoys charged with gas. Various repairs were made.

1905

Marigold.—This iron screw steamer was built in 1890 and is of 587 tons burden. She was employed in caring for buoys, inspecting light-houses, and delivering supplies and fuel to light-stations and fog-signals. She steamed some 15,939 miles and consumed about 1,137 tons of bituminous coal, delivering supplies to 353 lights, 34 steam fog-signals, and keeping charged with gas 37 gas buoys. This vessel was fitted with a balance rudder last winter, and this has made a great improvement in her steering qualities; the tactical diameter has been reduced, and she can now be easily handled in narrow channels.

1906

Marigold.—This iron screw steamer was built in 1890 and is of about 587 tons displacement. She was employed in caring for buoys, inspecting light-houses, and delivering supplies and fuel to light-stations and fog-signals. She steamed some 12,000 miles, and consumed about 812 tons of bituminous coal, delivering supplies to 243 lights, 34 steam fog-signals, and keeping 38 buoys charged with gas. On her buoy trip in November, 1905, the crank web of the low-pressure engine broke. She was towed to Detroit by the tender *Amaranth*, where a new crank web was fitted. She was docked and repaired in May, 1906.

LIGHT-HOUSE TENDERS.

1907.

Marigold.—This iron screw steamer was built in 1890, and is of 587.43 tons burden. She was employed in caring for buoys, inspecting light-houses, and delivering supplies and fuel to light-stations and fog-signals. She steamed some 13,760 miles and consumed about 992 tons of bituminous coal, delivering supplies to 220 lights, 34 steam fog-signals, and keeping charged with gas 37 buoys. She received needed fitments, supplies, and repairs.