

THE HYDROGRAPHIC OFFICE OF THE U. S. NAVY

by

REAR-ADMIRAL W. R. GHERARDI,
HYDROGRAPHER OF THE UNITED STATES NAVY.

On the occasion of the hundredth Anniversary of its Foundation the Hydrographic Office of the United States of America published a special pamphlet, entitled: "*Special Notices to Mariners — One Hundredth Anniversary Number 1830-1930*". An extract from this pamphlet relative to the History of the Service follows.

EARLY HISTORY.

In 1809 William LAMBERT, an amateur astronomer, addressed a letter to Congress suggesting the establishment at Washington of a national astronomical observatory. This eventually led to the earliest Congressional action on record to give permanency to the principle of supplying public vessels with information in relation to those coasts and waters to which their voyages might be directed. It was in the act of August 31, 1842, that authorization was contained for "the construction of a depot of charts and instruments of the Navy of the United States".

However, during the years prior to this act, through positive action on the part of officers of the United States Navy, matters had been so shaped as to quickly fulfill the desires of the proponents of an institution to advance the interests of nautical science, it having become apparent that there was an urgent need that the Navy and the merchant marine should be provided with charts and sailing directions, and that a national astronomical observatory and a national meteorological service should also be provided. On December 6, 1830, following a recommendation by Lieut. L. M. GOLDSBOROUGH, United States Navy, to the *Board of Navy Commissioners*, a "depot of charts and instruments" was established at the seat of government. This depot took charge of such nautical charts and instruments as had collected at the various navy yards and assumed the care and issue of charts and instruments furnished United States vessels. The object of the depot was to do away with the difficulties and dangers to which our national vessels had been previously exposed from want of an orderly and sufficient supply of information of all parts of the world to which their services might be directed.

Lieutenant GOLDSBOROUGH was placed in charge of the depot, which was established in a rented house on G Street between Seventeenth and Eighteenth Streets in Washington, D.C.

The difficulties that were experienced in maintaining an adequate supply of charts, all of which were purchased from civilian firms, early led to a recommendation from the *Board of Navy Commissioners* to the Secretary of the Navy that means for providing charts should be installed at the depot. The introduction of a lithographic press in May, 1835, constituted the initial attempt at chart production.

EARLY CHARTS.

In 1836 Lieut. Charles WILKES, United States Navy, who in 1834 had relieved Lieutenant GOLDSBOROUGH as head of the depot, was selected to proceed to Europe for the purchase of scientific instruments for the United States Exploring Expedition, which had been authorized by Congress in response to popular sentiment that the United States should take a larger part in scientific work for the advancement of navigation and commerce. WILKES subsequently was charged with organizing and commanding the expedition.

It is a notable fact that the first four engraved charts were published by the depot in 1837. These were of *Georges Shoal and Bank* a great fishing ground situated in the Atlantic Ocean eastward of Cape Cod. The United States brig *Porpoise* and schooners *Maria* and *Badassah* under Lieutenant WILKES conducted this survey. The work of engraving these charts, and all engraved charts published by the depot for the first thirty-five years of its existence, was done under contract by private concerns.

The outstanding surveys of those early days were those made by the United States Exploring Expedition headed by WILKES from 1838 to 1842. This was the first scientific expedition to leave the shores of the United States fitted out and provided for by an act of Congress. The exploring fleet consisted of the United States sloops of war *Vincennes* and *Peacock* and the United States brig *Porpoise*, together with several auxiliary vessels.



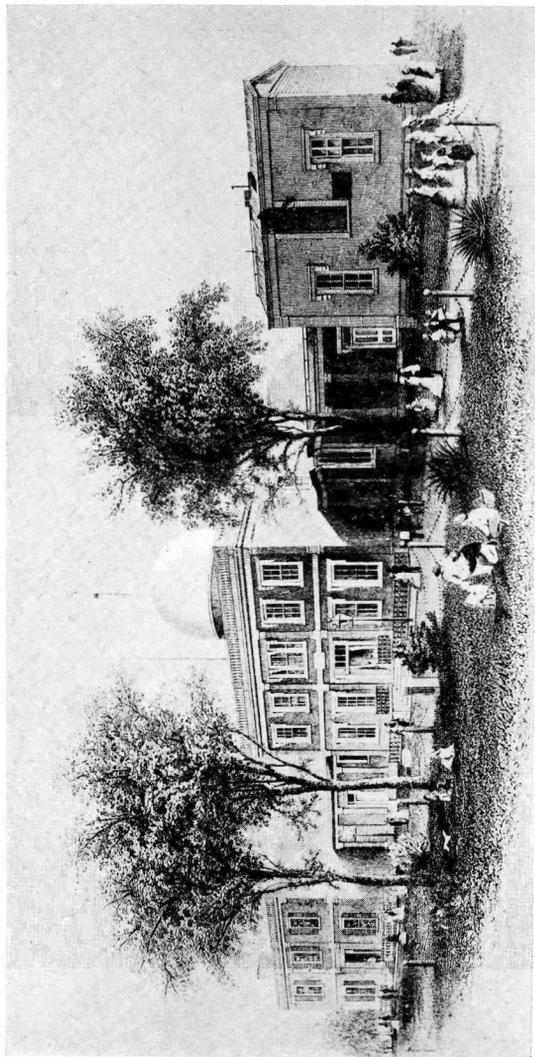
Lieut. Matthew F. MAURY, U. S. N.



Commander Th. S. FILLEBROWN, U. S. N.



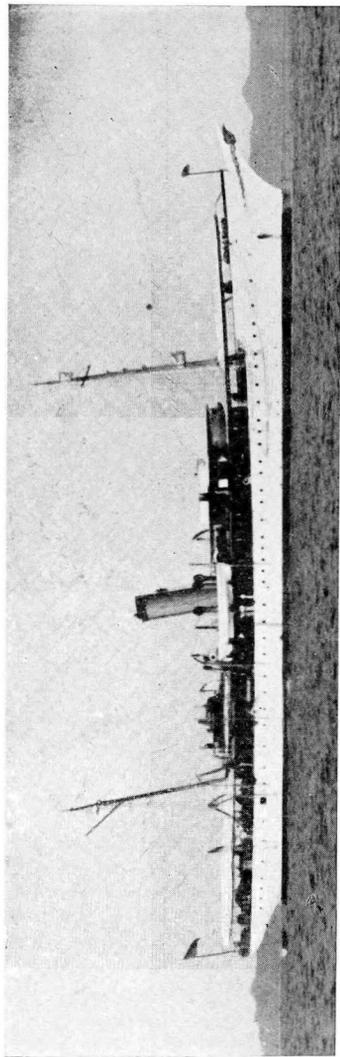
Lieut. Charles WILKES, U. S. N.



U. S. Hydrographic Office — 1844-1866



Lieut. L. M. GOLDSBOROUGH, U. S. N.



U. S. S. Niagara

To form some idea of the field of operation covered by this expedition, it is necessary to realize that the work was started on the coast of Brazil, thence to Madeira, and later to Patagonia, the Antarctic Continent (Wilkes Land), up through the Pacific Islands, Sulu Sea, Philippines, Japan, China, Fiji Islands, Hawaiian Islands, Samoan Islands, Alaska, Strait of Juan de Fuca, and the Columbia River.

From these surveys there were issued subsequently 87 engraved charts, which have continued to serve up to the present time as the basis of charts issued by all the maritime nations.

Not only did the United States Exploring Expedition contribute largely to the data for charts of the regions surveyed, but for many years afterwards WILKES, by authority of Congress, was engaged in directing the compilation and production of more than 20 volumes dealing with such sciences as hydrography, meteorology, botany, and geology, as well as natural history and kindred subjects.

Among other early surveys by United States naval vessels were those made by the PERRY Expedition to Japan from 1852 to 1854. While the primary object of this expedition was of a diplomatic nature for the purpose of opening ports for trade to the United States, yet the expedition made many surveys, that of the Gulf of Yedo (Tokyo) being perhaps the most complete. In addition, the expedition obtained much valuable data relating to the typhoons and winds of the western Pacific and the Japanese current of the North Pacific, as well as a fund of nautical information which was later used in compiling sailing directions.

The course of astronomical research by the United States Government was largely shaped by the predilections of Lieut. James S. GILLISS, United States Navy, who in 1837 succeeded Lieutenant WILKES in charge of the depot. GILLISS was deeply interested in the advancement of astronomical science, especially those branches of it pertaining to navigation, and became an advocate of enlarging the function of the depot to include those of an astronomical observatory. He succeeded through the enactment of legislation in securing a permanent depot for charts and instruments and also an astronomical observatory; and it was to this edifice, which was occupied by the United States Naval Observatory down to 1893, that the nautical books, charts, and instruments belonging to the Navy were transferred in 1844.

In 1842 the *Board of Navy Commissioners* that had governed the Navy for twenty-seven years was dissolved and the present bureau system was established in its place. The depot of charts and instruments was placed under the Bureau of Ordnance and Hydrography. The institution was officially known from 1830 to 1844 as the *Depot of Charts and Instruments*, but during the next ten years the names *Naval Observatory*, *National Observatory*, *Hydrographical Office*, and others were used indiscriminately. By order of the Secretary of the Navy, in December 1854, it was thenceforth called the *United States Naval Observatory and Hydrographical Office*. As such it was known until the statutory establishment of the *Hydrographic Office* as a separate institution in 1866.

MATTHEW FONTAINE MAURY.

On July 11, 1842, Lieutenant MAURY, United States Navy, relieved Lieutenant GILLISS in charge of the depot. The seeds of MAURY's achievements in the science of the sea were sown in the early days of his life at sea as an officer in the United States Navy. Earlier observations turned his mind toward a series of investigations which later brought him exalted fame throughout the world.

During the years 1842-1861, in which MAURY was in charge of the institution, his talents and inclinations being essentially those of a meteorologist and oceanographer, he became recognized as taking account of scientific matters in general relating to the ocean. His investigations and writings on the winds which blew over the surface of the water and their agencies in minimizing the duration of the passage of ships; the configuration of the ocean bed from the sea level down to the greatest depth; the temperature, circulation, and physical and chemical properties of sea water; the currents; the tides; the waves; the composition and distribution of marine deposits; the nature and distribution of marine organisms; the relation of man to the ocean in the development of fisheries; commerce; civilization; navigation; hydrography; and marine meteorology were all subjects within the purview of this great naval scientist.

MAURY began his collection of information from the logs of men-of-war and merchant vessels for the purpose of constructing nautical charts to show the physical features of the ocean and all facts of value to the maritime world. This resulted in the issue of wind and current charts, "*Pilot Charts*", track charts, trade-wind charts, whale feeding-ground charts, thermal charts, storm and rain charts, and eight large volumes of

sailing directions. All of these were concerned with the safe navigation of the known waters of the globe.

In 1853 a conference was held at Brussels, at the invitation of the Government of the United States, for the purpose of devising a systematic and uniform plan of meteorological observations at sea. This conference was attended by representatives of all the principal maritime nations. There the plan was adopted of establishing a system of meteorological observations at sea and of observations of the winds and currents of the ocean with a view to the improvement of navigation and the acquirement of a more correct knowledge of the laws which govern those elements. MAURY represented the United States and was offered the chair at the meetings, but tactfully declined. Soon nineteen-twentieths of the world's shipping, through the navies and voluntary cooperation of the nations' merchant marine, were engaged in securing the information required.

At the outbreak of the Civil War MAURY cast his fortunes with the Confederacy, and his practical labors for the Navy and merchant marine ceased.

In further commendation of this eminent man, who did so much for this institution in promoting the interests of the seafarer, and whose labors have given him the title of the "*Pathfinder of the Seas*," it is well to note the principal works upon which the claim to his fame chiefly rests. They are: The Wind and Currents Charts; Sailing Directions; his book, *The Physical Geography of the Seas*; and *Pilot Charts*. He instituted a system of deep sea sounding, and was among the first to suggest the establishment of telegraphic communication between continents by submarine cables. The first cable was laid on the line indicated by him. He was the first scientist to foresee the possibility of daily weather reports. As early as 1855 he laid down the steamer lanes in the North Atlantic, the most essential features of which were adopted thirty-six years later.

At the top of the Hydrographic Office *Pilot Charts* appear these words: *Founded upon the researches made in the early part of the nineteenth century by Matthew Fontaine MAURY while serving as a Lieutenant in the United States Navy.* This is an appropriate memorial to MAURY who will always be held in the highest esteem by mariners of every nation and especially by those of the United States Navy. The American people of to-day are recognizing his abilities and have commemorated his brilliant achievements for mankind.

HYDROGRAPHIC OFFICE.

In 1866 Congress passed an act to establish a *Hydrographic Office*, thereby severing the connection between that office and the Naval Observatory. This act reads in part as follows:

"There shall be a *Hydrographic Office* attached to the Bureau of Navigation in the Navy Department, for the improvement of the means for navigating safely the vessels of the Navy and of the mercantile marine, by providing, under the authority of the Secretary of the Navy, accurate and cheap nautical charts, sailing directions, navigators, and manuals of instructions for the use of all vessels of the United States, and for the benefit and use of navigators generally. (U. S. Code, Title 5, sec. 457).

"The Secretary of the Navy is authorized to cause to be prepared, at the *Hydrographic Office* attached to the Bureau of Navigation in the Navy Department, maps, charts, and nautical books relating to and required in navigation, and to publish and furnish them to navigators at the cost of printing and paper, and to purchase the plates and copyrights of such existing maps, charts, navigators, sailing directions and instructions, as he may consider necessary, and when he may deem it expedient to do so, and under such regulations and instructions as he may prescribe. (U. S. Code, Title 5, sec. 458.)"

Thus defined, the object of the *Hydrographic Office* is to place within reach of mariners, at small expense to them, such useful information as can not be collected profitably by any private individual, but which the Government can readily gather, without additional cost, through agencies already established.

In 1866 the *Hydrographic Office* was moved to what is known as the *Octagon House*, at Eighteenth Street and New York Avenue. Commander Thomas S. FILLEBROWN, United States Navy, was detached from the Naval Observatory and appointed *Hydrographer*. In the summer of 1879 the *Hydrographic Office* was removed from the *Octagon House* to the same buildings in which the Navy Department was located, and it has since been quartered along with the rest of the department. By act of Congress in 1898 it was transferred from the *Bureau of Navigation* to the *Bureau of Equipment*; and on July 1, 1910, it was transferred back to the *Bureau of Navigation*.

From 1866, when the Hydrographic Office was established as a separate unit of the Navy Department, up to the present day the activities of the office have constantly expanded and progressed. In 1869 it began the publication of *Notices to Mariners*. In 1882 the transfer of photolithographic charts to copper plates was begun. The publication of *Pilot Charts* in their present make-up was started in 1883 with the issuance of the *Pilot Charts* of the North Atlantic Ocean, followed in 1894 by that of the North Pacific Ocean, in 1909 by that of the South Atlantic Ocean, in 1910 by that of the South Pacific and Indian Oceans, and in 1915 by that of the Central American Waters. These charts are now issued monthly for the North Atlantic, North Pacific, and Indian Oceans and the Central American Waters, and quarterly for the South Atlantic and South Pacific Oceans.

During the course of years, naval vessels have made surveys in Korea; China; Mexico; Central America; West Indies; Brazil; Uruguay; the North and South Atlantic, North and South Pacific, and Indian Oceans; and in the Great Lakes. From these operations large additions have been made to our accurate knowledge of the surface of the globe. Successive telegraphic longitude expeditions have been sent out at intervals since 1874. In constructing charts for use at sea, the accurate determination of latitude and longitude is of the utmost importance, since the navigator starting on a voyage must know the exact position of his point of departure and of his destination, as well as the location of dangers to be avoided. He must know the error and rate of his chronometer when he sets out, but as the rate is not constant he should have some means of rerating at any place where he may stop. If the longitude of this place is well determined the operation of obtaining the error and rate is an easy one, and may save his vessel from loss.

The surveying of the high seas and of foreign coasts is still being carried on. At the present time there are three expeditions in which the U. S. S. *Hannibal*, U. S. S. *Nokomis*, and U. S. S. *Niagara* are employed. Aircraft are used to assist these vessels and are of great value in making reconnaissance flights and for photographing the terrain. They are also used for transporting personnel and supplies over areas rendered inaccessible by reefs, lagoons, and marshes.

By the establishment of branch hydrographic offices in the principal maritime centers of the United States, first inaugurated in 1884, increased facilities for the collection and dissemination of navigational information have been provided.

Representatives from the *Hydrographic Office* have participated in several international hydrographic conferences. As a result of the International Hydrographic Conference in London in July, 1919, the International Hydrographic Bureau, of which Rear Admiral A. T. LONG, U. S. N. (Ret.), is a director, was established at Monaco.

INTERNATIONAL ICE PATROL.

In May, 1912, the *Hydrographic Office* recommended to the Navy Department that suitable ships be detailed to cruise in the region of icebergs near the tail of the Grand Banks of Newfoundland as an ice patrol for passing vessels. In response to this recommendation the Navy Department detailed the U. S. S. *Birmingham* and the U. S. S. *Chester* for this duty. This recommendation resulted from the sinking of the S. S. *Titanic* in 1912 after collision with an iceberg in the North Atlantic.

This particular service for the safeguarding of lives and property at sea was a forerunner of what is now the international ice patrol. By international agreement, patrol ships supplied by the United States Coast Guard take station, upon the recommendation of the *Hydrographic Office*, when reports from vessels crossing the North Atlantic indicate that icebergs are getting far enough south to constitute a menace to safe navigation on the then obtaining North Atlantic lane routes. Reports from the patrol ships and other vessels are received in the *Hydrographic Office*, where they are analyzed and broadcast by radio daily. The ice positions are plotted on a chart and issued weekly to mariners as a supplement to the *Hydrographic Bulletin*.

NORTH ATLANTIC LANE ROUTES.

By an agreement entered into by the steamship companies concerned, certain "lane routes" have been established across the North Atlantic for the greater safety of ships. While the *Hydrographic Office* has no jurisdiction in establishing or changing these lane routes, except that of offering advice, it is one of its duties to keep ships informed of the routes as established and changed from time to time. These routes are shown on the *Ice Supplement*, *Pilot Charts*, and also on some navigational charts.

During the World War there was a great demand for the publications of the Hydrographic Office. All work was subordinated to that of supplying the nation's war needs for charts and other nautical data. After the armistice the activities again became normal.

AVIATION ACTIVITIES.

A post-war activity of the *Hydrographic Office* of increasing importance is that of safeguarding aircraft in transoceanic or coastal flights. To meet this new development the *Hydrographic Office* is now publishing monthly a *Pilot Chart* of the Upper Air for the North Atlantic and also one for the North Pacific. As aviation progresses the *Upper Air Charts* will eventually cover the other oceans.

To take care of the needs of aircraft, particularly amphibian planes and sea planes, a comprehensive charting program is under way. Sets of air charts for coasts of the United States, Mexico, Central America, and the West Indies are now completed and are being issued. These charts indicate to the aviator, in addition to details of terrain, distances and courses from place to place, landing fields, and airway beacons along the routes. They show pictures of airports as seen from the air and give their available resources, repair facilities, and other items of interest, within the area covered. The aviation charting program embraces the entire South American coasts.

A series of handbooks, giving flying directions and information concerning routes and port facilities for aircraft in various regions, is now in course of preparation.

STATIC AND STORMS.

Machines to record automatically the direction and intensity of the manifestations of atmospheric electricity known as "static" have been developed recently from specifications drawn up by the *Bureaus of Engineering and Aeronautics* of the Navy at the instance of the *Hydrographic Office*. Several of these instruments have been recently installed in the Gulf of Mexico-Caribbean Sea area for use in locating storms and defining the paths of hurricanes. Analyses of simultaneous records will be used to obtain cross bearings of cyclonic disturbances. It is expected that it will be possible to locate the centers of West Indian hurricanes soon after their formation and to track their subsequent path of travel. Information obtained will be disseminated in the same manner as other information sent out by the Hydrographic Office.

MANUALS AND TABLES.

The *Hydrographic Office* alone of the institutions of the United States Government has the statutory obligation to produce epitomes and manuals for the guidance of navigators in conducting their observations and keeping their reckoning on the seven seas. Among the well-known books of this nature is the *American Practical Navigator*, an epitome of navigation and nautical astronomy, which has served successive generations of American navigators since the days when Nathaniel BOWDITCH first produced it over a hundred years ago. Under the provisions of the act of Congress establishing the *Hydrographic Office* the copyright of this work was acquired, and it has since been revised many times to keep pace with the progress of the nautical sciences.

From the small depot of 1830, with a working force of two officers and one nautical expert, the *Hydrographic Office* has expanded to an establishment with a working force of eleven officers and one hundred and eighty civilians, supplemented by nineteen fully equipped branch offices at the most important points on our Atlantic, Pacific, and Gulf seaboard and on the shores of the Great Lakes. There are twenty officers and twenty-four civilians in the branch offices. The *Hydrographic Office* is under the immediate direction of the *Hydrographer*, a naval officer of high rank.

In the central office at the Navy Department there are five main divisions which in turn have thirty subdivisions. Much could be said of the activity of each subdivision and of the energetic, painstaking, and intelligent devotion to duty of the civilian employees that contribute to the whole work. These civilians are mostly specially trained hydrographic and cartographic engineers, nautical scientists, computers, engravers, photographers, and lithographers. It is sufficient to say that the *Hydrographic Office* is comparable to any large well-organized concern which not only manufactures and distributes its own products but in addition does its own scientific research work. It is the United States repository of nautical information of the world and the scientific agency to which the citizens and the Government look for authentic maritime information.

There are always on its shelves 300,000 charts and 100,000 journals and books ready for issue.

The office has some 7,000 mariners and aviators of all nationalities on its correspondence list who keep up a constant flow of information respecting the seas and the air of the world. In addition it receives information from the vessels of the Navy, American consuls, scientific organizations, and foreign Governments. There is a free exchange of information and publications between the United States *Hydrographic Office* and the hydrographic offices of the other navies of the world.

This extensive correspondence is the very life of the office and makes it and keeps it an up-to-the-minute organization. Thus, it is better equipped than any private enterprise or other department of the Government to investigate, collect from all parts of the world, compile, and distribute hydrographic and related information. The fund of information to the seafarer would be totally inaccessible except through such a long-established and carefully organized system as characterizes its service. This system of collection and distribution of maritime news is one of the most perfect that has been devised in the interest of the navigator. Furthermore, its scope and value to the merchant marine can not be overestimated. The outlay from the United States Treasury for the dissemination of information by the *Hydrographic Office* to mariners and aviators is in the nature of a premium upon an insurance policy for the security of shipping—a premium which is indeed insignificant in comparison to the value of the shipping to the Nation. That the merchant sailors and the fliers fully appreciate this service is evinced by the testimonials which are constantly being received in the *Hydrographic Office* from the mariners of all nations.

A typical testimonial is one from the general manager of the Officers' Federation of London, who in a letter to the *Hydrographic Office* dated August 26, 1930, says in part :

"This federation, which represents over 12,000 officers in the British merchant navy, has, through the reports of its federated members, good reason to know of the efficient work performed by the United States *Hydrographic Department* in supplying charts, recording dangers to navigation, and in numerous ways disseminating information of the highest importance to the safety and interests of ships and seamen, quite apart from nationality."

The *Hydrographic Office* celebrates its hundredth anniversary with the proud satisfaction of knowing that it is continuing to carry out the obligation imposed upon it by the laws under which it was created and that in so doing it is assisting in making the navigation of the sea and the air safe throughout the world for the vessels of the Navy and the merchant marine and aircraft. The *Hydrographic Office* is not only a military and naval necessity to the national defense but also a vital national industrial asset to the commerce of the United States.

OFFICERS IN CHARGE OF DEPOT OF CHARTS AND INSTRUMENTS

Louis M. GOLDSBOROUGH, Lieutenant. <i>December 6, 1830.</i>	Matthew F. MAURY, Lieutenant. <i>July 11, 1842.</i>
Charles WILKES, Lieutenant. <i>March 12, 1833.</i>	James M. GILLISS, Captain. <i>April 23, 1861.</i>
James M. GILLISS, Lieutenant. <i>June 14, 1837.</i>	Charles H. DAVIS, Rear Admiral. <i>April 28, 1865.</i>

HYDROGRAPHERS.

Thomas S. FILLBROWN, Commander. <i>August 1, 1866.</i>	Robert H. WYMAN, Captain. <i>October 1, 1870.</i>
Napoleon B. HARRISON, Captain. <i>July 28, 1868.</i>	Samuel R. FRANKLIN, Captain. <i>May 17, 1878.</i>
Edward SIMPSON, Commander. <i>December 31, 1868.</i>	John C. P. DE KRAFFT, Captain. <i>July 14, 1880.</i>
George F. EMMONS, Commodore. <i>October 5, 1869.</i>	John R. BARTLETT, Commander. <i>June 30, 1883.</i>

- George L. DYER, Lieutenant.
June 1, 1888.
- Henry F. PICKING, Captain.
November 20, 1889.
- Richardson CLOVER, Lieutenant Comdr.
June 1, 1891.
- Charles D. SIGSBEE, Commander.
May 31, 1893
- Joseph E. CRAIG, Commander.
April 19, 1897.
- Chapman C. TODD, Commander.
January 22, 1900.
- Wm. H. H. SOUTHERLAND, Lieut. Comdr.
November 4, 1901.
- Harry M. HODGES, Lieut. Comdr.
February 9, 1904.
- Charles C. ROGERS, Commander.
October 29, 1906.
- Albert G. WINTERHALTER, Commander.
June 1, 1908.
- John J. KNAPP, Commander.
January 12, 1910.
- George F. COOPER, Commander.
May 29, 1912.
- Thomas WASHINGTON, Commander.
April 20, 1914.
- Thomas SNOWDEN, Captain.
June 21, 1916.
- Seaton SCHROEDER, Rear Admiral (Ret.).
October 30, 1917.
- Edward SIMPSON, Captain.
March 10, 1919.
- Lloyd H. CHANDLER, Rear Admiral.
June 23, 1920.
- Louis R. DE STEIGUER, Captain.
July 28, 1921.
- Frederic B. BASSETT, Captain.
January 9, 1922.
- Walter S. CROSLY, Capt., Rear Admiral.
July 1, 1925.
- Frank H. ROBERTS, Commander.
August 1, 1927.
- Clarence S. KEMPF, Captain.
October 20, 1927.
- Walter R. GHERARDI, Rear Admiral.
June 21, 1930.

