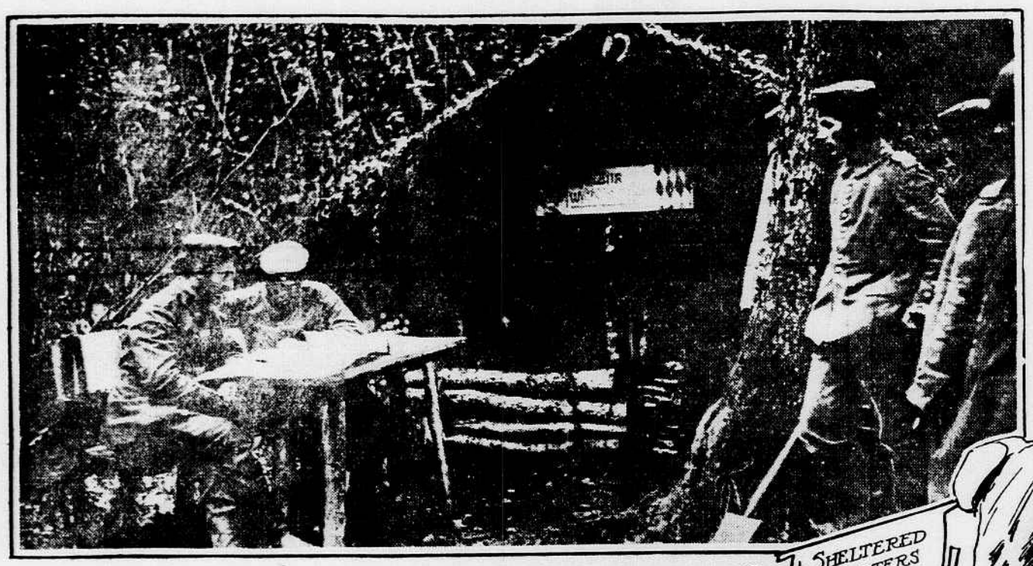
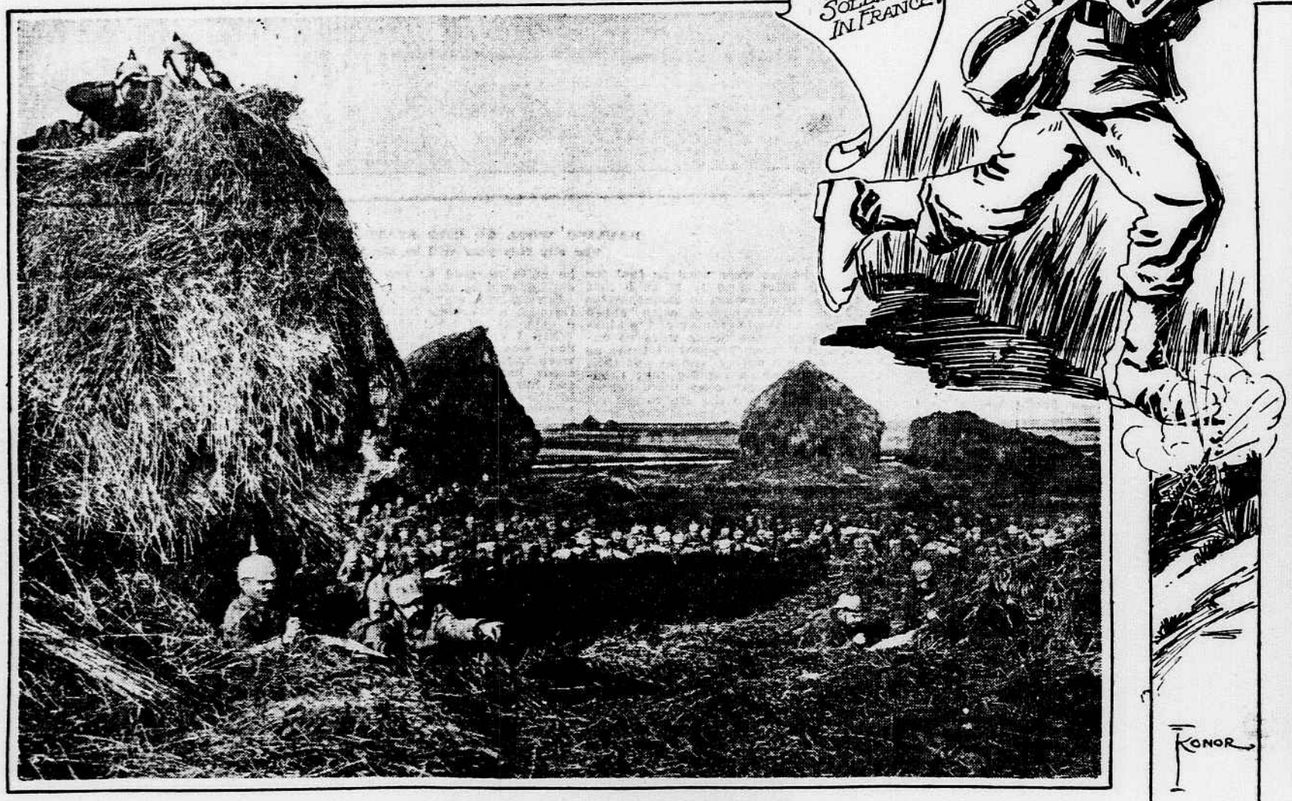
At the Battle Front With the German Army



SHELTERED QUARTERS ERECTED BY GERMAN SOLDIERS IN FRANCE.

GERMAN SOLDIERS ENJOY A BREATHING SPELL NEAR THE FRONT IN NORTHERN FRANCE.



GERMAN INFANTRY IN COVERED POSITION SHORTLY BEFORE A CHARGE

TYPES OF RUSSIAN PRISONERS OF WAR IN DOBBERITZ CAMP GERMANY

UNCLE SAM'S ALMOST PERFECT SYSTEM OF BEACONS AND WARNINGS OF THE SEA

Lights and Buoys Are Indispensable to Navigation Both by Night and Day, and They Are Watched and Attended With Never-ceasing Care—Government Maintains Lights All the Way From Ordinary Lanterns On the Mississippi River to a 25,000,000-Candlepower Light South of New York—The Most Powerful Light in the World—The Oldest of the Many Lighthouses—Work of the Lighthouse Service—The Flashing Beacons—Submarine Bells as Fog Signals—The Lightkeepers and Instances of Their Bravery While on Duty—Lights Cost Government $5,874,509 Last Year.

As you sit on the deck of a vessel at night on the rivers, bays, sounds and on the ocean along the coasts of the United States and you see the flickering of distant lights, or hear the deep, rhythmical tones of a bell, or the loud warning roar of a foghorn, or the shrill shriek of a siren, remember they are there as part of one of Uncle Sam's most perfect systems for the protection of life and property, and that the beginning of this system of lights was provided for before the formation of the United States government.

The government maintains lights all the way from ordinary lanterns on some parts of the Mississippi river to a 25,000,000-candlepower light south of New York, the most powerful in the United States, if not in the world.

* * *

These beacons and warnings of the sea and painted buoys are indispensable to navigation both by night and day, and they are watched and attended with never-ceasing care. Human eyes are open and alert wherever there is a lighthouse, and in the case of other lights they burn as the result of mechanical adjustment that is marvelous or by daily care.

For New York harbor and immediate approaches alone 268 aids to navigation are required, including 46 shore lights, 2 light vessels and 38 lighted buoys; there are 192 buoys of all classes and 37 fog signals, including sounding buoys. A chart of New York harbor in 1737 shows not a single aid to navigation there at that time. One may imagine the difficulties of Hendrik Hudson when, in 1609, he sailed into New York bay in the Half Moon.

There are 5,004 lighted aids to navigation in the United States. Of these 1,590 are either lighthouses or major lights. What are known as minor lights number 2,791; light vessels number 52; gas buoys, 453, and float lights, 118.

Unlighted aids to navigation are maintained as carefully as the lighted ones. There are 519 fog signals, 48 submarine signals, 86 whistling buoys, 233 bell buoys, 6,230 other buoys and 1,978 day beacons. In all, the United States maintains 14,198 aids to navigation.

There are 5,562 employes in the lighthouse service under Commissioner George R. Putnam, and only 43 of these are in Washington. The lighthouse service is a part of the Department of Commerce.

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Lighting dangerous waters in which abound reefs, rocks and shoals has progressed from wood fires and candles to oil vapor and electric lamps. The early lighthouses were lighted by wood or coal fires burned in open braziers, and later by candles inclosed in lanterns. The resulting light was necessarily weak and fitful and a large part was lost by being diffused in directions of no use to mariners. A coal fire was burned at the Isle of May light, on the coast of Scotland, up to 1816, and the famous Eddystone light was lighted with twenty-four wax candles up to 1811.

Oil lamps were early used in this country, if not from the first lighting of Boston light. Fish oil, sperm oil, colza oil, lard oil and mineral oil were in turn burned, increasing expense in each case compelling a change. Circular wick lamps, with a central current of air, were invented by Argand in 1782. At the present time lamps with from one to five concentric wicks and burning a high-grade of kerosene oil are used in a majority of lighthouses. More than 700,000 gallons of oil are burned each year at light stations of the United States, about 350,000 gallons of which are for lighthouse illumination.

For the more important lights the incandescent oil vapor lamp is now used, having been introduced by the French in 1898. In this lamp the oil is heated and vaporized and is burned mixed with air under a mantle which is made incandescent. This gives a much more brilliant light than the wick lamp, with a smaller consumption of oil. This change of lamps at Cape Hatteras increased the brilliancy of the light from 34,000 to 160,000 candlepower, while the consumption of oil was reduced nearly one-half.

Electric lights are used only at a few light stations. The expense is too great to warrant the employment of electricity at many important stations. For some harbor lights it can be used to advantage by taking current from local source of supply, and a light can thus be maintained in an exposed position and controlled from the shore.

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The electric light at Navesink, on the highlands just south of New York harbor, is the most powerful coast light in the United States. This light shows each five seconds a flash of one-tenth second duration estimated at 25,000,000 candlepower. Although on account of the curvature of the earth, the light itself cannot be seen more than two miles, its beam has been reported to have been observed in the sky at a distance of seven nautical miles. This light consists of a bivalve lens, with an electric arc light source. The lens is seven feet four inches in diameter and there are two of them, back to back with the arc light in between, so that the light is converged into two diametrically opposite beams, each of 25,000,000 candlepower. These lenses are mounted on a mercury float so that they revolve with the least amount of friction and power.

The tallest light tower in this country, 200 feet high, is the Cape Hatteras lighthouse, North Carolina. It has a spiral painting of red and white to furnish a distinctive day mark to mariners. A light must be about 200 feet above the water to be seen from the deck of a vessel twenty nautical miles distant; beyond that distance the curvature of the earth would prevent a light at this elevation being seen.

The oldest existing lighthouses in the United States, both built in 1764, are at Sandy Hook, New Jersey, and Cape Henlopen, Delaware. The walls of the Sandy Hook tower are seven feet thick at the base and it is 150 feet in height.

There are in use a large number of acetylene gas-lighted beacons, supplied by tanks of gas of sufficient capacity to maintain a quick flashing light for five months without attention These are visited by lighthouse tenders and replenished. In other acetylene lights the gas is generated from carbide at the stations or in the buoy. Oil gas under compression is also extensively used for lighted buoys, having first been employed for this purpose in 1878. Some of the acetylene beacons are provided with a sun valve which saves gas by automatically cutting off the gas supply during the time the sun shines.

There is a flashing beacon on Richardsons Rock, a wave-swept rock, west of the Santa Barbara Islands, California, which, without attention, will flash its warnings every three seconds for seven months, or over 6,000,000 flashes, before it requires another charge of gas.

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There are ninety-five lights on Alaskan waters, and this number is due to the facility with which flashing gas lights, unattended, may be established in that region, where it would be difficult and expensive to maintain keepers.

Submarine bells were first regularly employed as fog signals in the United States in 1906. The bell is suspended in the water from a light vessel to a depth of twenty-five to thirty feet, and is operated by compressed air, or the bell is mounted on a tripod on the bottom and worked by electric power transmitted from the shore through a cable, or it is suspended from a buoy and actuated by the motion of the sea, which moves a vane and winds a spring. Sound from submarine bells is transmitted through the water more uniformly and effectively than it is through the air from aerial signal. However, the efficient use of the submarine bell requires that vessels be equipped with suitable receiving apparatus attached to the hull on each bow and telephonically connected with the wheel house. By comparing the loudness on the two sides the direction of the signal may be obtained. Submarine bells have frequently been heard through the water at distances of fifteen miles and more.

Light vessels are placed in locations off the coast where it would be impracticable or needlessly expensive to build a lighthouse, and they usually mark the approach to a port or bay or the outer limit of an offlying danger. They are equipped with powerful and distinctive lights and fog signals. Life on a lightship is somewhat dreary, but not without excitement, and the men are allowed liberal shore leave.

The pay of lightkeepers is small and the life is lonely. Nevertheless, it attracts a class of faithful men willing to take large risks in doing their duty and also helping those in distress. There are many cases of faithful service and bravery. The hurricane of September, 1906, did serious damage to lighthouse property along the gulf coast, and a number of lives were lost at Sand Island and at Horn Island light stations. At the latter the keeper, his wife and daughters were drowned.

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Walter J. Calfee, keeper of post lights on the St. Johns river, Florida, after failing a distance of twenty-two feet while attempting to light a beacon, remained unconscious for more than two hours, and then, with a broken leg, crawled back to his boat through a surf, got another lamp, and placed it on the beacon post. He then walked home, a distance of eight miles.

Commissioner Putnam tells a pathetic story of the keeper of the Key West light, William A. Bethel, who, after thirty-five years of service, became so absorbed in his duty that he would not leave his task even for a short vacation, laboring under the delusion that no one but himself could properly care for the light. On a certain very stormy night a ship was wrecked near the fort at Key West. The keeper, then nearly seventy years old, excited by the storm and the prolonged whistle blasts of the unfortunate vessel, insisted that the wreck was due to the front-range light being out, although it had been examined by his son and found properly burning. In spite of his feeble condition he procured a lantern, and resisting efforts to detain him, went on foot in the storm to the range light and satisfied himself that it was really burning, and he died not long afterward of the exposure.

The keeper of Van Weis point light, New York, died about three years ago, at the age of ninety-three years, having tended the light for fifty-three years.

The keeper of the most distant light in Alaska—Cape Sarichef—returned recently, his first absence in three years. At this station there is sometimes an interval of five months between mails and the keeper's only neighbor is a trapper, ten miles away. A lightkeeper on the Columbia river, Oregon, has taken only two days' leave in twenty-three years, and one of these two days was for the purpose of getting married.

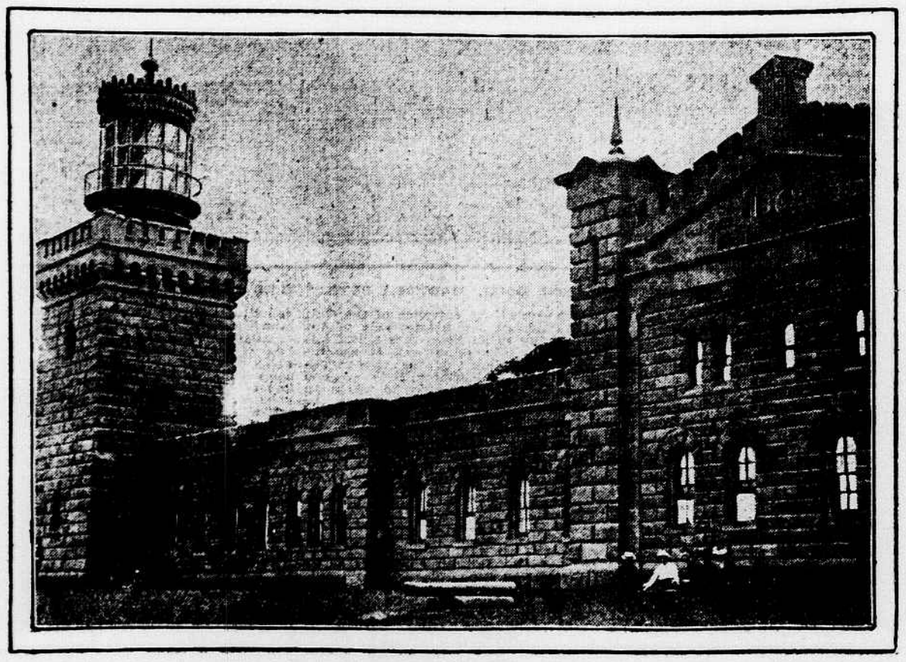
There are a number of woman lightkeepers. One of these, the keeper of Angel Island light in San Francisco bay, reported that after the machinery of the fog signal was disabled she had struck the bell by hand for twenty hours and thirty-five minutes until the fog lifted and that two days later when the machinery was further disabled she stood all night on the platform and struck the bell with a nail hammer with all her might.

* * *

Ida Lewis, who died about three years ago, was a widely known lightkeeper. She lived at Lime Rock lighthouse on a ledge in Newport harbor, for fifty-seven years, her father having been appointed keeper when she was twelve years old. She was keeper of the light for thirty-two years. There are official records of her having rescued thirteen people from drowning. On one occasion she saved three men whose boat had swamped while they were attempting to pick up a sheep, and then she rescued the sheep.

The first lighthouse on this continent was built in 1715 at the entrance of Boston harbor by the province of Massachusetts, and was supported by light dues on all incoming and outgoing vessels, except coasters. Several other lighthouses were built by the colonies.

For the last fiscal year it cost the government $5,874,509 to maintain not only in this country, but in our insular possessions, not including the Philippines, these lights and warnings that safeguard hundreds of thousands of human lives and property which in value runs into the millions. The service outside of Washington is divided into nineteen lighthouse districts, each of which is under the charge of a lighthouse inspector. In addition there is on Staten Island, New York harbor, a general lighthouse depot where many of the supplies for the whole service are purchased and stored and sent out for distribution and where much of the special apparatus of the service is manufactured or repaired.



THE MOST POWERFUL LIGHT IN THE UNITED STATES. NAVESINK LIGHTHOUSE, WITH 25,000,000 CANDLEPOWER.

THE OLDEST EXISTING LIGHTHOUSE, AT SANDY HOOK, NEW JERSEY. IT IS 150 FEET IN HEIGHT.

The Foolish Urchin.

HERMAN RIDDER, the German-American journalist, said at the German-American Chamber of Commerce in New York:

"You complain that the war goes slowly? But you would think it went fast enough if you were in the trenches. To complain that a war so colossal as this goes slowly is to be as foolish almost as little Willie.

"Little Willie, at the age of six, was sent to school for the first time. At the end of his first school day he tore home, snatched up the latest comic supplement, and ran his eye over the printed words that came out of the people's mouths in the jokes. Then he threw the supplement down and said:

"'That's no good of a school!'

"'Why, Willie, what makes you say that?' exclaimed his mother.

"'Oh,' said he, 'here I've been to it a whole day and ain't learned to read yet.'"