

UNATTENDED FULLY AUTOMATIC LIGHTHOUSES.

(Extracted from a publication of the Crouse-Hinds Company, Syracuse, N. Y.).

Many lighthouses are located in exposed and dangerous locations. The lighthouse keeper at these stations is not only exposed to the dangers of bad weather conditions but may at times be unable to maintain contact with the mainland for weeks at a time.

In 1942 the Crouse-Hinds Company built for the United States Coast Guard several special rotating lighthouse beacons designed to operate at unattended locations. These were adaptations of airport beacons and consisted of two 36" double-end drums mounted one on top of the other so as to produce four beams which could be adjusted at varying angles with respect to each other. The horizontal spread could be changed by means of auxiliary lenses and the speed of rotation of the entire assembly could be varied to produce light characteristics which would match those of any existing flashing light beacon. Figure 1 shows such a beacon.

The rotation mechanism for these beacons was mounted indoors in the room below the beacon so that it could be serviced without the mechanic being exposed to the weather. The beacon was equipped with automatic lamp changer so that a burned out lamp was replaced instantly. These beacons would operate for at least a month between service periods and allowed the exposed and dangerous locations to be unattended.

These beacons can be controlled by astronomical dial time clocks or by photoelectric control units which turn them on at dusk and off at dawn. Figure 2 shows one of these new robot lights at Los Angeles Harbor at Long Beach, California. This light station is equipped with a radio beacon as well as the light beacon. It is also built to withstand earthquakes.

These first rotating lighthouse beacons have performed satisfactorily but one feature of their construction has proven to be undesirable. With the rotating beacon heads exposed to the weather the job of installing new lamps and of cleaning the optical system could at times be disagreeable and hazardous.

In an effort to correct this condition the U. S. Coast Guard issued a specification for a new design of rotating lighthouse beacon which would produce the same results but with completely enclosed optical system. To meet this specification the Crouse-Hinds Company developed a new form of rotating lighthouse beacon shown in Figures 3, 4, and 5.

This new beacon, known as type LHB, is constructed in two decks each of which contains two 24" parabolic mirrors, mounted at 90 degrees to each other so their focal points coincide and a single lamp will produce two beams 90 degrees apart. These two decks are adjustable with respect to each other and rotate together. Lenses are mounted in front of each mirror designed to produce horizontal beam spreads of 6 degrees, 18 degrees, or 36 degrees as desired. The speed of rotation can be 1, 2, 3, 4-1/2, 6 or 12 r.p.m. according to the type of gears installed in the mechanism. The beacons can be arranged for either A.C. or D.C. current and utilize two 1000-watt lamps. There is an automatic lamp changer for each optical system and the lamps which are rated at 500 hours life are automatically replaced when they burn out.

For lighthouses where new structures are erected the type shown in Figures 3 and 4 is installed. The lantern shown in Figure 3 is the portion which is exposed to the atmosphere. When it is desired to inspect or service the equipment the entire optical system is dropped through the floor to the room below by use of the counter-weighted elevator mechanism shown in Figure 4. It is never necessary, therefore, for the service mechanic to be exposed to the elements while checking the equipment.

For lighthouses already in operation, where the increased efficiency of this new optical design will give the lighthouse greater range as well as allow unattended operation, the beacon shown in Figure 5 is installed in the existing structure.

Such a beacon has been fitted inside the dome of the Fire Island Lighthouse. This lighthouse was built in 1827 and for many years served the area along Long Island with the Fresnel lens and a flashing incandescent lamp. It was rated at 300,000 candlepower. The new beacon is rated at 1,000,000 candlepower and is visible for considerably greater distance.

The new lighthouse on the Upper Peninsula of Lake Michigan, which is still under construction, is equipped with one of the new type LHB beacons and will have a radio beacon tower similar to that of the Long Beach installation. It also will be an unattended light station which will permit the lighthouse keeper to live in safety and comfort on the mainland.

With all the advantages of unattended operation obtained with this latest design of lighthouse its cost, due to the use of standardized mechanical and electrical parts and modern manufacturing techniques, is only a fraction of the cost of the original Fresnel lens lighthouse beacon. Here is just one more example of the improvements that modern science and engineering have contributed to the efficiency and safety of human life.



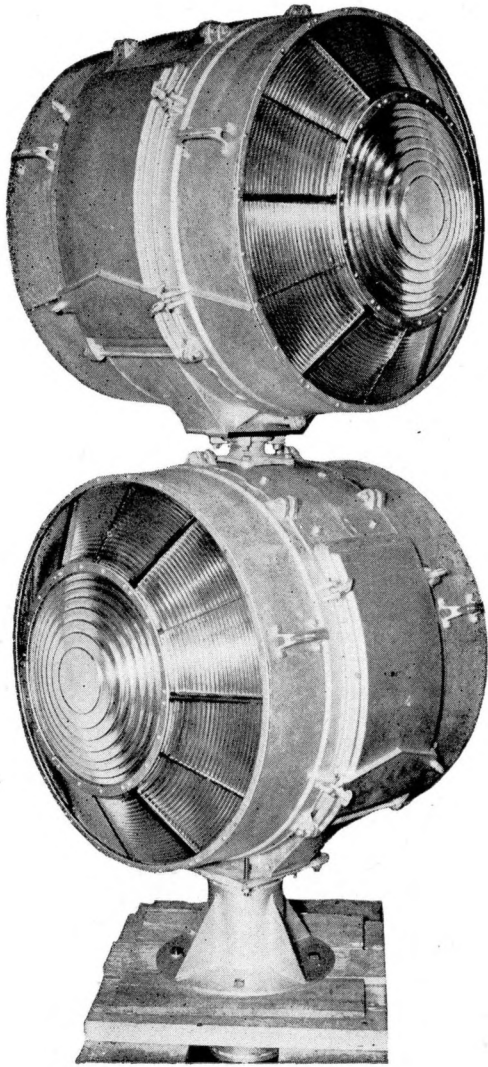


FIG. 1

Crouse - Hinds Company - Two 36" double end drums lenses system.

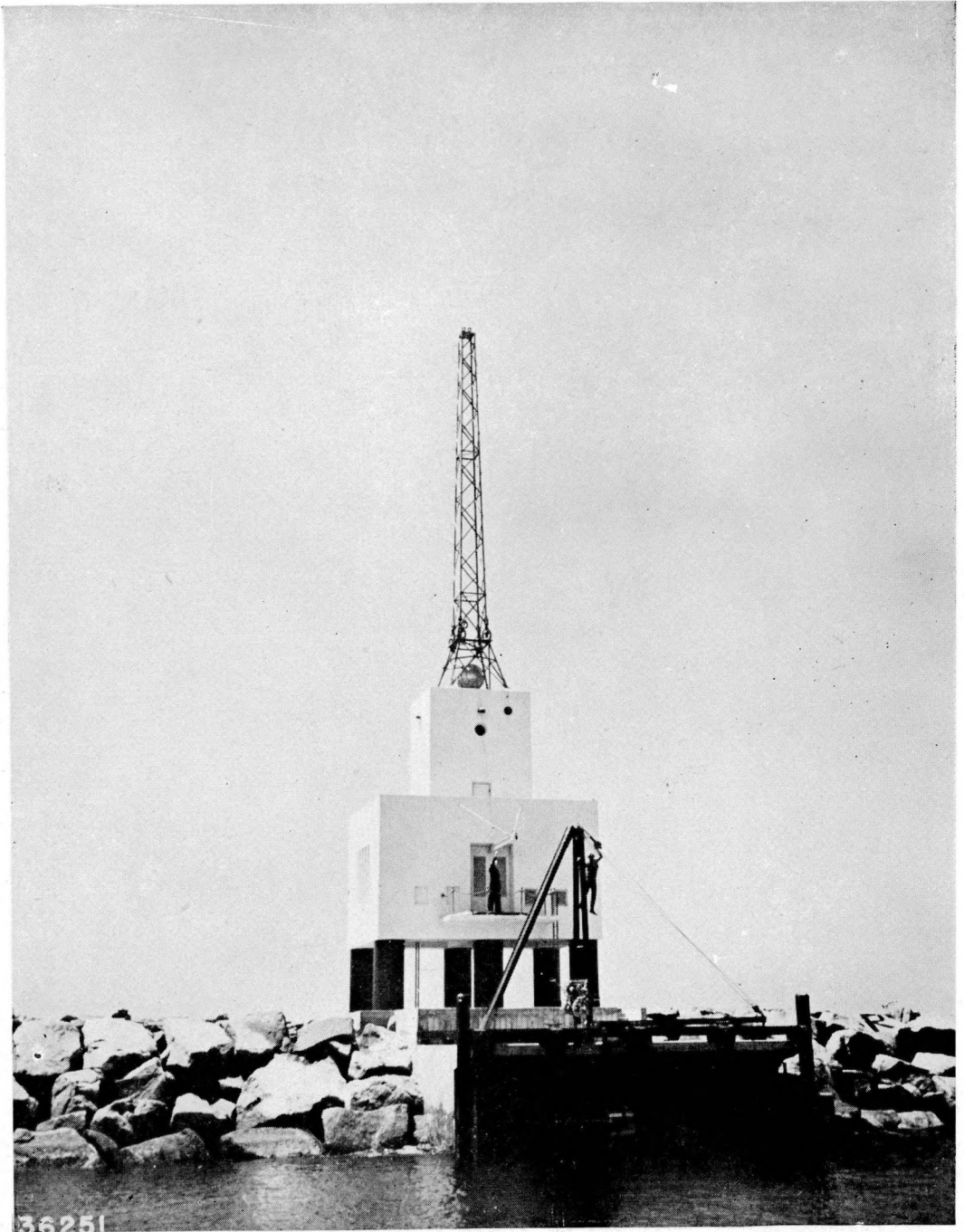


FIG. 2.

Long Beach Lighthouse - Los Angeles Harbor, California - Crouse Hinds Company of Syracuse (New York).

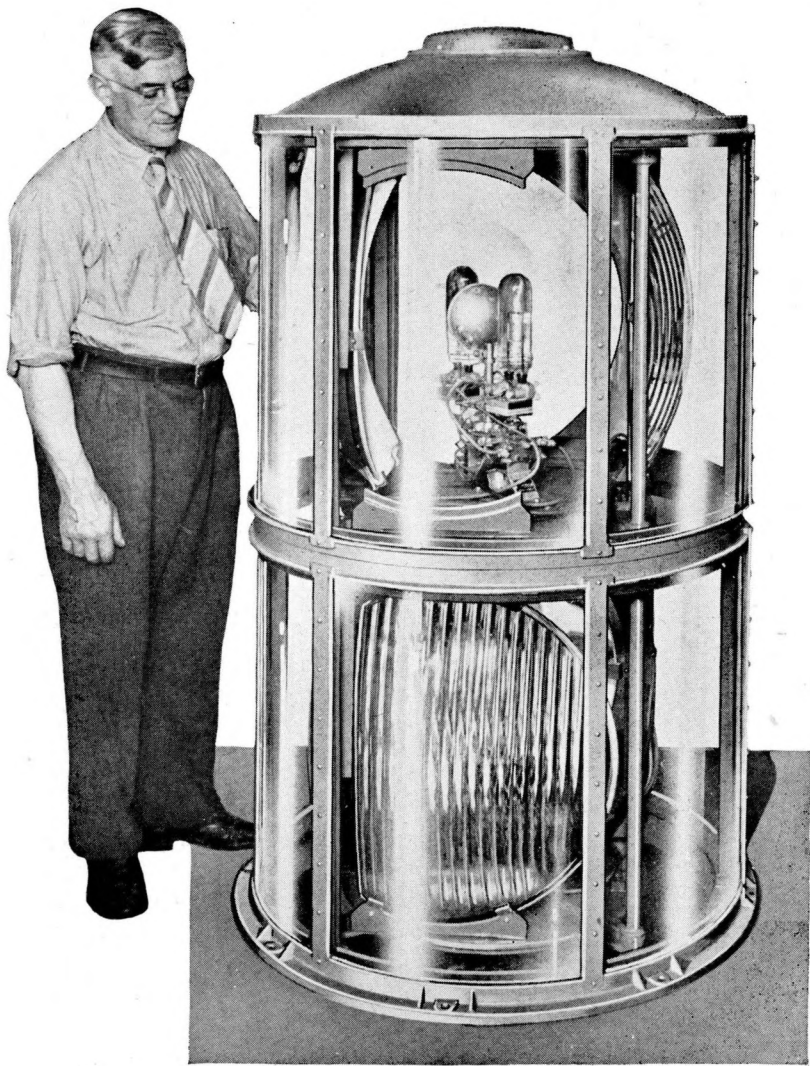


FIG. 3.

Crouse Hinds Company Rotating Lighthouse Beacon - Portion exposed to the atmosphere.

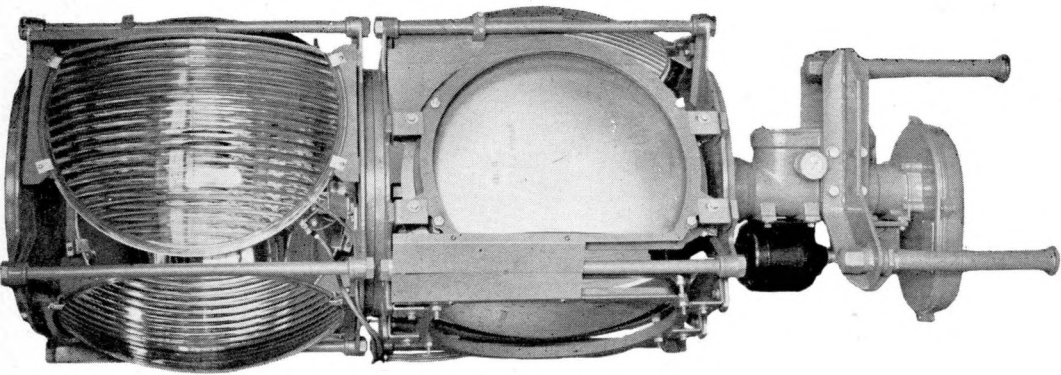


FIG. 5.

Crouse Hinds Company Rotating Lighthouse Beacon installed in the existing Structures and permitting unattended operation.

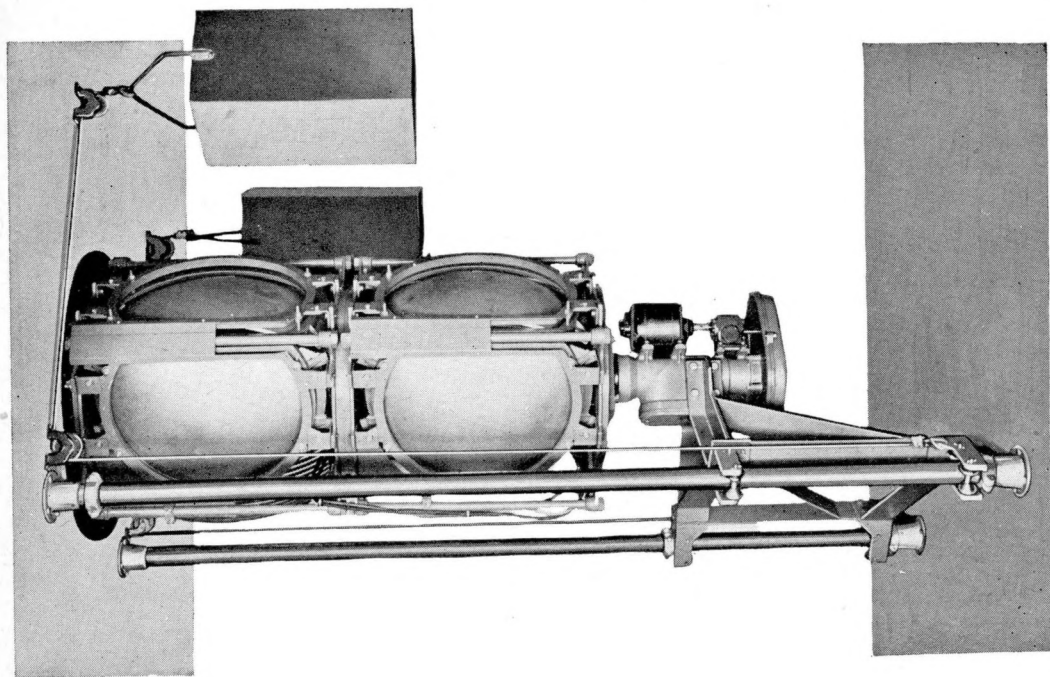


FIG. 4.

Crouse Hinds Company Optical System dropped for checking the equipment.