

A MONTHLY PUBLICATION

*of the*  
**CAPE BLANCO  
 HERITAGE SOCIETY**



**CBHS BOARD MEETINGS:** Currently held at Point.B Studio at 10:00 AM on the 2nd Tuesday of every month.  
**PLEASE NOTE:** Our meetings are open to everyone who would like to attend. We invite and encourage anyone interested in CBHS to participate!

# 155 Years of Fresnel Lens History at Cape Blanco



Photo: CBHS Archives



Photo: Jim Griggs

Photo: USCG Archives

L to R: Cape Blanco's lens framework bears the mark of two distinctive makers; US Coast Guard maintaining the lens in 2017; Keeper Bob Johns.

By CBHS with Jack Graham ~ If you have ever visited Cape Blanco to view the historic second order fresnel lens in person, it is an experience that will be etched in your memory. It begins with the breathtaking views on the hike to Oregon's oldest lighthouse and most westerly point which can only be surpassed by a trip yet further to the top of the tower where one can appreciate those epic 360° views from the lantern room. No other lighthouse light in Oregon shines out from a higher elevation above the water emanating from one of the last remaining second order fresnel lenses in the American West (*Point Bonita Lighthouse, CA, is still active*). However, the distinctive qualities of Cape Blanco's exquisite fresnel lens does not end here. To gain a full appreciation of it we must dive a little deeper into the history of Cape Blanco and the beautiful lens itself.

The Fresnel lens was a game-changer in optics, particularly for lighthouses. It was developed by Augustin-Jean Fresnel in 1822, revolutionizing maritime safety by creating a much stronger and more focused beam of light from a single lamp (for more historical background, see ["Lighthouse Technology ~ The Mother of Invention"](#), CBHS News of Note, July 2025). The tech-

nology first reached Cape Blanco in 1870 and Head Keeper Harvey Burnap had the honor of lighting the wick of the Funck lamp on December 20 1870. The original lens was a first order ("orders" being a size classification) fixed (non-rotating) Fresnel lens sourced from Henry-Lepaute of Paris, France. The lens had drum shaped panels to provide the steady beam of light at 45,765 candlepower making Cape Blanco's characteristic visible 21 miles out to sea. The first order lens once installed at Fowey Rocks Lighthouse (at right, now on display at the Coast Guard ATON School in Yorktown, VA) is identical to the original Cape Blanco lens. Made at the same factory, U.S. Lighthouse Board plans show the same number of upper and lower prisms so this gives us a visual as to what the first lens looked like.

Light lists were published first by the U.S. Lighthouse Board (1852-1910) and later the Bureau of Lighthouses so mariners could identify the lights and their signals. Sometime after the 1911 Light List was publish-

ed, Cape Blanco's signal changed. The new signal provided flashes of light, instead of a steady beam. The change was accomplished by installing an eclipsing device that utilized a clockwork system which rotated a shield in front of the light at intervals to provide the flash. This change added "winding clockworks" to the keepers' list of duties.



First-order Fresnel Lens

In early 1936, the lighthouse was electrified, and the first lens was replaced with an eight side, rotating second order beehive lens with bull's-eye prisms, also built in France by Henry-Lepaute. This lens rotated by an electric motor. We do not know what happened to the original lens after it was taken by truck to Coos Bay and shipped off to the Lighthouse Depot at Tongue Point, Astoria, presumably for storage.

Orlo Hayward has the distinction of being the head keeper in 1936 when the second order fresnel lens was installed at Cape Blanco. It was his responsibility to ready the original first order lens for

shipping aboard the *Tender Manzanita*. On December 6, 1936, Keeper Hayward reported to the Superintendent of Lighthouses in Portland that the replacement lens at Cape Blanco had suffered damage—a sprung door frame and three broken bull’s-eye prisms. The replacement lens was repaired and installed as planned. It was found that the negligence of E.E. Lewis, assistant keeper, resulted in the damages and he was compelled to resign “without prejudice” on July 22, 1937. This unfortunate mishap actually led to a very distinguishing feature of our lens—it is signed by two famous lens craftsmen, Augustin Henry-Lepaute (*Lepaute Clock Company*) who produced the second order lens as delivered to Cape Blanco on that fateful day on December 6, 1936, and Louis Sautter (*The Sautter Lens Works located on the Champs-Élysées in Paris*) who conducted the repair on the damaged prisms.



Orlo E. Hayward

The new second order lens was a marvel of technology; measuring 4'8" in diameter and 6'8" in height; coupled with the speed it turned it provided a unique flash of light every 20 seconds (18.2 off and 1.8 on) that could be seen 26 miles out to sea. This extraordinary

advance in automation would eventually render the lighthouse keepers obsolete.

For the better half of the 20th century, lighthouse operations in regards to the lens room ran smoothly. The world, however, was certainly changing. In 1939, the Bureau of Lighthouses merged with the U.S. Coast Guard, transferring stewardship of the beacon to the USCG. Shortly thereafter, WWII became a reality and the USCG set up a base at Cape Blanco. Many buildings were added to the grounds to facilitate this effort including a LORAN station to further aid in navigation. In September of 1942, the light was unsuccessfully used for strategic advantage by the Imperial Japanese Navy to drop incendiary bombs on the Continental U.S.

Time passed and the fresnel lens remained faithfully serviced by the USCG, with trained personnel and volunteers seeing to its care and maintenance. Despite advances such as GPS, the beacon provided inspiration and security as the oldest continually operating lighthouse in Oregon, as well as the most westerly continually operating lighthouse in the U.S. (*Cape Flattery*

*Lighthouse, WA, no longer has a light*).

Stormy seas and weather events such as the Columbus Day Storm of 1962 (170-200 mph gusts!) would come and go, yet the Fresnel lens shone on, keeping the ships on course with only a handful of notable shipwrecks over time. It wasn't until after the lighthouse was fully automated in 1980 that the lens was seriously harmed through a senseless act of vandalism in 1992. After a nationwide search for someone qualified to repair the historic lens, the Friends of Cape Blanco found Hardin Optical in nearby Bandon, OR. Larry Hardin repaired the lens in 1994, considering it one of the optical masterpieces of the 19th century. He was chosen again to do a full restoration in 2002.



Hardin Bull's-eye

In 2023, the second-order fresnel lens stopped turning when its motor ceased to function. After a prompt and unsuccessful repair attempt, the problem appears to be faulty bearings. The lens room curtains are drawn (*a nod to the pre-USCG light-keeper practice of protecting the motionless lens from any possible damage*) and an LED beacon installed to the West. As we wait for an expert fresnel lens inspection, we ponder the conundrum of how lighthouse keepers became obsolete. ✨

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155th Anniversary Edition

**OUR MISSION:** To provide interpretative and educational services for the Cape Blanco Light Station, Historic Hughes House and Ranch and the Port Orford Lifeboat Station. We are a 501(c)(3) non-profit organization and your donation is tax-deductible.

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