



A Fresnel lens consists of a series of “flash panels” attached together in a rough circle. Each flash panel consists of a central convex lens with prisms placed above and below this “bull’s eye.” The prisms bend (refract and reflect) rays of light and focus them into a specific direction, which makes the light much brighter. (Push the button and turn the knob at the same time on the lightbox below to see how the prisms bend light.)

A Lighthouse can be identified by the pattern of its flashes or its “characteristic.” The number of flashes per minute depends on the number of flash panels (bull’s eyes) and the speed at which the lens revolves. The lens is secured to a rotating stand which is set atop a series of brass chariot wheels. Originally, a clockwork mechanism was located beside the rotating stand and attached to the stand by a series of gears. The clockwork was driven by a weight suspended by a cable which descended down inside the tower. This system was replaced with a 5 hp electric motor after the Lighthouse was electrified in 1931.

Cape Canaveral’s 1st Order Fresnel lens was removed from the tower in 1993 due to damage from rocket launch vibrations and is now on display at the Ponce de Leon Inlet Lighthouse Museum. The lens on its pedestal measures 16 feet 5 ½ inches tall with an interior diameter of 70 inches. The lens weighs 12,000 pounds and contains 24 panels and 368 prisms. Its light could shine 22 miles out to sea.

The lens was originally developed for lighthouses by French physicist and engineer, Augustin-Jean Fresnel in 1823. Today, much smaller single-piece designs are also used for automobile headlamps, brake, parking, and turn signal lenses.



Bulls eye of the 1st Order Fresnel Lens