Arc Searchlight Encyclopedia Article

Arc Searchlight

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Arc Searchlight

Searchlights depend on special lenses and reflectors to focus electric light into a pinpoint beam that can illuminate objects thousands of feet away. Since about 1870, carbon arc lamps have been used as the light source for searchlights. During World War I, Elmer Sperry, an American engineer, invented a high-intensity arc searchlight. The United States Navy and other armed forces quickly adopted Sperry's light for military purposes.

In today's large searchlights, chemicals are added to the carbon to increase the arc light's brilliance. Like a car's headlights, searchlights focus their beam with a parabolic reflector, a curved metal cup which has the special property that it directs the light scattering from the source into a narrow stream of parallel rays. Parabolic reflectors came into use in the late 1800s. Before then, searchlights had used a special mirror invented by Colonel Alphonse Mangin for the French army in 1877. Some searchlights also use a Fresnel lens to concentrate the light beam. This type of lens, which has a surface divided into concentric rings, was originally developed in 1820 for lighthouses by the French physicist Augustin-Jean Fresnel (1788-1827).