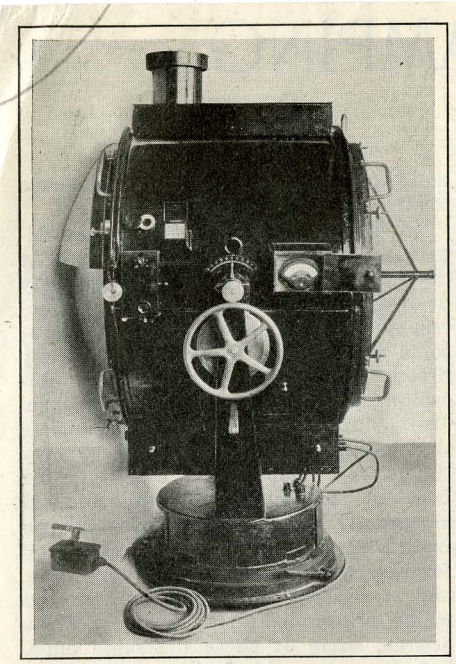
MORE LIGHT ON WAR

BY C. L. EDHOLM



THE SPERRY SEARCHLIGHT, SIDE VIEW

The wheel in the center controls the elevation, and the peep sight just above and to the right enables the operator to watch the arc without being blinded

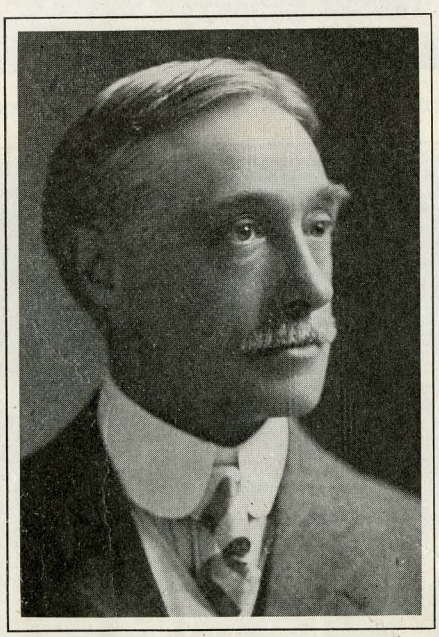
SO powerful that a newspaper can be read by its light at a distance of thirty miles, the Sperry searchlight is conceded to be without a rival as a projector of brilliant rays. The huge device weighs three tons, stands ten feet high, and its mirror has a diameter of five feet. Mounted on the roof of the Sperry Building in Brooklyn, it was used on election night to flash returns, and in the city of Albany, 150 miles away, the pencil of light could be seen against the sky as it swung back and forth.

Stated in terms of candlepower, the figures may not convey a clear impression, so after stating that the candlepower is more than one and a quarter billion, or 320,000 per square inch, one may add that the beam of this searchlight is as brilliant as the sun at eight o'clock in the morning or four in the afternoon, New York latitude. Sandy Hook Lighthouse is equipt with one of the most powerful beacons along any seacoast, yet this new searchlight is twenty-two times more brilliant, and if its ray were turned upon a ship it would follow and illumine the vessel until it dipped below the horizon. It is for such purposes that a searchlight is intended in navy use, so its comparative efficiency may be stated thus: that the target is illuminated ten times as brilliantly as by an ordinary projector.

In modern warfare an important use of the searchlight is to detect aircraft, therefore the carriage permits this beam to be turned in a circle and at any direction upward to ninety degrees. It is possible for the operator to control it from a distance of fifty feet, enabling him to focus accurately upon any point. This is accomplished by an electrical mechanism which swings the three ton weight accurately and easily upon ball bearings. Efficient illumination at a great distance is due in part to the fact that the rays in the beam are nearly parallel; therefore the light is concentrated upon the target instead of being diffused over surrounding objects. This is the result of producing a crater which more nearly approximates the mathematical point of light than does that in any other lamp.

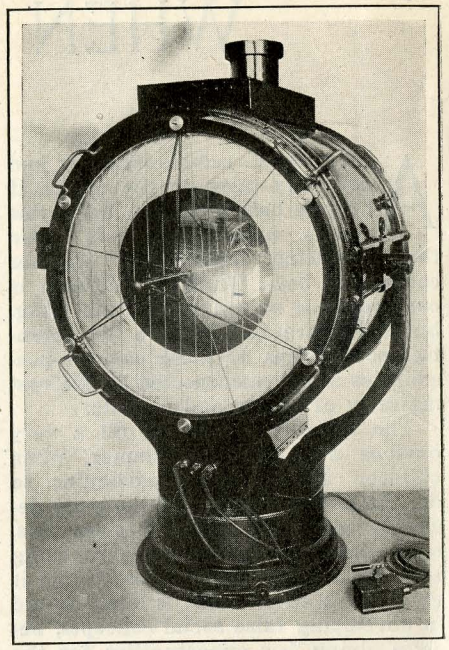
The heat thrown out by this light is so intense that when focussed sharply it will set paper afire at a distance of 250 feet, while men working in its glare find their skin reddening and peeling—the effects being similar to sunburn, but more painful. This is not surprizing in view of the fact that the temperature of the arc is 9000 degrees Fahrenheit. This is 7000 degrees higher than the melting point of the metal holders of the carbons, and as the holders are only an inch away from this intense heat it is necessary to protect them by a current of cool air. So a motor driven centrifugal blower is employed which forces a current of air thru the electrode or carbon supports and discharges it thru heat-radiating discs that surround the holders. Otherwise such a light could not be operated, as the metal parts would be melted in short order.

Several points of difference account for the extreme brilliance of this type of lamp with its high intensity electric arc. Its effectiveness is due to small electrodes, the special or impregnated carbons used, the manner in which they burn and the large parabolic mirror reflecting the light. The voltage across the arc is about 75. The lamp is operated at such a high temperature that the carbons give off a superheated vapor which burns in a crater of small diameter that is maintained in the positive electrode, thus adding to the beam's intensity. A peep sight furnished with colored glass is used to enable the operator to watch the arc without being blinded by the glare, or he can see an exact reproduction of the arc formed by lenses upon ground glass outside of the lamp. The light is reduced or shut off by means of an iris diaphragm (similar to a type used on high grade cameras) which may be seen in the front view of the searchlight back of the glass.



ELMER A. SPERRY,

Inventor of the searchlight, and also of a ship stabilizer, the gyro-compass, and the first electric arc light



THE GREAT MIRROR

This glare of one and a quarter billion candlepower is as brilliant as afternoon sunlight. The box on the floor provides electric control thirty feet away

The Sperry light is designed for various military and naval purposes, besides those of peace. It locates enemy forces, vessels or air craft, and is useful also in throwing a screen of light, for it is impossible to see *thru* the beam. Thus operations and movements of friendly forces or vessels can be screened from the enemy view by throwing the light across the field from one side.

It is also available for signaling up to one hundred miles, and may be used by field forces when mounted on an armored car. It is in use at present by the navies of the first class European powers.

Elmer A. Sperry, the designer of this important device, is an electrical engineer and scientist, who was appointed a member of the Naval Advisory Board upon nomination of the American Society of Aeronautical Engineers in 1916. He has been the recipient of many honors from foreign nations as well as our own, honors earned by such valuable inventions as the gyrocompass, ship stabilizer, electric coal mining machinery, and (in coöperation with his son Lawrence Sperry) the aeroplane stabilizer. When only nineteen years old, he designed the first electric arc light and dynamo and a few years later, in 1883, he erected on Lake Michigan the highest electric beacon in the world. Mr. Sperry was also one of the first designers of electric street railway cars.

New York City