

April 26, 1932.

E. PEARSE

1,855,867

SEARCHLIGHT

Filed Oct. 6, 1930

3 Sheets-Sheet 1

Fig. 1.

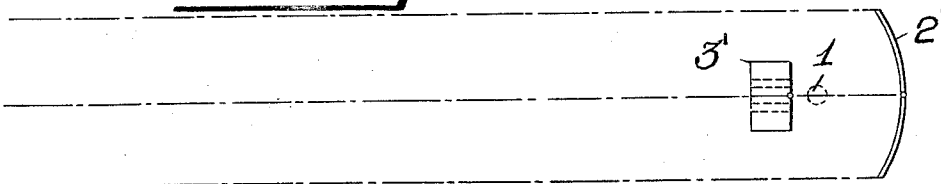


Fig. 2.

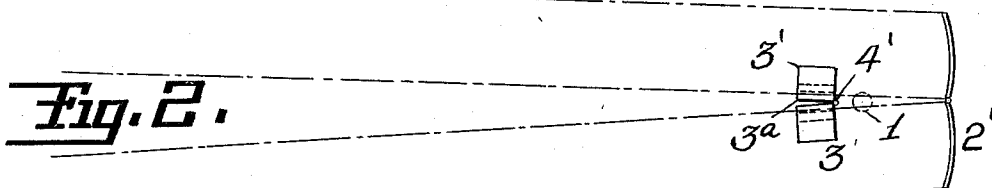


Fig. 4.

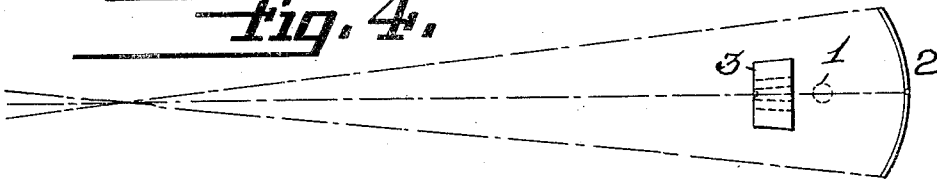


Fig. 5.

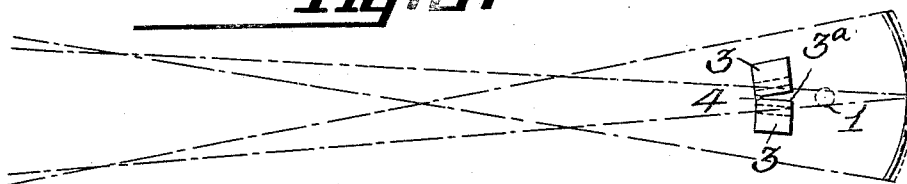
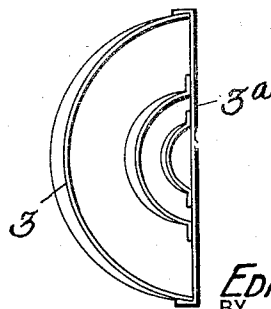
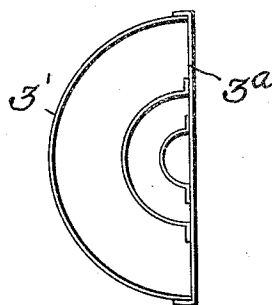


Fig. 3. Fig. 6.



INVENTOR.
EDMUND PEARSE
BY
Herbert F. Thompson
his ATTORNEY.

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E. PEARSE

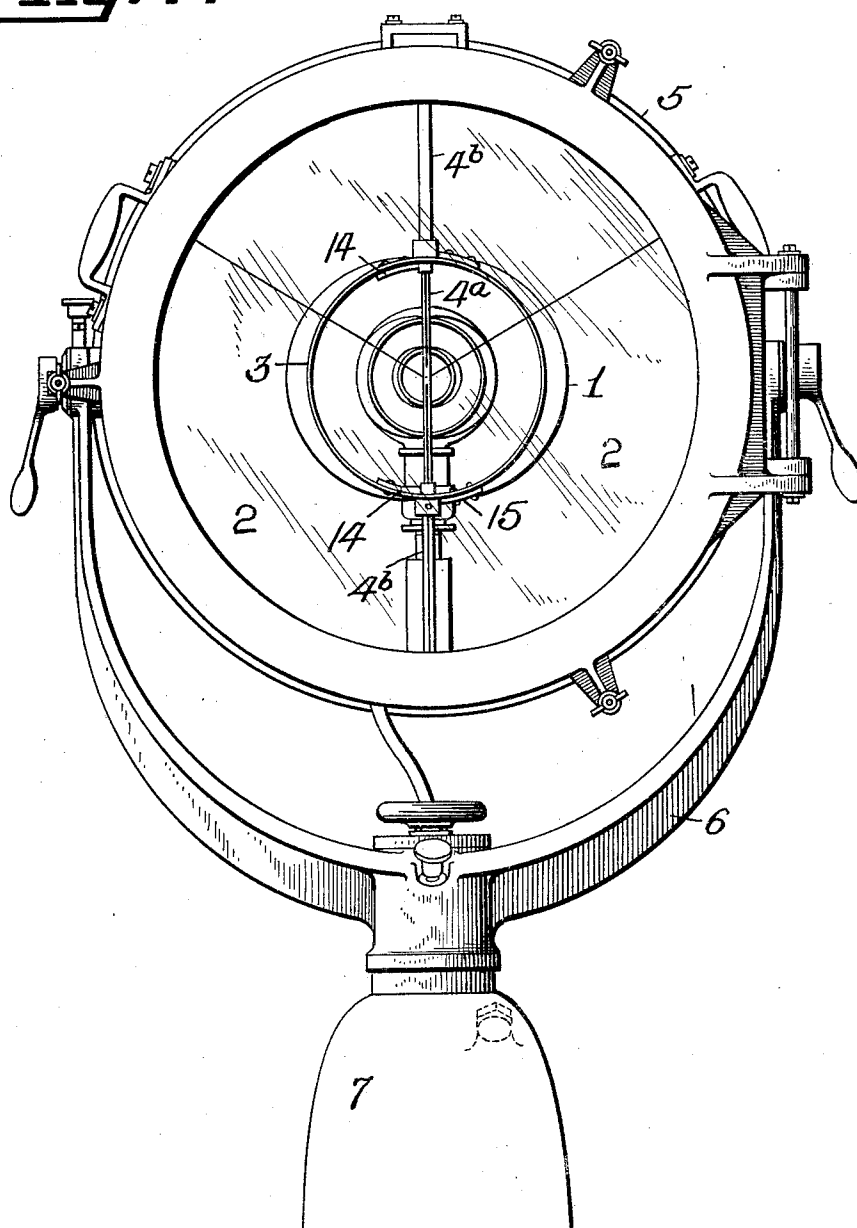
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Fig. 7.



INVENTOR
EDMUND PEARSE
BY
Herbert H. Thompson
his ATTORNEY.

April 26, 1932.

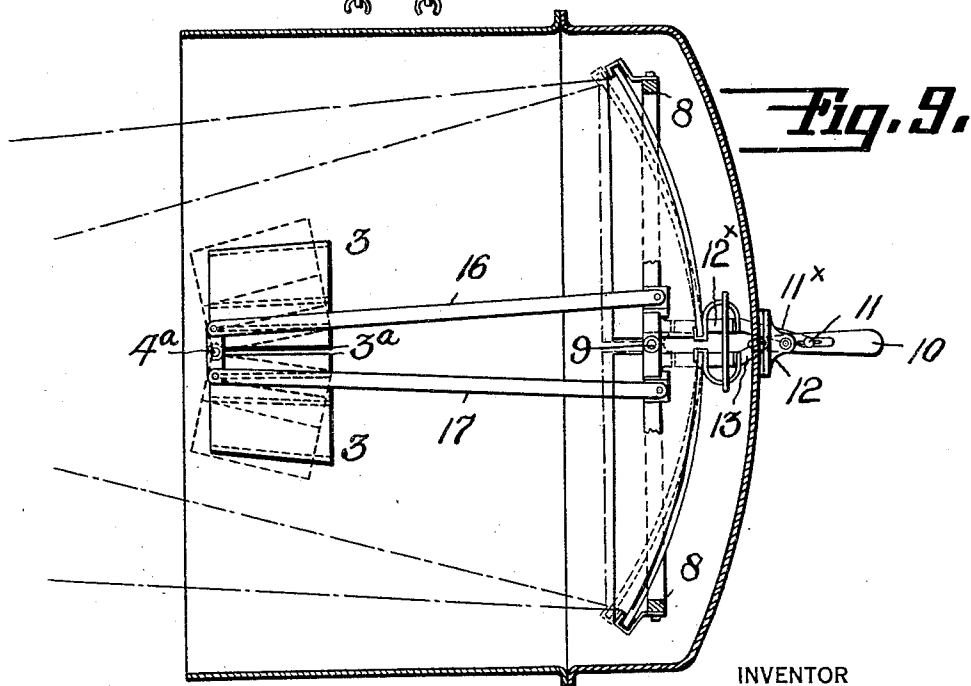
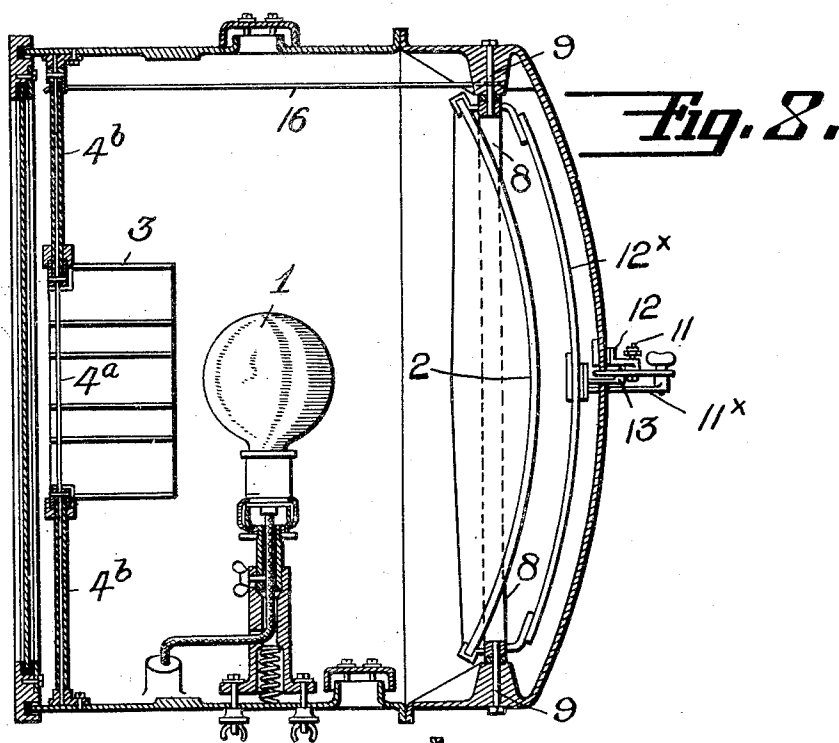
E. PEARSE

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SEARCHLIGHT

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3 Sheets-Sheet 3



INVENTOR
EDMUND PEARSE
BY *Herbert W. Thompson*
ATTORNEY.

UNITED STATES PATENT OFFICE

EDMUND PEARSE, OF EYNSFORD, ENGLAND, ASSIGNOR TO SPERRY GYROSCOPE COMPANY INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK

SEARCHLIGHT

Application filed October 6, 1930, Serial No. 486,562, and in Great Britain October 14, 1929.

This invention relates to searchlights and has particular reference to searchlights of the kind in which the beam is split vertically into two halves which are deflected laterally to leave a relatively dark zone straight ahead as required particularly by vessels travelling by night through the Suez Canal.

The advantages of electric arcs as the source of light in searchlights are generally known particularly the advantage due to the smallness of the light source. Owing, however, to the relatively great expense of arc lamp mechanism and its need of skilled attention, incandescent light is sometimes used as the light source in projectors and the disadvantage due to the unavoidably great size of the light source is overcome or minimized by so-called stray light rings in the form of short cylinders or rings mounted concentrically with respect to the beam axis.

The chief object of the present invention is to render the use of an incandescent light source practicable in searchlights of the Suez Canal type and with this object in view the invention consists broadly in dividing the stray light rings and providing means whereby lateral deflection of the half-rings takes place correspondingly with lateral deflection of the halves of the split-beam. Clearly, however, although the invention is particularly applicable to projectors using incandescent light it is also applicable to arc lamp projectors.

For simplicity and uniformity of operation, the half-rings and half-mirrors may be interconnected in pairs so that a single manipulation causes actuation of both pairs, for which purpose each half-ring may be connected to the corresponding half-mirror by any convenient form of gearing or linkage or other form of mechanical transmission. In one simple embodiment of the invention the half-rings are mounted upon a vertical hinge-pin common to all of them, whilst each half-ring or set of half-rings is connected by a link to the adjusting mechanism of the split mirror.

The stray-light rings may be of the usual form or of any other form suited to the purpose in view.

The diverging of the two halves of the rings in accordance with the present invention not only deals effectively with the stray light but serves to present an obstruction to the light which ordinarily streams directly forward from an incandescent lamp.

In order that the invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings which illustrate one embodiment of the invention and in which:—

Figures 1 and 2 are two diagrammatic plan views of a searchlight with paraboloid mirror, Figure 1 showing the beam un-split whilst Figure 2 shows it split.

Figure 3 is an end view of one half of the set of stray light rings seen in plan in Figures 1 and 2.

Figures 4 and 5 are views similar to Figures 1 and 2 respectively of a searchlight having a mirror which is parabolic in vertical section and elliptical in horizontal section.

Figure 6 is an end view of one half of the set of stray light rings seen in plan in Figures 4 and 5.

Figure 7 is a front elevation of an incandescent lamp projector constructed and adapted to operate in accordance with the present invention.

Figure 8 is a longitudinal section and Figure 9 is a horizontal section.

Referring first to Figs. 1 to 3 it is seen that light from the source 1 strikes the split mirror 2' and is thereby directed forwards as a cylindrical beam in Figure 1 and as a converging beam in Figure 4. The central portion of the beam in each case passes through the concentric stray light rings 3'. According to Figure 2 the beam is split into two diverging substantially semi-cylindrical beams and the two halves of the split rings are made to diverge correspondingly from a common vertical hinge pin 4' at the rear end of the rings 3'. According to Figure 5 the beam is split into two half beams crossing one another and the two halves of the rings 3 are correspondingly displaced angularly about a common vertical hinge pin 4 at the front end of the rings. It will be understood that

instead of hinging the half rings at their front or rear ends as shown in Figures 5 and 2 respectively, any other convenient means for enabling the halves to be moved divergently may be employed.

Referring now to the construction shown in Figures 7, 8 and 9 the drum casing 5 is shown tiltably mounted in the yoke 6 surrounding the pedestal 7. At the front of the drum are mounted the split rings 3 and at the rear is mounted the split mirror 2 whilst between the rings and the mirror and at the focus of the latter is mounted the incandescent lamp 1 as light source.

The split mirror 2 is mounted in a split carrier ring 8 the halves of which are rockably secured to the drum by vertical hinge pins 9, 9, so that each half mirror with its half ring carrier can be moved angularly around the vertical axis of the hinge pins.

The mechanism shown for moving the halves of the carrier ring 8 comprises a handle 10 pivoted to rock in a horizontal plane about a pivot pin 11 carried by a bracket 12 secured to and projecting outwardly from the centre of the back plate of the drum. This handle 10 is connected to one half of the carrier 8 by means of a horizontal link 11* and curved vertical arm 12* and is connected to the other half of the carrier by means of a horizontal link 13 and a similar curved vertical arm. The points of connection of the horizontal links 11* and 13 with the handle 10 are on opposite sides of its pivot pin 11 and the points of connection of the respective arms 12* with the respective carrier halves are on opposite sides of the vertical hinge pins 9. Hence a rocking motion of the handle 10 will cause the halves of the carrier 8 to swing towards one another as shown in dotted lines in Figure 9 or away from one another.

The two halves of the stray light rings 3, 3, are secured as to one half to a vertical rod 4^a and as to the other half to sleeve members 4^b surrounding the rod, the said rod and sleeve members constituting the entire hinge pin for the rings. The rod 4^a is secured to its half of the split rings by two lateral arms or cranks 14 (Fig. 7) and the sleeves 4^b are secured to their half of the split rings by lateral arms or cranks 15 (Fig. 7).

The rocking of the halves of the mirror in unison with the halves of the rings is effected by horizontally extending bars 16 and 17.

It will be understood that by rocking the handle 10 to right or to left the mirror halves will be made to converge or diverge and that the halves of the stray light rings will be simultaneously rocked to correspond, the dotted positions of the ring halves in Fig. 9 corresponding with the dotted positions of the respective mirror halves. Obviously, however, the rocking of the mirror halves in unison with the ring halves can be effected by

various other forms of mechanism and that the linkages above described are only one embodiment of the necessary means.

Each D-shaped assembly of half rings 3 has a solid vertical wall or boundary plate 3^a (Figs. 3 and 6) and it is to be noted that when the halves are angularly separated as shown either in Figures 2 or 5 the divergent vertical plates present a central baffle or obstacle of appreciable size to light travelling forwardly direct from the lamp and thereby perform the useful function of preventing such direct light from becoming troublesome to approaching vessels.

What I claim is:—

1. A searchlight of the type having a "split" mirror forming two hinged halves and stray light rings, characterized by the fact that the stray light rings are also "split" forming two hinged halves so as to be capable of movement to correspond with the movements of the mirror halves.

2. A searchlight as claimed in claim 1, in which the halves of the split mirror are mechanically connected to the respective halves of the stray light rings so as to move therewith.

3. A searchlight comprising a mirror formed in two halves swingable about a diametrical hinge, stray light rings also formed in two halves swingable about a diametrical hinge, means connecting each half-mirror to its respective half-ring so that they move together, and means for turning the connected pairs about their hinges.

4. A searchlight as claimed in claim 3 in which the means provided to move the mirror halves and ring halves are controlled from a common operating handle.

5. A searchlight as claimed in claim 3 in which the respective halves of the stray light rings are provided with vertical boundary plates to offer an effective baffle or obstacle to the travel of beam rays directly forward when the beam is split.

In testimony whereof I have signed my name to this specification.

EDMUND PEARSE.