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IRIS PROTECTION APPARATUS FOR HIGH-INTENSITY SPOTLIGHTS

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This invention relates to iris protection apparatus for a high intensity spotlight, and more particularly to such apparatus, applicable to spotlight equipment having a high powered light source, which generates great heat in the form of radiant heat energy, for protecting the iris apparatus conventionally used with such spotlights from damage by radiant heat.

In modern types of spotlights of the type conventionally known as "Klieglights," such as are in common use in the larger theaters and in moving picture and television studios, it has become common to use higher and higher powered sources of illumination. Even if conventional means be resorted to for ventilating such apparatus by fans or other equipment of a similar nature, the light sources transmit large amounts of heat by radiant energy alone, which cannot be diminished in intensity by any ventilation or air circulation means. It is necessary, therefore, that all the portions of the spotlight apparatus which is subject to such intense heat radiation be constructed in a manner and from material which will be proof against substantial damage by radiant heat energy in order that the apparatus as a whole have a reasonable life. This is a relatively simple matter as to stationary walls and other parts not required for the transmission of light and particularly as to parts which are not in the direct focused beam of the radiant energy. It is common, however, to use iris shutter apparatus in conjunction with such spotlights which include a plurality of simultaneously movable segments adjustable by a suitable manually operated means for predetermining the diameter of the spot of light produced by the apparatus as a whole. It is further conventional in such apparatus that the iris shutter means shall be adjusted within certain limits, one of which is a completely closed position, thus shutting off the spot by adjustably reducing its diameter to zero. Inasmuch as the means normally used for making the segments of the iris shutter apparatus are relatively sensitive to heat, and as such apparatus is and must be in the direct focused beam of the light and heat energy, these shutters or segments of the iris shutter apparatus are particularly vulnerable to radiant heat.

It is, of course, possible to direct a blast of cooling air onto such apparatus so as to tend to keep it sufficiently cool to prevent damage thereto. However, such means, which may be classed broadly as ventilation means, are often inadequate to protect the iris shutter apparatus. This is particularly true where the source of light may be a high intensity incandescent bulb having a rating of the order of magnitude of 3,000 watts or more. Under such circumstances, further and particular protection means must be provided in

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order that the iris shutter apparatus shall have an appreciable normal life. The provision of such a protection means is therefore a primary object of the present invention.

5 A further and more detailed object of the present invention is to provide a heat absorbing shutter mounted in the spotlight apparatus between the light source and the iris shutter apparatus, along the path of radiant heat energy from the light source and movable into and out of a position to intercept radiant energy from this light source, so as to protect the iris shutter apparatus when it is adjusted to its closed position aforesaid.

15 It is necessary, of course, that the heat absorbing shutter be movable out of a position in which it will intercept any part of a beam of light which may pass through the iris shutter apparatus at any of the practical or usable open positions of the latter. For this reason, means are preferably provided in accordance with the present invention to prevent movement of the heat absorbing shutter into a light beam intercepting position during the time the iris shutter apparatus is open at any one of its adjusted positions. The provision of such means is a further object of the present invention.

A further and detailed object of the present invention is to provide a common means for adjusting the iris shutter apparatus between its several operative positions and preferably to and including a fully closed position, and also for moving the heat absorbing shutter to and from a position in which it will protect the iris shutter apparatus during the time the latter is closed.

Other and more detailed objects of the present invention will appear from the following particular description of a preferred embodiment thereof and will be pointed out in the appended claims, all when considered in connection with the accompanying drawings, in which:

Figure 1 is a view substantially in longitudinal vertical section of a spotlight apparatus embodying the present invention;

45 Fig. 2 is a view substantially in transverse vertical section, taken on the line 2—2 of Fig. 1 illustrating the operation of the apparatus in several positions;

Fig. 3 is a fragmentary view, similar to that of Fig. 2, showing some of the operating mechanism and showing the parts in a position in which the iris shutter apparatus is fully opened; and

55 Fig. 4 is a fragmentary detailed view substantially in horizontal section on the line 4—4 of Fig. 3.

There is first described the spotlight apparatus as a whole and the portions thereof which are essentially similar to prior and known types of such apparatus with the possible exception of