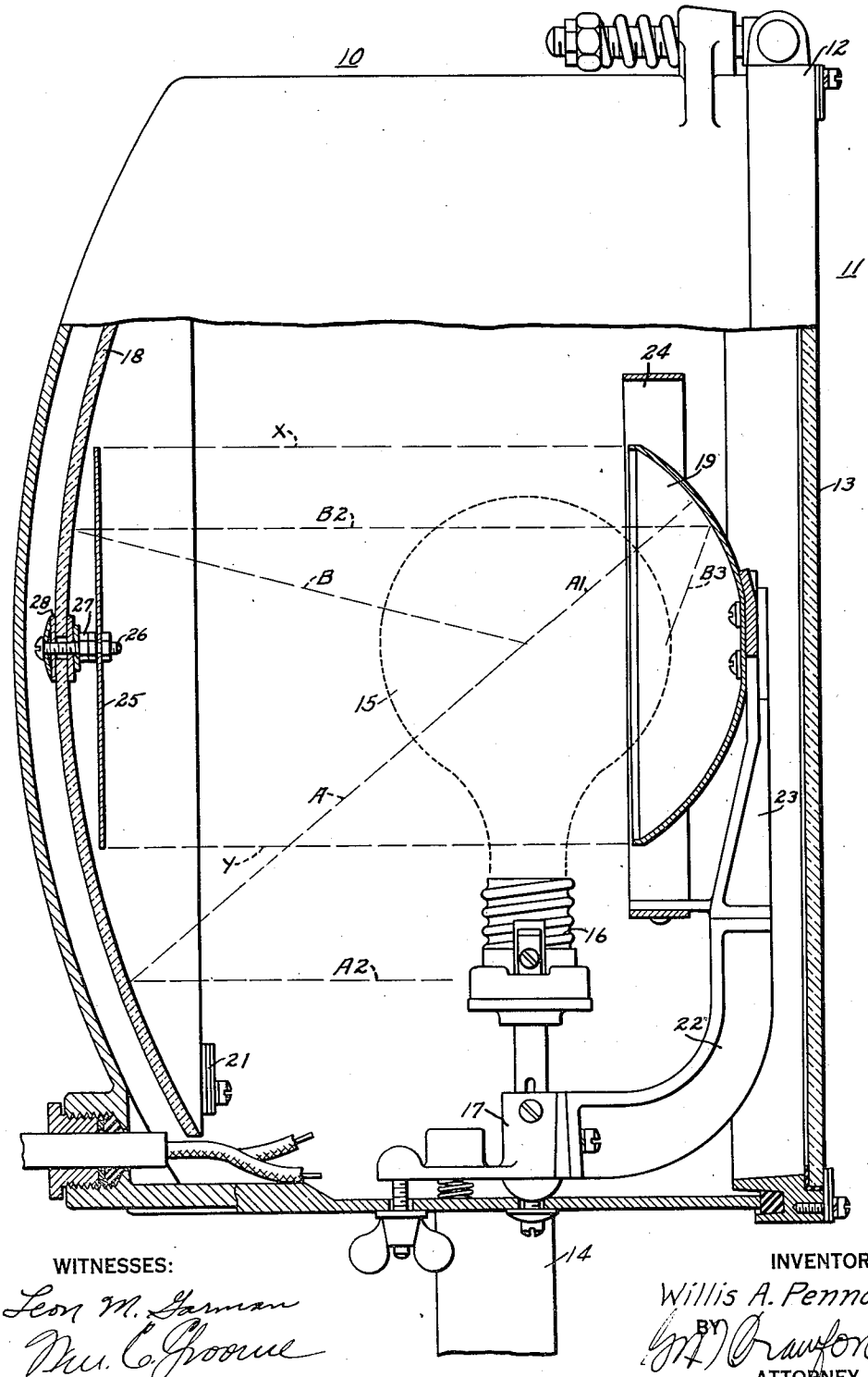
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REFLECTOR SYSTEM FOR LIGHTING UNITS

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REFLECTOR SYSTEM FOR LIGHTING UNITS

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My invention relates, generally, to lighting units, and, more particularly, to reflector systems for searchlights, floodlights and the like.

Tandem reflector systems employing various types of main reflectors such, for example, as parabolic and elliptical types, and an auxiliary reflector of the spherical type have been utilized in searchlights, and the like, for increasing the efficiency and light output thereof. I have discovered, however, that while these reflector systems function as intended in some respects, their use often results in exceptionally short lamp life due to blistering, softening or devitrification of the glass envelope or bulb of the lamp caused by the inherently misdirected light rays of the system. This results from the fact that the spherical reflector is located immediately in front of and on the opposite side of the lamp from the main reflector, so that the light rays reflected back onto the spherical reflector from an area at the central part of the main reflector, i. e., the misdirected rays, are reflected by the spherical reflector in a concentrated manner onto the side of the bulb adjacent the spherical reflector. This results in a concentration of destructive heat energy on the bulb.

I have discovered that this disadvantage may be overcome and the destructive effects of the misdirected light rays eliminated or appreciably reduced, by masking off those rays which cause damage without in any way affecting or reducing the useful light output of the reflector system.

The object of my invention, generally stated, is to provide a reflector system for a searchlight, or the like, which shall be of simple and economical construction and which shall function to produce the maximum light output without damage to the glass envelope of the light source.

A more specific object of my invention is to provide for substantially reducing the amount of and/or intensity of the misdirected light in a tandem reflector system.

A further object of my invention is to provide for utilizing a tandem reflector system in searchlights, and the like, without causing damage to the envelope of the light source through the concentration thereon of misdirected light energy.

Another object of the invention is to provide for masking off, by means of an opaque shield, or otherwise, a predetermined area on the main reflector of a tandem reflector system to substantially eliminate or reduce the heating up of the glass envelope of the light source used therewith due to the concentration of misdirected light rays thereon.

These and other objects of my invention will become more apparent from the following detailed description when read in conjunction with the drawing in which the single figure is a partially sectionalized view in elevation of a searchlight embodying the principal features of my invention.

The invention is being disclosed in a practical form suitable for application to searchlights and the like, although it is to be understood that it has application wherever a tandem reflector system is utilized, whether it be in a floodlight, searchlight or some other type of lighting unit employing a light source in the form of an incandescent or other lamp having a glass or otherwise destructible envelope which may become damaged or impaired by abnormal light energy concentration thereon.

Referring to the drawing, there is shown a preferred embodiment of my invention as it may be applied to a searchlight of well known construction. The searchlight comprises, generally, a body or drum 10 having a front opening which is closed by a door 11 comprising a door ring 12 hinged to the drum and a glass lens 13. The drum 10 may be mounted for movement in both elevation and azimuth in a well known manner on the bow 14 which is only partially shown for the sake of simplicity.

The searchlight is provided with an incandescent lamp 15 supported by the socket 16 from the lamp adjuster 17 mounted at the bottom of the drum as shown.

The searchlight is further provided with a tandem reflector system comprising, a main or primary reflector 18 and an auxiliary reflector 19.

The main reflector 18 may be of any suitable type, such, for example, as a polished and silvered glass reflector supported at the back of the drum by means of suitable clips 21. This reflector may be of a parabolic or elliptical shape or any other suitable shape.

The spherical reflector 19 may be composed of aluminum having a reflecting surface. It may be supported in any suitable manner, such, for example, as by means of the bracket 22 and spider 23, the bracket 22 being attached to the lamp adjuster 17 as shown. If desired, the spider 23 also may be utilized to support a louver 24.

As pointed out hereinbefore, the primary object of my invention is to provide for reducing or eliminating the destructive effects of the misdirected light rays in a reflector system of this type, in order that the energy from these light

rays will not be concentrated upon the surface of the lamp bulb.

As will be readily understood, all of the light rays from the lamp 15, such as may be illustrated by the dash line A, are projected as useful rays A2 through the front door of the searchlight drum. The rays A1, which strike the spherical reflector 19 are reflected back through the filament or light source zone of the lamp and are added to the useful light rays A2.

It will be further understood, however, that all of the light rays, such, for example, as those illustrated by the dash line B, and which fall upon the main reflector 18 in an area represented by the lines X and Y, are projected back onto the spherical reflector 19 as rays B2 and are reflected by it as rays B3 onto the surface of the bulb 15. All of the rays B, B2 and B3 are the misdirected light rays of the system and are those rays which cause damage to the lamp bulb.

In order to eliminate the destructive effect of these rays, I have provided for masking them off from the main reflector or rendering them ineffective. This result may be effected in a number of different ways. However, in this instance it is accomplished by means of an opaque shield 25 suitably attached to the face of the main reflector 18 by means of the machine screw 26, nuts 27, and washers 28. This shield is preferably made of an opaque or non-reflecting material which absorbs or fails to reflect any of the light rays B which are projected upon it from the filament zone of the lamp. It should be of such diameter as to effectively intercept all of the rays B. When the shield is mounted in the position shown closely adjacent to the face of the main reflector, it is substantially of the same diameter or configuration as that of the spherical reflector 19. It will be readily understood, however, that this shield may be positioned at almost any point between the main reflector and the lamp 15, and that its diameter will vary accordingly.

While I have shown the use of an opoque shield for accomplishing the desired result, it will be apparent that this result may be accomplished in other ways. For example, the main reflector 18 may be provided with an opening of suitable size, or the reflecting surface of the reflector may be omitted or removed over a predetermined area which is equivalent to that covered by the shield. In addition, this area on the face of the reflector might be covered with heat or light absorbing material. Likewise, the shield 25 may be composed of heat or light absorbing material. In fact, the desired results may be accomplished by any means which functions to block off from the main reflector all of these rays from the light source which, when reflected by it, will fall upon the spherical reflector 19.

In view of the foregoing description, it will be apparent that my invention provides for readily and economically improving the operation of a tandem reflector system without in any way impairing or reducing the efficiency of the lighting unit in which it may be used. By utilizing the principles of my invention, the tandem reflector system may be used with all its attendant advantages without the disadvantage of reduced life of the lamp resulting from the destructive heating effects of the misdirected light rays of the system.

Since it is apparent that various changes and modifications may be made in the illustrated example of my invention without departing from the principles thereof, it is intended that all matter contained herein shall be considered as illustrative and that the invention shall be limited only by the scope of the appended claims.

I claim as my invention:

1. A lighting unit comprising, a housing having a front opening, a transparent cover for said opening, a main bowl-shaped reflector mounted in the back of the housing opposite the front opening, an incandescent lamp, means including a socket for supporting the lamp in the housing in front of the main reflector with its axis at right angles to the axis of the main reflector and the light source region on the focal point of the main reflector, an auxiliary spherical reflector of lesser diameter than the main reflector and spaced from the lamp and supported within the housing on the opposite side of the lamp directly facing the main reflector with its axis coinciding with the axis of the main reflector and its center point in the light source region of the lamp, and an opaque nonreflecting circular shield supported from the main reflector intermediate the said reflector and light source directly opposite the spherical reflector, said shield having an effective diameter of such magnitude as to mask off an area on the main reflector to prevent any light rays from the lamp being reflected from the main reflector into the spherical reflector for re-reflection onto the glass envelope of the lamp adjacent the spherical reflector, thereby to prevent damage to the glass envelope by concentrated heating.

2. A lighting unit as defined in claim 1, wherein said auxiliary spherical reflector is supported from the lamp supporting means, and said circular shield is supported by means positioned in an opening in the main reflector.

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