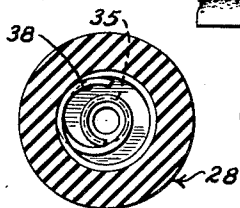
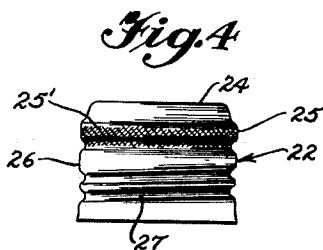
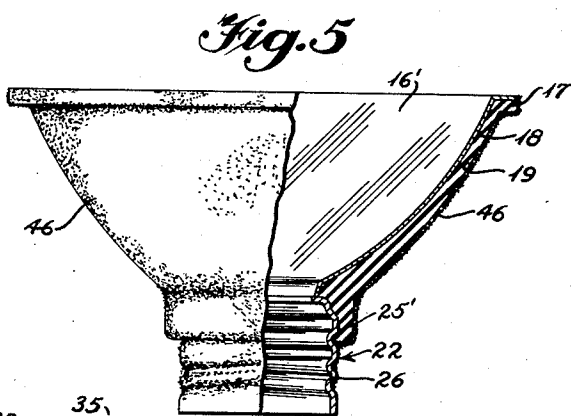
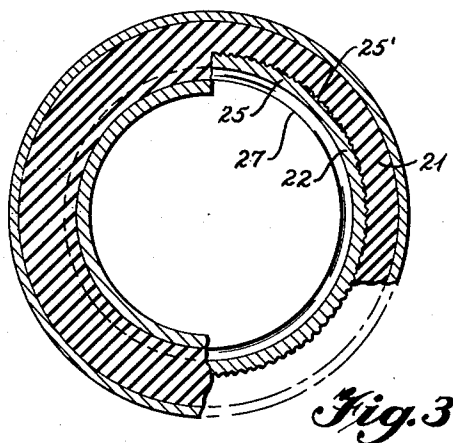
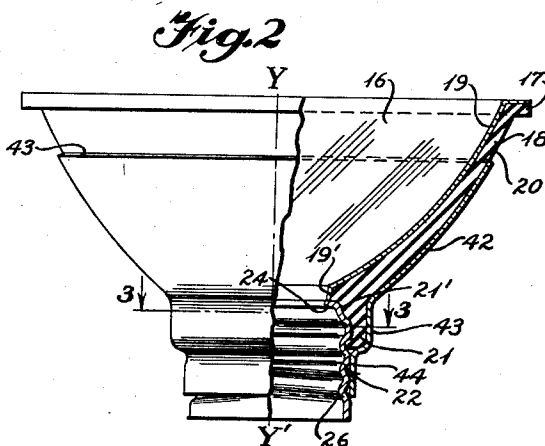
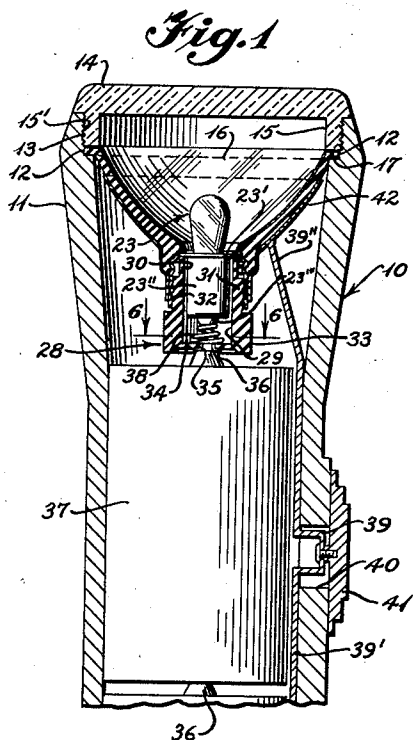


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E. J. GARLAND
FLASHLIGHT REFLECTOR ASSEMBLY FOR
PREFOCUSED LAMP MOUNTING
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1

My invention relates to improvements in a flashlight and, more particularly, to the reflector assembly for a pre-focused type lamp mounting.

The principal object of my invention is to provide an assembly consisting of a molded electrically non-conductive reflector body and a metallic socket for receiving a pre-focused type lamp wherein the reflector body has metallic reflective coating deposited on its front face and an electrical conductive material positioned on its rear face in electrically conductive contact with the metallic socket.

A further object of my invention is to provide a flashlight reflector assembly for mounting a pre-focused type lamp which is easily manufactured, is relatively inexpensive and yet furnishes a permanent highly reflective surface for a pre-focused type lamp.

A still further object of my invention is to provide a molded reflector of electrically non-conductive material having an outwardly extending bead at its front end so that it may be secured in the end of a flashlight case, an integrally molded apertured neck at its center which has secured therein a tubular metallic socket formed with a seating flange for a pre-focused type lamp and having threads formed in the walls thereof to receive a lamp securing plug while the front face of the reflector has deposited thereon a permanent highly reflective coating and the rear face of the reflector has fitted thereagainst a conductive concave-like element which is provided with a centrally apertured sleeve press fitted over the socket and in electrical contact therewith.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples are given by way of illustration only and, while indicating preferred embodiments of the invention, are not given by way of limitation, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

For a more complete understanding of the nature and scope of the invention, reference may be had to the following description and drawings in which:

Fig. 1 is a cross sectional view of the forward half of a flashlight showing the mounting of the reflector assembly, pre-focused type lamp, batteries, and electrical contact from the switch to

2

the conductive rear surface of the reflector and thence to the lamp;

Fig. 2 is a side elevation partially in section of one form of the reflector assembly as depicted in the flashlight in Fig. 1;

Fig. 3 is an enlarged cross-sectional view along section line 3—3 in Fig. 2;

Fig. 4 is a side elevation of the metallic socket of the reflector assembly;

Fig. 5 is a side elevation partially in section of a modified form of reflector assembly showing a conductive coating on the rear side of the reflector body; and

Fig. 6 is a cross sectional plan as viewed along section line 6—6 in Fig. 1.

Throughout the various figures of the drawings like reference numerals refer to similar parts.

Referring to Fig. 1, a typical flashlight case, herein illustrated as of non-conductive material, is indicated generally at 10 and is provided with an outwardly tapered front end 11 having a shouldered recess 12 formed in the end thereof which is threaded as indicated at 13 to receive a lens 14. Lens 14 is provided with a rearwardly extending annular shoulder 15 that is externally threaded at 15' so that it may be positioned by means of threads 13 in recess 12. It will be understood that the foregoing description of the flashlight head is for illustration only and that various arrangements, known to the art, may be employed for positioning and securing the reflector.

A reflector assembly, according to my invention, is generally indicated at 16 and is provided with a molded on bead 17 which extends outwardly at the front end of the reflector and transverse to the longitudinal axis Y—Y' through the center of the reflector. This bead 17 fits within the shoulder 12 and has the annular shoulder 15 of the lens 14 screwed thereagainst so as to hold the reflector in mounted position in the end 11 of the flashlight. Here again it should be understood that the shape of the outer flared end of the reflector has been adapted to the illustrative form of flashlight head—the shape of this outer end of the reflector may be changed to cooperate with other forms of flashlight beads.

In Fig. 2 the reflector assembly 16 is shown in somewhat enlarged form. The body 18 of the reflector is of electrically non-conducting readily molded plastic material, such as styrene, which may be suitably shaped in an injection mold. It is desirable to mold the body under conditions which provides for a very smooth surface

for receiving a metallic reflective coating. The body 13 is formed with a concave front end or face 19 which terminates in an inwardly and rearwardly tapered throat portion 19' while its front end is formed with the head 17 as previously described. The rear face 20 is convex in shape and somewhat complementary in shape to the front face 19. The extreme rear end is formed as a rearwardly projecting neck 21 which is apertured at 21' to receive a metallic tubular socket generally indicated at 22. The longitudinal axes of the socket 22 and the neck portion 21 coincide with the longitudinal axis Y—Y' of the reflector.

Reflector body 18 has its front face or end 19 coated with a permanent highly reflective metallic coating preferably aluminum which preferably is deposited while in vaporized condition as by means of a high vacuum depositing process. The front face surfaces 19 and 19' provide a highly reflective area for light emanating from the pre-focused type lamp generally indicated at 23 in Fig. 1.

The metallic socket 22 is of tubular shape and is formed with an inwardly extending flange 24 at its forward end to provide a seat for the flange 23' on the pre-focused type lamp 23 which also has the customary cylindrical shaped shank 23''. Socket 22 is formed with one or more outwardly extending annular ribs 25, see Fig. 4, which may be provided with a knurled outer surface 25' to afford a more secure gripping action in the molded neck 21 as shown thereabout in Fig. 2. The socket 22 has a rearwardly extending skirt portion 26 which projects from the end of the neck 21 of the reflector body. This skirt portion has threads 27 formed in its wall and particularly on the inner surface to receive a screw plug 28 as shown in Fig. 1. The screw threads 27 may extend through substantially the whole length of the socket so that the threads thus formed proximal to the flanged end 24 will serve as and replace rib 25. I prefer, however, to use rib 25 as shown in Figures 2 and 4 to more positively secure the socket 22 within the molded neck 21 and minimize detachment from turning.

Referring to Fig. 1, there is shown the screw plug 28, by way of example, that holds the pre-focused type lamp 23 in operating position in the reflector assembly. Plug 28 may be molded of suitable plastic non-conductive material and is formed with a longitudinal aperture 29 extending therethrough which is in spaced relationship about the shank 23'' of the lamp 23. The forward end portion 30 of the plug 28 is formed as a reduced annular portion so as to fit within the surrounding socket 22 and still have its forward end pressed against the flange 23' on the lamp 23 to hold it in operative position. Adjacent this reduced end portion 30 is a slightly enlarged annular portion 31 which is formed with threads 32 on its outer surface so as to be received within the threads 27 in the socket 22. The rear end of the plug 28 is further enlarged at 33 and may be provided with a knurled surface or ribs (not illustrated) so that it may be more easily grasped in the fingers and screwed into assembled position. Plug 23 is formed with an end wall 34 which is apertured in its center to receive a conductive apertured rivet 35 which is secured therein as by crimping each end against the surrounding end wall surface. This rivet 35 is in electrical contact with the end terminal post 36 of the battery 37. In electrical contact with the rivet 35

and housed within the elongated chamber 29 in the plug 28 is a coiled spring 38, see Figures 1 and 6. Each end of coiled spring 38 extends helically and a small coil is formed at each end, one of which is in contact with the rivet 35 while the other is in contact with the terminal 23'' on the rear end of lamp 23.

In Fig. 1 there is shown in a typical flashlight, a switch 39 which is slidably mounted in the aperture 40 formed in the wall of the flashlight 10. The slide switch 39 has attached an insulated operator 41 which slides on the outside of the flashlight casing. Slide switch 39 has a rearwardly extending conductive portion 39' which extends so as to make contact with the back end of the rearmost battery (not shown) while the forwardly extending conductive end 39'' of the slide switch is shown in contact with the conductive means, to be described, on the rear of the reflector.

In the two types of reflectors shown, one type in Figures 1 and 2 and another type in Fig. 5, the construction may be identical except for the conductive means at the rear of the reflector.

In Figures 1 and 2 the conductive means consists of a metallic concave, dish-like, element 42 of brass or other metal having a shape which is complementary to all or a selected part of the rear surface or face 20 of the reflector body 18. The element 42 may cover the entire rear surface 20 but a saving of metal may be effected by partial coverage and as shown in Fig. 2 extends forwardly to 43 where its edge is in spaced relationship to the end of the reflector 18. It is only necessary that the element 42 project forwardly a sufficient amount so as to provide a conductive contact for the end 39'' of the sliding switch member 39. The rear end of the element 42 is apertured to be received over the neck 21 as at 43 and at 44 so as to fit over and be in contact with the skirt portion 26 of the metallic socket 22. This metallic conductive element 42 is press fitted against the rear surface or face 20 of the reflector body 18 and against the neck portion 21 and the skirt portion 26 of the socket 22. Element 42 therefor serves the multiple functions of providing a conductive path between switch member 39 and sleeve 22 and also a strengthening backing for the reflector assembly.

In the modified type of reflector 16' shown in Fig. 5 all of the parts are similar to the reflector shown and described in Figures 1 and 2, except for the conductive means on the rear of the reflector body 18. It will be noted here that the rear face or surface 19 of the reflector body 18 is coated with a conductive coating 46 which may be metal sprayed on while in molten condition. This coating 46 is extended to cover also a portion of the skirt 26 of the metallic socket 22 so that an electrical conductive path is provided over all areas on the rear 19 of the reflector 18 and the junction thereof with the metallic socket.

The electrical conductive nature of the element 42 and the coating 46 permits a circuit to be completed from the base terminal of the battery 37 to the switch contact 39'', thence through the metallic socket 22, and through the flange 23' of the lamp 23 which is seated against the flange 24 on the socket 22. The other circuit from the battery electrode or post 36 is through the rivet 35 and spring 38 to the terminal 23'', on the rear end of the lamp 23.

Either of the types of reflector assemblies shown in Figures 2 and 5 provide for a very effi-

5

cient flashlight reflector which is easily manufactured and at a relatively low cost.

In the foregoing description references have been made to the various elements of the flashlight used to illustrate the environment of the reflector and assembly which comprises the present invention. It will be understood that the details of the flashlight casing are not part of or limitations on, the present invention. The flashlight casing may be of any desired shape or size, may be constructed of conductive or non-conductive materials, and may be provided with any desired type of switch employing either a stationary or movable contact strip. Obviously, the socket member 22 will be so positioned within the neck 21 of the reflector as to locate the flashlight bulb in the desired focal point, with regard to the parabolic reflecting surface of the reflector. Metal socket member 22 may be inserted in neck 21 in the plastic reflector after the latter has been preformed, as by softening the neck, or may be inserted in other manners. The preferred manner of positioning socket 22 is by insertion thereof in the mold and molding the reflector and neck 21 with the socket in situ.

Since it is obvious that certain further changes can be made in the foregoing constructions without departing from the spirit and scope of this invention, it is intended that all matter shown in the accompanying drawings or described hereinbefore shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflecting coating, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture therethrough with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said apertured neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp and threads formed in the wall of said socket, said reflector having electrical conductive means on the surface of the rear side which is in electrical contact with said metallic socket, said reflector assembly being adapted for use with a tubular plug having a central aperture adapted to be received over the shank of a pre-focused type lamp, a reduced diameter end portion adapted to seat against and hold the flange of a pre-focused type lamp against said socket flange and a threaded portion of larger diameter than said end portion adapted to be threaded into said threads in said socket.

2. In a flashlight as described in claim 1 wherein the extreme forward end of the reflector is molded with a bead extending outwardly and transverse to the longitudinal axis through the center of said reflector.

3. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflecting coating, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture therethrough having its longitudinal axis coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said apertured neck and having a skirt portion

6

projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp, an outwardly extending rib in the tubular wall proximal to its flanged end to assist in anchoring the socket in the tubular neck and threads formed in the skirt portion of the socket, said reflector having electrical conductive means on the surface of the rear side thereof which is in electrical contact with said metallic socket, said reflector assembly being adapted for use with a tubular plug having a central aperture adapted to be received over the shank of a pre-focused type lamp, a reduced diameter end portion adapted to seat against and hold the flange of a pre-focused type lamp against said socket flange and a threaded portion of larger diameter than said end portion adapted to be threaded into said threads in said socket.

4. In a flashlight as described in claim 3 wherein the extreme forward end of the reflector is molded with a bead extending outwardly and transverse to the longitudinal axis through the center of said reflector.

5. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflecting coating deposited thereon, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture therethrough with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said apertured neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp and threads formed in the wall of said socket, said reflector having an electrical conductive coating deposited on the surface of the rear side thereof, on said neck and on said metallic socket to provide for electrical conduction, said reflector assembly being adapted for use with a tubular plug having a central aperture adapted to be received over the shank of a pre-focused type lamp, a reduced diameter end portion adapted to seat against and hold the flange of a pre-focused type lamp against said socket flange and a threaded portion of larger diameter than said end portion adapted to be threaded into said threads in said socket.

6. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflecting coating deposited thereon, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture therethrough with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said apertured neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transversely inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp and threads formed in the wall of said socket, a concave shaped metallic element having an apertured neck adapted to fit over the neck on said reflector, press fitted over at least part of the rear of said reflector and the neck of the reflector and in electrical contact with the skirt of said socket, said concave shaped metallic element being at least so coextensive with the rear side

of said reflector as to provide a surface for engagement with a switch arm of a flashlight said reflector assembly being adapted for use with a tubular plug having a central aperture adapted to be received over the shank of a pre-focused type lamp, a reduced diameter end portion adapted to seat against and hold the flange of a pre-focused type lamp against said socket flange and a threaded portion of larger diameter than said end portion adapted to be threaded into said thread in said socket.

7. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflective coating, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture there-through with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, and a tubular metallic socket secured within said apertured neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp, an outwardly extending rib in the tubular wall proximal to its flanged end to assist in anchoring the socket in the tubular neck and threads formed in the skirt portion of the socket, said reflector having electrical conductive means on the surface of the rear side thereof which is in electrical contact with said metallic socket to provide for electrical conduction from the rear side of the reflector to said metallic socket.

8. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflective coating, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture there-through with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said apertured neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp, an outwardly extending rib in the tubular wall proximal to its flanged end to assist in anchoring the socket in the tubular neck and threads formed in the skirt portion of the socket, and an electrical conductive coating deposited on the surface of the rear side of

the reflector, on said neck and on said metallic socket to provide for electrical conduction from the rear side of the reflector to said metallic socket.

9. In a flashlight as described in claim 7 wherein the extreme forward end of the reflector is molded with a bead extending outwardly and transverse to the longitudinal axis through the center of said reflector.

10. In a flashlight, the combination of a molded reflector of insulating material, the forward face of the reflector being concave and provided with a metallic reflecting coating, the rear end of the reflector having an integrally molded rearwardly projecting neck provided with an aperture there-through with the longitudinal axis thereof coinciding with the longitudinal axis of the reflector, a tubular metallic socket secured within said aperture neck and having a skirt portion projecting rearwardly beyond said neck, said socket having a transverse inwardly extending flange at its forward end adapted to create a seat for the flange of a pre-focused type lamp, an outwardly extending rib in the tubular wall proximal to its flanged end to assist in anchoring the socket in the tubular neck and threads formed in the skirt portion of the socket, and a concave shaped metallic element having an apertured neck adapted to fit over the neck on said reflector, press fitted over the rear of said reflector, the neck of the reflector and in electrical contact with the skirt of said socket, said concave shaped metallic element extending forward along the rear side of said reflector to where it is in spaced relationship to the extreme front end of said reflector to provide for electrical conduction from the rear side of the reflector to said metallic socket.

11. In a flashlight as described in claim 10 wherein the extreme forward end of the reflector is molded with a bead extending outwardly and transverse to the longitudinal axis through the center of said reflector.

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