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3,128,050

FLASHLIGHT AND REFLECTOR ASSEMBLY THEREFOR

Filed July 20, 1960

2 Sheets-Sheet 1

FIG. 1

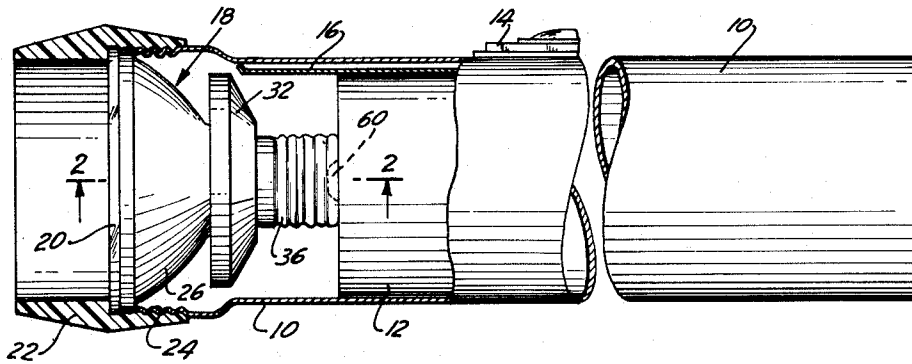
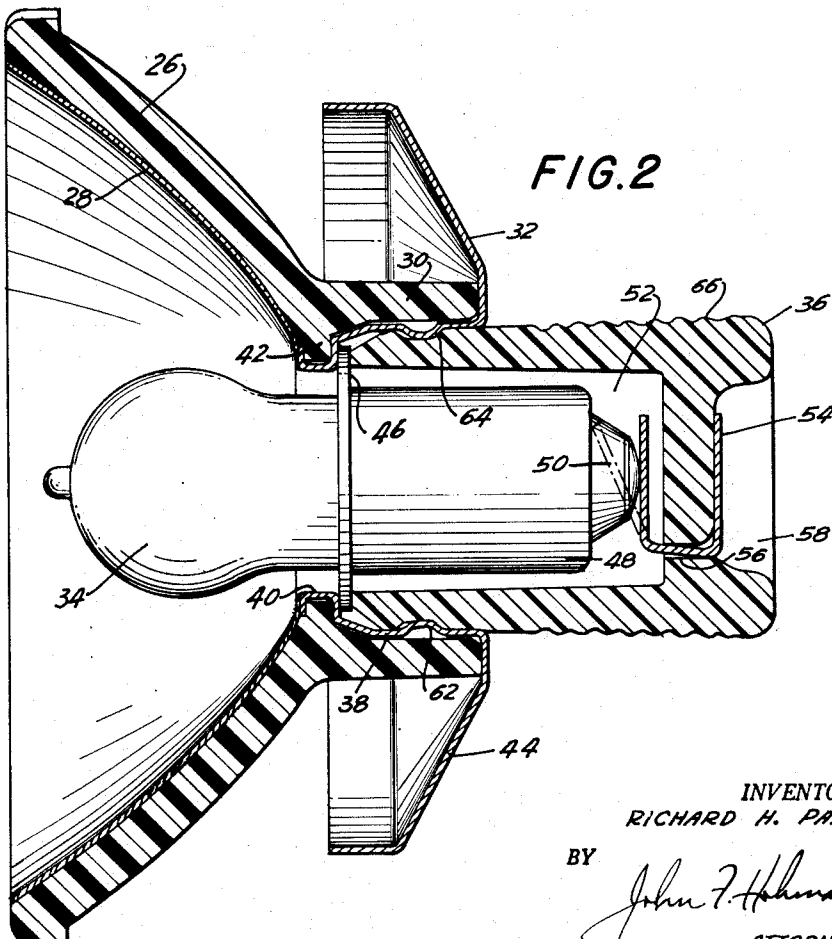


FIG. 2



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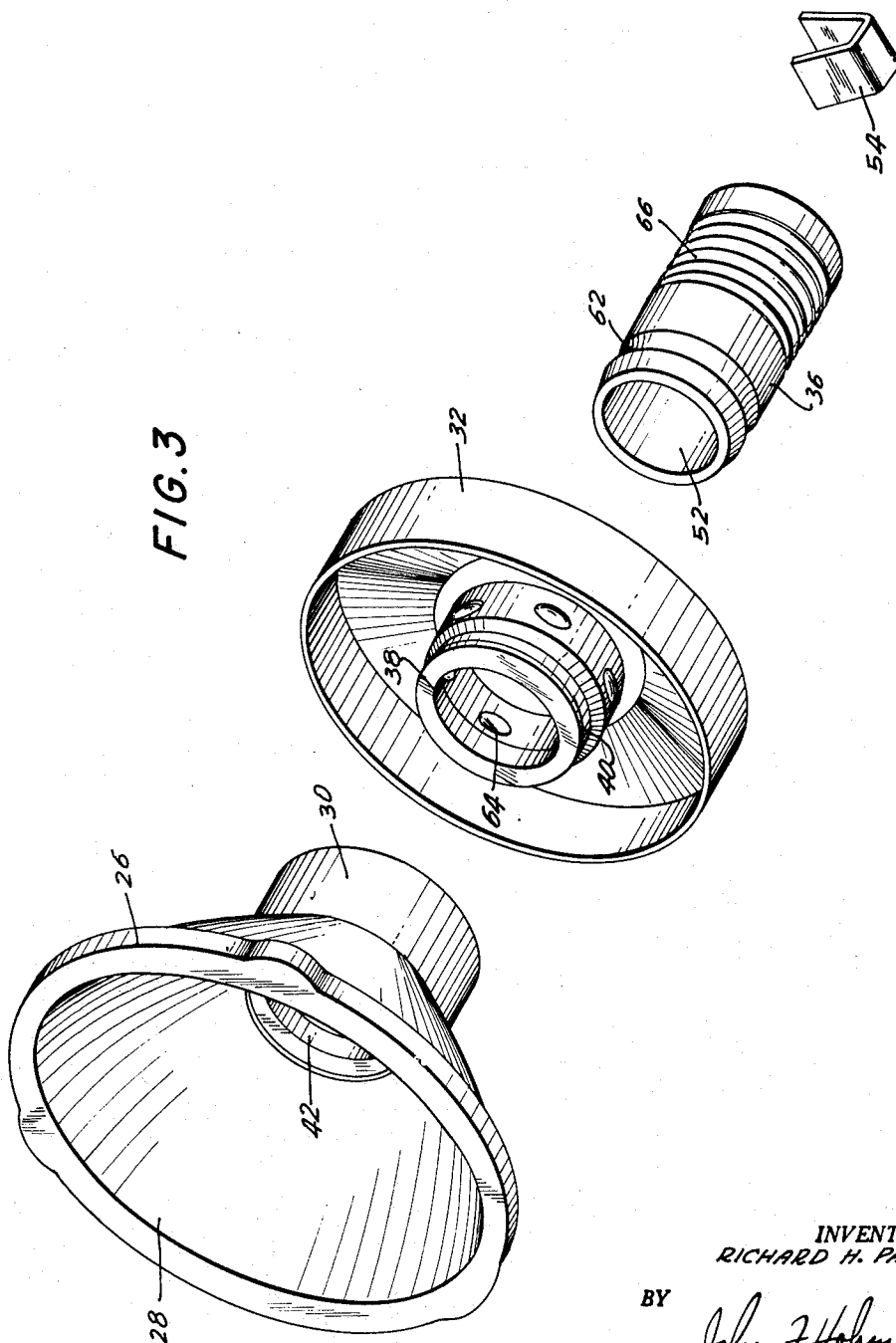
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2 Sheets-Sheet 2



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FLASHLIGHT AND REFLECTOR ASSEMBLY THEREFOR

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1 Claim. (Cl. 240-10.66)

This invention relates to a flashlight and, more particularly, it concerns the provision of an improved reflector assembly for a flashlight.

In a reflector assembly of the type to which the invention particularly refers, there is employed a reflector body composed of a non-conductive material, such as plastic, having a metallic reflecting coating thereon, and lamp retainer parts which are detachable for replacement of the lamp when needed. Heretofore, because these parts have been made threadably mountable to the reflector body, difficulty has been experienced both in the manufacture and use of a flashlight incorporating a reflector assembly of this type. For instance, it has been common for the lamp retainer parts of the reflector assembly to become loosened during use of the flashlight, or for these parts to have never been sufficiently tightened during manufacture, with the result that contact with the lamp may frequently be lost during use of the flashlight subjecting it to interrupted operation.

It is therefore an important object of the invention to provide an improved reflector assembly for a flashlight.

It is a more specific object to provide a reflector assembly of the type having a reflector body composed of a non-conductive material having a reflecting surface thereon and having lamp retainer parts which are detachable for replacement of the lamp when needed and which at the same time, in addition to being easily and quickly assembled during manufacture, are not subject to becoming loosened during use of the flashlight.

Still another object is to provide a reflector assembly which is simple in construction and highly economical to manufacture.

These objects are accomplished by the invention which comprises a reflector assembly for a flashlight having a reflector body composed of a non-conductive material having a reflecting surface thereon and having a lamp retainer plug which is detachably snapped into place within the reflector body.

In the accompanying drawings:

FIG. 1 is an elevational view, partly broken away, of a flashlight embodying the principles of the invention;

FIG. 2 is an enlarged detail sectional view of a reflector assembly embodying the invention; and

FIG. 3 is an exploded view of the reflector assembly parts shown in FIG. 2.

Referring now to the drawings, there is shown in FIG. 1 a flashlight of a conventional construction having a flashlight casing 10 within which are disposed batteries 12, the casing 10 being composed suitably of a thin gage metal such as, for example, chrome plated steel. Mounted to the casing 10 is a switch 14 and inside the casing 10 is a switch contactor member 16 which is mounted to the switch 14 and movable therewith. Indicated generally at 18 is a reflector assembly embodying the invention positioned within the forward end of the casing 10 which together with a lens 20 is held in place by a lens ring 22, suitably of plastic, which is threaded onto the casing at 24.

As shown in detail in FIGS. 2 and 3, the reflector assembly 18 is of the type comprising a molded reflector body 26 composed of a non-conductive material, such as plastic, for instance, polystyrene, and having substantially corresponding concavo-convex sides, the concave side of which is provided with a metallic reflect-

ing coating 28, and a central apertured cylindrical neck 30. The reflecting coating 28 suitably may be composed of aluminum and may be applied to the reflector body 26 by conventional vacuum-metallizing techniques.

Co-axially mounted to the reflector body 26 within the apertured cylindrical neck 30 is a contact shell 32, a lamp 34 and a lamp retainer plug 36. The contact shell 32 is composed of metal and is preferably of frusto-conical shape with a tubular socket 38 axially formed therein. The tubular socket 38 is fixedly sleeved into the apertured neck 30 of the reflector body 26 and has a flanged end 40 which interlocks with an annular flange 42 which is integrally molded to the opening of the apertured neck 30. It will be noted that the reflecting coating 28 on the surface of the reflector body 26 preferably covers the flanged end 40 of the tubular socket 38. This may be conveniently accomplished by applying the reflecting coating 28 after the contact shell 32 has been assembled to the reflector body 26. The frusto-conical portion of the contact shell 32 forms an annular shaped skirt 44 which projects radially outward from and out of contact with the reflector body 26. The flanged end 40 of the tubular socket 38 also provides a seat against which is mounted the flanged neck 46 of the lamp 34. The lamp 34 is of the conventional type having a cylindrical base 48 including a button type terminal 50.

The lamp retainer plug 36 is tubular shaped and is composed of a resilient material, preferably a molded plastic, for instance, polyethylene. It has a socket 52 within which is disposed the base 48 of the lamp 34 and a substantially U-shaped leaf type spring 54 which makes contact with the terminal 50 of the lamp 34. The leaf spring 54 extends through a slot 56 in the closed end of the retainer plug 36 and resides partly outside of the plug in a recessed portion 53. This recessed portion 53 is fashioned to receive the terminal of one of the batteries 12 within the casing 10 of the flashlight, as indicated at 60 in FIG. 1, and serves to locate and centralize the batteries 12 making it easier to assemble all component parts of the flashlight.

Provision is made in accordance with the invention for detachably snapping the lamp retainer plug 36 in place within the reflector body 26. For this purpose, the lamp retainer plug 36 is provided at its forward end with an annular groove 62. Coinciding with this groove, the tubular socket 38 has a group of radially inwardly directed projections 64 which, as best seen in FIG. 3, are provided at spaced radial intervals about the inner circumference of the tubular socket 38. While it will be understood, of course, that other similar means may be utilized in place of these projections, for instance, an annular bead may be used equally as well, they are preferred in the embodiment of the reflector assembly shown.

To attach the lamp retainer plug 36, for instance, during manufacture, it is a simple matter to snap it in place within the reflector body 26 by pushing it into the tubular socket 38 until the projections 64 and the groove 62 engage. Once attached, due to its flexibility, it being slightly under compression when snapped into place, and due also to the rigidity of the tubular socket 38, the lamp retainer plug 36 is held firmly in place so that it is not apt to become detached or loosened during use of the flashlight. When replacement of the lamp 34 is needed, it is an equally simple matter to detach the lamp retainer plug 36 by pulling it out of the tubular socket 38. For the purpose of grasping the plug 36, it is provided with a knurled portion 66 at its outer end.

Referring again to the flashlight shown in FIG. 1, the flashlight circuit which includes the reflector assembly 18 is completed by setting the switch 14 on the flash-

light casing 10 forwardly to the "on" position of the switch. This causes the switch contactor member 16 movably with the switch 14 to come into contact with the radially outwardly projecting skirt portion 44 of the contact shell 32, thereby to complete the circuit. In the reflector assembly 18, contact with the lamp 34 is achieved through the contact shell 32 and specifically through the flanged end 40 of the tubular socket 38 which is in contact with the flanged neck 46 of the lamp 34. This contact is maintained by the forward end of the lamp retainer plug 36 which when attached within the reflector body 26 urges the flanged neck 46 of the lamp 34 against its seat provided by the tubular socket 38 at its flanged end 40. It will also be noted that the lamp retainer plug 36 supports the load of the batteries 12 within the casing 10 so that in the event the flashlight is dropped, for example, the batteries 12 will not press against the lamp 34 and cause it to fail. When it is desired to open the circuit, the switch 14 is set rearwardly to the "off" position of the switch, and the contactor member 16 is withdrawn from the contact shell 32 to an "out of contact" position as shown. It will be appreciated that the invention is not limited to use in a flashlight having a movable type switch, but that it may also be used as well in a flashlight which employs a lock type switch, for example.

It will thus be readily seen that a reflector assembly embodying the invention offers several advantages which are outstanding. For one, it consists of lamp retainer parts which are simple in construction, which may be quickly assembled during manufacture and which are quickly detachable for replacement of the lamp when needed, but which at the same time are not subject to being easily loosened during use of the flashlight. It will be particularly noted, for example, that all threaded parts of the reflector assembly, heretofore employed, have been eliminated by the invention. Also, an important feature of the reflector assembly is the use of a leaf type spring to make contact with the base terminal of the lamp. This feature eliminates the customary use of a coil type spring which has been troublesome in the past and provides for positive contact with the lamp and battery terminals and for easy and quick assembly during manufacture. It will, of course, be understood that the scope of invention is by no means limited to the specific embodiment of a flashlight shown and described herein, but may be employed in a variety of flashlight constructions as well as other types of illumination devices, for example, a conventional type lantern.

What is claimed is:

In a flashlight having a casing, a movable switch mounted on said casing and inside said casing a plurality of battery cells and a switch contactor member mounted to said switch, the combination of a molded plastic reflector body mounted in one end of said casing, said reflector body having substantially corresponding concavo-convex sides and a central apertured cylindrical neck, the concave side of said reflector body having a metallic reflecting coating therein, a metallic contact shell, said contact shell including a rigid tubular socket co-axially sleeved into the cylindrical neck of said reflector body and an integral skirt portion projecting radially outwardly from and out of contact with said reflector body, said skirt portion being adapted to make electrical contact with said switch contactor member in one position of said switch, said tubular socket having a plurality of annularly disposed substantially equally spaced projections directed radially inwardly from its inner wall, a resilient plastic lamp retainer plug, said plug having an open forward end for receiving a lamp provided with a flange around the neck thereof and a closed end, the forward end of said plug being detachably snapped into place in said tubular socket by means of an annular groove so positioned on its exterior surface as to engage said plurality of spaced projections when said plug is pushed into said tubular socket to seat the flange of the lamp therein, said closed end of said plug having a recessed portion for receiving the terminal of one of said battery cells in said casing, and a generally U-shaped leaf spring mounted in said closed end of said plug, one leg of which makes electrical contact with the base of said flashlight lamp and the other leg of which resides in said recessed portion for contacting said battery cell terminal and for aligning said reflector body and plug with said battery cells in said casing.

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