Dec. 24, 1957 A. H. MOORE 2,817,754

TORCH HEAD SAFETY FLASH LIGHT

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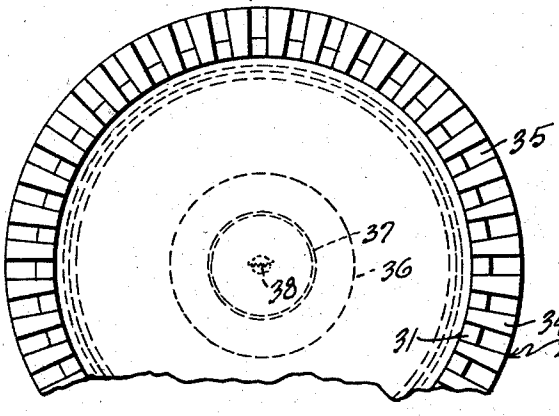

Fig. 2.

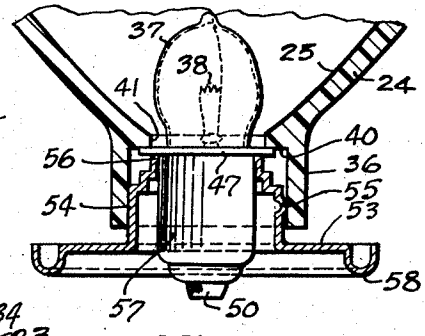

Fig. 7.

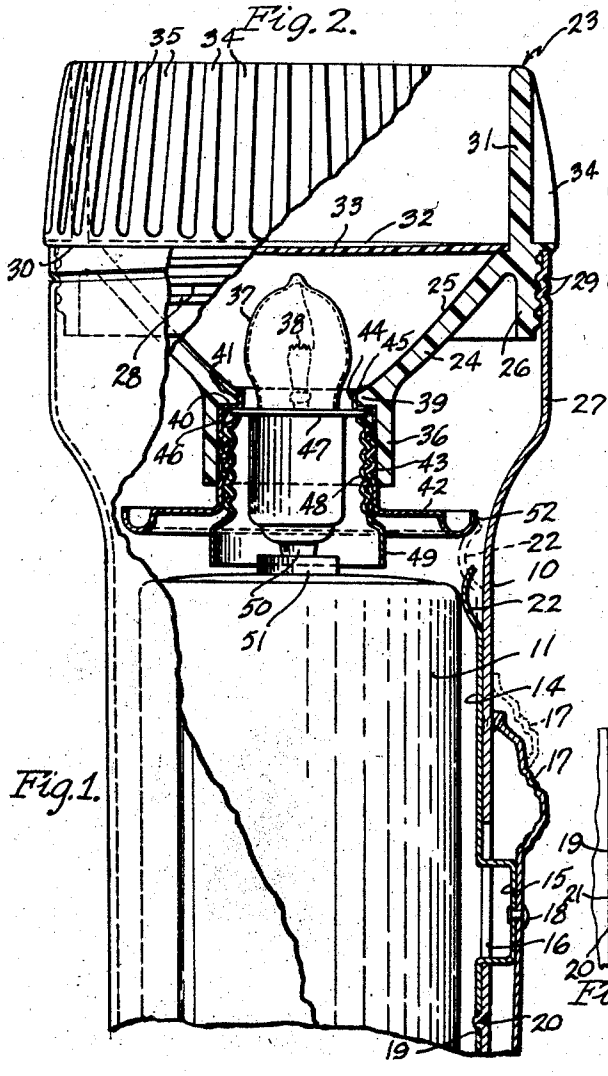

Fig. 1.

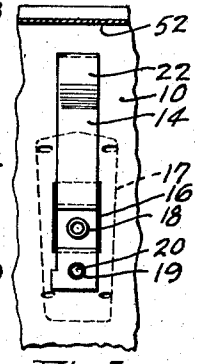

Fig. 5.

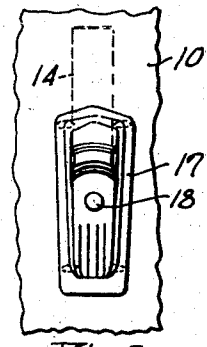

Fig. 6.

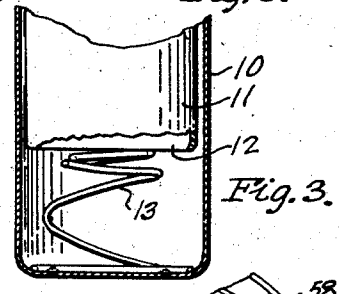

Fig. 3.

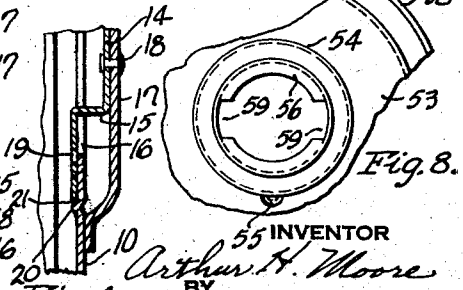

Fig. 4.

Fig. 8.

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TORCH HEAD SAFETY FLASH LIGHT

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5 Claims. (Cl. 240—10.66)

This invention relates to hand flashlights, and particularly to a torch head safety flashlight, and has for an object to provide an improved safety torch head for hand flashlights which is practically unbreakable and which has an exposed portion or rim beyond the end of the body, which will glow, giving a safety warning from the side in addition to the usual forwardly directed illuminating beam of light.

Another object is to provide an improved construction for this safety head, which is molded in one integral piece of plastic, and in which the aluminum or other reflecting surface for the parabolic reflector is deposited directly on the surface of the plastic, thus eliminating the use of a separate reflector.

With the foregoing and other objects in view, I have devised the construction illustrated in the accompanying drawing forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In this drawing:

Fig. 1 is a partial side elevation and partial section through the head end of the flashlight on an enlarged scale;

Fig. 2 is a top plan view thereof;

Fig. 3 is a section on a reduced scale of the lower end of the flashlight body;

Fig. 4 is a detail section of a portion of the switch;

Fig. 5 is a plan view of the switch from the inner side of the body;

Fig. 6 is a similar view from the outside of the body;

Fig. 7 is a detail section showing a modified means of mounting the light bulb, and

Fig. 8 is a plan view of a portion of the contact plate for the bulb holder.

The structure of flashlight shown comprises a drawn metal body or shell 10 in which are mounted the usual batteries 11, and in this case the lower end of the metal shell 12 of the lower battery is grounded on the body or shell 10 by the wire spring 13. Mounted on the side of the body or shell is any suitable type of control switch, the switch shown comprising a strip 14 of resilient metal including an intermediate offset 15 extending outwardly through an elongated slot 16 in the shell on which is secured an operating thumb piece or finger grip 17, in this case riveted to the offset of the conductor strip 14 at 18. The lower end portion of the strip 14 is provided with an opening 19 which, when the switch is in the "off" position receives a bump 20 formed in the wall of the body to yieldingly hold the switch in the "off" position, as shown in full lines Fig. 1. When the switch is shifted upwardly to the "on" position shown in dotted lines, Fig. 1, the lower end of the strip slides over the bump 20 to retain the switch in this position. The upper end of this switch is provided with a rounded or curved portion 22 to engage the rim of the contact plate bulb holder to close the circuit in the lamp bulb, as will later be described.

The improved safety torch head is shown at 23 and is molded in one integral piece of plastic. It comprises a body portion 24 forming a parabolic reflector having a parabolic reflector surface 25. Depending from the outer upper or larger rim of this body and parabolic reflector is a circular flange 26 which is provided with means for securing it in the enlarged outer end 27 of the metal shell or body 10. In this case this flange is provided with a screw thread 28 molded on the outer surface of the flange and screwed into a similar thread 29 formed in the wall of the body. In mounting the head this flange is telescoped and screwed into the outer open end of the body, and the head is provided with a shoulder 30 at the top of the flange and thread to engage the end of the shell or body and limit its movement into the body.

Projecting outwardly from the outer or larger end of the parabolic reflector and surrounding this outer larger end of the reflector is a hollow safety ring 31, and it will be seen that from the location of this ring it projects outwardly beyond the open end of the body or shell 10 so that it is exposed and is visible from the side of the flashlight. Within this ring at the outer end of the reflector 25 is an annular shoulder 32 on which rests the plastic lens 33. This lens is a relatively thin disc of plastic material of slightly larger diameter than the inner diameter of the ring 31 so that as it is forced into position within this ring to a position on the shoulder 32 it is somewhat concaved, as shown in Fig. 1, and therefore tends to expand and clamp or grip at its outer edge against the inner side of the ring 31 to hold it in position. To increase the strength of the ring 31, and also to improve its appearance its outer surface may comprise a series of laterally spaced longitudinal ribs 34 separated by grooves or channels 35, and the outer edges of these ribs may be convexly curved, as indicated at the right of Fig. 1, from substantially tangent to the outer edge of the ring 31 to the uoter edge of the shoulder 30.

At the inner or smaller end of the body 24 of the parabolic reflector is a tubular downwardly extending extension 36 in which is mounted the lamp bulb 37 with its filament 38 substantially at the focal point of the parabolic reflector 25. The reflecting surface of this reflector 25 is of light-reflecting material deposited directly on the surface of the plastic material forming the body 24 so that a separate reflector element is not required. The reflecting material is preferably aluminum and is preferably deposited by vaporizing the aluminum by heat in a vacuum and depositing on the surface of the plastic by a known process. There may be a coating of lacquer or lacquer composition applied first to the surface of the plastic material, but the aluminum is in effect deposited directly on the surface of the plastic so that the reflecting surface is supported directly on the surface of the plastic. During the deposition of the vaporized aluminum the remaining surfaces of the head exposed to the material would be masked by suitable means.

At the upper end of the extension 36 there is an inwardly extending flange 39 forming a shoulder 40 facing downwardly and a reduced opening 41 at the inner or smaller end of the reflector through which the light bulb 37 extends. The light bulb is mounted in a contact plate 42 which has a screw threaded extension 43 telescoped within the extension 36 of the plastic head and has a reduced portion 44 extending through the opening 41 and rolled over at 45 to form a securing means with the flange 39, the offset 46 seating against the shoulder 40. The lamp bulb has a metal flange 47 which forms its outer contact and is seated against the offset 46 with a clamping screw shell 48 threaded into the threaded extension 43 with its inner end clamping the rim 47 against the shoulder 46 and forming electrical contact therewith. The outer end of the shell 48 projects below the plate 42

and forms a hand grip 49 by means of which the shell may be removed and inserted in changing the light bulbs. The center contact 16 of the light bulb engages the center contact 51 of the upper battery 11. The outer rim of the plate 42 is laterally curved to form an annular flange 52 rounded on its outer surface to be engaged by the curved end portion 22 of the contact strip 14 of the control switch, as indicated in dotted lines Fig. 1, to ground this plate and the lamp contact 47 on the shell or body and close the circuit from the batteries through the lamp bulb.

A somewhat modified means of mounting the lamp bulb is shown in Fig. 7. In this case the flange 47 of the lamp bulb is seated against the shoulder 40 at the top of the extension 36 and a contact plate bulb holder 53 is provided for retaining this bulb in position. This plate has a central tubular extension 54 telescoped within the extension 36, and one wall of this portion 54 is provided with an outwardly pressed lug or bump 55 to frictionally engage the inner wall of the extension 36. At its upper end the extension 54 is reduced and terminates in an inwardly directed flange 56 of an inner diameter substantially that of the outer diameter of the shell 57 of the lamp bulb so as to hold the bulb central in the opening 41, and also to provide electrical contact with the flange 47. The outer rim of the plate 53 is curved, as shown at 58, the same as the plate 42 is curved at 52, for engagement with the curved end 22 of the switch 14. The flange 56 may have one or more notches 59 (Fig. 8) for passage of the lump of solder usually found on the outer surface of the lamp shell 57. In this mounting for the lamp bulb all that is required is to seat the bulb within the extension 36 with its flange 47 against the shoulder 40, and then force the extension 54 of the plate 53 into the bore of the extension 36 with its upper reduced end flange 56 tightly against the flange 47. The frictional engagement of the extension 54 and the bump 55 against the inner extension 36 will retain it in position, it being formed to be of a size to be sufficiently tight, and it forms the grounding means for the bulb contact 47 through the switch contact to the shell or body.

It will be understood from the above that the head 23 is molded in one integral piece of a suitable plastic material, and that the lamp bulb and the lens can be mounted in this head and then this whole assembly mounted in the open end of the metal body 10 by a single simple operation of telescoping and threading the flange 26 into the open end of this body. This leaves the hollow ring 31 projecting from the end of the body 10 where it is visible from the side, and the plastic material is sufficiently translucent so as to glow or be illuminated when the light bulb is lighted to provide the usual light beam directed forwardly from the reflector 25. It is preferred to make the plastic material of the head red in color so as to provide the standard danger indication from the side when the flashlight is being used, but it is not necessarily limited to this color, as it could be white or any other color, as ivory, for example, to give a glowlight effect. In either case it provides a safety torch head for flashlights.

Another important feature of this construction is the depositing of the light reflecting material, preferably the vaporized aluminum, directly on the parabolic surface 25 of the plastic material. With suitable plastic material this head is practically unbreakable, as is also the plastic lens 33.

Having thus set forth the nature of my invention, I claim:

1. A flashlight comprising a hollow body for holding a battery and open at one end, a head for said open end including a reflector having a concavely curved tapered reflector surface on which is deposited a coating of light reflecting material, a flange depending from the outer rim of said reflector telescoped with the open end of the body, and a hollow safety ring extending outwardly from the outer rim of the reflector and exposed beyond the end of the body, said reflector, flange and ring being molded in one integral piece of plastic, a shoulder within the ring at the outer rim of the reflector, a lens on said shoulder comprising a plastic disc of normally somewhat larger diameter than the inner diameter of the ring so that in place it is somewhat concavely curved, said reflector provided with an opening and integral means forming an inwardly facing socket at its inner smaller end for mounting a light bulb within the reflector, and switch means for closing a circuit from the battery to said bulb.

2. A flashlight comprising a hollow body for holding a battery and open at one end, a head for said open end molded in one piece of plastic including a reflector having a hollow tapered reflector surface with reflecting material deposited on this surface, an integral flange depending from the outer rim of the reflector telescoped with the open end of the body, and an integral open translucent ring extending forwardly from the outer rim of the reflector and located beyond the outer end of the body so as to be exposed, said ring being open at its outer end, an outwardly facing shoulder at the inner end of the ring about the larger end of the reflector, a transparent disc on said shoulder over the open end of the reflector, the reduced inner end of the reflector being provided with an opening, said head also including a tubular extension integral with the reflector extending inwardly from the inner and smaller end thereof forming an inwardly facing socket leading inwardly from said opening for mounting a lamp bulb in the opening, means for securing a lamp bulb in the socket, and switch means for closing a circuit from the battery to said bulb.

3. A flashlight comprising a hollow body for holding a battery and open at one end, a head for said open end including a reflector having a concavely curved tapered reflector surface on which is deposited vaporized aluminum, a flange depending from the outer rim of said reflector telescoped with the open end of the body, and a hollow translucent safety ring extending outwardly from the outer rim of the reflector and exposed beyond the end of the body, said reflector, flange and ring being molded in one integral piece of plastic, an outwardly facing shoulder at the inner end of the ring about the outer end of the reflector, a transparent disc on said shoulder covering the outer end of the reflector, said reflector provided with an opening at its iner end and a tubular extension integral with the reflector forming a socket at the inner side of said opening for mounting a light bulb in the opening, and switch means for closing a circuit from the battery to said bulb.

4. A flashlight comprising a hollow body for holding a battery and open at one end, a head for said open end formed of a single piece of molded plastic including a body portion provided with an outwardly facing tapered reflector surface on which is deposited a coating of light reflecting material, an integral outwardly extending translucent hollow safety ring extending outwardly from the outer larger rim of the reflector and open at its outer end, an outwardly facing shoulder in the ring at the outer end of the reflector, a transparent disc on said shoulder closing the larger end of the reflector, said plastic body portion at the smaller end of the reflector provided with an opening therethrough and an inwardly facing socket extending from the opening adapted for mounting a lamp bulb projecting through the opening into the reflector, means securing the head to the open end of the body with said ring projecting outwardly from the end of the body so as to be visible from the side, and switch means controlling operation of the bulb by the battery.

5. A flashlight according to claim 2 in which there is a circular contact plate provided with a tubular extension extending laterally from one side thereof mounted in the socket and forming means for mounting a lamp bulb in the socket and the opening, and a movable switch mem-

ber on the body movable to and from engagement with said contact plate.

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