

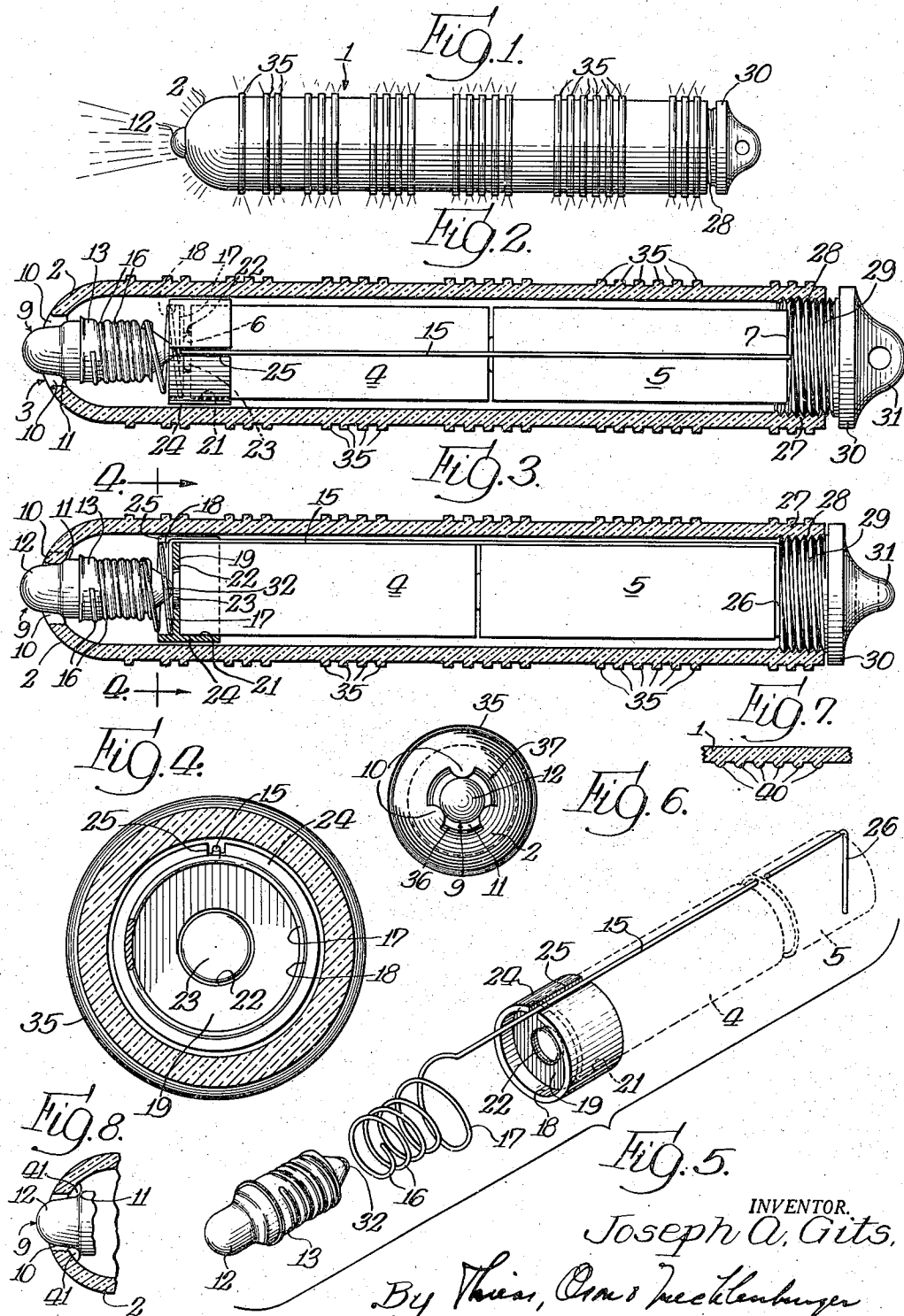
April 10, 1945.

J. A. GITS

2,373,306

FLASHLIGHT

Filed May 2, 1942



INVENTOR.
Joseph A. Gits.

By *Thies, Otto Beckenbeyer*
Attys.

UNITED STATES PATENT OFFICE

2,373,306

FLASHLIGHT

Joseph A. Gits, Chicago, Ill., assignor, by mesne assignments, to himself and Jules P. Gits, Chicago, Ill.

Application May 2, 1942, Serial No. 441,447

5 Claims. (Cl. 240—10.68)

This invention relates to a new and improved flashlight structure and more particularly to certain novel features of construction.

In the art of flashlight construction, durability and simplicity of design are important factors in producing a satisfactory device at low cost. While numerous designs have been proposed, it will be observed that they generally involve a structure making the cost of manufacture high. Moreover, they contain an arrangement of parts that renders them impractical and not durable. Irrespective of construction, many required a number of parts made of metal. These metal parts are not only undesirable but make the problem of insulation to prevent battery leakage while the device is not in use rather difficult.

An object of this invention is to provide a flashlight structure that is simple, durable and inexpensive to manufacture. To this end, the invention is directed to a simple design of barrel or shell preferably molded as a single piece, although this is not necessary, and having a novel form of lamp mounting with respect to the front end of the barrel to make and break the circuit in a simple way, this circuit and lamp mounting being provided by a single piece of wire that is coiled at the front end to act as a lamp receiving receptacle, the wire then being extended longitudinally along the inside of the shell to contact the rear terminal of the battery. A simple design of barrel closure at the rear end novelly results in a means for overcoming the spring tension afforded by the wire coiling whereby to bring the front battery terminal into circuit closing relation with the lamp bulb, this spring tension normally functioning to hold the lamp bulb in a position against the periphery of an opening at the front end of the barrel. The parts are simple and few. A simple insulation cap may tip the front end of the battery to keep the wire away from the front battery terminal and permit control of the circuit closing action without the danger of accidental contact or current leakage.

A further object of the invention is to provide an improved flashlight barrel or shell of thermoplastic material that may be molded as a continuous piece and eliminate the usual lens and bulb carrying cap at the front end.

A still further object of the invention is to provide in a flashlight structure a new and novel barrel or shell that is preferably made of a plastic material having the same index of refraction and light transmitting qualities as glass and to so arrange the lamp bulb in the barrel that a certain portion of the light waves are transmitted rearwardly through this barrel and caused to reflect radially or substantially radially from along the periphery of the barrel to produce effective illumination at this area in addition to the illumination produced by the beam of light

thrown forwardly from the lamp bulb. This illumination along the barrel of the flashlight has been definitely found to be of value, particularly in complete blackouts where this side illumination aids the individual who may be handling the flashlight.

In its more specific aspects, the invention is directed to accomplishing this latter feature by providing ribs or areas about the periphery of the flashlight barrel that act as means which cause the transmitted light waves traveling along the flashlight barrel to be reflected outwardly, said means being preferably, although not necessarily, arranged along the barrel's periphery in a manner to distribute these transmitted light waves substantially uniformly from end to end of the barrel.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combination of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from the following description and drawing which form a part hereof.

In the drawing:

Figure 1 is a side elevational view of a flashlight embodying the invention;

Fig. 2 is a sectional view looking down upon the parts within the casing.

Fig. 3 is a similar section but taken at right angles to the view shown in Fig. 2;

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is an exploded view in perspective illustrating the interior parts;

Fig. 6 is a view of the front end of the barrel illustrating beads against which the lamp bulb is held;

Fig. 7 is a fragmentary section of the barrel to illustrate a modified form of rib or light reflecting area; and

Fig. 8 is a detail section of a modified form of front end.

A flashlight comprising an embodiment of the invention herein disclosed is illustrated in the drawing. It comprises an elongated shell or barrel 1 that may be reduced in diameter at the front end 2 and may terminate in a bulb opening 3. Tubular shell 1 is adapted to carry one or more batteries 4 and 5, or some other suitable source of current supply, providing battery terminals 6 and 7 or their equivalent for opposite sides of a lamp circuit. A lamp bulb 8 is adapted to be seated within shell 1 at opening 3, the latter being provided with a plurality of spaced beads 10 against which bulb 8 bears, the bulb being provided with an annular shoulder 11, a top 12 and a terminal shell 13, which, in the instant case,

may be threaded for a purpose to be presently described.

Shoulder 11 of this lamp bulb 9 is held against the inner surface of beads 10 so that tip 12 may either lie in or extend through opening 3. With the bulb 9 arranged in opening 3, a direct beam of light will be produced forwardly of the flashlight.

A wire 15 is provided to extend longitudinally of shell 1. The front end of this wire 15 is coiled, as indicated at 16, to form a receptacle receiving portion into which terminal shell 13 may be threaded, the forward convolutions of this coiled portion engaging the threads of shell 13 and the last convolution 17 which may be of larger diameter lying in a recess 18 in a cap 19. Cap 19 is preferably made of insulation material and is provided with a slightly larger recess 21 into which the front end of battery 4 is adapted to seat. The design of this cap 19 with opposed recesses 18 and 21 uniquely provides a center wall which may be apertured at 22 to receive a battery terminal 23 of battery 4. Also, cap 19 will be furnished with an annular wall 24 of a diameter that may be slightly less than the internal diameter of shell 1. In order that wire 15 may extend longitudinally within shell 1 between this shell and the batteries, annular wall 24 of cap 19 is slotted at 25. This wire 15 may be of relatively small diameter and of light weight so that it will in its entirety comprise only a small mass of metal. To illustrate, the weight of wire 15 need not exceed one and one-half pounds of metal for one thousand flashlights. The rear end 26 of wire 15 is then bent inwardly to contact rear terminal 7 of battery 5. If two or more batteries are used, they may be inserted in shell 1 in endwise relation so that their terminals at their intermediate or adjacent ends will be held in contact with each other.

The rear end 27 of shell 1 is internally threaded at 28 to receive a threaded plug or closure 29 having a finished exterior disk portion 30 and an apertured lug 31 extending therefrom that is adapted to be manually gripped to turn this closure 29 and move it either inwardly or outwardly of shell 1. Closure 29 acts as a circuit closing or opening member. When closure 29 is threaded inwardly, pressure is applied at the rear end of battery 5 to cause the latter to press forwardly in shell 1 and to move thereby battery 4 so as to bring the front battery terminal 23 lying in aperture 22 in cap 19 into electrical contacting relation with the center terminal 32 on lamp bulb 9. The action of closure 29 when it is moved inwardly is to overcome the spring tension that is advantageously obtained when wire 15 is coiled at 16 and several convolutions are allowed to remain between lamp bulb 9 and the forward end of battery 4. This spring tension is sufficient to keep the batteries or source of current supply—no matter in what form it may be provided—against closure 29 with the intumed arm 26 of wire 15 therebetween. Hence, when this closure 29 is turned several times, the advance it makes inwardly in all that is required to move the batteries forwardly to bring battery terminal 23 into contacting relation with lamp terminal 32. When the closure 29 is turned to move outwardly, the last convolutions of wire 15 will have sufficient tension to cause the batteries to travel with the closure 29 and break the closed circuit relation between battery terminal 29 and lamp terminal 32. It will be understood that the arrangement disclosed is intended to effect a circuit closing relation between these two parts and that it is

not considered to be a departure from the invention to use intermediate members so as to avoid direct contact therebetween.

It will be observed from the foregoing description that the simple wire 15 formed in the manner shown functions with insulation cap 19 to comprise practically the entire interior structure. The interior structure of a flashlight heretofore required the use of a number of current conducting parts, particularly if more than one battery was employed. The small single battery flashlight had little, if any, practical value, and consequently, it failed to meet the problem of current conduction from the rear of the barrel to the lamp at the front. Wire 15 provides for minimum use of metal which is of decided advantage in a flashlight. The barrel 1 merely comprises two parts and eliminates the heretofore necessary front cap in which the lamp bulb and the lens assembly were inserted or by means of which access was given to the lamp bulb. In the present structure, the lamp bulb 9 is merely threaded into the coils 16, and the cap 19 placed over the end of battery 4 with wire 15 lying in slot 25. These parts are then inserted with batteries 4 and 5 into barrel 1 and closure 29 is then threaded into the rear end. From the standpoint of cost, both with respect to materials and labor, the present structure may be made for a substantial sum less than flashlights as heretofore constructed.

Barrel or shell 1 is preferably molded of a plastic material. I have found that flashlights as heretofore constructed usually confine their light beam to the area in front thereof and do not provide for illumination sidewise or along the handle with the result that if used in substantially total darkness, the person handling the flashlight is unable to have the proper vision in the area about him. This difficulty may be overcome by providing ribs 35 about shell 1 which function as light reflecting means to distribute light waves transmitted through the shell 1 at the front end. To aid in accomplishing this result in a most efficient way, shell 1 is preferably made of plastic material having a high index of refraction. This plastic material may be Lucite or some other suitable material having the necessary light transmitting characteristics. Also, the lamp bulb 9 may be positioned with respect to opening 3 in front end 2 to cause light waves to strike this shell so that they may be transmitted through its wall rearwardly where ribs 35 are disposed.

It is found that ribs 35 nearer the front end 2 of shell 1 will reflect more light than those that are disposed at the rear end, and that the resulting uneven distribution of reflected light by the ribs can be compensated for by grouping the ribs 35 closer together near the rear end so that substantially the same volume of light can be reflected outwardly from the barrel at any point therealong. In other words, an arrangement can be provided by first using a single rib 35 adjacent the front end 2, then by grouping say two of these ribs, and then by adding to each succeeding group another rib so that substantially the same intensity of reflected illumination will be obtained along the entire body. Other arrangements to secure the same results can obviously be used as by changing the shape of the ribs or by locating them in a different way, this all being contemplated as being within the scope of the invention disclosed. In this connection, ribs 35 may be of any cross-sectional shape. In Figs. 1 to 3, inclusive, these ribs 35 are illustrated as rectangu-

lar in cross section, and, in Fig. 7 they are illustrated as semi-circular in cross section.

The plastic material used for shell 1 may be transparent or translucent as long as it will permit the transmitted light waves to travel along the shell and be reflected outwardly therefrom when they reach the ribs 35. These ribs 35 are found, in my opinion, to act as light reflecting means and function to interrupt the light waves and reflect them substantially radially of shell 1. The same type of plastic material may be used for closure 29 although this is not necessary. On the other hand, by employing beads 10 to support the lamp bulb 9, spaces 36 may be provided and walls 37 are thereby obtained, which, I believe, afford a more efficient arrangement for the absorption of the transmitted light waves emitted from lamp bulb 9. Thus, the light waves are permitted to travel rearwardly through the body of the shell 1 so as to be reflected outwardly at the ribs 35.

In Fig. 8, beads 41 are provided on the inner surface and adjacent opening 3 at the front end of barrel 1. These beads 41 will also keep lamp bulb 9 properly centered in opening 3 and support the same at shoulders 11.

Without further elaboration, the foregoing will so fully explain the gist of my invention that others may, by applying current knowledge, readily adapt the same for use under varying conditions of service, without eliminating certain features, which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured to me by the following claims.

I claim:

1. A flashlight comprising a shell of molded insulation material adapted to receive one or more batteries providing battery terminals for opposite sides of a lamp circuit, one end of said shell being rounded and terminating with an opening in the end thereof, a lamp bulb seated within said shell at said opening, a wire extending the length of said shell, the front end of said wire being formed into a receptacle receiving portion for said lamp bulb, the rear end of said wire being in contact with one of said battery terminals, and an insulating cap at the front end, said cap being cup shape at one face to seat the formation of said wire in nested relation therein at the front end whereby to hold said lamp bulb centered and keep said wire away from the other battery terminal, said cap being apertured about said other battery terminal, and means for bringing said lamp bulb and said other battery terminal into circuit closing relation.

2. A flashlight comprising a shell adapted to receive one or more batteries providing battery terminals for opposite sides of a lamp circuit, one end of said shell being tapered and having an opening therein, a lamp bulb seated within said shell at said opening, a wire extending the length of said shell, the front end of said wire being coiled to receive said lamp bulb, the rear end of said wire being in contact with one of said battery terminals, and an insulating cap cupped at opposite sides for fitting over one end of said batteries and for receiving the coiled portion of said wire, said cap being apertured but holding said coiled wire portion away from said aperture and the other battery terminal, and means for bringing said lamp bulb and said other battery terminal into circuit closing relation through said aperture.

3. A flashlight comprising a shell adapted to receive one or more batteries providing battery terminals for opposite sides of a lamp circuit, one end of said shell having an opening therein, a lamp bulb seated within said shell at said opening, a wire extending substantially the length of said shell, an insulation cap between said lamp bulb and the front battery terminal, said cap being seated over the end of the battery and being apertured to expose the front battery terminal, the front end of said wire being coiled to provide a receptacle for said lamp bulb, one of the convolutions seating against said cap concentrically about said aperture and normally holding the lamp bulb away from both said aperture and said front battery terminal whereby to maintain an open circuit condition, a slot in the periphery of said cap for receiving the wire extending rearwardly in said shell, the rear end of said wire being bent into contact with the other battery terminal.

4. A flashlight comprising a shell adapted to receive one or more batteries providing battery terminals for opposite sides of a lamp circuit, one end of said shell having an opening therein, a lamp bulb seated within said shell at said opening, a wire extending the length of the batteries, an insulation cap between said lamp bulb and the front battery terminals, said cap being recessed on both sides and apertured, a wire extending lengthwise of said shell, the front end of said wire being coiled to receive the lamp bulb and to effect a spring tension holding the lamp bulb against the periphery of said shell opening, one of the convolutions of the coiled wire being seated in one of the cap recesses about its aperture, the opposite recess of said cap fitting over and upon one end of the batteries so that the front battery terminal is exposed through said aperture, the peripheral wall of said cap being slotted to permit said wire to extend longitudinally of said shell, the rear end of said wire being bent to contact the rear battery terminal.

5. A flashlight comprising a shell adapted to receive one or more batteries providing terminals for opposite sides of a lamp circuit, one end of said shell having an opening therein, a lamp bulb seated within said shell at said opening, a wire extending longitudinally of said shell, an insulation cap between said lamp bulb and the front battery terminal, said cap being recessed on both sides and apertured, a wire extending lengthwise of said shell, the front end of said wire being coiled to receive the lamp bulb and to effect a spring tension holding the lamp bulb against the periphery of said shell opening, one of the convolutions of the coiled wire being seated in one of the cap recesses about its aperture, the opposite recess of said cap fitting over and upon one end of the batteries so that the front battery terminal is exposed through said aperture, the peripheral wall of said cap being slotted to permit said wire to extend longitudinally of said shell, the rear end of said wire being bent to contact the rear battery terminal, and adjustable means at the rear end of said shell for overcoming said spring tension whereby to effect a closed circuit condition for said lamp bulb by axially moving the batteries forwardly to bring said front battery terminal into electrical relation with said lamp bulb.