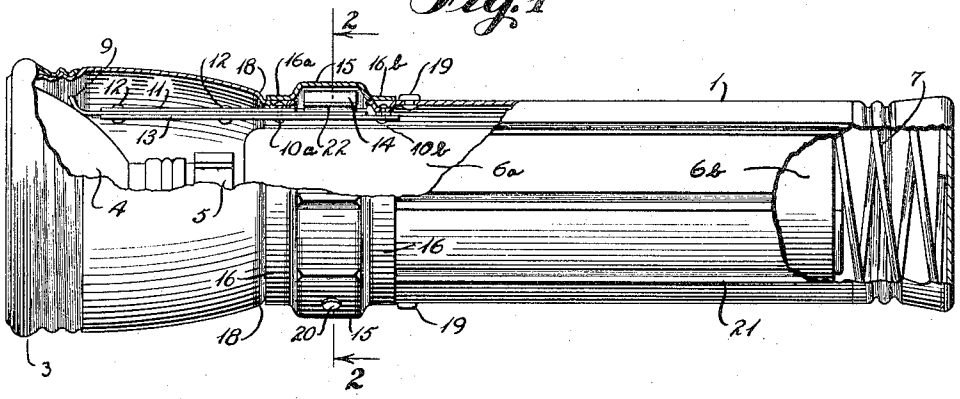
Sept. 16, 1958 E. J. GARLAND 2,852,632

FLASHLIGHT CONSTRUCTION

Filed July 5, 1955

Fig. 1



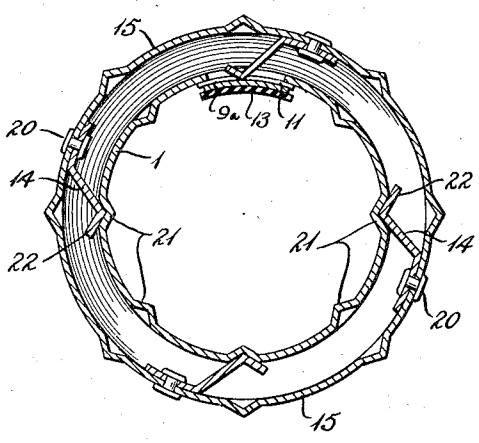


Fig. 2

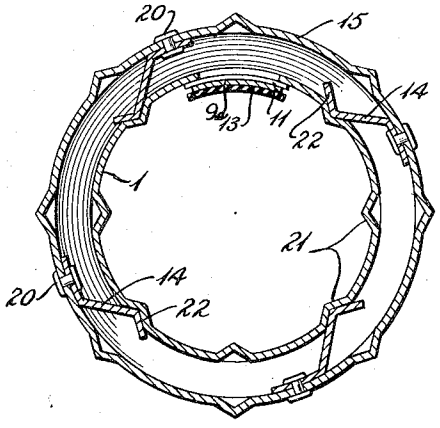


Fig. 3

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FLASHLIGHT CONSTRUCTION

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4 Claims. (Cl. 200—60)

This invention relates to a novel electrical switching mechanism, and particularly to a novel electrical switching mechanism adapted for use with a tubular flashlight casing.

Flashlights now commonly in use are customarily provided with a push-button type of switch. In the most common type of switch, it is usually necessary to depress a small button in order to complete the electrical circuit. A slide may then be advanced toward the front end of the flashlight, generally, to lock the button in depressed position and maintain the circuit of the flashlight in a closed position and to provide continuously a beam of light. A major disadvantage of switches of this type resides in the difficulty of locating and maneuvering the switch, particularly in emergency situations.

A principal object of this invention is to provide a novel type of flashlight switching mechanism which will be very easy to locate and operate in the darkness and under other disadvantageous conditions.

Another object of this invention is to provide a switch for a flashlight which is a major feature in the silhouette or contour of the flashlight, readily discernible to the vision as well as to the touch.

Another object of this invention is to provide a ring switch for a tubular flashlight casing which is operated by rotation of the ring, and which is so constructed as to lock in either the "on" or the "off" position.

These and other objects of the invention, which will become more readily apparent from a detailed reading of the following description, are achieved by providing a tubular flashlight casing with a rotatable ring adjacent the head of the flashlight casing. Secured within the ring are a plurality of contact springs bearing against the flashlight casing. At one point on the casing, an electrical contact strip is exposed which is in electrical contact with the top terminal of the foremost dry cell in the casing through the lamp filament and electrical connections in the lamp socket and reflector. The rotating ring and the contact springs secured thereto are desirably in electrical connection with the bottom terminal of the rearmost dry cell in the flashlight through contact of a bottom spring in the casing with the bottom of the dry cell. Controlled rotation of the ring may bring the contact springs, individually, into electrical connection with the exposed contact strip, thereby completing the electrical circuit and energizing the flashlight.

The familiar advantage of locking the switch in either the "on" or the "off" position may be obtained by providing an angularly bent portion at the lower extremity of each contact spring, and providing correspondingly contoured indentations in the flashlight casing. With the indentations in the casing being circumferentially spaced in the casing at distances corresponding to the positions of the contact springs, the seating engagement of the springs within the indentations provides resistance to undesired rotation of the ring.

The many advantages of the ring switch of this invention, and the details of its construction, may be best understood by reference to the drawings, in which:

Fig. 1 is a side elevational view of a flashlight assembly containing the ring switch of this invention, in partial section;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 showing the ring switch in the "on" position;

Fig. 3 is a similar sectional view showing the ring switch in the "off" position.

Referring now in detail to the drawings, the tubular flashlight casing 1 may be of the conventional type which opens only at the lens end, upon removal of the lens cap 3. Within the flashlight casing there may be disposed a reflector assembly 4 containing the light bulb and a contact base 5 making electrical contact with the top terminal of a conventional dry cell 6*a*. Electrical contact with the bottom terminal of the rearmost dry cell 6*b* is provided through a contact spring 7, which is in electrical contact with the flashlight casing 1. Although the flashlight casing 1 may be constructed of any desired conductive material, the preferred material is sheet metal susceptible of a high polish on the exterior for attractive appearance, and coated with copper on its interior surface for enhanced electrical conductivity.

The electrical circuit between the bottom terminal of the rear cell 6*b* in the flashlight and the top terminal of the front cell 6*a* is completed through the switching mechanism of this invention, one embodiment of which is illustrated in partial cross-section in Fig. 1. In this embodiment of the invention, the undersurface of the reflector bowl 4 is formed of or coated with conductive metal such as copper and is in electrical contact with one terminal of the light bulb, the other terminal of the light bulb being connected to the top terminal of the front dry cell 6*a*. The metal coating on the undersurface of the reflector bowl thus is an integral part of the electrical switch circuit. A permanently positioned spring-like electrical connector 9 provides resilient contact with the copper coating on the undersurface of the reflector bowl, and extends rearwardly into the tubular casing, where it is securely positioned by a pair of rivets 10*a* and 10*b* which are located on opposite sides of the rotatable ring and its components. The electrical connector 9 is insulated from the casing by an interposed fiber insulating strip 11 which is secured in position on the electrical connector 9 by a pair of grommets 12. The front rivet 10*a* is also desirably employed to secure the fiber insulating strip 11 in position. The fiber insulating strip 11 terminates immediately beyond the front rivet 10*a*, thus exposing a terminal portion of the electrical connector 9. This exposed terminal portion of the electrical connector 9 is referred to hereinafter, for convenience, as a contact strip 9*a*. If desired, an additional fiber insulating strip 13 may also be employed on the inner side of the electrical connector 9 to prevent accidental electrical contacts of an undesired nature, with the dry cell 6*a*, and to shield and support the electrical connector 9.

As in indicated in the drawings, and particularly in Figures 2 and 3, contact strip 9*a* is exposed to contact with the contact springs 14 through an aperture in the flashlight casing 1. The contact strip 9*a* is insulated from the flashlight casing by the interposition of a fiber insulation sheet 11 which overlaps the front side edge of the contact strip, and is securely held in position by the front rivet 10*a*, from which it is insulated by allowing the rivet to pass through an aperture in the contact strip. Since the contact strip 9*a* terminates within the aperture in the casing, its free end is spaced from the casing and is electrically insulated therefrom. The inner fiber insulating strip 13 provides insulation and support for the free end of the contact strip.

Electrical contact between the contact strip 9*a* and the flashlight casing 1 is obtained by rotation of the ring 15 so that one of the contact springs 14 is moved into electrical connection with the contact strip 9*a*, as is illustrated in Figure 2. The rotatable ring 15 is desirably a channel-shaped cross-section, having lateral flanges 16*a* and 16*b* bearing against the flashlight casing in a moderately loose engagement. Longitudinal movement of the ring with respect to the flashlight casing is restricted by abutment of the foremost flange 16*a* against the shoulder portion 18 of the lens cap 3, and by the abutment of the rearmost flange 16*b* against a pair of stop rivets 19. Electrical contact between the rotatable ring 15 and the flashlight casing 1 is provided through the close engagement of the flanges 16*a* and 16*b* with the abutting and underlying portions of the casing, and through contact between the contact springs 14 and the casing.

The contact springs 14 are desirably made of a resilient metal so that there is a true spring action. Although it would be possible to provide a single contact spring in the ring switch of the invention, it is preferred that a plurality of contact springs be provided in order to minimize the amount of rotation of the ring necessary into the "on" and "off" positions. Thus, as shown in Figures 2 and 3, there may be four contact springs provided, spaced at equal distances around the circumference of the rotatable ring 15. Each contact spring is desirably secured to the rotatable ring by a rivet or other conventional securing means 20 which will provide good electrical connection between the contact spring and the rotatable ring as well as a secure physical interconnection therebetween. To resist accidental displacement of the rotatable ring 15, the flashlight casing 1 is desirably provided with a number of longitudinal indentations 21, of a size designed to receive in seating engagement an angularly bent portion 22 on each of the contact springs 14. The engagement of a plurality of the angularly bent portions 22 with the corresponding indentations 21 in the casing is sufficient to provide a strong resistance to unintentional rotation of the rotatable ring 15. The engagement of the angularly bent portions 22 of the contact springs 14 with the indentations in the casing also provides good electrical connection between the rotatable ring 15 and the casing 1, as previously pointed out.

The relationship between the angularly bent portions 22 of the contact springs 14 and the indentations 21 in the flashlight casing 1 is such as to permit rotation of the ring 15 in either direction, clockwise or counterclockwise, particularly where the material of springs 14 possesses sufficient stiffness. However, it will be appreciated that by modifying the angularity or when using weaker materials the direction of rotation may be limited to one direction either clockwise or counterclockwise, depending upon the direction in which the spring ends 22 are disposed.

The above-described preferred embodiment of the invention provides a ring switch for a flashlight in which the rotatable ring may be located promptly even in complete darkness. This switch provides a positive control over operation of the flashlight, while at the same time unintentional or accidental change in the position of the switch is prevented. It will readily be appreciated by those skilled in the art that many modifications may be made in the above-described embodiment of the invention, which nevertheless are within the scope of this invention. Thus, for example, it is contemplated that two or more contact strips 9*a* could be provided, for example, at diametrically opposed locations within the

flashlight casing. An increase in the number of contact strips would, of course, tend to decrease the electrical resistance of the flashlight and would insure good electrical connection despite any loss in resilience in any one of the contact springs after long usage. Similarly, although the above description has related to a ring switch providing electrical contact between a conductive flashlight casing and a connector strip in contact with with a copper coating on the reflector bowl, it would be possible to employ the same type of switch in connection with a flashlight having a non-conductive plastic casing and any conventional type of electrical connection between the bottom terminal of the rearmost dry cell and the contact springs.

I claim:

1. In an electrical flashlight having a tubular casing adapted to house at least one energizing battery and provided with a head portion within which is disposed a reflector bowl and lamp bulb, said casing being in conductive contact with one battery terminal and said lamp bulb being in conductive contact with said reflector bowl and with another battery terminal of opposite polarity, the improvement which comprises a plurality of spaced longitudinally disposed grooved indentations in said casing, at least one port on the side of said casing, at least one contact strip, one end of which is in conductive contact with said reflector bowl, the opposite end of which is disposed opposite said port, said contact strip being wholly within said casing and insulated therefrom, a circumferentially mounted ring switch mounted on and over said casing, over said port and in conductive contact with said casing, said ring switch having mounted on its underside at least one spring contact member biased toward said contact strip and toward said grooved indentations in said casing, the inner end of each spring contact member being shaped to seat in and conform to said grooved indentations, said ring switch being stopped to prevent longitudinal reciprocating movement thereof but being rotatable in a given direction entirely around the circumference of said casing.

2. The improvement of claim 1 in which there are a plurality of spaced spring contact members mounted on said ring switch, and a greater number of grooved indentations in said casing, the spacing of said grooved indentations and said spring contact members being such that when one spring contact member is in conductive contact with said contact strip and said switch is in circuit closing position another spring contact member is seated in locking position in a grooved indentation.

3. The improvement of claim 2 in which the numbers and spacing of said spring contact members and said grooved indentations, respectively, are such that when no contact member is in conductive contact with said contact strip and said switch is in open circuit position at least one spring contact member is seated in locking position in a grooved indentation.

4. The improvement of claim 3 in which each grooved indentation and the inner end of each spring contact member is V-shaped.

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