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O. T. WOOD

2,309,687

FLASHLIGHT

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FIG. 1.

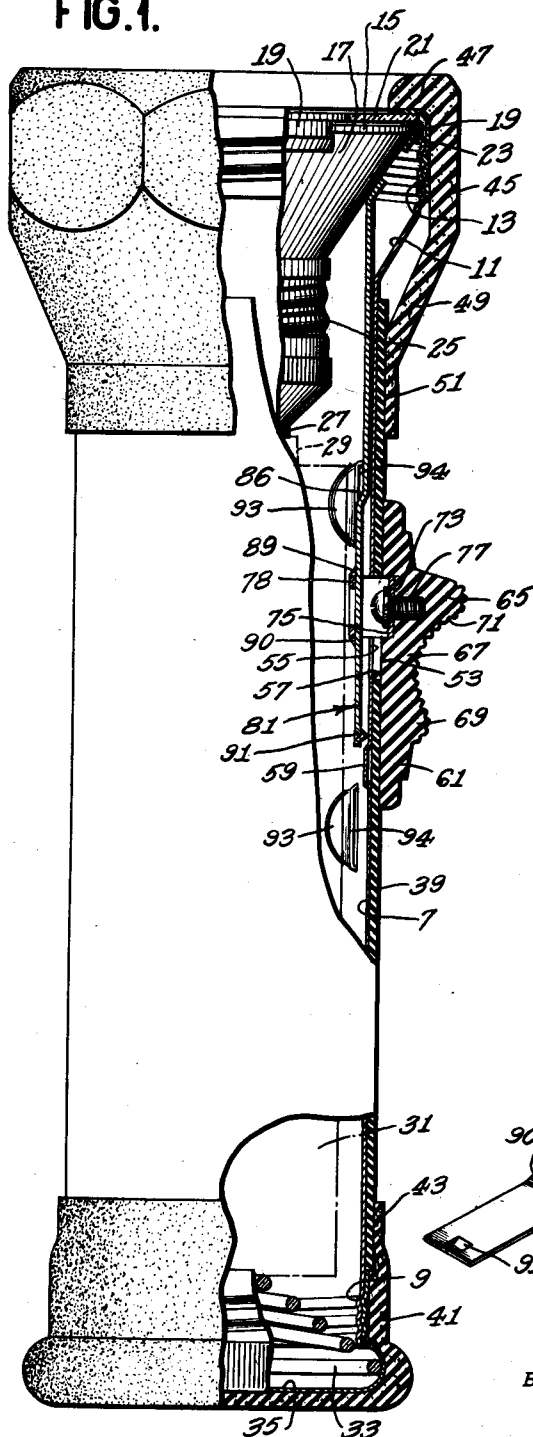


FIG. 2.

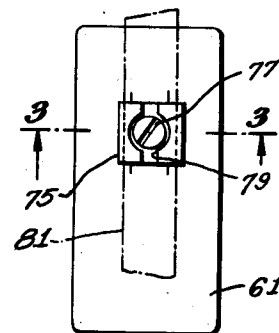


FIG. 3.

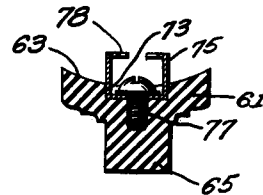
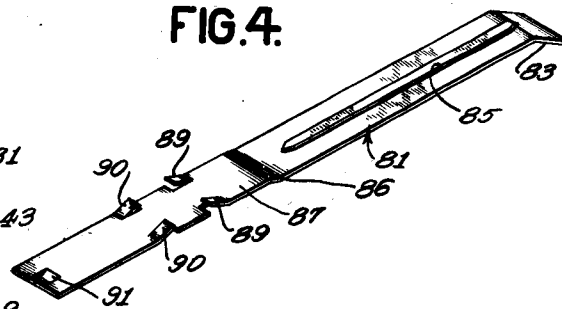


FIG. 4.



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FLASHLIGHT

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Application February 16, 1940, Serial No. 319,208

6 Claims. (Cl. 240—10.66)

This invention relates to electric flashlights and hand lanterns of the kind in which a removable battery of dry cells is connected and disconnected at will to an incandescent lamp from which the light is reflected in a given direction.

More particularly the invention relates to a circuit closer for such flashlights.

The primary object of the present invention is to provide a circuit closer which may be readily disassembled from a flashlight so that broken parts may be replaced and the circuit closer reassembled into the flashlight.

Another object of the invention is a flashlight switch which readily adapts itself to assembly and disassembly with respect to the flashlight without the use of tools.

Still another object of the invention is a flashlight circuit closer characterized by few parts and whereof the component parts are simple of construction and easily replaced.

The invention also seeks a flashlight to which the circuit closer of this invention may be readily adapted.

Yet another object of the invention is a circuit closer particularly adapted to a so-called insulated flashlight.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description, taken in connection with the accompanying drawing illustrating one embodiment by which the invention may be realized, and in which:

Figure 1 is a view, in side elevation, showing a flashlight to which the present invention has been applied, parts being removed to show details of construction;

Figure 2 is a view in plan, looking from below, and showing the thumb piece or slide of the circuit closer;

Figure 3 is a transverse sectional view of the circuit closer taken in the plane indicated by the line 3—3 in Figure 2, looking in the direction of the arrows, and with the contact strip removed from the slide; and

Figure 4 is a perspective view showing the circuit closing contact strip of this invention.

Referring first to Figure 1, the flashlight to which the present invention is illustrated as applied is a so-called insulated flashlight whereof no metal parts are exposed so that the flashlight may be handled and set down among electrical equipment without danger of short circuit. As shown, the flashlight casing comprises a metallic cylindrical shell 7 threaded at its one end, as at

9, which, in the illustrated embodiment, is what may be considered the bottom end of the flashlight and at its opposite or upper end increases progressively in diameter, as at 11, to a cylindrical threaded portion 13.

The threaded upper end 13 supports the rim or lip 15 of the reflector 17, there being insulation 19 surrounding the lip 15 whereby the reflector is insulated from the conductive casing 11. Resting on the insulation 19 is a lens 21 of any desired characteristic. Lens 21 is held in position on the threaded end 13 of the casing by a lens ring 23 screwed on to the threaded end 13.

The reflector is illustrated as of the type shown in copending application Serial Number 180,949 filed December 21, 1937, and now Patent No. 2,274,178 dated Feb. 24, 1942, wherein the lamp is supported within the reflector by a cup-shaped enclosure 25 which terminates in a contact 27 adapted to make electrical connection with the central terminal 29 of the battery 31, the battery 31 being held against the contact 27 by a battery positioning spring 33 in the bottom cap 35. Cap 35 is removably secured on the threaded end of the casing. The circuit is completed from the battery positioning spring 33 through the casing 7 and contact strip 81 of the circuit closer of this invention. The reflector 17 contacts with and conducts electric current to that lamp terminal which is not electrically connected to the battery terminal 29.

The flashlight of this invention is completely covered by insulating material. In the illustrated embodiment, the casing 7 is enclosed by a cylindrical outer casing member 39 of dielectric material, such as fiber. As shown, the lower end of this fiber covering 39 terminates at a point which permits the bottom cap 35 to be screwed on the lower end of the casing. The bottom cap is illustrated as covered by a removable insulating cap 41, preferably of rubber, having a flexible lip 43 adapted to overlies the lower end of the fiber casing 39.

The upper end portion of the flashlight is enclosed within a member of insulating material, preferably rubber, consisting of a cylindrical portion 45 having the intumed lip 47 which overlies the lens ring 23 and a constricted somewhat thinner and more flexible rubber portion 49 which terminates in a flexible annular lip 51 which overlies the upper end of the fiber housing 39 so that, by means of these three elements 39, 41 and 45—51 of insulating material, all the metallic parts of the flashlight are completely enclosed or covered by dielectric material.

The circuit closer of this invention is particularly applicable to a flashlight of the character just described although by no means confined in its use thereto. An opening 53, preferably rectangular, is formed in the dielectric outer casing 39. This opening is preferably of its longest dimension in the longitudinal direction of the casing. The metallic inner casing is formed with an opening 55 substantially registering with the opening 53 and having an outwardly deflected tongue or lip 57 integral therewith which extends upwardly and forwardly in the opening 53 to serve as a stop for the circuit closer in this retracted position. This lip 57 is an edge or surface angularly related to the contact strip 81. The rear end of the slot 55 in the brass case 7 is deflected upwardly for two purposes. The first purpose is to help retain the fiber tube and the brass tube piercings 53 and 55 in register. The second purpose is to provide a sloping surface against which the rearmost end of the contact strip will cam or slide when the strip is inserted into the slide.

Slidable on the outer surface of the dielectric casing 39 is the slide or thumb piece 61 which may conveniently be rectangular, as shown in Figure 2, and of transverse and longitudinal dimensions to materially overlie the surface of the casing 39 on all sides of the opening 53. The surface of the slide 61 proximate the dielectric casing 39 is formed of a curvature whose radius is substantially that of the radius of the outer surface of the dielectric casing 39 as shown at 63 in Figure 3.

The upper surface or exposed surface of the slide 61 may be of any convenient configuration to permit engagement by the thumb, say, of the hand holding the flashlight, to permit the manipulation of the circuit closer. Thus, in the illustrated embodiment, forwardly of the midpoint of the slide 61, the slide is formed with an elevated portion 65 and is then of progressively changing thickness, as at 67, to a rear point which is of increased thickness, as at 69, but of lesser thickness than the portion indicated at 65 and is corrugated or otherwise roughened, as at 71, to provide a surface which will conveniently receive the thumb of the manipulator without danger of slipping.

At a thicker portion of the slide and on the axis thereof, the lower surface 63 is formed with a rectangular recess 73 which receives a sleeve 75 of rectangular cross-section secured in position by means, say, of a screw 77. In order to permit access to the head of the screw 77, the outer face of the sleeve 75 is slotted, as at 79, and in register with the aperture through which the screw passes. The slot is of increased diameter sufficient to permit the passage of the head of screw 77 as shown in Figure 2.

Carried with the slide 61 within the casing 7, 39 is a reciprocating contact strip indicated generally at 81 and shown in perspective in Figure 4. At this forward end, the contact strip is deflected somewhat, as at 83, as a contact surface to engage and make electrical connection with, say, the reflector 17 of the flashlight. Intermediate its contact portion 83 and the slide, the contact member is formed with a longitudinal rib 85 for strength and to space slightly the contact member from the inner conductive casing 7.

That portion of the contact strip 81 proximate the slide 61 is offset, as at 87, and is formed with inwardly deflected tongues 89 and 90 which are shown in Figure 4 as four in number, two along

each edge of the strip and directed toward one another to form stops, it being observed that the spacing of the tongues 89 and 90 are such as to receive between them the side 78 of the sleeve 75 on the slide when the circuit closer is disposed in its normal position within the sleeve 75.

Rearwardly of the opening 55, the inner conductive casing 7 is formed with an inwardly offset portion or boss 59 of a dimension, in the circumferential direction of the inner casing 7, not greater than and conveniently less than the circumferential dimension of the opening 55. At its rear end, the circuit closer is provided with an outwardly directed boss or lug 91 which normally bears on the inner surface of the conductive casing 7 to retain the contact member 81 in spaced relation to the inner casing 7. Thus, the lug 91 and the offset 86 together with the rib 85, if present, serve to hold the sliding contact 81 against the inner side of the sleeve 75 so that it cannot work loose as the slide is manipulated. When the lug 91 is at the rearmost portion of the boss 59, it serves as a retaining latch for the open circuit position of the switch contact strip. When the switch contact strip is advanced to the closed circuit position, the lug 91 will then drop off from the boss 59 against the foremost end of this boss so as to releasably retain the switch contact strip in closed circuit position.

To retain the slide against lateral movement and to form a guideway or channel for the contact 81 to move in, semi-circular bosses 93 are struck inwardly in the conductive casing 7 two on each side of the path of the slide 81 so that the opposed straight sides 94 of these bosses form, in effect, the walls of a groove within which the contact 81 reciprocates. These bosses also space the battery 31 from the contact member 81.

The structure just described permits the circuit closer to be readily disassembled. To remove the switch in the flashlight illustrated, the flexible rubber hood 51 is first rolled back away from the lens ring 23 and the lens ring which carries the lens and reflector assembly is then unscrewed from the flashlight casing. Obviously, if no insulatory material such as the hood 45, 49, 51 is present, it would merely suffice to remove the lens ring and withdraw the reflector and lamp socket to permit access to the interior of the casing. The batteries, if present, would then be removed so as to permit the insertion of a finger.

For removal, the slide 61 is moved to circuit closed position, shown in Figure 1. The finger is then inserted and pressure exerted against the inner surface of the offset portion 87 say, between the lug 91 and the adjacent pair of tongues 90. Pressure against the tensioned contact strip at this point moves the offset portion as a whole inwardly within the sleeve 75 and releases engagement of the tongues 90 with respect to the wall 78 of the sleeve permitting the contact member 81 to be slid forwardly by the frictional engagement of the finger which exerts the pressure and removes the strip out the open end of the casing. The slide 61 is then free to be lifted off the casing, carrying with it the sleeve 75.

Assembly of the circuit closer is accomplished by a reversal of these steps. The slide is first placed in position with the sleeve entering the openings 53 and 55, the sleeve 75 being in the rearmost end of the openings, i. e., the end toward the bottom cap. The contact strip 81 is then inserted with the deflected end 83 directed toward the casing 7 and pushed through the sleeve 75 until the tongues 89 and 90 snap into place on opposite sides

of the sleeve 75 when the switch is assembled and ready for operation.

It will be recognized that while the circuit closer of this invention is particularly applicable to an insulated flashlight, that it is equally applicable in any situation where a circuit is to be closed by a sliding contact member and no limitation is intended by the phraseology of the foregoing description, or illustrations in the accompanying drawings, except as indicated in the appended claims.

What is claimed is:

1. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate its ends, a slide disposed wholly on the outer surface of the casing and movable over the opening, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side secured to the slide, side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient contact strip within the sleeve and supported on the inner side of the sleeve and formed remote from one end of the sleeve with an outwardly offset portion in spaced relation to the sleeve and engaging the casing and also formed remote from the opposite end of the sleeve and spaced therefrom with an outwardly offset portion engaging the casing to thereby place the intermediate inwardly offset portion of the strip under tension in spaced relation to the casing in position in the sleeve, means on the strip interengaging the inner side of the sleeve to hold the strip in position in the sleeve whereby said strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing and out of engagement with the sleeve.

2. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate its ends, a slide disposed wholly on the outer surface of the casing and movable over the opening, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side secured to the slide, side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient contact strip within the sleeve and supported on the inner side of the sleeve and formed remote from one end of the sleeve with an outwardly offset portion in spaced relation to the sleeve and engaging the casing and also formed remote from the opposite end of the sleeve and spaced therefrom with an outwardly offset portion engaging the casing to thereby place the intermediate inwardly offset portion of the strip under tension, said strip being formed with inwardly directed opposed abutment means engaging opposite ends of the inner side of the sleeve to position the strip in the sleeve in spaced relation to the casing whereby said strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing and out of engagement with the sleeve.

3. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate

its ends, a slide disposed wholly on the outer surface of the casing and movable over the opening, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side secured to the slide, side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient circuit closing strip within the sleeve and supported on the inner side of the sleeve and formed remote from one end of the sleeve with an outwardly offset contact making portion in spaced relation to the sleeve and engaging the casing and also formed remote from the opposite end of the sleeve and spaced therefrom with an outwardly offset lug portion engaging the casing to thereby place the intermediate inwardly offset portion of the strip under tension in position in the sleeve in spaced relation to the casing, means on the strip interengaging the inner side of the sleeve to hold the strip in position in the sleeve whereby said strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing and out of engagement with the sleeve.

4. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate its ends, a slide disposed wholly on the outer surface of the casing and movable over the opening, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side secured to the slide, side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient circuit closing strip within the sleeve and supported on the inner side of the sleeve and formed remote from one end of the sleeve with an outwardly offset contact making portion in spaced relation to the sleeve and engaging the casing and remote from the opposite end of the sleeve and spaced therefrom with an outwardly offset lug engaging the casing to place the strip under tension in position in the sleeve in spaced relation to the casing, means on the strip interengaging the inner side of the sleeve to hold the strip in position in the sleeve whereby said strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing and out of engagement with the sleeve, said casing being formed with an inwardly extending boss to position the lug whereby the circuit closing strip may be selectively retained in open or closed circuit position.

5. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate its ends, a slide disposed wholly on the outer surface of the casing and movable over the opening, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side secured to the slide, side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient circuit closing strip within the sleeve and supported on the inner side of the sleeve and formed remote from one end of the sleeve with an outwardly offset contact making portion in spaced relation to the sleeve and engaging the casing and remote from the opposite end of the sleeve and spaced therefrom with an

outwardly offset lug engaging the casing to place the strip under tension in position in the sleeve in spaced relation to the casing, means on the strip interengaging the inner side of the sleeve to hold the strip in position in the sleeve whereby said strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing to permit withdrawal of the strip in the direction of the contact making portion of the strip, said opening being formed with a lip angularly related to the plane of the strip and in a plane intersecting the axis of the casing to deflect and guide the lug carrying end of the strip during its insertion in the sleeve.

6. In a flashlight, circuit closing means capable of being dismantled without the use of tools comprising the combination with an open ended tubular casing formed with an opening intermediate its ends, a slide of insulating material disposed wholly on the outer surface of the casing and movable over the opening, said slide being formed on its under surface with a rectangular recess, a tubular sleeve, rectangular in cross-section, disposed in the opening and comprising an outer side removably secured in the recess in the slide,

side walls extending through the opening and an inner side within the casing in radially spaced relation to the slide, a resilient circuit closing contact strip, an intermediate portion of which is disposed within the sleeve and is supported on the inner side of the sleeve and formed, remote from one end of the sleeve, with an outwardly offset portion in spaced relation to the sleeve bearing against and sliding along the inner surface of the casing and a contact making outwardly offset portion remote from the opposite end of the sleeve and spaced therefrom and bearing against and sliding along the casing to place the strip under tension and position it in the sleeve in spaced relation to the casing, means on the strip interengaging the inner side of the sleeve to hold the strip in position in the sleeve whereby the strip may be disengaged from the sleeve by a finger inserted through the open end of the casing and pressing the intermediate portion outwardly toward the casing to permit the withdrawal of the strip in the direction of the contact making portion of the strip and the removal of the slide and tubular sleeve as a unit for replacement of damaged parts.

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