

April 23, 1940.

W. J. OFFICER ET AL

2,197,941

FLASHLIGHT SWITCH

Filed Aug. 17, 1936

4 Sheets-Sheet 1

Fig. 1.

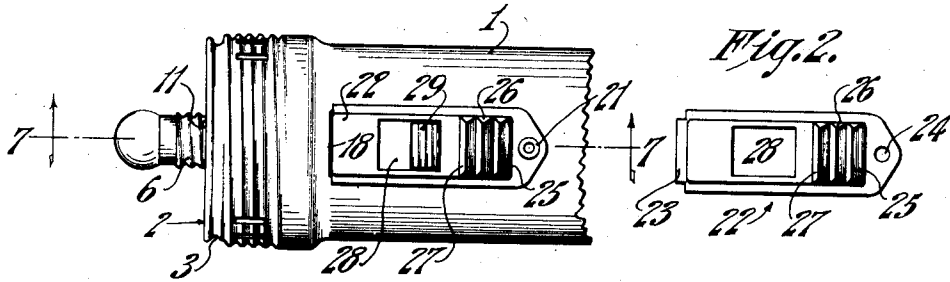


Fig. 2.

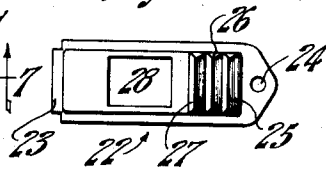


Fig. 3.

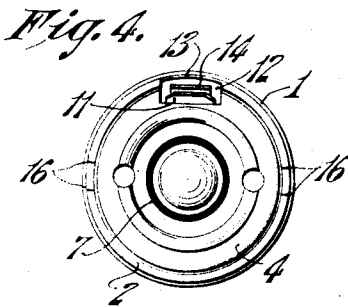
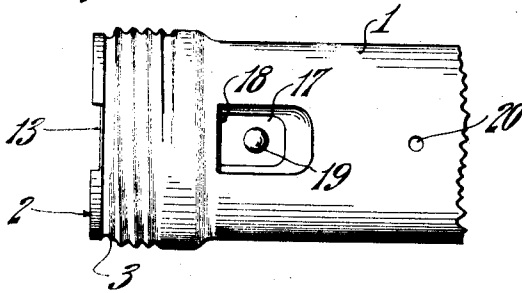


Fig. 5.

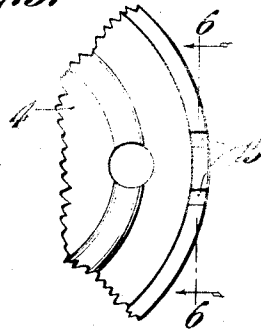
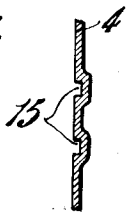


Fig. 6.



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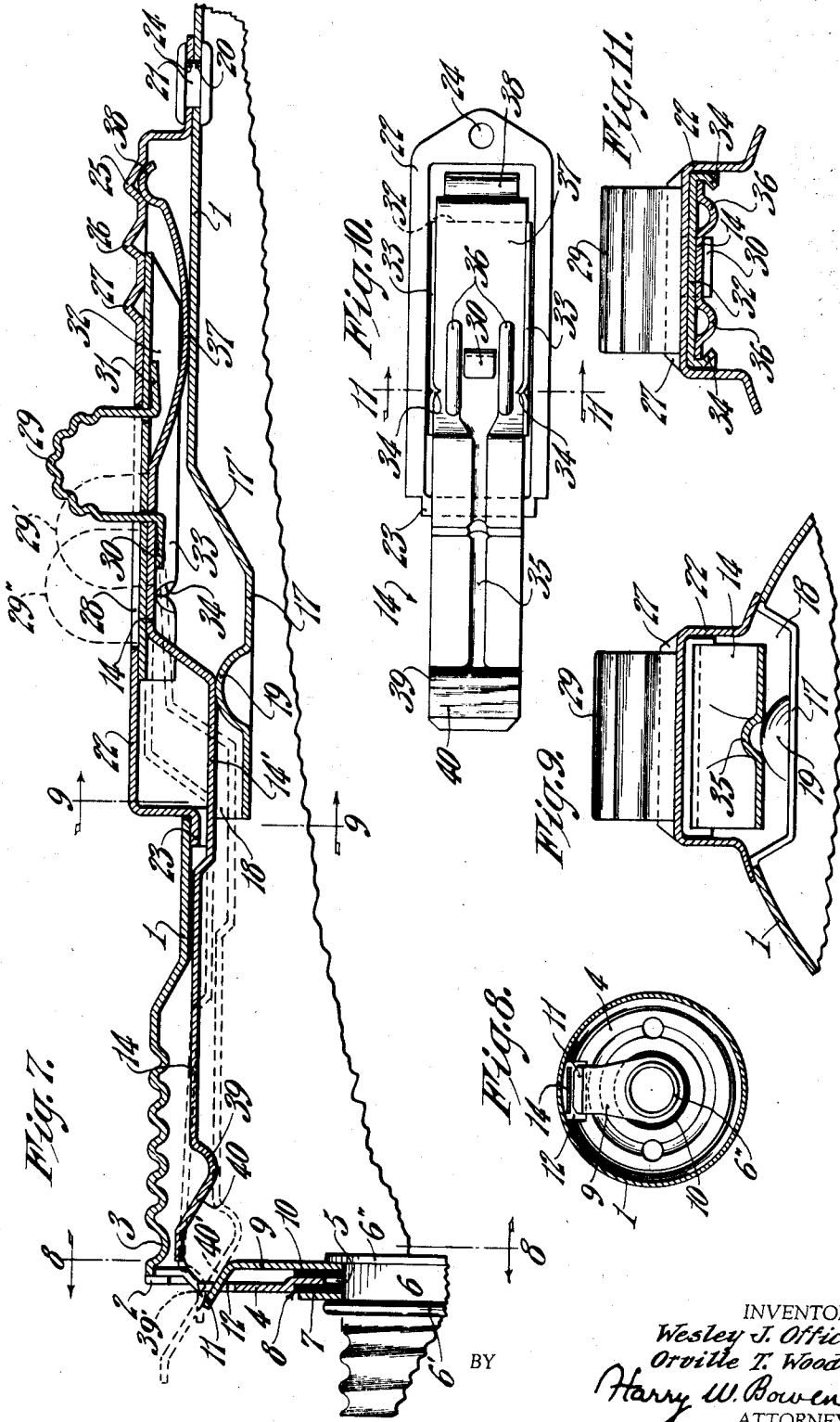
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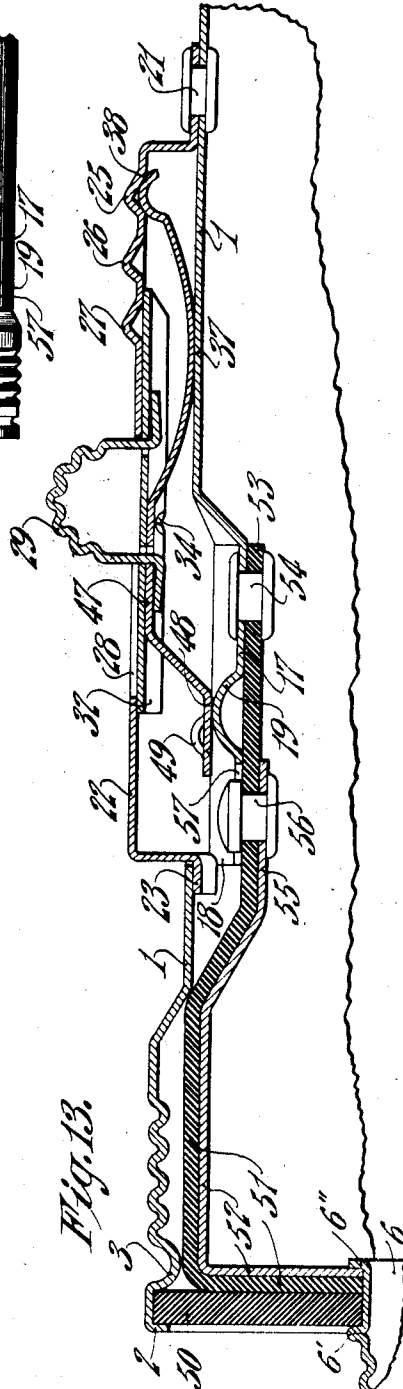
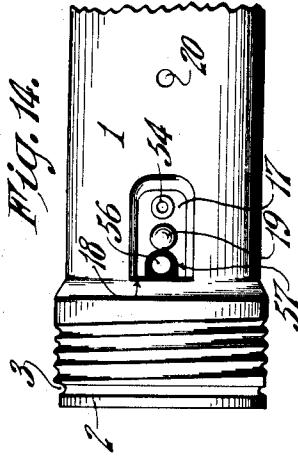
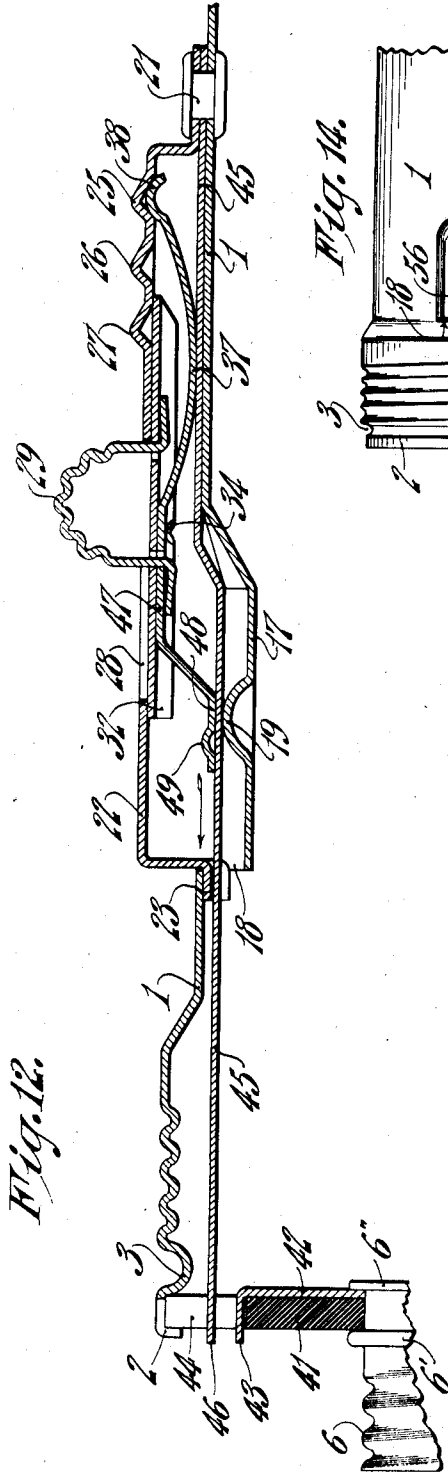
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4 Sheets-Sheet 3



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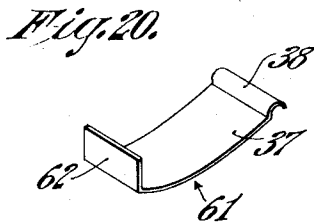
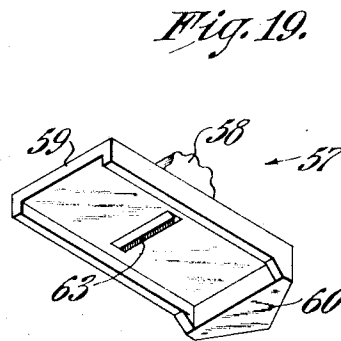
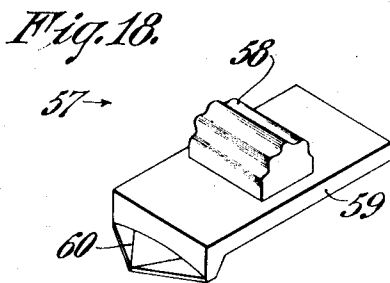
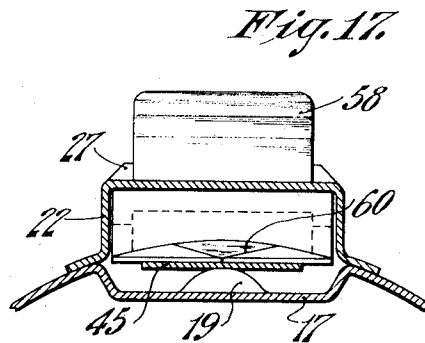
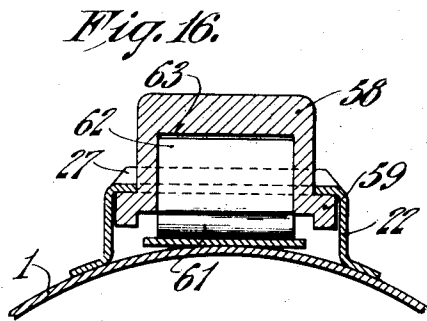
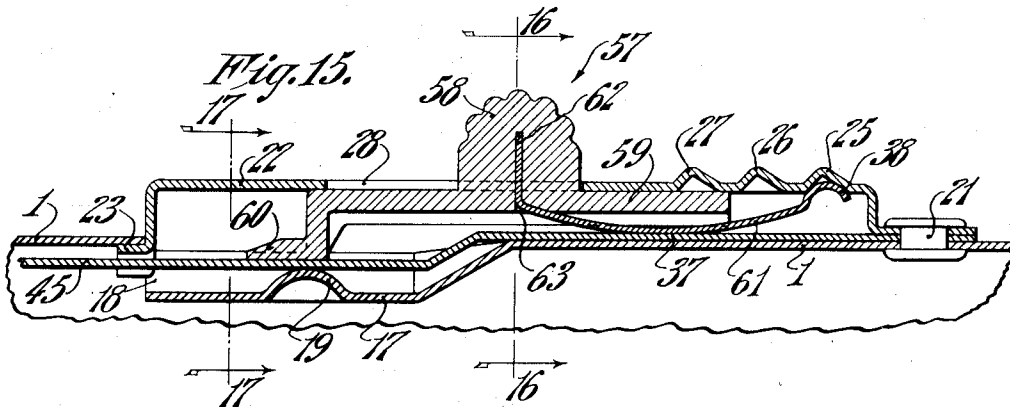
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,197,941

FLASHLIGHT SWITCH

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Application August 17, 1936, Serial No. 96,364

7 Claims. (Cl. 240—10.66)

Our invention relates to improvements in flashlight switches, and is particularly pertinent to that type of flashlight switch known in the art as a three-position switch, in which the actuating member of the switch construction has three definite positions, first, an open circuit position in which the electrical circuit is open; second, an intermittent or flash position, in which the electrical circuit may be closed by manual manipulation of the actuating member; and third, a closed circuit position, in which the electrical circuit is held in closed position.

An object of this invention is to provide a three-position switch construction, incorporating means for definitely and positively locating and holding the switch actuating member in any one of its three positions.

A further object of the invention is to provide a three-way switch construction and co-operating parts so arranged that insulation of the switch contact strip is unnecessary, thereby reducing the cost of manufacture relative to existing methods, and improving the reliability and life of the flashlight.

A still further object of this invention is to provide a three-position switch construction involving a minimum of parts, resulting in a substantial reduction in the cost of manufacture and assembly.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification taken in connection with the accompanying drawings.

In carrying this invention into effect, a lamp socket screw shell is supported from the casing and insulated from the casing. A contact member is electrically connected to the lamp socket and is adapted to be electrically connected with a contact strip, whereof an actuating member is movably supported in a switch housing, there being operative connecting means for actuating the contact strip, whereby the contact strip may be brought into engagement with the contact member for closing the electrical circuit. In one aspect of the invention, there is provided co-operating means between the actuating member and the housing, which is, in effect, part of the casing, for positioning and holding the actuating member in open circuit position, intermittent or flash position, or closed circuit position.

Preferred embodiments of our invention are illustrated in the accompanying drawings, in which—

ing with switch, screw shell, and lamp assembled thereon.

Fig. 2 is a plan view of the switch housing.

Fig. 3 is a partial plan view of the flashlight casing.

Fig. 4 is an end view of the casing, showing the screw shell supporting disc.

Fig. 5 is a detail view of a portion of the screw shell supporting disc.

Fig. 6 is a sectional view, taken on the line 6—6 of Fig. 5.

Fig. 7 is a longitudinal sectional view, taken on the line 7—7 of Fig. 1.

Fig. 8 is a cross sectional view, taken on the line 8—8 of Fig. 7.

Fig. 9 is a cross sectional view, taken on the line 9—9 of Fig. 7.

Fig. 10 is an underside plan view of the switch housing, and contact strip.

Fig. 11 is a cross sectional view, taken on the line 11—11 of Fig. 10.

Fig. 12 is a view similar to Fig. 7, illustrating a modified form of construction.

Fig. 13 is a view similar to Fig. 7, illustrating a further modification.

Fig. 14 is a partial plan view of the casing, shown in Fig. 13.

Fig. 15 is a longitudinal sectional view of a switch construction in which the actuating button is formed from a plastic material.

Fig. 16 is a cross sectional view, taken on the line 16—16 of Fig. 15.

Fig. 17 is a cross sectional view, taken on the line 17—17 of Fig. 15.

Fig. 18 is a perspective view of the actuating button, shown in Fig. 15, taken from above.

Fig. 19 is a perspective view of the actuating button, shown in Fig. 15, taken from beneath, and

Fig. 20 is a perspective view of the button-positioning member.

Referring now to the drawings in detail, in which like numerals refer to like parts throughout:

A battery casing 1 is formed near its front end 2 with an inwardly projecting bead, or knurl 3, which provides a shoulder, or seat, for a metallic disc 4. (See Fig. 7.) In assembling, the disc 4 is placed against the knurl 3 and the end 2 of the casing 1 is folded or spun inwardly over the disc 4, as clearly indicated at 2 in Fig. 7. The disc 4 is provided with a central opening 5, relatively larger in diameter than a lamp socket screw shell 6, and the lamp screw shell 6 is supported on the disc 4 by a washer 7 of insulation which

Fig. 1 is a partial plan view of a flashlight cas-

is engaged in a socket, or recess 8, formed in the disc 4. A contact member 9 is also supported on the metallic disc 4 and insulated therefrom by a washer 10 of insulation. The disc 4, washers 7 and 10, and contact member 9 are assembled firmly as a unit by means of the lamp socket screw shell 6, which tightly grips these members between the bead 6' and flange 6''. The contact member 9 is provided with a contact lip 11, which is bent at an angle, as illustrated in Fig. 7, and extends outwardly through an opening 12, formed in the metallic disc 4. The casing 1 is also provided with a notch 13 which registers with the opening 12, to provide clearance around the portion or bent lip 11 and a contact strip 14. (See Fig. 4.) To insure proper registration of the opening 12, notch 13, contact strip 14, the disc 4 is provided with detents 15, and, at assembly, after the end 2 of the casing 1 has been folded over the disc 4, the portion thus folded is struck inwardly into the detents 15, as indicated at 16 in Fig. 4, thus preventing relative rotary movement between the casing 1 and disc 4. The casing 1 is formed with a depressed portion 17 terminating at its forward end in a slot 18, and the depressed portion 17 is provided with a raised bump or projection 19, the purpose of which will be later explained. The casing 1 is also pierced at 20 for an eyelet or rivet 21. A housing 22 is formed with a forwardly extending tab portion 23 at its front end, and pierced adjacent its rear end at 24 to receive the eyelet or rivet 21. The housing 22 is securely attached to the casing 1 by engagement of the tab 23 in the slot 18, in co-operation with the eyelet 21.

The housing 22 is also formed with the V-shaped station grooves 25, 26, and 27, and an opening 28 through which an operating button 29 projects. The operating button 29 is secured by means of tabs 30 and 31 to a channel-shaped slide member 32 slidably supported within the housing 22, and the contact strip 14 is also secured to the slide 32 and button 29 by the tab 30. The contact strip 14 is also secured to the slide 32 by indenting the flanges 33 at 34, as shown clearly in Figs. 7, 10, 11, 12, and 13. The contact strip 14 is ribbed at 35 and 36 for rigidity, and is formed with a rearwardly extending spring portion 37 terminating in a hook, or roll 38, which is normally engaged in one of the position grooves 25, 26, and 27. The end of the contact strip 14, opposite the hook 38, is formed with a downwardly projecting bead or roll 39, terminating in an end portion 40 bent at an angle approximating the angle of the lip 11 on the contact member 9.

The operation is simple. The operating button 29, slide 32, and contact strip act as a unitary structure. In the inoperative, or open circuit position, with the hook 38 engaged in the groove 25, a portion 14' of the contact strip 14 rests on the bump 19, thereby preventing depression of the button 29. When the button 29 is moved forwardly until the hook 38 is engaged in the intermediate, or flash position groove 26, the button 29 may then be depressed as indicated at 29' in Fig. 7. Such depression forces the contact strip 14 downwardly until the end 40 thereof is in contact with the lip 11 of the contact member 9. This position is indicated by dotted lines 40', in Fig. 7. A further forward movement of the button 29, to the position indicated at 29'', in Fig. 7, with the hook 38 engaged in the closed circuit position groove 27, will move the contact strip 14 forwardly until the bead 39 is engaged on the lip 11,

as indicated at 39', and the free end of strip 14 is within the recess 12. The indented portion 17 of the casing 1 serves also to position the battery (not shown) in the casing, to clear the contact strip 14 and provide for absolute freedom of movement of the contact strip. The rear, sloped portion 17' of the part 17 serves as a guide for easing the battery, during insertion, into the casing by the portion 17.

In the modified construction, illustrated in Fig. 12, a disc 41 of insulating material is secured in the casing 1 between the bead 3 and flange 2, and the disc 41 and a contact member 42 are secured together between the bead 6' and the flange 6'' of the lamp socket screw shell 6. The contact member 42 is formed with an outwardly projecting lip 43 which extends through an opening 44 in the disc 41. A contact strip 45 is fixedly secured on the casing 1 by means of the eyelet 21, and extends thence forwardly through the slot 18 in the casing 1 and terminates at 46, over or above the bent lip 43. A spring-actuating member 47, formed with the spring portion 37 and groove-engaging hook 38, is secured in the slide 32, and is formed with the downwardly bent portion 48 which rides on the top of the contact strip 45. The portion 48 is formed with a raised bump or bead 49. The operation is similar to that described for the construction, shown in Fig. 7, except that the contact strip 45 is fixed and does not move longitudinally with the operating button 29. With the parts in the inoperative or open circuit position, indicated in Fig. 12, the hook 38 is engaged in the groove 25, and the portion 48 of the member 47 rests on the strip 45 directly over the bump 19 in the casing 1. In this position, deflection of the button 29 cannot deflect the strip 45 into engagement with the contact lip 43. When the button 29 is moved forwardly, until the hook 38 is engaged in the groove 26, the portion 48 of the member 47, will be positioned forwardly of the bump 19, and depression of the button 29 will force the fixed strip 45 downwardly, until the end 46 is in contact with the lip 43. When the button 29 is moved forwardly, until the hook 38 is engaged in the groove 27, the bump or bead 49 on the spring portion 48, is forced under the flange 23 of the housing 22, thus forcing the contact strip 45 downwardly into permanent engagement with the lip 43.

In the construction, shown in Fig. 13, a disc 50 of insulation is secured in the casing 1 between the bead 3 and flange 2. The lamp screw shell 6, supported in the disc 50, binds the ends of an insulation strip 51 and a contact strip 52 to the disc 50. The opposite end 53 of the insulation strip 51 is secured on the under side of the portion 17 of the casing 1 by a rivet, or eyelet 54. The corresponding end 55 of the contact strip 52 is secured on the insulation strip 51 by a rivet, or eyelet 56. The portion 17 of the casing 1 is formed with a slot 57 to clear the rivet 56 and prevent electrical contact between the casing 1 and rivet 56. The construction of the housing 22, button 29, slide 32, and spring 37 is the same as shown in Fig. 12. The operation is the same as that described for the construction shown in Fig. 12, except that in the intermittent position controlled by the groove 26, depression of the button 29 will bring the part 48 into engagement with the contact strip 52 through the rivet 56, and in the closed circuit position controlled by the groove 27, engagement of the part 49,

under the flange 23, will also bring the part 48 into engagement with the rivet 56.

In the construction, illustrated in Figs. 15 to 20, inclusive, the construction and operation is the same as that shown in Fig. 12, with the exception of the operating button, slide, and spring. The operating button, slide, and forward portion of the spring have been combined in a single member 57 of plastic, or molded material. This member 57 is formed with a button portion 58, a slide portion 59, and a foot portion 60, corresponding to the portions 48 and 49 of the spring 47 in Fig. 12. A spring member 61, having the spring portion 37 and hook 38, is formed with an upwardly extending portion 62 by means of which the spring 61 may be secured to the member 57 by pressing the portion 62 into a groove 63, formed in the member 57. The operation is the same as that described for the construction, shown in Fig. 12.

It will be readily understood, by those skilled in the art, that the switch constructions disclosed in this application are applicable to all flashlights in which the lamp terminal is grounded through the batteries to the casing and the lamp shell grounded to a contact member, insulated from the casing and capable of electrical connection with some part of the switch construction only.

What we claim is:

1. Means for operating a slidable contact for closing the circuit with a contact terminal in a flashlight construction having a battery-enclosing casing, a struck-up portion in the casing, a housing on the casing having spaced grooves, said slidable contact having a springy part that engages the spaced grooves, a thumb piece slidable in the housing and connected to the said contact, the slidable contact normally engaging the struck-up portion of the casing when the springy part of the contact is in one groove for maintaining an open circuit with the contact terminal and disengaged from the struck-up portion when the springy part of the slidable contact is in another groove for effecting either an intermittent or closed circuit.

2. In a switch construction for flashlights, a reciprocable composite actuating member comprising a contact member, a thumb piece having a lip and a plate formed with flanges, said flanges being bent into engagement with the contact member, the contact member and the flanged plate having registering openings, respectively, to the lip portion on the thumb piece passing through said openings and being bent to engage the contact member and the flanged plate, whereby the contact member, the thumb piece and the flanged plate are permanently secured together to move as a unit.

3. In a flashlight switch construction, a casing formed with a depressed recess provided with a struck-up portion, said casing being also formed with an opening adjacent said recess and an inclined ramp opposite said opening, a switch housing secured on said casing and having a flange engaged in said opening, a disc secured in an end of said casing and provided with an opening extending inwardly from the periphery thereof, a contact terminal secured on said disc and insulated from said casing and having a part located in the opening in said disc, a lamp socket secured on said disc and electrically connected to said contact terminal, a contact strip in said casing and normally engaged on said struck-up portion for spacing said strip from said contact

terminal, a switch slide in said housing in operative engagement with said strip, an operating button on said slide, said housing being provided with position grooves, a spring on said slide cooperating with said position grooves for locating said slide in three positions relative to said struck-up portion, an open circuit position in which the contact strip is spaced from the contact terminal, a flash position in which the contact strip may be depressed by said button into engagement with said terminal, and a closed circuit position in which the contact strip is depressed into engagement with the contact terminal.

4. In a flashlight switch construction, a casing, a lamp socket, a contact terminal electrically connected to said lamp socket, said lamp socket and said terminal being insulated from said casing, said casing being formed with a recess and an opening communicating with said recess, a projection in said recess, a housing on said casing provided with a flange engaged in the opening in the casing, a contact strip in said housing and extending into said casing through said opening and having an end thereof normally spaced from said contact terminal, a slide in said housing provided with an operating button, a spring on said slide, said housing being formed with three position grooves cooperating with said spring to position said slide, said slide and said projection cooperating to space said contact strip and said contact terminal to maintain an open circuit when said spring is engaged in one of said grooves, said slide and said button cooperating to depress said strip into electrical contact with said terminal when said spring is in another of said grooves, and said slide and said casing cooperating to depress said strip into electrical connection with said terminal when said spring is in the third of said grooves.

5. In a flashlight, in combination, a battery containing casing, a lamp socket, a contact electrically connected with the lamp socket, said lamp socket and the contact being insulated from the casing, said casing being formed with a recess defined by a flat bottom wall terminating in an opening communicating with the casing interior, a conductive contact strip in the recess having a portion thereof adapted to engage the first named contact, a housing on said casing and whereof a part encloses said recess, said housing being formed with an opening, a slide in the recess, an actuating member carried therewith and movable in the opening in the housing, a reciprocable member in the recess comprising operating means for the contact strip, positioning means carried with the reciprocable member and relatively fixed positioning means adapted to contact therewith, whereby said conductive contact strip may be positioned either in open circuit, intermittent or closed circuit position.

6. In a flashlight, in combination, a battery containing casing, a lamp socket, a contact electrically connected with the lamp socket, said lamp socket and the contact being insulated from the casing, said casing being formed with a recess defined by a flat bottom wall terminating in an opening communicating with the casing interior, a housing on said casing whereof a part encloses said recess, said housing being formed with an opening, a slide in the recess, an actuating member carried therewith and movable in the opening in the housing, a conductive contact strip in the recess movable in the opening and having a portion thereof adapted to engage said first named contact, resilient positioning means carried with

the slide and having a portion engaging the casing and relatively fixed positioning means to co-act therewith whereby said conductive strip may be positioned either in open circuit, intermittent or closed circuit position.

7. In a flashlight, in combination, a battery containing casing, a lamp socket, a contact electrically connected with the lamp socket, said lamp socket and the contact being insulated from the casing, said casing being formed with a recess defined by a flat bottom wall terminating in an opening communicating with the casing interior, a conductive contact strip in the recess having a portion thereof adapted to engage the first named contact, a housing on said casing and

whereof a part encloses said recess, said housing being formed with an opening, a slide in the recess, an actuating member carried therewith and movable in the opening in the housing, a reciprocable member in the recess and comprising operating means for the contact strip, said contact strip being resilient and comprising a positioning end, relatively fixed positioning means adapted to coact therewith, whereby said conductive contact strip may be positioned either in open circuit, intermittent or closed position and a portion of said contact strip intermediate its ends engaging the casing.

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