Aug. 14, 1951 J. G. SCHNEIDER 2,564,612

FLASHLIGHT SWITCH

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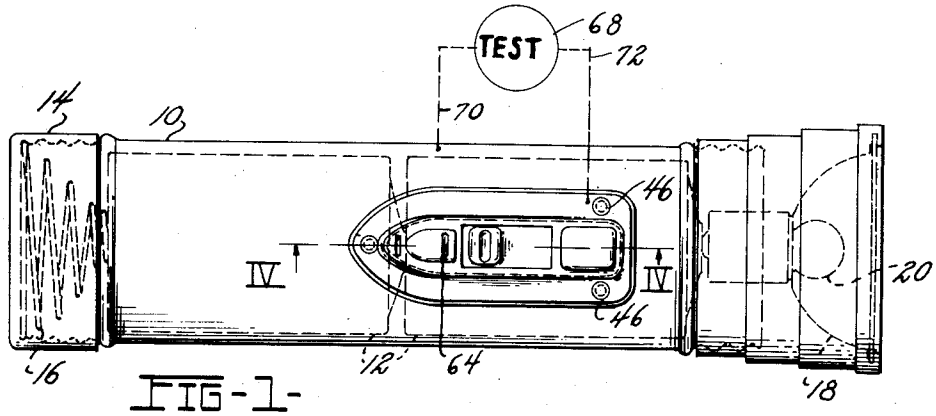


FIG-1-

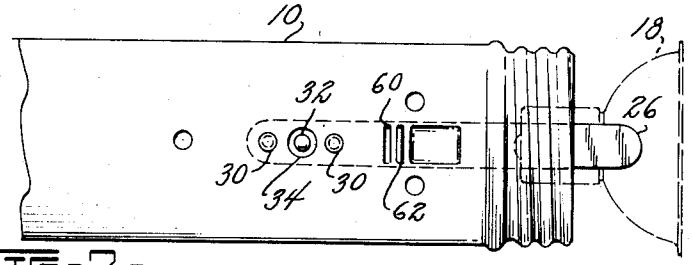


FIG-2-

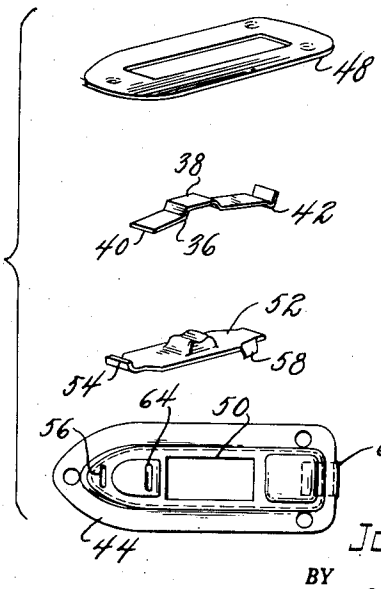


FIG-3-

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FLASHLIGHT SWITCH

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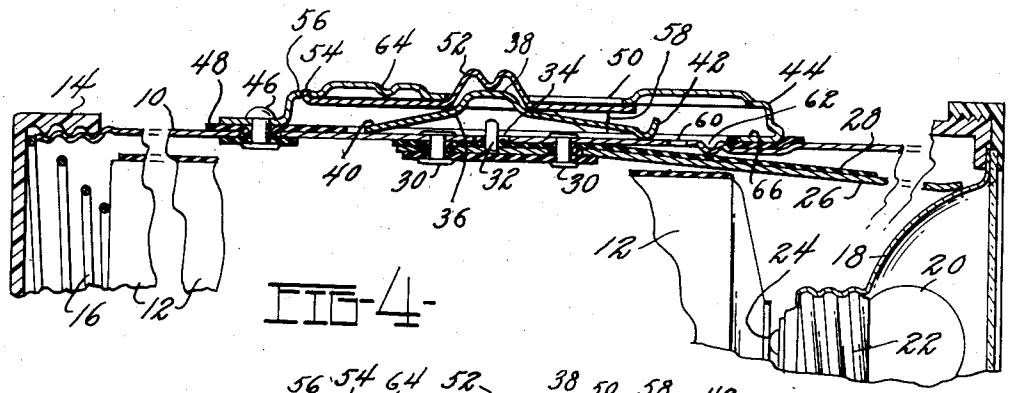


FIG-4-

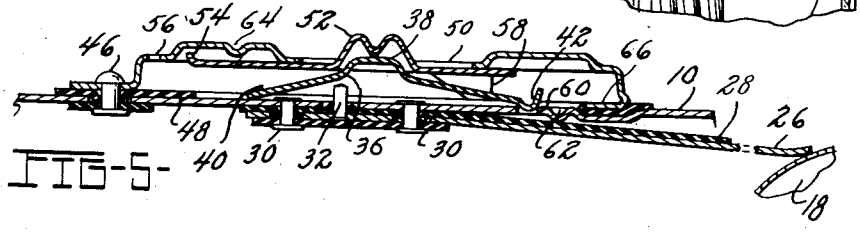


FIG-5-

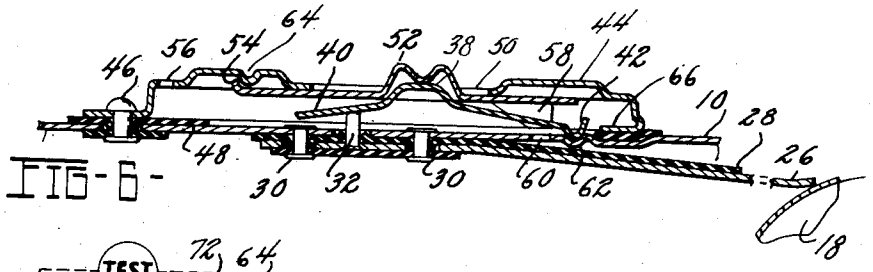


FIG-6-

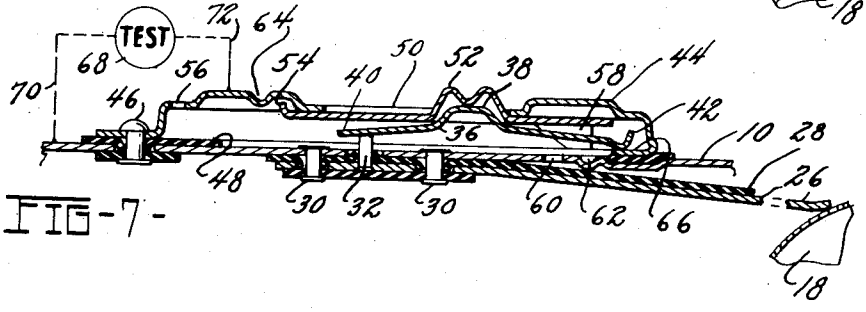


FIG-7-

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FLASHLIGHT SWITCH

Filed June 21, 1949 4 Sheets-Sheet 3

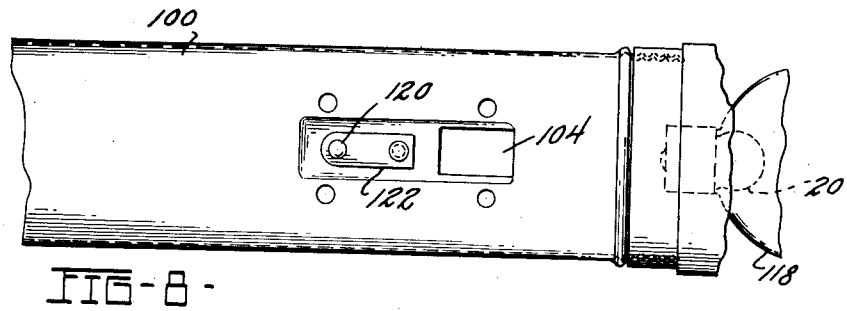


FIG-8-

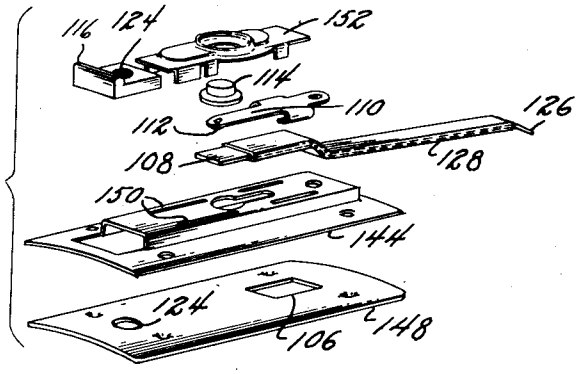


FIG-9-

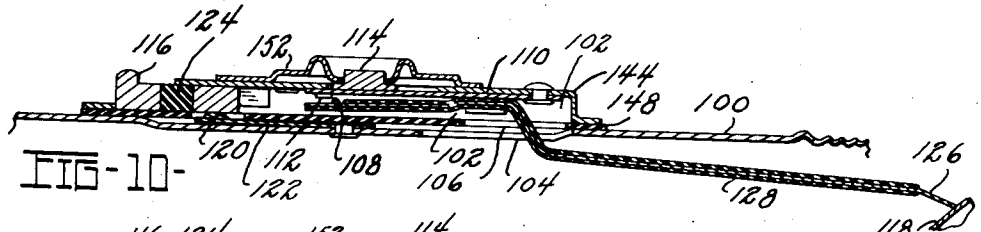


FIG-10-

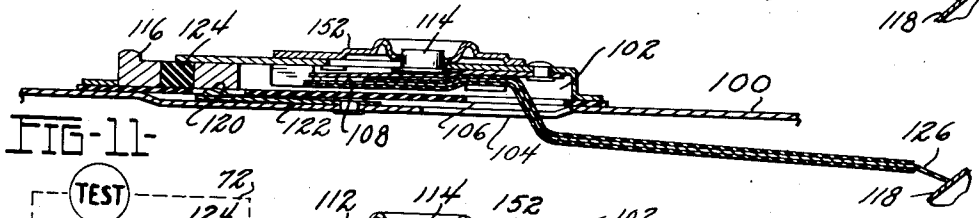


FIG-11-

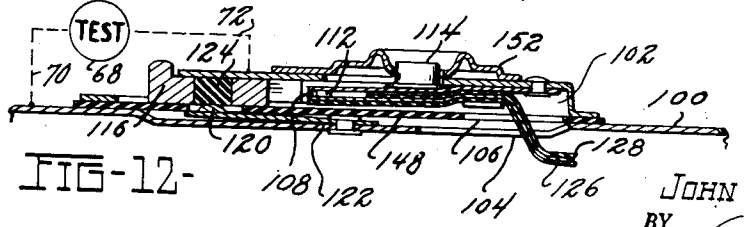


FIG-12-

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FLASHLIGHT SWITCH

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FIG-13-

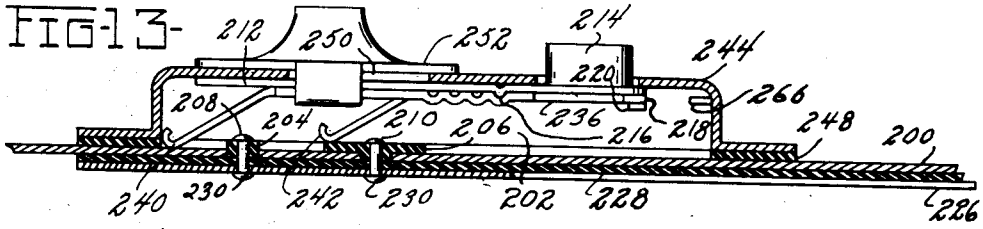


FIG-14-

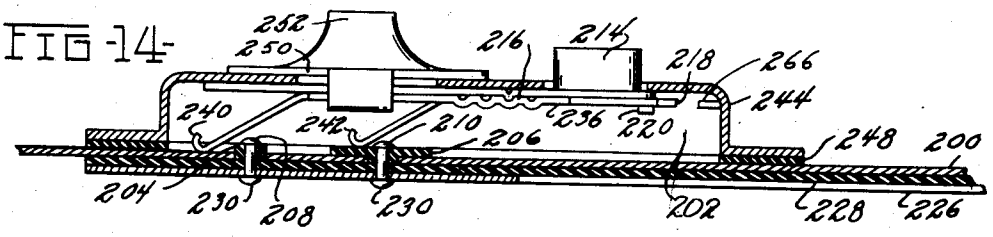


FIG-15-

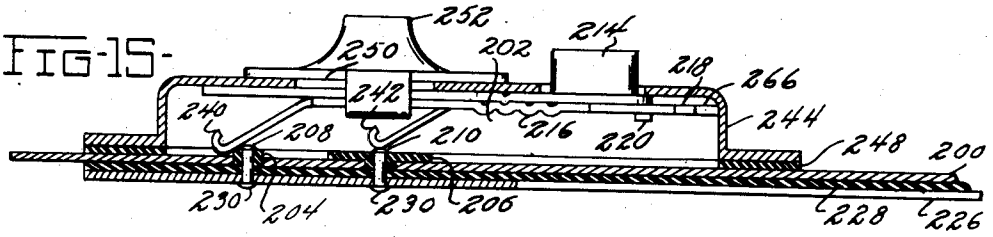
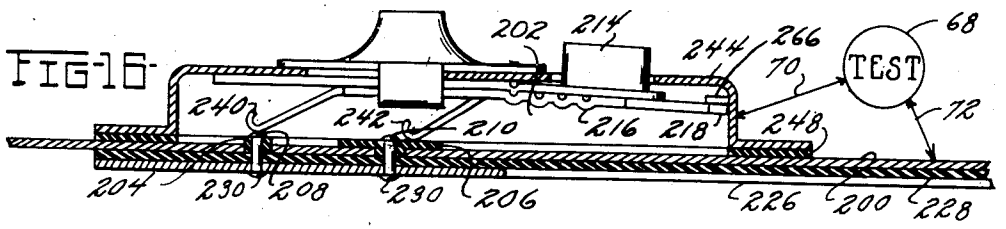


FIG-16-



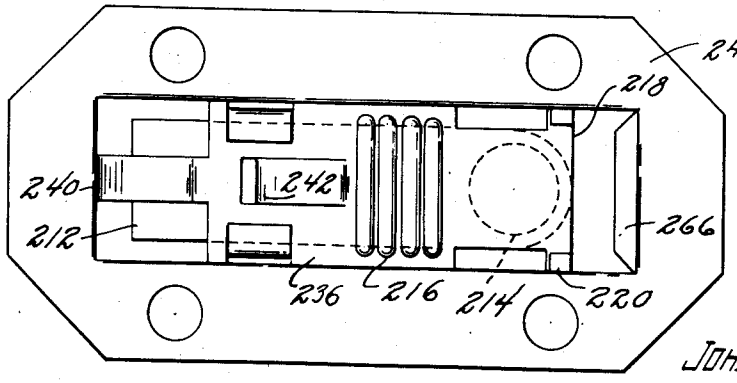


FIG.-17-

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Patented Aug. 14, 1951

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UNITED STATES PATENT OFFICE

2,564,612

FLASHLIGHT SWITCH

John G. Schneider, Toledo, Ohio

Application June 21, 1949, Serial No. 100,397

8 Claims. (Cl. 200—60)

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This invention relates to flashlights, more particularly to novel switch constructions which increase the utility of the flashlight.

An object of this invention is to provide a switch for a flashlight which retains the normal flashlight appearance and its utilities and adds an additional feature, that of converting the flashlight into an instrument for testing electrical devices.

Another object of the invention is to provide a switch for a flashlight operable in the usual manner to utilize the light therefrom and further operable to convert the flashlight into a testing device.

And another object of the invention is to provide a flashlight switch which not only controls the normal operations of the flashlight but may be further manipulated to convert the flashlight into a testing device, which switch incorporates no additional parts or design which would tend to place the use thereof beyond the limits of economical production, dependable operation, or induce self-shorting within its circuit.

Other objects and advantages of this invention relating to the arrangement, operation and function of the related elements of the structure, to various details of construction, to combinations of parts and to economies of manufacture, will be apparent to those skilled in the art upon consideration of the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Referring to the drawings:

Fig. 1 is a side elevation of a flashlight embodying the invention herein;

Fig. 2 is a view of the portion of the flashlight casing which mounts the switch;

Fig. 3 is a distributed view of the parts forming a preferred form of the switch mechanism;

Fig. 4 is a view on the line IV—IV, Fig. 1, with the switch in "off" position;

Fig. 5 is a view similar to Fig. 4, with the switch in "blinker" or "flashing" position;

Fig. 6 is a view similar to Fig. 4, with the switch in "steady light" position;

Fig. 7 is a view similar to Fig. 4, with the switch in "test" position;

Fig. 8 is a view similar to Fig. 2, showing the casing adapted to mount and cooperate with a modified form of switch mechanism;

Fig. 9 is a distributed view of the parts of the modified form of the switch for mounting on the casing of Fig. 8;

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Fig. 10 is a longitudinal section through the switch of Fig. 9, with the parts in "off" position, and from which position "blinker" operation may be effected;

Fig. 11 is a view similar to Fig. 10, with the parts in "steady light" position;

Fig. 12 is a view similar to Fig. 10, with the parts in "test" position;

Fig. 13 is a longitudinal section, similar to Fig. 4, through the type of flashlight switch which embodies a pair of circuit controllers, this type also incorporating features of the invention herein and with the parts being shown in "off" position;

Fig. 14 is a view similar to Fig. 13, the parts being in "blinker" position;

Fig. 15 is a view similar to Fig. 13, the parts being in "steady light" position;

Fig. 16 is a view similar to Fig. 13, the parts being in "test" position; and

Fig. 17 is a bottom plan view of the switch of Figs. 13 through 16.

The battery housing is herein shown as a tubular metallic casing 10 which may contain one, or a plurality in series, of batteries 12, as the energy source. Removable cap 14 normally closes one end of the casing and spring 16 positioned by the cap to engage the housing and one pole of the energy source places the conductor member 10 in series therewith.

A reflector 18 is mounted with the housing at the opposite end from the cap 14 and is electrically insulated therefrom in usual flashlight practice. The reflector mounts lamp 20 with the threaded portion 22 of its base in electrical contact therewith and its base tip 24 or other contact in electrical communication with the other pole of the energy source.

Conductor strip or bar 26 in contact with the reflector extends therefrom along the interior of the casing and is insulated therefrom by non-conductor pad or strip 28. Rivets 30 or equivalent means fixedly mounts the bar 26 to the casing, these rivets also being insulated against any direct contact therewith.

The bar 26 mounts pin 32, remote from the reflector, as an electric terminal of the bar, which pin radially extends through an aperture 34 in the casing 10, which aperture is of greater diameter than the pin, so there is no contact between the pin and the casing. It is apparent any electrical connection between the terminal 32 and the casing 10 completes the lamp circuit.

A manually operable switch is provided having a reciprocatory contact strip 36 shiftable relatively to the terminals, the casing and the switch

housing and has four distinct stations between its limits of movement which may be designated "off," "flash or blinker," "steady light," and "test."

This contact strip 36 comprises a length of spring brass or bronze centrally arched to provide a bridge portion 38 between its pin cooperating terminus 40 and its casing engaging terminus 42 remote therefrom. The terminus 42 is in the form of a reverse bend providing a smooth sliding contact cooperating along the casing as well as a seat engaging offset hereinafter more fully discussed.

A housing 44 is provided for the contact strip which comprises an escutcheon plate stamped from sheet metal and fixed to the casing 10 by rivet-like fastening means 46 which also anchor an insulation frame plate 48 between the housing and casing thereby insulating the housing 44 from the casing 10.

The housing 44 is provided with a slideway 50 therein as a guide for manually shiftable metallic slide 52 projecting therethrough from the housing interior wherein it is seated on the bridge portion 38 of the contact strip 36. Shifting the slide along the slideway in turn shifts the contact therewith from station to station.

At one end of the slideway or at "off" position, the slide 52 has a terminal offset 54 engaging seat 56 in the housing as a releasable catch holding the slide against non-intended movement. The spring nature of the contact acts to hold the slide against the inner face of the housing with the catch in holding position. A slight depressing of the slide releases the catch so that the slide may then be shifted away from the first or "off" station. Remote from the catch, the slide is provided with a pair of ears 58 maintaining the contact in proper alignment relative to the coacting parts. In their "off" position (Fig. 4), the contact terminus 40 engages the casing 10 as does the terminus 42 and the intermediate bridge portion 38 is arched over and above the pin terminal 32 such a distance that a depression of the slide 52 as far as the contour of the parts permit will not bring the contact 36 into engagement with the pin. Hence the circuit to the lamp remains open.

The slide 52 is shifted from the first station to the second station or the "flash or blinker" position (Fig. 5). This position may be determined and felt by the operator, in that the terminus 42 engages seat 60, which may be an opening in the casing 10. At this position the contact 36 still arches over the terminal 32 and the termini 40, 42, maintain their contact with the casing 10, but the terminus 40 is brought into such juxtaposition as to the pin that a partial depression of the slide causes a contact between the terminus 40 and the pin 32. This lights the lamp and a release of the slide causes the spring element to shift away from circuit closing contact thereby extinguishing the light.

The slide may be shifted to the third or "steady light" station (Fig. 6). Here the contact terminus 40 rides up onto the terminal 32, the terminus 42 rides into a seat 62 embossed in the housing 10, while the offset 54 engages an embossing 64 in the switch housing 44. These two engagements not only insure a firm contact for closing the lamp circuit, but permit the operator to feel the movement of the slide into "steady light" position.

The fourth step moves the slide to "test" position or where the parts are so positioned the housing 44 and the casing 10 are in series with the lamp therebetween and any connection between the housing and casing completes the circuit (Fig. 7). The terminus 40 still rides on the terminal 32 but the terminus 42 has shifted from its seat 62 to engage contact 66, for convenience herein shown as an integral tongue extending from the housing into its interior.

A device 68 to be tested has leads 70, 72, therefrom, one to contact the housing 44 and the other to engage the casing 10. If a closed circuit exists between these lines, the lamp 20 will burn.

Flashlights embodying the push-button-in-slide type of switch may also incorporate the test feature (Figs. 8 through 12). The casing 100 herein mounts housing 144 which is insulated therefrom by non-conductor frame plate 148 and is anchored in place by means of rivet-like fastening elements. This mounting provides a chamber 102 into which conductor strip 126 extends from reflector 118 through intermediate insulation 128 by way of aperture 104 in the casing and opening 106 through the plate 148. The strip 126 provides a terminal 108 within the chamber. The housing mounts a leaf spring element 110 carrying a terminal 112 which is movable toward and from the terminal 108 by push button 114 carried in slide 152 shiftable along ways 150.

In "off" position (Fig. 10), the slide 152 is at one end of the ways 150 and operation of the push button will close the circuit for "blinker" action. If the slide is shifted to the opposite end of the ways, the button holds this switch closed (Fig. 11), due to the canted extent of the strip 126 within the chamber 102. The housing is in series with the casing due to metallic slide block 116 engaging the housing and terminal 120 on spring finger 122 in turn riveted to the casing. The insulation plate 148 is provided with an opening 124 exposing the terminal 120 therethrough for this contact. When the flashlight is burning steady, the block or slide 116, serving as a secondary switch, may be shifted toward the push button and the slide has an insulation inset central plug 124 which engages the terminal 120 thereby breaking the circuit between the housing and casing but retaining the housing in series with the lamp. A test arrangement between the housing and casing is now in effect.

A return of the slide 152 to "off" position resets the slide 116 to place the housing in series with the casing.

The slide and button type of flashlight switch may also incorporate features of the invention (Figs. 13 through 17). The switch housing 244 is mounted on and insulated from the casing 200 by insulation frame plate 248. The lead 226 from the reflector is attached to the casing interior by means of rivet-like fastening conductor elements 230 and insulated from the casing by separator 228. The insulation of these elements 230 is completed by pads or platforms 204, 206, surrounding the elements and exposing their termini in the chamber 202 to provide terminals 208, 210, therein.

The slide 252 is shiftable along way 250 and carries contact strip 236, having terminals 240, 242, variously positioned as to the terminals 208, 210, in the four stations or positions of the slide. A spring plate 212 disposed between the housing and contact strip mounts push button 214. The plate 212 and strip 236 are provided with a detent and multiple seat construction 216 which

indicates and holds the contact relationships in the various stations.

In "off" position, the terminal **240** engages the casing **200**, while the terminal **242** rests on pad **206** clear of terminal **210**. At this station, terminal offset **218** from the strip **236** engages lugs **220** preventing operation of the push button **214**. These lugs **220** may be turned-in portions of the housing.

When the slide **252** is shifted to the second or "blinker" station, the terminal **240** still contacts the casing **200**, the terminal **242** is shifted along platform **206** into close proximity to terminal **210** and the offset **218** is clear of the lugs **220**. Now, a depression of the push button **214** warps the terminal **242** into engagement with terminal **210** and the lamp circuit is closed. A release of the button allows the spring plate **212**, acting in cooperation with the spring material of the strip **236**, to open the circuit.

The third station in this form of the switch also establishes a "steady light" condition for the circuit through the arrangement of the switch parts. The terminal **242** contacts and is held against terminal **210** while the terminal **240** still engages the casing. At this station, the offset **218** abuts the tongue **266** inwardly bent from the housing as a stop against shift of the slide beyond this third station without action by the push button. In other words, without an extra movement on the part of an operator, this switch operates as in normal flashlight practice.

Now to convert the flashlight into a testing apparatus, the push button **214** is depressed to shift the offset **218** laterally of the stop **266** and while held depressed, the slide is moved into its fourth or "test" station. Here the terminal **240** is shifted from the casing to engage terminal **208** while the terminal **242** is in contact only with insulation **206**. Now the casing and housing are in series with the lamp and a connection therebetween by lines **70** and **72** from a device **68** to be tested imparts a signal.

It will be seen features of the invention are readily adaptable into any of the types of flashlight switches either slide, button-in-slide, or button and slide types.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation, and it is not intended to limit the scope of the following claims beyond the requirements of the prior art.

What is claimed and is desired to secure by United States Letters Patent:

1. In a flashlight, a metallic casing, a series lamp circuit therefor including said casing, a primary switch for said circuit, a metallic member providing a housing for said switch said member being electrically insulated from said casing, and a secondary switch mounted by said member

and shiftable therein for connecting and disconnecting said member into said circuit.

2. The structure set forth in claim 1 wherein means are provided to limit the opening of the circuit by the secondary switch to a time when the primary switch is in circuit closing position.

3. In switch mechanism for a flashlight, a metallic member mounted on the casing of said flashlight and electrically insulated therefrom, a first switch mounted on said member operable for the normal operation of said flashlight, and a second switch mounted by said member operable to place said metallic member in and out of electrical contact with said casing.

4. Switch mechanism for a flashlight including a metallic member mounted on the casing of said flashlight and electrically insulated therefrom, said member providing a switch housing, said casing providing one terminal for the circuit of said flashlight with the other terminal extending from within said casing into the housing, a first slide shiftably mounted by said housing and including means movable into contact with said latter terminal, and a second slide mounted on said metallic member shiftable to place said metallic member into and out of electrical contact with said first named terminal.

5. The structure set forth in claim 4 wherein said second slide is rendered inoperative unless said first slide is in terminal contacting position.

6. Switch mechanism for a flashlight wherein the casing of said flashlight is one terminal of the circuit for said flashlight and the other terminal is provided by a conductor extending through said casing to the exterior thereof, said mechanism embodying a metallic member mounted on said casing, electrically insulated therefrom and providing a housing for said latter named terminal, a pair of slideways defined by said member, a first slide in one of said slideways operable as a switch to open and close the circuit between said latter named terminal and said metallic member, and a second slide in the other of said slideways operable to open and close the circuit between said metallic member and said casing.

7. The structure set forth in claim 6 wherein the arrangement of said slides one as to the other, precludes operation of the second slide by a predetermined positioning of said first slide.

8. In flashlight switch mechanism for a flashlight having a metallic casing, means mounting and electrically insulating said mechanism on the flashlight casing, a first switch in said mechanism for normally operating said flashlight, and a second switch in said mechanism operable to electrically connect and disconnect said mechanism with said casing.

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