

Oct. 1, 1946.

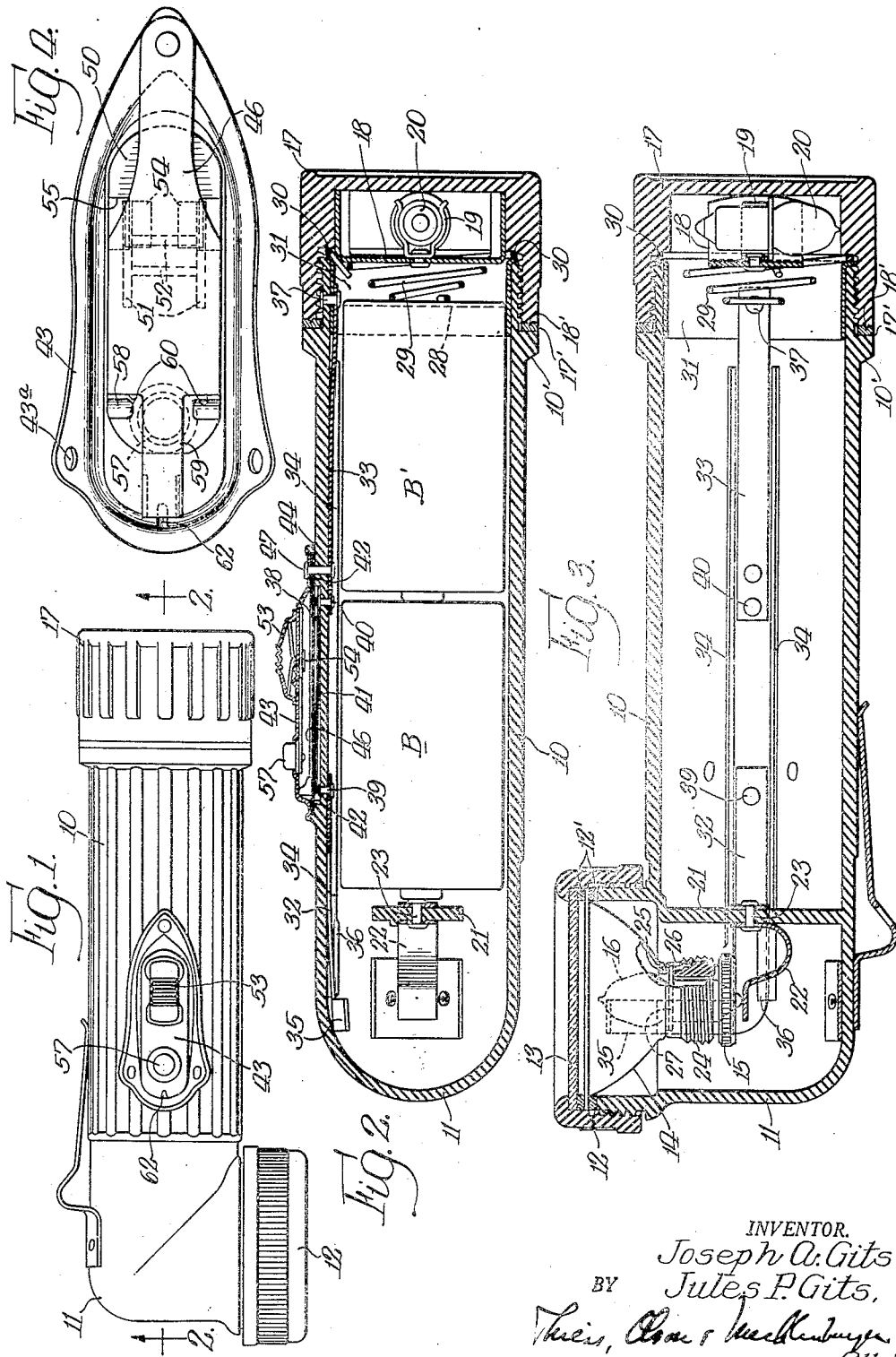
J. A. GITS ET AL

2,408,393

FLASHLIGHT

Filed Jan. 20, 1944

2 Sheets-Sheet 1



INVENTOR.
Joseph A. Gits
BY Jules P. Gits,
Thies, Chase & MacKenzie
Attys

Oct. 1, 1946.

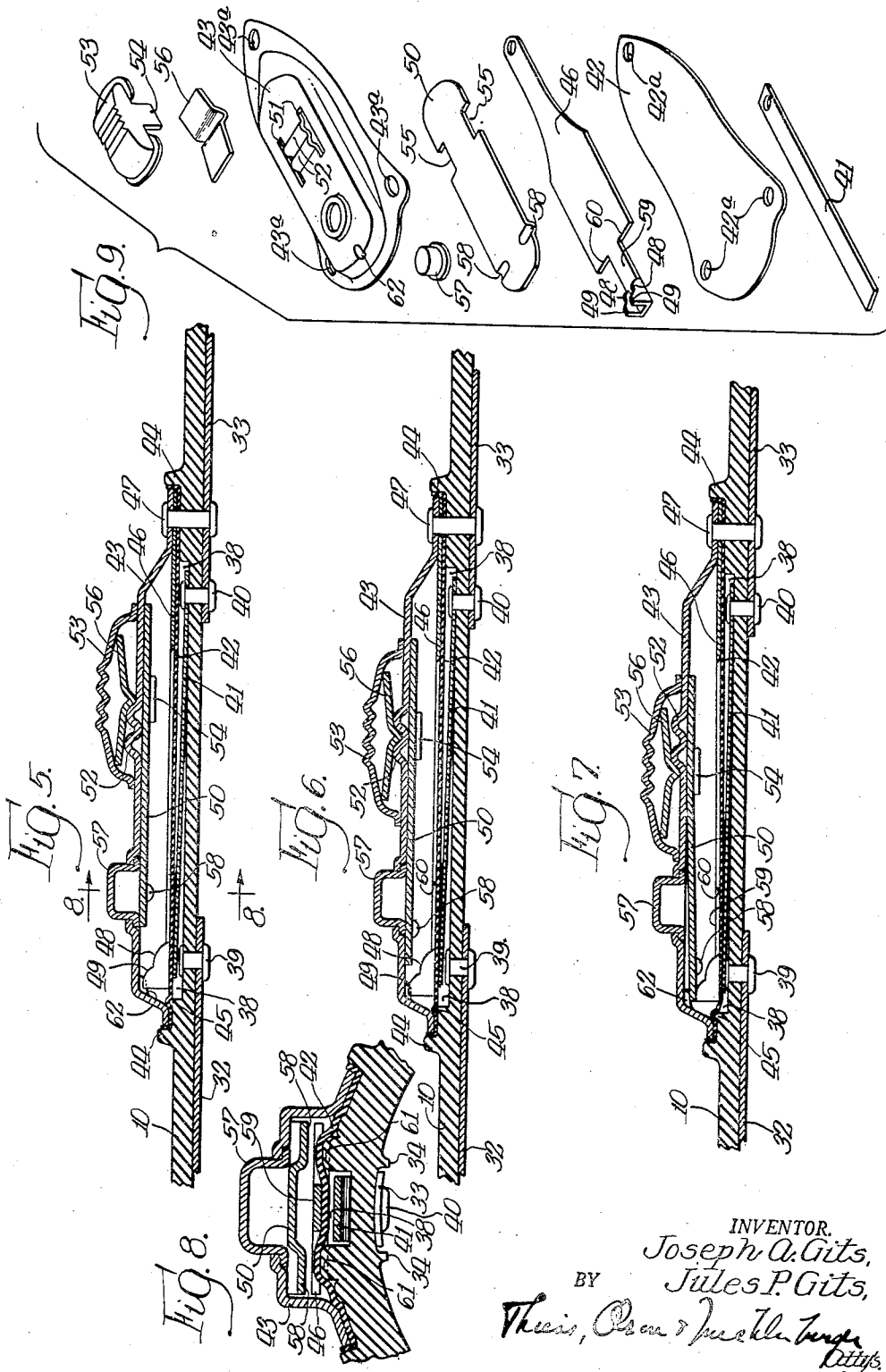
J. A. GITS ET AL

2,408,393

FLASHLIGHT

Filed Jan. 20, 1944

2 Sheets-Sheet 2



INVENTOR.
Joseph A. Gits,
BY Jules P. Gits,
Theiss, Osborn & Jacklin, Inc.
Attorneys

UNITED STATES PATENT OFFICE

2,408,393

FLASHLIGHT

Joseph A. Gits and Jules P. Gits, Chicago, Ill.

Application January 20, 1944, Serial No. 518,942

20 Claims. (Cl. 200—60)

1

This invention relates to flashlights and more particularly to waterproof flashlights, an object being to provide such a device that shall have all the necessary features of construction and operation to enable its convenient and satisfactory use under all ordinary conditions and under the most severe conditions as well, such as in heavy rains, fording streams, submergence, the necessity of signaling by flashing or by a continuous beam, sometimes immediately upon emerging from the water. Such use, of course, involves a switch, and practical requirements necessitate that it be located on the side of the elongated shell or casing, be comparatively flat or thin with no greatly protruding parts such as operating levers or the like, be conveniently operable for intermittent or continuous beam operation or for no operation at all, and the parts to remain in their selected positions of operation until positively moved therefrom whereby to avoid accidental or inadvertent displacement.

In such devices, the current conductors may be arranged inside the shell or casing where they are protected but the switch contacts connected therewith must be brought out to the exterior for engagement by the movable switch contacts in order to make and break the circuit therethrough without the operating movable parts passing through the shell. But the switch housing overlying and enclosing said contacts and switching parts has operating devices passing therethrough, such as a push-button for the intermittent or flash operation of the switch, the connections of a three-position thumb-piece, or other parts, which are not water-tight with the housing and therefore may admit more or less dampness or moisture to the interior of the same.

A further object of the invention, therefore, is to provide a device of the class described which, while conforming to the standard requirements as to form, size, space and operation, shall not permit dampness within the switch housing to reach the switch contacts.

In carrying out the invention, provision is made for separating the switch proper between the exposed ends of the conductor contacts and the operating mechanism therefor. The switch contacts are preferably operated by a transverse or radial movement as distinguished from a longitudinal movement, having reference to the elongated shell or casing of the device, as by a suitable spring metal contact strip fixed at one end to one of the conductor rivets or exterior extensions with its free end standing over and normally out of contact with the other exterior conductor

2

rivet or extension. The free end of the spring is thus adapted to be brought into contact with the other rivet or conductor contact by an inward substantially radial pressure or butt contact movement instead of a longitudinal sliding contact movement.

These switch contacts are preferably seated in a shallow exterior recess or groove in the shell beneath the housing of the switch mechanism of sufficient depth to accommodate the radial movement of the spring contact in opening the circuit.

A thin flexible gasket, sheet or layer of suitable waterproof material is placed over the recess and the contacts and is sealed to the casing at its edges, preferably as hereinafter described.

The switch housing and operating parts, preferably of a more or less flat construction, are placed over the said gasket, the peripheral flange of the housing conforming to the surface contour of the casing about the recess and being suitably secured to the casing as by rivets through the casing walls and gasket. This effectively clamps and seals the gasket around its edges to the casing about the recess or groove and prevents the entrance of moisture to the recess with its switch contacts.

The switch-operating mechanism thus enclosed within the housing outside the flexible gasket includes a radially or transversely acting pressure member placed over the position of the spring contact within the groove inside of the gasket, whereby said contact may be operated by the pressure of said member directly through the gasket without rubbing along the surface of the same as would be the case with a longitudinally slidable or rubbing contact operating device in the housing, and without being attached thereto. Thus the life of the gasket is preserved, a better and more positive action of the switch contacts is obtained, and no sacrifice is made of the compact flat top housing and longitudinal operating mechanism therein, as will be described.

Thus various additional objects of the invention are present and all will appear from the detailed description and claims to follow, in connection with the accompanying drawings which represent an embodiment of the invention, and in which—

Fig. 1 is a side view of a flashlight embodying the present invention;

Fig. 2 is a longitudinal section of the same, taken on the line 2—2 of Fig. 1;

Fig. 3 is a similar section, taken at right angles to that of Fig. 2;

Fig. 4 is a bottom view of the exterior switching mechanism;

Fig. 5 is a longitudinal section on a larger scale through the switch and casing wall and showing the parts in the "off" position of the switch;

Fig. 6 is a similar view showing the switch parts in the intermediate position for intermittent or flashing operation of the light;

Fig. 7 is a similar view showing the parts in the third position for the continuous or beam operation of the light;

Fig. 8 is a cross-section through the switch and casing on the line 8—8 of Fig. 5; and

Fig. 9 is an exploded view of the switch parts in perspective.

The flashlight shown comprises preferably an elongated shell or casing 10, circular in cross-section, having at the front end a right-angular head 11, which is threaded to receive an internally threaded cap 12, adapted to carry a lens 13 and an assembly comprising a reflector 14, a light socket 15 and a light bulb 16. Shell or casing 10 is preferably elongated to receive one or more batteries B, B', or the equivalent, arranged therein in stacked relation, so that the terminals thereof are at or near the opposite ends of the shell or casing.

The shell or casing 10 is preferably of insulation, such as thermoplastic material, which may be molded at low cost, particularly if molded under pressure by injection. This material, additionally, is somewhat yieldable and resilient whereby to withstand fracture, chipping or denting when the device is dropped or otherwise roughly handled. Further, its yieldability and resiliency may be controlled by the use of suitable plasticizers to enable the material to withstand wide variations in temperature as well as rough handling. The cap 12 may be of the same material. The lens 13 may be made of transparent thermoplastic material having the same index of refraction as glass, whereby to reduce liability of breakage of lens in case of dropping or other accident.

The rear end of this shell or casing 10 is externally threaded to receive an internally threaded closure cap 17 preferably of the same material as the shell, said cap having a chamber receiving a metal strip with its ends bent rearwardly to form a removable U-shaped bracket 18, provided with a spring grip 19 riveted centrally thereto to carry an extra lamp bulb 20, if desired.

The interengaging threads at the ends of the shell 10 and on the caps 12 and 17 tend to form a watertight seal when the caps are threaded in position. An adequate number of threads, together with the tendency of the thermoplastic material to have a tight gripping action between its own surfaces, provides a seal that prevents water or moisture from creeping past the threaded engagement into the interior of the shell.

However, gaskets 12' are provided on opposite sides of the rim of reflector 14 and a gasket 17' is provided between a shoulder 10' on casing 10 and cap 17. Cap 17 may have a V-shaped rib 18' about its rim adapted to bite into gasket 17' when cap 17 is threaded tightly into its position engaging shoulder 10'. These gaskets 12' and 17' are furnished when it is desirable to assure a watertight relation between casing 10 and both caps 12 and 17. As stated, the tendency of thermoplastic material to provide a tight gripping action when an adequate number of threads and the proper size relation between

them are provided, may be sufficient to secure a watertight seal at both ends of the casing for certain uses of the flashlight. When gaskets 12' and 17' are used, it will be impossible for moisture or water to reach the interior of the flashlight under any condition of use because they assure a watertight relation at all times.

The reflector 14 is preferably somewhat arcuate in shape and the light socket 15 is preferably provided with an open end through which the central terminal of the lamp 16 may project. A transverse bridge 21 across the shell 10 may be molded integrally within the shell at the juncture of the cylindrical portion and the right-angular head 11. From the central terminal of the lamp 16 the circuit is continued through the bridge 21 by a curved spring contact member 22 engaging at its free end the said terminal of the lamp bulb and being secured at its other end to the adjacent face of bridge 21 by means of a rivet 23 which passes through the bridge and the inner head of which forms a terminal for engaging the front terminal of the forward battery B, as shown in Figs. 2 and 3.

The lamp and socket arrangement may be of any approved type so long as the lamp when in final position has its other terminal connected with the metallic reflector, which, as will be described, is arranged to be connected through suitable conductors, including the operating switch, with the rear terminal of the rear battery B'. The arrangement shown, however, is preferred, in which the socket 15 is an externally threaded tubular sleeve of insulating material which, if desired, may be the same as that of the shell. This threads into the metallic extension 24 of the reflector 14. This extension 24 may be integral with the reflector 14 or formed as a separate part and interlocked therewith as indicated at 25, but in any event a metallic shoulder 26 is formed so that the flange 27 of the bulb 16, forming the other terminal of the bulb 16, may be clamped against the shoulder or flange 26 when the socket 15 is threaded into position, as shown in Fig. 3, whereby the electric circuit of the lamp to the reflector is completed.

The rear battery terminal 28, comprising the end plate of battery B', will firmly press against spirally coiled spring 29 to compress it and hold it against seat 30 forming an internal shoulder in cap 17. This will bring the outer convolution of the spring into firm electrical engagement with an annular metal insert, collar or sleeve 31 at the rear end of the cylinder 10, when the end cap 17 is tightened.

The circuit is brought from the ends of the shell to the location of the operating switching mechanism by two metal contact strips 32 and 33 which are located between two integrally formed spacer ribs 34 on the inside surface of the shell, said ribs being of sufficient height to prevent the batteries coming into contact with the conductor strips to prevent short circuits or leakage of current in the event the insulation of the batteries breaks down.

The forward strip 32 has a right-angular extension or contact end 35 pressing resiliently against the adjacent outer surface of the reflector 14 which permits the reflector assembly to be readily removed and inserted without special attention being given to the contact 35 or the use of tools to disconnect or connect the same. This spring 35 completes the electric circuit from the reflector to the conductor 32. The lower spacer rib 34, as seen in Fig. 3, that is, on the opposite

5

side of the conductor 32 from the reflector assembly, may have an integrally formed flange 36 extending under and upwardly inside the conductor strip 32 whereby to form a shelf-like supporting means for this forward end of the conductor strip in order to keep the right-angularly extending finger or end 35 of conductor 32 properly supported whereby suitably to engage the reflector to complete the circuit therethrough.

The rear conductor strip 33 at the rear end of the shell is secured thereto by a rivet 37 which also holds the inserted sleeve 31 in place as well as the conductor in good electrical contact therewith, the formed head of the rivet being pressed down to seat at or below the threaded surface to avoid interference with the threading of end cap 17 in place or its removal.

The inner ends of conductors 32 and 33 are disposed opposite an elongated recess or groove 38 formed in the exterior of the shell or casing 10. This recess is long enough to overlap the adjacent ends of the conductors 32 and 33, wide enough (Fig. 8) to accommodate the switch spring contact to be described, and deep enough to receive the said spring contact and permit its free end proper operation transversely to open and close the circuit, as shown and hereafter described.

The rear end of forward conductor strip 32 is secured in place by a rivet 39 seated in the forward end of recess or external groove 38, and serves as one of the terminals or contacts of the switch for opening and closing the circuit of the device. The forward end of conductor 33 is likewise secured in place by rivet 40 which is seated at the rear end of the groove or recess 38 and serves to secure the contact spring 41 in the bottom of the recess and to provide a current-conductive path thereto. This spring extends to the forward end of the recess over the contact rivet 39. It is normally biased to stand away from or over the said contact rivet, but upon a transverse inward pressure being applied to its free end it closes contact with said rivet to complete the circuit of the device.

These rivets, and in fact all the rivets passing through the shell, are of the type and kind that permit their heads to be formed without providing connections that allow water and moisture to seep into or otherwise gain access to the interior of the shell 10. The yieldable or pliable nature of the thermoplastic material of the shell and the forming operation of the heads cause them to be firmly pressed against and bite into the material, and, in the case of conductors 32 and 33, to be pulled tightly against the inner wall of this thermoplastic material and form thereby a perfect seal at each rivet.

In order that water or moisture may not get into the recess 38 and to the rivets and switch contacts therein, a suitable thin, flexible or elastic layer, sheet or gasket 42 of rubber or rubber-like waterproof material, preferably neoprene, is laid over the recess and the switch contacts and parts therein and is clamped and sealed at its edges in water-tight relation to the shell or casing 10 preferably by the peripheral edge flange of the housing 43 of the switch-operating parts, as will be described.

This switch housing 43 has a central raised flat portion and a sloping edge portion terminating in an outwardly extending peripheral flange which is formed to conform to the surface of the shell or casing to which it is attached. The switch casing has a peripheral outline, as shown

6

in Figs. 4 and 9, and the shell or casing 10 of the device has molded thereon a seat for the peripheral edge flange thereof, as indicated. An outer marginal raised rib or bead 44 on the shell 10 surrounds the said seat and flange of the housing and a similar raised rib or bead 45 is at the inner periphery of the seat for the flange of the switch housing 43.

The neoprene or similar sheet or gasket 42 is of the same outline form as the switch housing 43, as seen in Fig. 9, but is a little larger, so that when placed in position over the switch contacts and recess, and the switch housing is pressed down thereon as indicated, the gasket is compressed between the said beads or ribs 44 and 45 and to the seat by the flange of the switch housing. This seals the joint all around against the entrance of moisture. The switch housing 43 is firmly riveted to the shell or casing of the device, preferably by three rivets, two at the forward end and one at the rear, as indicated by the holes 43^a in Fig. 9, passing through the said flange, the gasket having similar holes 42^a, and the elongated casing or shell 10, said rivets being of the leak-proof type mentioned. Thus the switch contacts within the groove or recess in the shell or casing 10 and the conductor rivets and connections therein are entirely protected from the presence of moisture.

The free end of spring contact 41 within the recess or groove moves in a radial or transverse direction to open and close the circuit and is operated by simple pressure through the gasket. Thus there is no undue wear on the inside of the gasket from such movement, as might be the case with sliding switch contacts or the like.

Likewise the switch-operating pressure on the outside of the gasket is radial or transverse, so that no undue wear thereon due to a sliding engagement takes place in operating the switch. This is accomplished by a longitudinally stationary pressure member or spring 46, seen in perspective in Fig. 9, and which is secured at its rear end to shell or casing 10 by the rear rivet 45 47 of the switch housing 43 which passes through the housing flange, the gasket and the shell 10, and in this instance also through the rear conductor strip 33 which serves as a washer or bearing plate for the rivet on the inside of the shell, thus securing all these parts fixedly together and in watertight relation so far as concerns the admission of moisture to the inside of the shell 10.

This member 46 extends forwardly to the forward part of the raised part of housing 43, over the outside of gasket 42, and with its free end over the end of contact spring 41 on the inner side of the gasket 42. The spring member 46 is biased when in position so that its free end tends normally to rise and not to apply pressure through the gasket on the spring contact 41, although it may lie more or less close to the gasket 42. When an inward pressure is applied to the free end of this switch-operating spring 46, therefore, the pressure is carried through the gasket 42, which is elastic, flexible or loose enough to permit the same, and the switch spring 41 is thereby depressed and closes contact with the rivet contact 39, to close the lamp circuit of the device. When the pressure on the member 46 is released, it, together with the gasket and contact spring 41, will return to normal position and the circuit is opened.

It is desirable, and for some uses imperative, that the switch have a permanent on or closed position for continuous beam or ray operation of

the light, at which time the push-button cannot affect the operation; a permanently open or off position, when the push-button is likewise incapable of closing the circuit; and another or intermediate position when the push-button may be operated in the usual way to open or close the switch for flashing or temporarily lighting the lamp.

In order to accomplish this in a simple, inexpensive and convenient manner without unduly enlarging or thickening the flat and shallow switch housing, the forward end of switch-operating spring 45 is provided on the outside with two steps 48 and 49, which are conveniently formed by bending up two appropriately formed side wings from the spring itself, as seen in Fig. 9. These steps are adapted to be appropriately engaged by the forward broad end of the member 50, shown in Fig. 9, which is suitably slidable along the inside of the flat top of the switch housing 43, as will be now described.

The central raised portion of the housing 43 is provided with a pair of slits 51 and an intermediate portion which is centrally corrugated, to provide, in effect, two round transverse shoulders or ribs 52. Thumb-piece 53, shown separately in Fig. 9, is provided with side legs 54, one on each side, passing respectively down through the slots 51 in the top of the housing and through the side notches 55, of the slidable member 50 on the inside of the housing. The ends of these legs are bent inwardly on the under side of the member 50 in order to hold this member against the under side of the switch housing and enable it to be moved therealong by a corresponding movement of the thumb-piece 53.

The three positions of this thumb-piece to which the slidable spring member 50 is moved to obtain the off, flash and on positions of operation of the device are definitely located by the angular or V-shaped leaf spring 56 on the inside of the thumb-piece, as shown, the central point or line of which rides over the ribs 52 as the thumb-piece is forcibly moved in either direction and causes said thumb-piece to assume and come to rest in one of the three positions, as shown in Figs. 5, 6 and 7, unless forcibly moved therefrom.

A push-button 57 is mounted in the housing 43, as shown, over the forward portion of slidable spring 50 which tends to keep the button in place, the flange of the button normally seating in the raised ring of the housing.

In the off position of the parts, as shown in Fig. 5, the thumb-piece 53 is in its rear position. The forward end of the slidable member 50 lies in the rear of the steps 48 and 49 on the end of the switch-pressing member 46. Ordinarily, the depression of the push-button in this position of the parts would not be sufficient to cause the end of the member 50 to press down on the member 46 enough to close the switch contact 41 in the recess under the gasket. But to insure against such a closure of the switch by a forced depression of the push-button, lugs 58 on the lower side of the member 50 near its outer edges are formed, preferably by striking them up from the material of the member. These lugs 58 are far enough apart to straddle the reduced end 59 (Fig. 9) of member 46, and are in advance of shoulders 60 thereof, so that the member 46 is not depressed thereby. Then, on the shell or casing 10 adjacent the groove 38 for the switch spring 41 and in advance of the shoulders 60 (Fig. 9) on member 46, slightly raised bosses 61

(Fig. 8) are formed in vertical or transverse alignment with the lugs 58 on the slidable member when in the off position. Accordingly, when push-button 57 depresses spring 50, in this off position of the parts, lugs 58 on slide 50 strike bosses 61 on the shell through the gasket, and cannot be forced down further to operate the member 46 to close the switch contacts of the device.

In the next position of the thumb-piece—the flashing position—the parts are in the position of Fig. 6, where the slidable member 50 has been pushed forward so that its forward free end overlies the first step 48 on the end of the switch-operating member 46. Depression of the push-button now causes the end of member 50 to engage steps 48 on member 46 and to press it down on the gasket and through the gasket to depress and close spring contact 41. Thus in this position of the parts the push-button 57 may be used to flash the light in the ordinary manner.

In the third or permanently on position of the parts, as seen in Fig. 7, thumb-piece 57 has been moved forward to its full on position. The free end of slidable spring 50 has been pushed over onto the higher step 49 of switch-actuating member 46, and the latter has been depressed to operate through gasket 42 the switch spring 41 to close the circuit. This entire movement of the end of spring 46 is brought about by pushing the end of spring 50 between the raised step 49 on member 46 and a lug or depression 62 on the inside of the housing formed preferably by indenting the rim of the raised part of the housing, as indicated in Fig. 9. This lug or indentation 62 does not interfere with the normal rise of the free end of spring 46, since the two wings constituting the said steps are able to straddle the same in the uppermost position of the member 46. The broad portion of the end of member 50 bridges the two wings forming the steps when pushed forward to contact therewith.

From the foregoing description it will be observed that the unique type of switch structure disclosed herein contemplates the use of a housing having a flanged rim adapted to be clamped upon a seat defined by the outer and inner beads 44 and 45, the flanged rim being held between these beads with gasket 42 compressed between the rim and seat and the forward end of the rim pressing against the outer edge of the gasket, which may be turned upwardly to lie between the forward end of the rim and the inside face of outer rib 44. Forming a seat of this character may be omitted as a feature of the switch structure, when so desired, but it novelly assists in the assembly of the switch structure upon the side of casing 10 and assures a water-tight fit when the switch structure is riveted in place. The inside rib 45 will of course, have a cutaway portion where member 46 extends forwardly from rivet 47 as shown in Fig. 6. Forming a recess in the wall of the barrel of a flashlight enables using a switch structure that hugs closely to the barrel, and also disposing switch parts in compact relation in this structure. This compactness is further made possible by these switch parts and their arrangement, the latter further providing positive operation and occupying but minimum space. In a device of the type described, which requires simplicity and minimum cost of production, novelty resides in using a spring contact member engaging one of the contacts serving as battery terminals and

positioned over the others of these contacts so that it may be pressed into circuit closing engagement therewith by a switch pressing member operable by a slidable spring member. The switch pressing member is disposed between the spring contact and the slidable spring member, and it acts conjointly with the slidable spring member to effect the closing of the circuit, either by a flashing or full on position, with a minimum movement of the parts.

Thus a waterproof flashlight is provided having a waterproof gasketed switch, without departing from accepted sizes and features of construction an operation and in which the gasket and engaging parts operate by transverse pressure, whereby wear on the gasket is minimized and the switch contacts are protected against dampness.

Having thus described the invention and the best manner now known for carrying same into effect, what is claimed and desired to be secured by Letters Patent is:

1. In a device of the class described, a waterproof casing, electric conductors therein arranged for connection with opposite terminals of a source of current supply housed in said casing and having portions in close proximity with each other, and switching means including contacts to make and break the circuit between said portions said contacts being exposed externally of said casing, a flexible waterproof layer overlying said contacts and in waterproof relation with said casing, and operating mechanism on the exterior of the casing to operate said contacts by pressure through said flexible layer.

2. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, contacts in electrical relation with said conductor ends and exposed at the outside of said casing, a flexible waterproof gasket overlying said contacts and in waterproof relation with said casing, and switch operating mechanism overlying said gasket to operate said contacts by pressure transmitted through the gasket to make and break the circuit through the contacts on the under side of the gasket.

3. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, contacts in electrical relation with said conductor ends exposed to the outside of said casing, a flexible waterproof gasket sheet overlying said contacts, a switch housing overlying said gasket sheet and clamping it in watertight relation at the edges to said casing, and contact operating means associated with the switch housing to operate said contacts by pressure thereon exerted through the said flexible gasket.

4. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, the casing having a recess in its outer face opposite said conductor ends, switch contacts in said recess in electrical connection with said ends, a flexible waterproof gasket sheet

overlying said recess and said contacts, a switch housing over said recess and gasket and clamping the gasket to the casing in watertight relation around the recess, and switch contact operating mechanisms connected with said switch housing to operate said contacts through the flexible gasket.

5. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, the exterior wall of the casing having a shallow recess opposite said ends, normally open switch contacts in said recess connected respectively through the bottom of the recess with said ends, a waterproof flexible sheet of material covering said recess and switch contacts therein, a housing over said sheet and recess and contacts having an edge flange clamping the flexible sheet as a gasket to the casing with a watertight connection, and operating means within the housing to operate said switch contacts in the recess by pressure through the flexible sheet to make and break the circuit through said contacts and conductors.

6. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, the wall of the casing adjacent said ends being recessed on the exterior, rivets passing through said ends into the bottom of the recess and securing the conductors to the casing, a contact spring in the recess secured at one end by one of said rivets and overlying but normally out of contact with the other of said rivets but adapted to be brought into contact therewith to close the circuit therethrough, a flexible waterproof gasket sheet overlying said recess and contact spring and overlapping the edges of the recess, a switch housing overlying said gasket and clamping the same at the edges to the casing with a watertight connection, and manually operated mechanism in the housing and over the contact spring with the gasket between to operate said contact spring to make and break the circuit through the said conductors.

7. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, contacts in electrical relation with said conductor ends exposed to the outside of said casing, a switch housing over said contacts having a peripheral flange, raised beads on the casing along the inner and outer edges of said flange, a sheet of flexible waterproof material overlying said contacts and extending to said outer bead and clamped at the edge portion to the casing between the said beads by the said flange in watertight relation, and switch operating means beneath the housing outside the said sheet to operate said contacts inside the sheet to control the circuit therethrough.

8. In a device of the class described, a waterproof casing having conductors therein for electrical connection with the opposite poles of a source of current supply, said conductors having portions in close proximity within the casing,

contacts connected with said portions exposed to the exterior of the casing, a sheet of flexible waterproof material overlying said exposed contacts, a switch housing over said sheet having a clamping flange conforming to the non-planular contour of the casing to clamp said sheet at its edge in watertight relation to the casing, and switch operating means in said housing to operate said contacts through the sheet to make and break the circuit through said conductors.

9. In a device of the class described, a waterproof casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two of the ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, contacts in electrical relation with said conductor ends exposed to the outside of said casing, a normally open spring contact to close when depressed the circuit through said exposed contacts, a switch housing on the casing over said contacts, a three-position slide inside the housing operated by a thumb-piece on the outside thereof, a push-button in the housing adjacent the thumb-piece, a metal strip secured at one end to said casing and extending under said push-button and slide and arranged at its free end when depressed to operate and close said spring contact, said slide serving in the off position to prevent operation of said strip by the push-button, in another position to permit its operation by the push-button to intermittently open and close the circuit, and in a third position to operate the spring contact to close the circuit independently of the push-button.

10. In a device of the class described, a casing, conductors in said casing arranged for electrical connection with opposite terminals of a source of current supply, two ends of said conductors being located in close proximity to establish a circuit making and breaking relation therebetween, contacts in electrical relation with said conductor ends and having portions extending through the wall of said casing, a spring contact member secured to one of said conductor contacts and extending over the other of said conductor contacts, a depressible member secured at one of its ends to have its opposite end in a position to press against said spring contact member and to move the latter into engagement with said other conductor contact, and a slidable member adapted to be moved to one of three positions, means for preventing said slidable member from engaging and actuating said depressible member into a position effecting an engagement by said spring contact member with said other contact member, and means to cause said slidable member to effect either of two movements of said depressible member, effecting either momentary or distant engagement by said spring contact member with said other conductor contact.

11. Switch mechanism for a flashlight comprising in combination, two contacts, a spring contact member in fixed electrical relation with one of said contacts and extending to a position over the other contact, a depressible member, and a slidable member, said members being disposed one above the other, said slidable member having a plurality of positions and being movable to effect actuation of said depressible member whereby to move said spring contact member into circuit closing position with said other contact, protrusions on said depressible member engageable by said slidable member, and means

to effect depression also of said slidable member when in a position to engage one of said protrusions, the other protrusion when engaged by said slidable member actuating said depressible member to effect a constant circuit closing relation between said spring contact member and said other contact.

12. Switch mechanism for a flashlight comprising, in combination, two contacts, a spring contact member secured to one of said contacts and extending to a position over the other contact, a depressible member secured at one of its ends to have its opposite end in a position to press against said spring contact member and to move the latter member into engagement with said other contact, a manually operable member adapted to have one of three positions, means for preventing said manually operable member from actuating said depressible member when in one of its positions and means to actuate said depressible member to effect either of two movements by the movement of said manually operable member to the other two of its said three positions, said movements of said depressible member effecting either momentary or constant engagement by said spring contact member with said other contact.

13. Switch mechanism for a flashlight comprising, in combination, a switch housing, a spring contact member, a depressible member and a slidable member, said slidable member being arranged to engage and depress said depressible member into engagement with said spring contact member whereby to move the latter to circuit closing position, and a plurality of points of engagement for said slidable member, one of said points of engagement preventing said slidable member when actuated from engaging said depressible member, the other two points of engagement being at different levels and disposed upon said depressible member, one of said two points of engagement causing momentary engagement only of said spring contact in circuit closing position when said slidable member is in a position and actuated to engage said point of engagement, the other of said two points of engagement causing a constant circuit closing position of said spring contact when said slidable member is moved to a position to engage said last point of engagement.

14. Switch mechanism for a flashlight comprising, in combination, a switch housing, a spring contact member, a depressible member and a slidable member, said slidable member being arranged to engage and depress said depressible member into engagement with said spring contact member whereby to move the latter to circuit closing position, abutment means on said depressible member, said abutment means having two engagement levels for said slidable member, one of said engagement levels requiring said slidable member to be depressed to engage the same and depress said depressible member into circuit closing position, and means on said switch housing to depress said slidable member down and upon the other engagement level when said slidable member is moved toward said other engagement level whereby said depressible member is depressed to actuate said spring contact member to circuit closing position.

15. Switch mechanism for a flashlight comprising, in combination, a spring contact member adapted to be secured at or near one end to the barrel of the flashlight, a manually slidable member above said spring contact member for ef-

13

fecting a depressing movement of said spring contact member to circuit closing position, and a housing for enclosing said spring contact member and said slidable member.

16. In a device of the class described, a casing, 5 spaced contacts carried by said casing, a spring contact member in fixed relation with one of said contacts for closing an electrical circuit by being depressed into engagement with the other contact, a well in said casing, said spring contact 10 being disposed in said well, a switch housing having an outwardly extending flange about its base, a seat upon said casing for receiving said flange, said seat being disposed about said well, a gasket between said seat and said flange, and a manually 15 movable member within said switch housing for effecting operation of said spring contact.

17. In a device of the class described, a casing, a well in said casing, a switch structure adapted 20 to be mounted upon said casing, the parts of said switch structure including a circuit closing member disposed in said well, a manually operable member and a housing for the same, a flange formed about the base of said housing, and spaced upstanding beads on said casing about said well 25 adapted to form a seat to receive said housing flange.

18. Switch mechanism for a flashlight comprising, in combination, a contact member adapted 30 to be secured to the barrel of the flashlight, a manually operable member above said contact

14

member for effecting a depressing movement of said contact member to circuit closing position, and a housing for enclosing said contact member and said manually operable member.

19. Switch mechanism for a flashlight comprising, in combination, a contact member adapted to be secured to the barrel of the flashlight, a manually operable member above said contact member for effecting a depressing movement of said contact member to circuit closing position, a flexible waterproof membrane disposed between said contact member and said manually operable member, and a housing for enclosing said membrane and both said members, said housing securing said membrane to said barrel whereby to seal said contact member in water-tight relation between said membrane and said barrel.

20. Switch mechanism for a flashlight comprising, in combination, a contact member adapted to be secured to the barrel of the flashlight, a manually operable member above said contact member for effecting a depressing movement of said contact member to circuit closing position, a housing for enclosing said contact member and said manually operable member, and a flexible waterproof membrane disposed within said housing to seal said contact member in water-tight relation.

JOSEPH A. GITS.
JULES P. GITS.