June 15, 1926. 1,588,515

E. R. BARANY

SWITCH

Filed Dec. 10, 1924

Fig. 1.

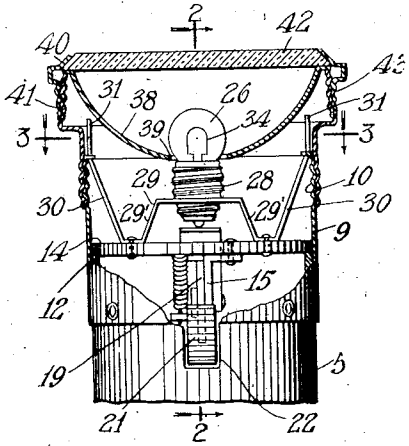


Fig. 2.

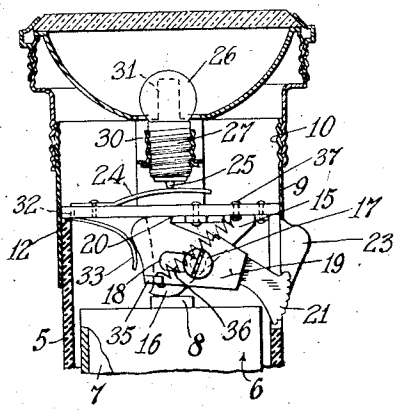


Fig. 3.

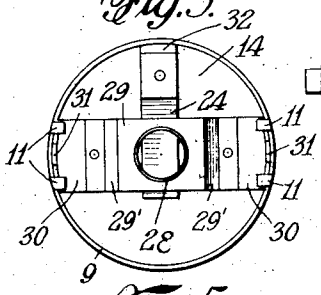


Fig. 4.

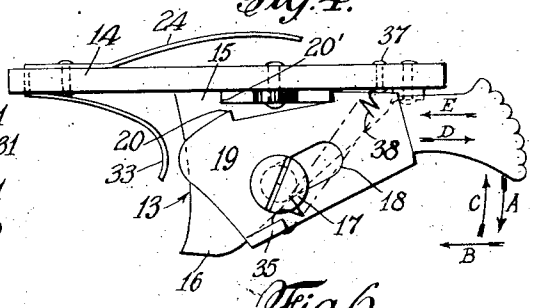


Fig. 5.

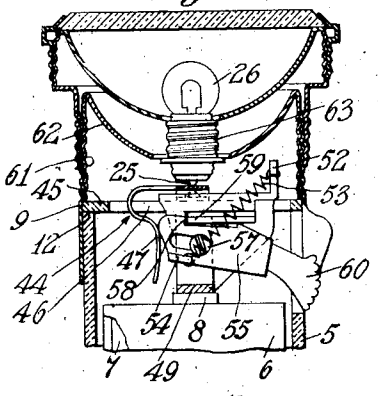


Fig. 6.

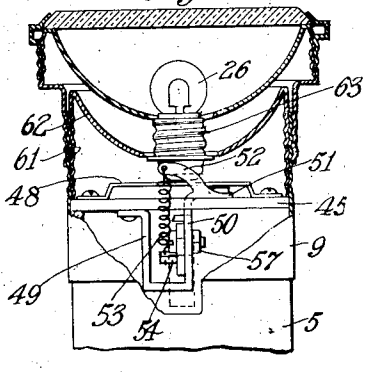


Fig. 7.

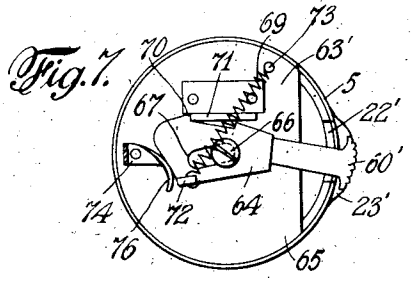
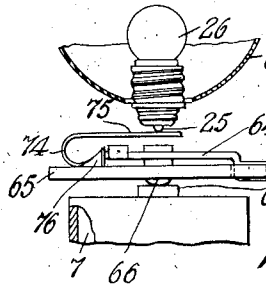


Fig. 8.



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UNITED STATES PATENT OFFICE.

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SWITCH.

Application filed December 10, 1924. Serial No. 754,913.

This invention relates to switches and is herein illustrated as embodied in a flashlight structure although not restricted to such use.

In the present day types of flashlights the one paramount objection to the switch mechanism resides in the fact that the usual operating member, exterior of the casing, is susceptible to such a simple movement that the circuit is often, under peculiar circumstances, accidentally closed through the lamp as a result of the operating member having been moved to circuit closing position, in which position it may remain, as it often does, until the battery is completely exhausted.

An important object of my invention is to provide a switch mechanism so constructed as to require of the operating or circuit closing member, in closing the circuit, a combination of movements such as are, on the one hand, extremely unlikely to be carelessly or accidentally imparted thereto and, on the other hand, are such as to enable the operator to most naturally and easily effect the operation of the switch.

Another object of the invention is to provide a switch so constructed that the various elements thereof may be easily assembled into a unit capable of being readily introduced into a flashlight structure or removed therefrom as the occasion may require.

A further object of the invention is to provide a switch unit of the character mentioned which is simple in construction, inexpensive to manufacture and reliable in operation.

Other objects and advantages of the invention will become apparent from the following description when taken in connection with the accompanying drawings in which—

Figure 1 is a sectional view through a flashlight having one form of switch embodying my invention associated therewith.

Figure 2 is a sectional view taken on line 2—2 of Figure 1, the switch structure being shown in elevation.

Figure 3 is a sectional view taken on line 3—3 of Figure 1, the flashlight lamp being removed.

Figure 4 is a somewhat enlarged view in elevation of the switch unit embodying my invention.

Figure 5 is a view similar to that of Figure 2, showing a modified form of switch unit embodied in a flashlight.

Figure 6 is a view similar to that of Figure 1, showing, however, the form of switch illustrated in Figure 5.

Figure 7 is a plan view of still another modified form of switch unit.

Figure 8 is an edge elevation of the switch unit support or base shown in Figure 7.

In the drawings wherein for the purpose of illustration are shown the preferred forms of my invention, the numeral 5 indicates a flashlight housing or casing adapted for the reception of a battery 6, of usual construction, employing a zinc container 7, which constitutes one pole of the battery, whereas the carbon electrode 8 constitutes the other pole thereof. Upon the housing or casing 5, is fitted a shell or sleeve 9, the outer end of which is screw-threaded as shown at 10 and provided with diametrically opposed pairs of inwardly projecting ears 11.

It will be noted that the housing 5 forms with the sleeve 9 a ledge 12 adapted to receive thereupon the switch unit embodying my invention and indicated as a whole by the numeral 13. The unit 13 comprises a disc 14, to the under side of which is connected an angle bracket 15, the depending leg 16 of which serves as a contact adapted to engage the carbon electrode 8 as shown. The depending leg 16 is provided with a transverse stud or rivet 17, projecting through an elongated slot 18 formed in a pivotally and slidably movable operating or circuit closing member 19. This operating member is provided at one end with a lug or hook 20, adapted to engage and cooperate with a locking element or block 20′ secured to the disk 14, and includes a thumb piece 21 which projects through a slot 22 formed in the housing 5. In order that the thumb piece 21 may be housed or enclosed to as great an extent as is practicable, when the switch is in its open position as indicated in Figure 4, the shell or sleeve 9 is struck up to provide a slotted lobe or housing 23.

To the disc 14, on the upper side thereof, is connected a resilient contact or finger 24 adapted to engage the central contact 25 of the usual flashlight lamp 26, the outer screw-threaded contact 27 of which is held in position within a screw-threaded receptacle 28. This receptacle is secured to and carried by

a yoke 29, the legs 29′ of which are attached to the disc 14 and terminate in upwardly and outwardly projecting resilient arms 30, so shaped as to provide fingers 31, which, when the switch unit is positioned as shown most clearly in Figures 1 and 2, project upwardly intermediate the ears 11 which engage the arms 30 to lock the unit in position upon the ledge 12.

The resilient contact finger 24, above mentioned, projects through a notch 32 formed in the disc 14 and terminates below the disc in a curved resilient contact 33 with which the operating member 19 is adapted to make contact, when moved to the position shown in Figure 2, thus establishing a circuit from the electrode 8 through the angle bracket 15, operating member 19, contact 33, contact 24, contact 25, lamp filament 34 one end of which is connected to the central contact 25 whereas the other end is connected to the outer contact 27 screw-threaded receptacle 28, yoke 29, and sleeve 9, which in turn may be connected to the zinc electrode 7 in accordance with usual practice. It will be noted that the operating member 19 is provided with a lug 35 adjacent the slot or opening 18. To this lug there is connected a tension spring 36 which, at its opposite end, is attached to the disc 14 by means of a pin or rivet 37.

In the form of my invention shown in Figures 1 and 2, the reflector 38 is provided with a central opening 39 through which the lamp 26 projects. This reflector is provided with a peripheral flange 40, adapted to seat upon the outer screw-threaded end of the reflector head 41, and is held in position by means of the usual lens 42 which is maintained in peripheral engagement with the flange 40 by means of a lens ring 43.

From the above description it will be apparent that upon removing the reflector head 41, carrying the lens ring 43, lens 42, and reflector 38, and thereafter urging the arms 30 toward each other to release their engagement with the respective lugs 11, the switch unit may be readily removed. When the unit is again introduced into the casing, the disc 14 seats upon the ledge 12 and the arms 30, due to their inherent resiliency, assume their respective positions shown in Figure 1, thus establishing a locking engagement between lugs 11 and the respective arms.

The switch unit 44, shown in Figures 5 and 6, although embodying the same principle of operation as that of the hereinbefore described form of unit, differs somewhat in construction. The modified form of switch unit, now under consideration, comprises a disc 45 having a relatively large opening 46 formed therein through which projects a depending resilient contact 47 carried by and preferably formed integral with a yoke 48 which bridges the opening 46 and is secured to the disc on the upper face thereof, as shown most clearly in Figure 6. To the disc 45, is secured a second yoke 49, the lower end of which serves as a contact. One leg 50 of the yoke 49 projects through the opening 46 and terminates in a base 51 which is attached to the disc 45 and provided with an arm 52 overlying the opening 46. To this arm, is connected a tension spring 53 which in turn, is connected to a lug 54 carried by an operating or circuit closing member 55 identical with that indicated by the numeral 19. This operating member is provided with a slot 56 adapted for the reception of a rivet, screw or bolt, indicated by the numeral 57, by means of which the operating member 55 is pivotally and slidably connected to the leg 50 of the yoke 49. The operating member 55 is provided at one end with a lug or hook 58 adapted to cooperate with a locking element or block 59 carried by the disc 45 and functioning in connection with the operating member 55 to retain the same in circuit closing position. The operating member 55, like the operating member 19, includes a thumb piece 60 which projects through the casing 5.

In the form of my invention shown in Figures 5 and 6, I dispense with the particular form of means shown in Figures 1 and 2 for locking the switch unit in position, and utilize a screw-threaded apron 61 which is adapted to be run down into engagement with the disc 45 to retain the same properly seated upon the ledge 12. This apron is provided with a cup shaped support 62 which carries centrally thereof a screw threaded socket 63 adapted for the reception of the lamp 26, the lamp being so projected through the socket 63 that the central contact 25 thereof engages the yoke 48 intermediate its ends.

When the operating member 55 is moved to circuit closing position, shown in Figure 5, a circuit is established from the carbon electrode 8 through the yoke 49, operating member 55, contact 47, yoke 48, lamp 26, lamp socket 63, support 62, apron 61 and sleeve 9, which in turn may be connected with the zinc electrode 7 in accordance with usual practice.

In considering Figures 7 and 8, wherein is shown another form of switch unit, embodying my invention and indicated as a whole by the numeral 63′, it will be noted that provision is made for transverse movement of the operating or circuit closing member 64 with respect to the casing. In order to enable me to provide for such movement, the operating member 64 is pivotally and slidably connected directly to the disc 65 by means of a rivet or the like 66 passed through an elongated slot 67 formed in the operating member. This rivet 66 functions as a contact adapted to engage the carbon

electrode 68 of the flashlight battery as shown in Figure 8. In the form of invention now under consideration, I make use of a tension spring 69 for maintaining the hook or lug 70, carried by the operating member 64, in engagement with a locking element or block 71 secured to the disc 65. This spring is connected at one end to a lug 72 carried by the operating member 64 and is, at its other end, connected to a pin 73 or other suitable anchor carried by the disc 65. To the disc 65, adjacent one end of the operating member 64, is connected a U-shaped contact 74, in the form of a flat and more or less resilient strip of metal, one leg 75 of the contact 74 being adapted to engage the central contact 25 of the lamp 26, whereas the other leg 76 is bent into a vertical curved plane, as shown most clearly in Figure 7, and is adapted to be engaged by the operating member 64.

It will be appreciated that the switch unit 63′, shown in Figures 7 and 8, is adapted to be used in connection with the form of flashlight shown in Figures 5 and 6 except, of course, the slot 22′ formed in the casing 5 through which the thumb piece 60′ projects will be formed transversely to the casing rather than longitudinal with respect thereto and the slotted lobe or housing 23′ will be arranged as shown. When using the form of switch shown in Figures 7 and 8 in connection with the type of flashlight disclosed in Figures 5 and 6, the disc 65 will be maintained in seated position upon the ledge 12 by means of the apron 61. Upon moving the operating member 64 to the position shown in Figure 7, a circuit will be established from the carbon electrode 68, through the rivet 66, operating member 64, U-shaped contact 74, lamp 26, support 62, apron 61 and sleeve 9, which in turn may be connected to the zinc electrode 7 in accordance with usual practice.

Inasmuch as the operation of the several forms of units herein shown and described is substantially the same, it is deemed necessary to elaborate, in this connection, only upon the form of switch shown in Figures 1 to 4, inclusive. When the operating or circuit closing member 19 is maintained in open circuit position, as shown in Figure 4, the tension spring 36 will be positioned somewhat off center with respect to the rivet 17 and to the right of its center as viewed in Figure 4. The spring 36 will, therefore, maintain the operating member 19 always in the position shown in Figure 4 under normal conditions. To move the operating member to circuit closing position shown in Figure 2, it is necessary to move the thumb piece in the two general directions indicated by the arrows A and B, respectively, in Figure 4. As a result of these movements the operating member 19 is swung slightly around the pivot 17 and is thereafter moved longitudinally thereupon. The instant the spring 18 passes over the center of the pin 17 to the left thereof, as viewed in Figure 4, the influence of the spring will effect a snap movement of the operating member, thus causing the same to slightly rotate about the rivet 17 and move into the position shown in Figure 2 thereby so positioning the lug or hook 20 as to enable it to cooperate with the locking element or block 20′ to effectively lock the operating member in circuit closing position. As a result of the operating member having been moved to the position shown in Figure 2, electrical contact is established between the resilient contact 33 and the operating member as will be readily appreciated. To open the circuit a movement of the thumb piece 21 in the direction of the arrow C will cause the operating member 19 to move about the pivot 17 as an axis thereby disengaging the locking element 20′. As movement of the operating member is continued the spring 36 is moved from the left over the center of the pin 17 to the right thereof, engagement being maintained all the while between the operating member and the resilient contact 33. The instant, however, the spring 18 passes to the right of the pivot, as viewed in Figure 4, the operating member is further moved in the direction indicatel by the arrow C, thereby causing the heel 77 of the operating member to engage the face of the locking element or block 20′ after which the operating member is thrust outwardly in the direction of the arrow D, which thrusting movement is effected by reason of the camming action set up between the heel 77 and the face of the locking element 20′. Upon continued outward movement of the operating member, as mentioned, the heel 77 will disengage the face of the locking element 20′ and due to the influence of the spring 36 will assume the position at the end of the locking element, as shown in Figure 4, in which position the operating member is positively locked against movement in the direction of the arrow E when subjected to a force applied in this direction.

From the above description of the operation of the operating member, it will be apparent that in closing the switch, movement in two general directions must necessarily be imparted to the operating member, thus eliminating to a very great extent accidental closing of the circuit through the lamp under extraordinary conditions. It will also clearly appear that the movements of the operating member necessary to close the switch are perfectly natural ones in the hands of one desiring to use the flashlight and that to so operate the switch as to

open the circuit requires also only a most natural manipulation on the part of the operator.

Having thus described my invention I claim:

1. A switch comprising a pair of contacts, and means for electrically connecting and disconnecting said contacts comprising a pivotal and slidable operating member requiring movement in two general directions to effect electrical connection between said contacts.

2. A switch comprising a pair of contacts, an operating member for electrically connecting one contact to the other, a support for said operating member, and means pivotally and slidably connecting said operating member to said support.

3. A switch comprising a pair of contacts, an operating member for electrically connecting one contact to the other, a support for said operating member, means pivotally and slidably connecting said operating member to said support whereby said operating member may be moved first about its point of connection with said support as an axis and thereafter laterally with respect to its point of connection with said support to effect electrical connection between said contacts.

4. A switch comprising a pair of contacts, a support, means for electrically connecting said contacts comprising an operating member pivotally and slidably connected to said support and adapted to be moved first about its pivotal connection with said support and thereafter laterally thereupon to effect electrical connection between said contacts, and means for locking said operating member against lateral movement with respect to its point of connection with said support prior to its being moved about its point of connection with said support.

5. A switch comprising a pair of contacts, a support, means for electrically connecting said contacts comprising an operating member pivotally and slidably connected to said support and adapted to be moved first about its pivotal connection with said support and thereafter laterally thereupon to effect electrical connection between said contacts, means for locking said operating member against lateral movement with respect to its point of connection with said support prior to its being moved about its point of connection with said support, and means for resisting the movements of said operating member with respect to its point of connection with said support when electrically connecting said contacts.

6. A switch comprising a pair of contacts, a support, means for electrically connecting said contacts comprising an operating member pivotally and slidably connected to said support and adapted to be moved first about its pivotal connection with said support and thereafter laterally thereupon to effect electrical connection between said contacts, means for locking said operating member against lateral movement with respect to its point of connection with said support prior to its being moved about its point of connection with said support, means for resisting the movements of said operating member with respect to its point of connection with said support when electrically connecting said contacts, and means for locking said operating member in circuit closing position upon the completion of its lateral movement with respect to its point of connection with said support.

7. A switch comprising a pair of contacts, a support, means for electrically connecting said contacts comprising an operating member pivotally and slidably connected to said support and adapted to be moved first about its pivotal connection with said support and thereafter laterally thereupon to effect electrical connection between said contacts, means for locking said operating member against lateral movement with respect to its point of connection with said support prior to its being moved about its point of connection with said support, means for resisting the movements of said operating member with respect to its point of connection with said support when electrically connecting said contacts, and means for locking said operating member in circuit closing position upon the completion of its lateral movement with respect to its point of connection with said support, the means for resisting said movements of said operating member being utilized to tend to retain said operating member in circuit closing position.

8. A switch unit comprising a base, contacts associated with said base, a support, an operating member pivotally and slidably connected to said support and adapted to be moved first in one direction and then in another whereby electrical connection between said contacts is established, and yieldable means resisting the said movements of said operating member.

9. A switch unit comprising a base, contacts associated with said base, a support, an operating member pivotally and slidably connected to said support and adapted to be moved first in one direction and then in another whereby electrical connection between said contacts is established, yieldable means resisting said movements of said operating member, and means for locking said operating member in circuit closing position upon the completion of said movements.

10. A switch unit comprising a base, contacts associated with said base, a support, an operating member pivotally and slidably

connected to said support and adapted to be moved first in one direction and then in another whereby connection between said contacts is established, yieldable means resisting said movements of said operating member, and means for locking said operating member in circuit closing position upon the completion of said movements, said yieldable means being adapted to facilitate the operation of said locking means and to cooperate therewith to retain said operating member in circuit closing position.

11. A flashlight switch adapted to be assembled as a unit exteriorly of the flashlight and thereafter introduced as a unit into the flashlight and comprising a support, a pair of contacts, an operating member pivotally and slidably connected to said support and adapted to be moved in one direction and then in another to electrically connect said contacts together, and means first tending to retard said operating member in its movements to circuit closing position and thereafter tending to retain said operating member in circuit closing position.

12. A flashlight switch adapted to be assembled as a unit exteriorly of the flashlight and thereafter introduced as a unit into the flashlight and comprising a support, a pair of contacts, an operating member pivotally and slidably connected to said support and adapted to be moved in one direction and then in another to electrically connect said contacts together, means first tending to retard said operating member in its movements to circuit closing position and thereafter tending to retain said operating member in circuit closing position, and means cooperating with said operating member and the last named means for locking said operating member in circuit closing position.

13. A switch unit adapted to be assembled exteriorly of and thereafter introduced into a flashlight as a unit, and means for locking said unit within said flashlight, said means being in the form of a yieldable spring device constituting a part of said unit and adapted for engagement with said flashlight.

14. A switch unit adapted to be assembled exteriorly of and thereafter introduced as a unit into a flashlight having a battery provided with a terminal and a lamp associated with said flashlight and having a terminal, said unit comprising a pair of contacts adapted to engage the first and second named terminals respectively, a support, a circuit closing member pivotally and slidably connected to said support and having a portion thereof adapted to project through the flashlight and adapted to be operated in two directions to effect an electrical connection between said contacts.

15. A switch unit adapted to be assembled exteriorly of and thereafter introduced as a unit into a flashlight having a battery provided with a terminal and a lamp associated with said flashlight and having a terminal, said unit comprising a pair of contacts adapted to engage the first and second named terminals respectively, a support, a circuit closing member pivotally and slidably connected to said support and having a portion thereof adapted to project through the flashlight and adapted to be operated in two directions to effect an electrical connection between said contacts, and means for so locking said unit within said flashlight as to maintain engagement between said contacts and the first and second named terminals respectively.

16. A switch unit adapted to be assembled exteriorly of and thereafter introduced as a unit into a flashlight having a battery provided with a terminal and a lamp associated with said flashlight and having a terminal, said unit comprising a pair of contacts adapted to engage the first and second named terminals respectively, a support, a circuit closing member pivotally and slidably connected to said support and having a portion thereof adapted to project through the flashlight and adapted to be operated in two directions to effect an electrical connection between said contacts, and means for so locking said unit within said flashlight as to maintain engagement between said contacts and the first and second named terminals respectively, said means being in the form of a locking element adapted for engagement with said support and flashlight.

In testimony whereof, I have affixed my signature to this specification.

EDMUND R. BARANY.