Oct. 27, 1936. C. E. PRYOR 2,059,029

SWITCH FOR ELECTRIC FLASHLIGHTS

Filed Nov. 18, 1931

Fig. 1.

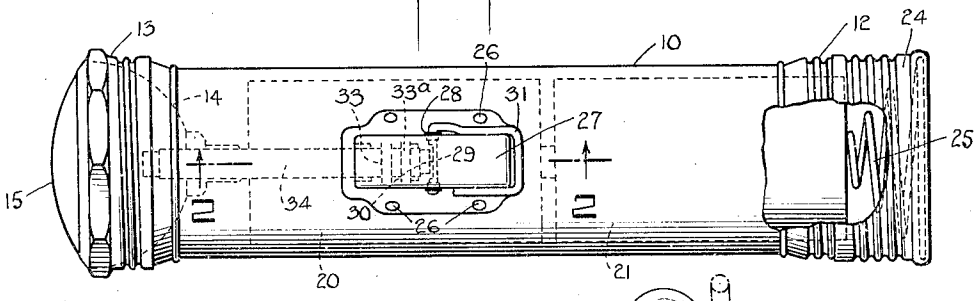


Fig. 2.

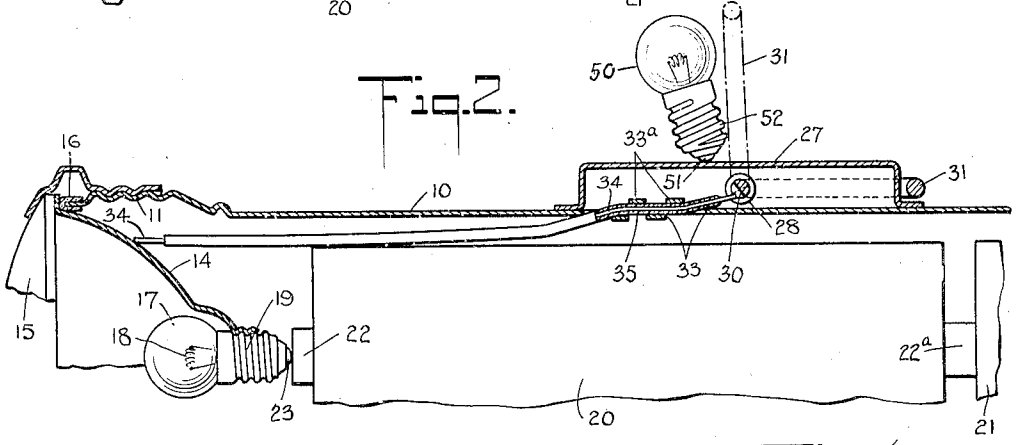


Fig. 3.

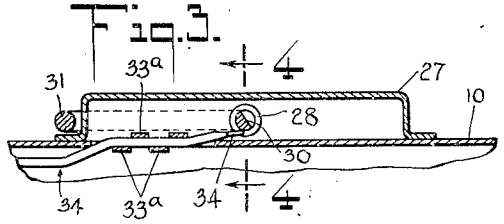


Fig. 4.

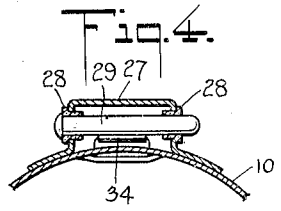


Fig. 5.

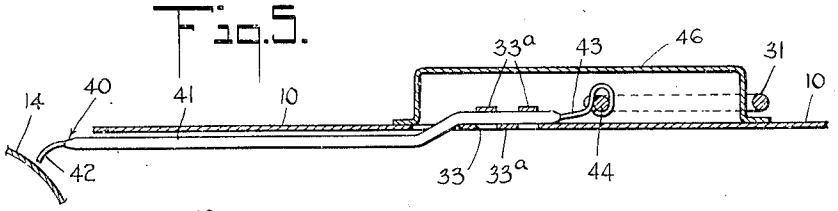
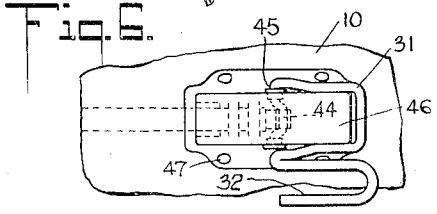


Fig. 6.



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SWITCH FOR ELECTRIC FLASHLIGHTS

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Application November 18, 1931, Serial No. 575,735

10 Claims. (Cl. 200—60)

My present invention relates to electric lamp devices and more particularly to an improved switch mechanism therefor.

In the ordinary electric lamp device of the portable type adapted to be manipulated by one hand, the switch mechanism is usually of the push button type or of a combined push button and slide type. When the push button type is utilized to make the circuit to allow current to pass through the lamp, such current will flow only as long as the push button is depressed, whereas in the push button and slide type the push button may be held depressed by a sliding movement thereof longitudinally of the case after it has been moved into operative position to close this circuit through the lamp bulb. Such prior devices are open to the objection that it is necessary either to constantly maintain pressure on the push button or hold the device in the hand after a rather complicated movement of the switch mechanism has taken place and in either event no means is ordinarily provided for holding the hand lamp other than in the hand. Various attempts have been made recently to avoid this difficulty, devices for this purpose taking the form of a loop attached to the usual end cap. This form, however, is not satisfactory as it is necessary to hold the hand lamp in a position above that where the light is directed in order to be able to utilize the light.

In my present invention, I have obviated the objections of prior devices of this character and have devised a switch which is extremely positive in its action and is free from the referred to and other disadvantages of the prior art.

My switch, preferably, has combined with its operating element a hook by means of which the entire hand lamp may be hung up in any one of a plurality of positions ranging from horizontal to vertical. In carrying out this feature of my invention, I preferably employ an eccentric cam member which may be mounted on the device as an integral part of the switch mechanism; such cam device is operated by a lever or equivalent structure which is easily rotated from non-operative to operative position, and vice versa, even by the hand of the user that holds the lamp device.

I also preferably associate with the operating lever and which forms an integral part of such lever, a hook or other like member by means of which the entire lamp structure may be suspended from a support in any one of a plurality of positions, the position of the operating lever with respect to the center of gravity of the lamp device being such as to maintain the contact closed while so held.

Another feature of my invention is an improved form of holding device for contact spring or like member, such structure comprising essentially a plurality of parallelly arranged bands formed of the material of the outer casing and extending transversely of the longitudinal axis of the casing and which may be utilized to either hold the spring contact member in rigid position or to form a bearing for the contact member should it be desired to slide the same into and out of engagement with the usual reflector to make and break the circuit through the lamp bulb filament.

Further features and objects of the invention will be more fully understood from the following detail description and the accompanying drawing, in which

Fig. 1 is an elevation of one embodiment of my invention;

Fig. 2 is a sectional elevation on line 2—2 of Fig. 1, which shows the switch lever in normal or nonoperative position;

Fig. 3 is a detail view of a portion of Fig. 2, showing the operating lever in an operative position;

Fig. 4 is a vertical section on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view similar to Fig. 2, showing another embodiment of my device;

Fig. 6 is a plan view of one end of Fig. 5.

Referring to the drawing, 10 designates the casing which is usually cylindrical in form, although it may be of any form desired; the casing may be made of any desired material, although preferably, the casing is made of conductive metal which is usually ornamented as desired. The casing 10 is usually threaded at each end as indicated by the reference numerals 11 and 12, respectively; there is provided a front open end or cap member 13 threaded to cooperate with the threads 11 and which is also utilized to securely fasten a reflector 14 in position within the open front end of the casing, a lens 15 being interposed between the member 13 and the reflector 14. Also, the outer rim of the open end of the casing 10, when of conducting material, is provided with an insulating washer 16 which, as will be apparent, electrically insulates the metallic reflector 14 from the metallic casing 10. The reflector 14 has secured therein the usual electric lamp 17 provided with a filament 18; one end of such filament 18 is electrically connected through the outer metallic contact shell 19 of such lamp, with the reflector 14. Disposed within the casing 10, are one or more

electric cell units 20 and 21; the number of electric cell units employed depends upon the size and type of the casing and on the desired voltage to be applied on the lamp bulb 17.

These electric cell units may be ordinary dry cells of which the central cathode 22 of the cell 20, as shown, is in electrical engagement with the center contact 23 of the lamp bulb 17 and is thus connected to the other end of the filament 18. The usual zinc casing of each electric cell unit 20 and 21, forms the anode thereof and the anode of the electric cell unit 20 is electrically connected to the cathode 23 of the electric cell unit 21. The end cap 24 is threaded on the threading 12 of the casing 10, the end cap being preferably of conducting material, and fitting within and abutting against the bottom of such cap 24 is a compression spring 25 which engages with the bottom of the cathode of the electric cell unit 21 to thereby electrically connect the cathode of the cell 21 with the casing 10.

Secured to the casing 10 in any convenient manner, as by rivets 26, is a hollow box-like structure 27, the open end or side of which lies adjacent to the surface of the casing 19. Mounted in the side walls of the structure 27 are tubular bearing members 28 which, when the casing 10 is made of conducting metal, is preferably of insulating material. Rotatably mounted in such bearing members 28 is a shaft 29 provided intermediate its ends and within the box-like structure 27 with a cam member 30. Preferably formed integral with the shaft 29 at one end thereof is an open lever 31 which as noted from an inspection of Fig. 1, may extend around a portion of two sides and one end of the box structure 27. This member 31 may serve as a hook and by means of which the casing 10 and all parts associated therewith may be suspended in any one of a plurality of different positions. If desired, and referring specifically to Fig. 6, this member 31 may have attached thereto or formed integral therewith an additional hook member 32 which also serves as a means for suspending the casing 10. The member 32 in the normal or non-operative position of the lever 31 as shown in Fig. 6, lies closely adjacent to the surface of the casing 10.

In the wall of the casing 10, and within that portion protected by the box-like structure 27 and in any convenient arrangement with respect to the cam 30 is a plurality of parallel slots 33 defining a plurality of parallelly arranged bands 33a some of which, as is clearly apparent from an inspection of Figs. 2 and 3 are bent upwardly and others are bent downwardly to thereby provide a simple mounting for the contact strip 34. Such conducting strip is covered with insulating material 35, which insulating material therefore prevents the contact strip 34 from being in electrical engagement with the casing 10 when the latter is of conducting material. After the contact strip 34 has been mounted, the parallel strips 33a formed by the slots 33 are pressed firmly into engagement with the insulation 35 on the contact strip 34.

As shown in Fig. 2, one end of the contact strip 34 is associated with the cam 30 so that such cam when in the position shown in Fig. 2 is out of engagement with such contact strip 34. The other end of such contact strip 34 is in constant good electrical contact engagement with the outer surface of the reflector 14 as clearly shown in Fig. 2. Under such conditions therefore, no current from the electric cell units 20 and 21 passes through the filament 18 of the lamp bulb 17. Upon rotating the lever 31 to rotate the shaft 29 to move the cam 30 from the position shown in Fig. 2 to the position where the cam 30 engages the end of the contact strip 34, and the lever 31 engages the member 27, as into the position shown in Fig. 3, the electric circuit is completed, assuming the two illustrated cell units 20, 21, from the anode of the electric cell unit 21 through the compression spring 25, end cap 24, casing 10, member 27, lever 31, cam 30, contact spring 34, reflector 14, outer casing 19 of the electric lamp bulb 17, the filament 18, the center contact 23 of the lamp bulb 17, cathode 22 of electric cell unit 20, anode thereof, cathode 22a of the electric cell unit 21. The circuit through the filament 18 remains closed until the lever 31 is moved to such a position as to bring the cam 30 out of engagement with the end of the spring contact 34 or to the position shown in Fig. 2.

The embodiment illustrated in Figs. 5 and 6, comprises parts corresponding to those illustrated in the foregoing figures and hereinabove described, and like parts are designated by like reference characters. However, in Fig. 5, the bands 33a are arranged in staggered relation so as to define a passage through which may slide the contact strip 40. This strip 40 is provided with insulation 41 throughout the major portion of its length, and it will be noted that such insulation 41 protects the strip 40 from contact with the bands 33a or otherwise with the metallic casing 10. One end 42 of the strip 41 is adapted to be displaced into and out of electric engagement with the reflector 14 to thereby make and break at will the circuit through the lamp 17. The other end 43 of the strip is formed as an eye or equivalent which engages with a cam or crank 44 or equivalent, formed on a shaft 45. This shaft 45 is rotatably mounted in bearings formed in the side plates of a switch cover 46 secured to the casing 10 by rivets 47 or in any other devised manner. In this form of my invention, the insulating bearing sleeves 28 may be dispensed with.

Secured to or formed integral with the shaft 45 is a combined lever and suspending hook, the lever portion being designated 31 and the hook portion 32.

The form of my invention illustrated in Figs. 1, 2 and 3 may be utilized as a means for testing lamps, fuses, or the like in the following manner: The lamp 50 or other electrical device to be tested is placed with one of its terminals, as its center terminal 51, in engagement with the member 27, and the lever 31 then rotated so as to be brought into engagement with the threaded shell terminal 52 of the lamp 50. This movement also rotates the shaft 29 so as to bring the cam 30 into engagement with the adjacent end of the contact strip 34, while maintaining the lever out of engagement with the member 27. The circuit through the filament 18 of the flash light lamp 17 is completed and lighted, provided the tested lamp is in good order. Also, the filament of the tested lamp 50, if in good order, is lighted. However, if the filament or other electrical circuit part of the tested lamp 50 and correspondingly for other electrical devices to be tested, is not in good order, the flash light lamp 17 will not be lighted.

The circuit during the testing of the lamp 50 is as follows: From the anode of the electric cell unit 21, compression spring 25, end cap 24, casing 10, member 27, terminal 51, filament of lamp 50 threaded shell terminal 52, lever 31, cam 30, contact strip 34, reflector 14, shell terminal 19, filament 18, center terminal 23, cathode 22 of electric

cell unit 20, anode thereof, cathode 22a of electric cell unit 21.

It will be apparent to those skilled in the art that the body portion 10 of the casing may be electrically non-conducting material, and in such instance, a strip of wire interconnecting the switch housing 27 with the rear end cap 24 or equivalent for the electrical connection with the anode of the electric cell unit or units, in substitution of the electrical connection afforded by the metallic material of the casing. In such embodiment of my invention, the insulated bearings 28 are omitted, to provide electrical connection between the lever 31 and the switch housing 27.

While I have illustrated and described certain preferred embodiments of my invention somewhat in detail, it is to be understood that I may vary the device without departing from the spirit of the invention.

I claim:

1. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a portion of electrically conducting material, and circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position.

2. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a portion of electrically conducting material, said electrically conducting portion being electrically connected to said conductor and serving to displace said conductor, and circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position.

3. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a cam portion of electrically conducting material, and circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position.

4. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a cam portion of electrically conducting material, said electrically conducting portion being electrically connected to said conductor and serving to displace said conductor, and circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position.

5. In a switch device, the combination of a casing, a conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a portion of electrically conducting material, circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position, and means carried by said movable switch arm for holding said switch arm in said predetermined position and suspending said casing and its stated associated elements.

6. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a portion of electrically conducting material, circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position, and means carried by said movable switch arm for holding said switch arm in said predetermined position and suspending said casing and its stated associated elements.

7. In a switch device, the combination of a casing, a displaceable conductor having an exposed end, a switch arm movably and insulatedly mounted in the casing, said movable switch arm embodying a portion of electrically conducting material, said electrically conducting portion being electrically connected to said conductor and serving to displace said conductor, circuit means arranged to effect circuit closure with a source of current at a predetermined position of said movable switch arm through its said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position, and means carried by said movable switch arm for holding said switch arm in said predetermined position and suspending said casing and its stated associated elements.

8. In a switch device for portable flash lights having a body and a source of current encased therein, the combination of a casing mounted on the body, a shaft rotatably mounted in the casing, insulating bushings in which the shaft is directly mounted to insulate the shaft from the casing, a contact cam member on said shaft, a switch arm secured to the end of the shaft and adapted, upon rotation of the shaft, to engage with the casing, and a conductor having an end lying in the path of rotation of the contact cam member, whereby engagement of the cam member with the conductor at a predetermined point in the rotation of the shaft completes the circuit from the conductor to the casing through the switch arm.

9. In a switch device the combination of a casing, a conductor having an exposed end lying within the casing, a movable switch arm, insulated bearings for said movable switch arm secured to the casing and insulating the movable switch arm from the casing, a cam body portion of electrically conducting material formed integral with said movable switch arm and arranged adjacent to and in operative relation with respect to the exposed end of the conductor, and circuit means arranged to effect

circuit closure through the casing with a source of current at a predetermined position of said movable switch arm with respect to the casing through the said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than at said predetermined position.

10. In a switch device, the combination of a casing, a conductor having an exposed end lying within the casing, a movable switch arm, insulating bearings for said movable switch arm secured to the casing and insulating the movable switch arm from the casing, a cam portion of electrically conducting material formed integral with said movable switch arm adjacent to and in operative relation with respect to the exposed end of the conductor, and circuit means arranged to effect circuit closure through the casing with a source of current at a predetermined position of said movable switch arm with respect to said casing through the said conducting portion, said switch arm being coordinated to effect circuit opening at a position of its movement other than said predetermined position, said electrically conducting portion at the stage of circuit opening being spaced from the exposed end of said conductor.

CLARENCE E. PRYOR.