Dec. 16, 1930. J. H. COHEN 1,784,820

ELECTRICAL SWITCH

Filed Dec. 18, 1924

FIG. 1.

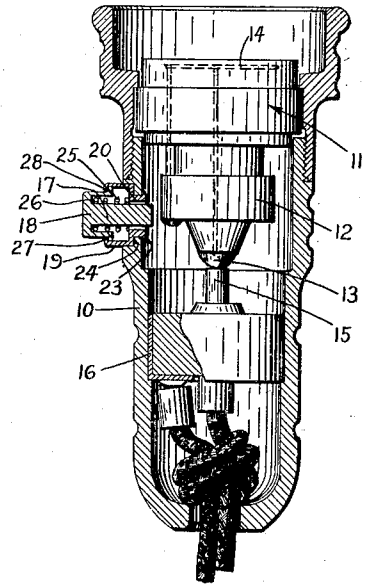


FIG. 3.

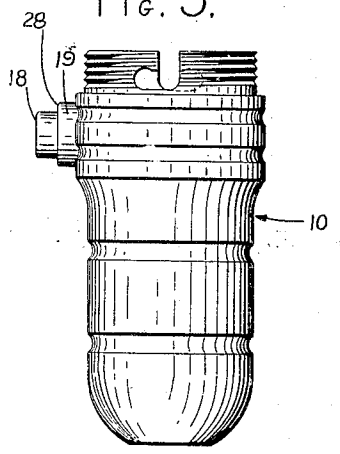


FIG. 2.

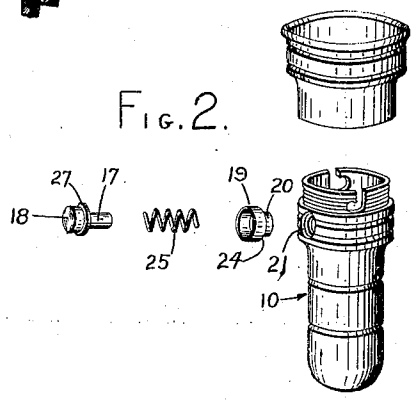
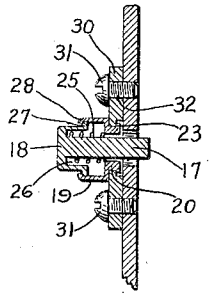


FIG. 4.



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UNITED STATES PATENT OFFICE

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ELECTRICAL SWITCH

Application filed December 18, 1924. Serial No. 756,740.

This invention relates to circuit controlling devices and more particularly to manually operable switches of the push-button type.

An object of this invention is to provide a switch which is easily and economically constructed and assembled, fool-proof in use, neat in appearance, and which may be made unusually small.

Another object is to provide a switch which may form a permanent part of a device or fixture to which it is desired to affix a switch.

Other objects and advantages will hereinafter appear.

In the accompanying drawings which show by way of example several physical embodiments of this invention,

Figure 1 is a sectional view on a large scale of one form of switch device made in accordance with this invention, and shown as applied to a cigar-lighter.

Fig. 2 is a disassembled perspective view of the parts constituting the switch device shown in Fig. 1, the parts being shown in the forms they have before the device is assembled.

Fig. 3 is an exterior view of the device shown in Fig. 1 as affixed to a cigar-lighter.

Fig. 4 is a view similar to Fig. 1 but showing a modification.

The push-button switch device shown in Fig. 1 is adapted to be affixed directly to a device with which it is to be used, for instance to the housing 10 of the cigar-lighter shown in Fig. 1. In the cigar-lighter the switch is adapted to control the flow of current through a heating unit 11 having a ferrule 12 and a central contact 13 severally connected to the ends of a resistance element 14 in the heating unit 11.

In the particular device shown, the central contact 13 is normally engaged with a contact 15 in the housing 10 connected to one wire of a current-carrying cable. The other wire of the cable is grounded on the housing through a shell 16 soldered thereto and electrically engaging the housing. The heating unit 11, which is made of lava, is so positioned in the housing as to maintain the resistance element 14 and the ferrule 12, normally out of electrical engagement with the housing. Hence, current does not normally flow through the resistance element 14, but only when the switch is operated as will now be described.

The switch of this invention comprises a longitudinally movable pin 17 having a finger-piece or button 18 formed integral with one end thereof. The pin and button are slidably mounted in a shell 19 fixed to the housing so that the end of the pin 17 may be moved inwardly to engage the ferrule 12 on the heating unit and thus cause current to flow through the resistance element 14, by connecting the ferrule to the housing 10.

Preferably, the shell 19 has a reduced nipple 20 which is adapted to extend through a suitable hole 21 in the housing 10 and beyond the inside surface of the same where the part 23 of the nipple which protrudes beyond the housing is beaded over until the shell 19 is confined to the housing between the flange 24, formed by the reduced nipple, and the beaded over part 23.

The button is spring-pressed outwardly to a position where its inner end is removed from the part which it engages to close the circuit, in this case the ferrule 12. This is preferably done, according to this invention, by a coil spring 25 having one end bearing against the flange 24 and the other end bearing against the button 18. To allow a maximum movement of the button 18, that is, such movement as will cause the button to engage the flange 24 without interference with the spring 25, the button is undercut at 26 to such an extent as to be capable of receiving the entire spring 25 when the latter is compressed.

The button 18 is guided for movement in the shell 19 by a flange 27 located on the button at its inner end and engaging the internal wall of the shell. This flange 27 also serves to limit the outward movement of the button to define its normal inactive position, for the flange is adapted in such position to engage a flange 28 on the shell 19. This flange 28 is produced on the shell 19 after the button and spring are assembled in the shell by spinning or swedging the forward end of the shell inwardly.

It will be noted that by this arrangement a complete telescopic relation is established between the shell 19 and the button 18, that the

flange 27 or the button is located in a confined chamber in the shell 19, and that when the parts are assembled they bear a fixed and permanent relation with one another and cannot become disarranged or fail properly to function.

As shown in Fig. 4, the shell 19 may be affixed to any suitable part either directly upon an article as shown in Figs. 1, 2 and 3, or indirectly, as upon a plate 30 for instance, which in turn may be fastened upon an article by rivets or screws 31 passing through holes 32 in the plate.

The parts are preferably assembled in the following manner: The nipple 20 of the shell 19 is placed in the hole 21 in the housing 10 or other part to which it is to be attached, as for instance in the plate 30 in the form shown in Fig. 4 or the device proper as in the form shown in Figs. 1, 2 and 3. Then the nipple is beaded over to securely fix the shell to the part on which it is mounted. Then the spring 25 is pressed on the pin 17 and the pin is slid into the shell and through the nipple 20. The button is then depressed until the flange 27 thereon is near flange 24 on the shell. And finally the flange 28 is formed on the shell 19 by spinning over the end of the shell.

It should be understood that the invention is not limited to the disclosed use in a cigar-lighter but that its field of application is broad.

Variation and modification may be resorted to within the scope of this invention and portions of the improvements may be used without other.

What is claimed as new, and for which it is desired to obtain Letters Patent, is:

1. A push-button switch device comprising a shell having a confined chamber at one end and an integral reduced nipple at the other end adapted to be inserted in an opening adapted to receive it and to be beaded over the periphery of said opening to secure the shell therein; and a button slidably mounted in said shell and having means formed integral therewith in the confined chamber for retaining the button to the shell.

2. A push-button switch device comprising a shell having a chamber at one end and having an opening at its front end adapted to be confined by beading over the material of the shell adjacent the opening; a button having a flange adapted to be inserted in said opening at the front end of the chamber before the flange is confined by such beading over operation and adapted to be held in the chamber against being drawn out through the front end after the opening has been confined; an integral reduced nipple on the shell adapted to be inserted in an opening in supporting means adapted to receive it and to be beaded over the periphery of said opening to hold the shell to the supporting device; a portion of the reduced nipple constituting means for restricting the rear end of the chamber to prevent the flange from being drawn through the rear end of the chamber and a pin on said button adapted to extend through said nipple to operating position.

Signed at Bridgeport, in the county of Fairfield, and State of Connecticut, this 11th day of December, 1924.

JOSEPH H. COHEN.