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ONE-PIECE SWITCH LEVER

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Fig. 1.

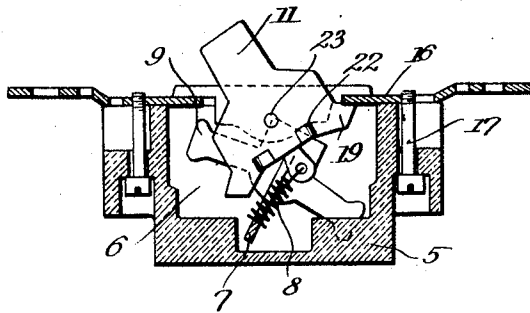


Fig. 2.

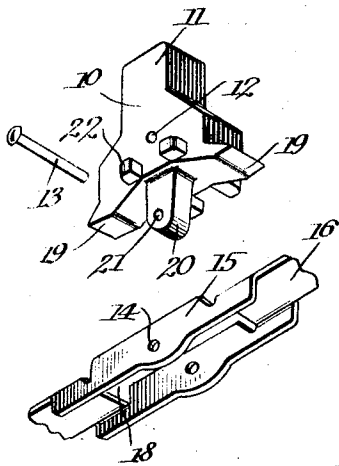


Fig. 3.

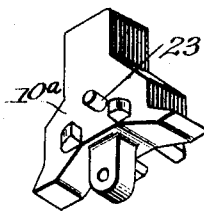
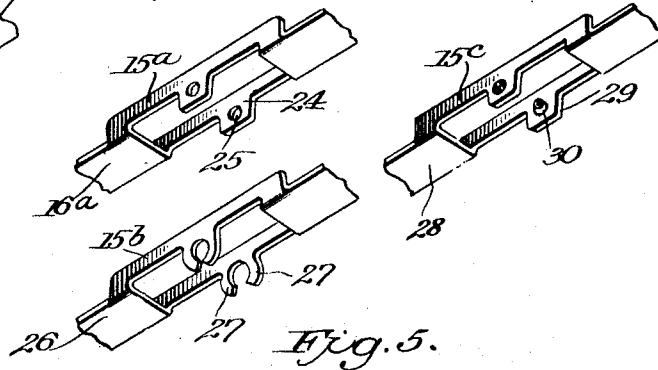
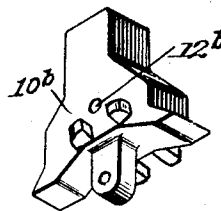


Fig. 4.



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UNITED STATES PATENT OFFICE

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ONE-PIECE SWITCH LEVER

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Application January 8, 1931. Serial No. 507,461

5 Claims. (Cl. 200—172)

This invention relates to new and useful improvements in snap or toggle switches and more particularly to the formation of the operating lever or button.

5 An important object of the invention is to provide an operating lever or button formed of a single piece of material with integral means forming the pivot of the lever, limiting the throw of the lever, attaching the blade actuating mechanism thereto, and for yieldingly moving the rocker across the axis of the lever in the event of the switch blade sticking to the stationary contacts.

10 Another important object of the invention is to provide improved and simplified means for mounting the operating lever in the mechanism.

15 Other objects and advantages of the invention will become apparent during the course of the following description.

20 In the accompanying drawing forming a part of the illustration and wherein like numerals are employed to designate like parts throughout the several views,

25 Figure 1 is a longitudinal vertical section through an electrical snap switch illustrating the present improvements therein.

30 Figure 2 is a scattered view showing perspective views of the operating lever and a portion of the bridge piece in which it is mounted.

35 Figure 3 is a similar view showing perspective views of a modified form of operating lever and a modified form of bridge piece or mounting for the latter.

40 Figure 4 is a corresponding view of a further modification of the invention showing perspective views of the operating lever and a still further modified form of the mounting therefor, and

45 Figure 5 is another modified form of bridge piece or mounting.

50 Referring now to the drawing for a more detailed description of the invention, the numeral 5 designates a switch casing preferably made from insulating material and provided with the usual interior cavity 6 for the reception of a snap or toggle mechanism well known in this art and comprising generally an oscillatory U-shaped rocker 7, having laterally projecting trunnions mounted in seats or recesses in opposed side walls of the casing, a compression spring 8 connected to the rocker and operating lever and a switch blade 9 mounted on one of the trunnions of the rocker, so as to be oscillated into and out of engagement with stationary contacts provided on the casing in such well known way as not to require further description. As is

well known in the art, the operating lever shifts the compression spring while compressing it, from one side of the lever axis to the other to cause the rocker to snap from one position to another and carry the switch blade 9 therewith, so that it is engaged and disengaged from the stationary contacts by a quick snap action. It is appreciated in the art that occasionally the oscillatory switch blade 9 will stick to the stationary contacts for one reason or another and that the compression spring 8 will not be of sufficient strength to shift the rocker 7 across the axis of the lever, in order to break the electrical circuit established by the switch blade being in engagement with the stationary contacts.

70 One form of the improved operating lever or button is disclosed in Figures 1 and 2 and is designated in general by the numeral 10. This lever is preferably formed or moulded from insulating material and is equipped as usual with an operating handle or finger piece 11, projecting exteriorly of the switch mechanism and insulating casing. In the form of invention shown in Figure 2, the body of the lever is pierced with a pivot aperture 12 for the reception of a pivot pin 13, which is adapted to extend through apertures 14 in marginal flanges 15, depending from the longitudinal edges of a bridge piece 16 secured to the open end of the insulating casing by means of the customary screws 17 extending through the casing from the back and passing through threaded apertures in the bridge piece. The medial portion of the bridge piece is equipped with a slot 18 bounded on its two longitudinal sides between marginal flanges 15, for the reception of the operating lever 10 therein and its pivotal connection to the flanges by the pin 13 passing therethrough and through the aperture 12 in the body of the lever 10.

80 In order to limit the throw of the lever 10 in both directions, it is provided below its axis and at opposite ends with outwardly projecting lugs or extensions 19, which are adapted to alternately engage with opposite ends of the slot 18 as the lever is oscillated back and forth to turn the switch on and off. In order to connect the compression spring 8 with the lever 10, the latter, on its inner face or bottom, is provided with an integral projection 20 extending in a direction opposite to the extension of the handle piece 11. This projection extends a distance below the bottom of the lever and at its lower end is pierced with an aperture 21 for receiving the upper end of the compression spring 8, as shown in Figure 1.

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To overcome the difficulty mentioned above of the switch blade adhering to the stationary contacts and in order to positively move the rocker from one position to another, a pair of spaced outwardly projecting lugs 22 are formed integral with the bottom of the operating lever 10 on the opposite side faces thereof and below the pivot aperture 12. The lugs of each pair are arranged upon opposite sides of the projection 20 and are adapted to alternately engage with opposite faces of the arms of the rocker 7 to unyieldingly move it to the desired position.

In the form of invention disclosed in Figure 3, the operating lever 10a on opposite sides is provided with integral outwardly projecting trunnions 23, which are round in cross section and are adapted to replace the removable pivot pin 13. Otherwise lever 10a is the same as lever 10 already described. When this form of operating lever is employed, the bridge piece 16a is provided with the customary slot and yieldable upstanding bordering side flanges 15a, each having a depending lug 24 provided with a pivot aperture 25. These flanges 15a are also preferably resilient, so that they can be sprung or spread apart to permit the trunnions 23 moving between the apertured ears or lugs 24 for entering the apertures 25, after which the flanges automatically return to normal position on opposite sides of the lever to pivotally mount them, or if desired the flanges may be bent back into position in case their resilience is not sufficient to return them to the normal position.

A further modification of this bridge piece is indicated at 26 in Figure 5 and the flanges 15b, which border its slot, are each provided with a pair of depending bendable lugs 27, the inner surfaces of which are curved as shown, so that when the two lugs are bent toward each other, they define therebetween, a circular aperture. In manufacture, these lugs are spaced apart as shown on the flange at the far side of the figure, so that the operating lever 10 can be inserted up through the slot 18 without springing the flanges 15b outwardly, while the trunnions 23 are positioned in the notches defined between these lugs. After the lever has been inserted in this position, the lugs 27 are bent inwardly toward each other and around the trunnions 23 to form bearings therefor, whereby the lever is effectively mounted in the bridge piece.

In the modification shown in Figure 4, the operating lever 10b is pierced with a pivot aperture 12b, which may extend entirely therethrough from side to side or it may assume the form of aligned recesses. Outside of this possible modification lever 10b may be exactly the same as lever 10 above described. The customary removable pivot pin is displaced by the construction of the bridge 28, which, in general, corresponds to the bridge pieces of the foregoing modifications. As in the preceding modifications, the slot in the bridge piece is bordered by upstanding flanges 15c, which are provided with depending ears 29. Each of these ears is punched inwardly to equip the same with an inwardly projecting teat or trunnion 30. These trunnions 30 are

adapted to enter the aperture 12 upon opposite sides of the lever for pivotally mounting the same. The flanges 15c are, of course, yieldable and resilient, so that they may be sprung apart to permit passage of the upper portion of the lever through the slot 18 and passage of the projections 30 along the sides of the lever until they snap into opposite ends of the opening 12 to securely and pivotally mount the lever.

From the foregoing description, it will be evident that a simple and inexpensive operating lever or button has been provided, which is quickly associated with the bridge piece without the necessity of handling a separate and detachable pivot pin and possesses all of the desired requisites for its connection to the operating mechanism, as well as an attribute which assures the operation of the snap mechanism should the contact blade become stuck to the stationary contacts.

It is to be understood that various changes in the construction and shape of the various parts may be resorted to without departing from the scope of the appended claims.

I claim:

1. An electric switch unit comprising a slotted bridge piece having bordering flanges bridging the slot, said flanges each having a bendable projection, an operating lever extending through said slot and having trunnions formed integral therewith, and said projections being bent around said trunnions to form bearings therefor.

2. An electric switch unit comprising a slotted bridge piece having bordering flanges bridging the slot, said flanges each having a pair of bendable projections, the inner complementary edges of which are curved, an operating lever extending through said slot and having trunnions formed integral therewith, and each pair of projections being bent around its trunnion to form substantially circular bearing apertures.

3. As an article of manufacture, a molded switch lever comprising a body, a handle portion integral with the body, laterally projecting trunnions integral with the body, and a pair of laterally extending lugs formed on each side of the body, the lugs of each pair being positioned at opposite sides of the longitudinal axis of the handle portion.

4. As an article of manufacture, a molded switch lever comprising a body, a handle portion integral with the body, laterally projecting trunnions integral with the body, a pair of laterally extending lugs formed on each side of the body, the lugs of each pair being positioned at opposite sides of the longitudinal axis of the handle portion, and an integral apertured projection opposite the handle portion.

5. In an electric switch, a lever pivot bearing comprising a flange, and tongues projecting from said flange, said tongues being bendable out of the plane thereof to provide a space between their free ends and bendable into the plane of the flange to close said space and define a substantially closed bearing aperture.

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