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2,933,577

PUSH BUTTON OPERATED ELECTRIC SWITCHES

Filed Sept. 9, 1958

2 Sheets-Sheet 1

FIG. 1.

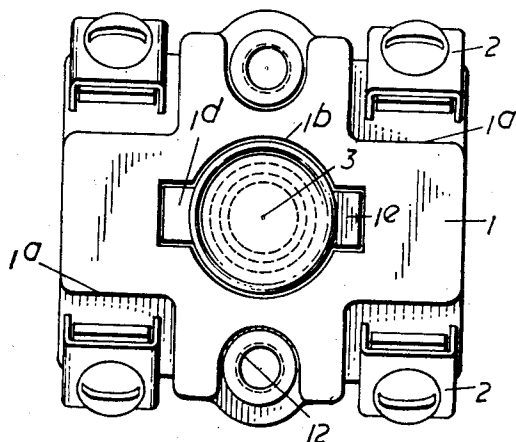
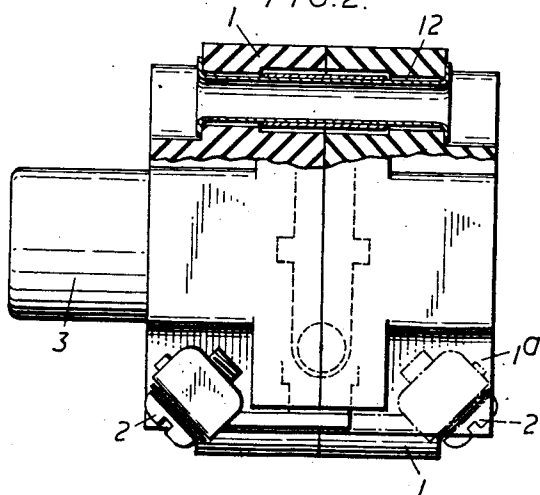


FIG. 2.



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FIG. 4.

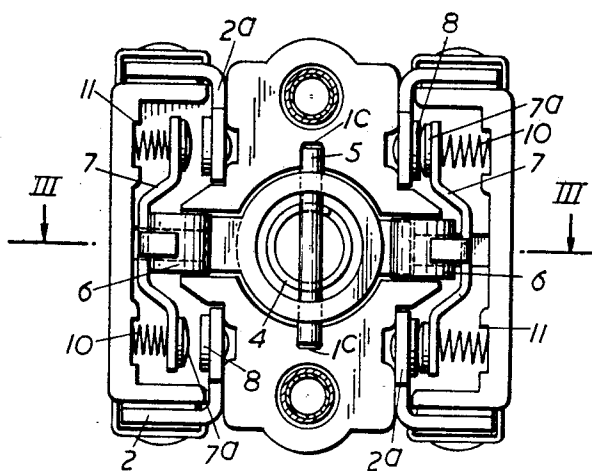
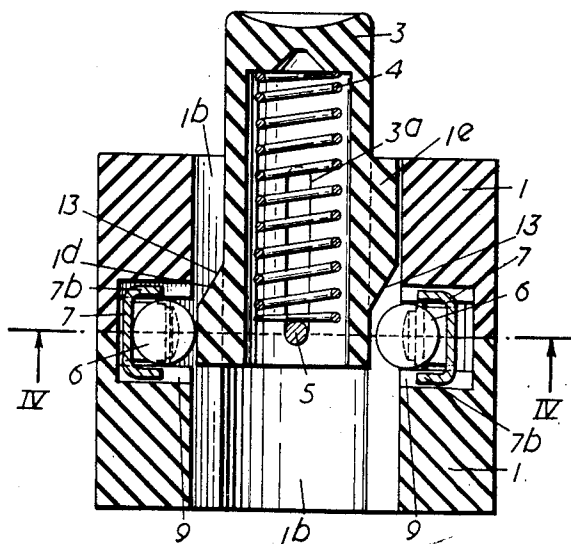


FIG. 3.



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PUSH BUTTON OPERATED ELECTRIC SWITCHES

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Claims priority, application Great Britain
September 16, 1957

4 Claims. (Cl. 200—153)

This invention relates to improvements in push button operated electric switches and has for its object to provide an improved construction adapted for compensating for production variations in the casing in which it is mounted.

According to this invention the plunger is provided with a ramp or rib of extended length adapted for laterally actuating the moving contact. The improved arrangement enables an extended overtravel of the button or plunger while providing a uniform break between the contacts. The button or plunger may be operated against the action of a spring accommodated in a bore of the plunger, thereby resulting in a compact construction, a retaining pin for the outer end of this spring acting as a guide and bearing.

In order to enable the invention to be readily understood reference will now be made to the accompanying drawings illustrating by way of example one construction for carrying the invention into effect, in which drawings:

Figure 1 is a plan.

Figure 2 is a side elevation with parts in section.

Figure 3 is a central vertical section on the line III—III of Figure 4.

Figure 4 is a section on the line VI—VI of Figure 3.

Referring to the drawings the switch comprises a pair of similar mouldings 1 of rectangular construction with recessed corners 1^a for the reception of terminals 2 and formed with aligning central bores 1^b for a plunger 3 made from a tubular length of nylon closed at one end. In the arrangement shown the terminals formed with bent arms 2^a clamped in position between the mouldings, are located in the recesses on the rear moulding. If desired however they may be mounted on the front moulding as shown in chain lines in Figure 2. The bore of the plunger accommodates a helical spring 4 which is maintained in compression by a transversely disposed metal pin 5 the ends of which protrude through diametrically opposite longitudinally disposed slots 3^a in the tubular portion of the plunger near its open end. The ends of the pin enter grooved bearings 1^c in the mouldings.

A pair of longitudinal ribs 1^d, 1^e on the outer surface of the plunger are spaced 90° from the slots 3^a, and each is engageable with a nylon roller 6 which actuates a moving contact 7. The latter consists of a bridge having buttons 7^a at its ends engageable with fixed contacts 8 mounted on the terminals 2. Midway of its length, a portion of the bridge of extended width, is bent to trough formation from the sides of which are bent short inwardly extending lugs 7^b. These lugs enter guiding grooves 9 in the mouldings and the centrally wide portion between the lugs ensures that the ends of the bridge with the contacts thereon are spaced from the mouldings to enhance the electrical characteristics. The trough formation of each moving contact as seen in Figure 4 receives a nylon roller 6 which is acted on by a rib 1^d, 1^e, on the

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plunger, for pressing the moving contact laterally outwards for disengaging it from the complementary fixed contacts 8 against the action of a pair of helical compression springs 10 each of which is seated at one end in a recess 11 of the moulding and at the other on one end of a moving contact.

Plungers with ribs of different shapes may be substituted for the plunger shown in order to obtain a variety of contact arrangements. For example the ribs may be of the same shape or the longer and shorter ribs may be reversed. Thus one set of contacts may be engaged when the other is disengaged or both may be engaged or disengaged at the same time. Each rib is formed with an inclined portion 13 for facilitating the operation of the roller. The central bores of the mouldings are of such length as to accommodate the plunger within them when it is depressed and the rib 1^e is of extended length in order to permit a substantial overtravel while providing a uniform break between the contacts. A number of units may be mounted in line, the projecting end of the plunger 3 of one unit being received in the bore 1^b of the lower moulding of the unit above it.

The mouldings are secured, with the parts clamped in position between them, by securing screws extending through tubular rivets 12. The fixed contacts and their terminals may be disposed on either the front or the back moulding.

The forms of the invention here described and illustrated are presented merely as examples of how the invention may be embodied and applied. Other forms, embodiments and applications of the invention, coming within the proper scope of the appended claims, will, of course, suggest themselves to those skilled in the art.

Having thus described our invention we claim:

1. A push button operated electric switch comprising a pair of mouldings provided with aligned bores therein, a pair of fixed contacts, a hollow plunger slidably mounted within said bores, said plunger provided with diametrical slots disposed therein, a helical compression spring housed within said hollow plunger, a pin mounted in said mouldings extending through said slots, said pin being transversely disposed relative to one end of said spring to maintain compression thereof, a lateral cam disposed on said plunger, a pair of movable contacts engageable with said fixed contacts, said movable contacts carried by a transversely moving plate, and a roller disposed between said cam and said moving plate.

2. A push button operated switch according to claim 1 in which said cam comprises a longitudinal rib, said rib being engageable with said roller to actuate said moving contacts and wherein said pin serves as a guide and bearing for said plunger.

3. A push button operated switch according to claim 2 in which said transverse plate comprises a bridge, the central portion of said bridge being of trough formation and provided with lugs extending inwardly therefrom.

4. A push button operated switch according to claim 3 wherein said moving contacts are disposed at each end of said bridge, said roller is disposed in said trough formation and grooves are provided in said moulding to guide said inwardly extending lugs.

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