

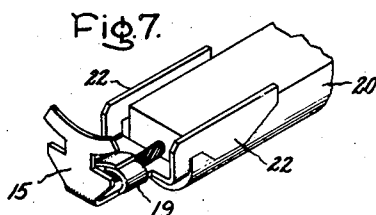
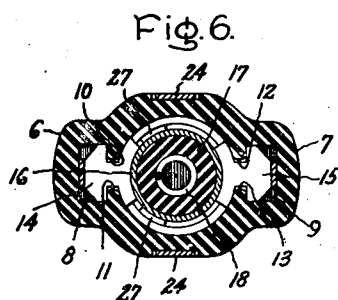
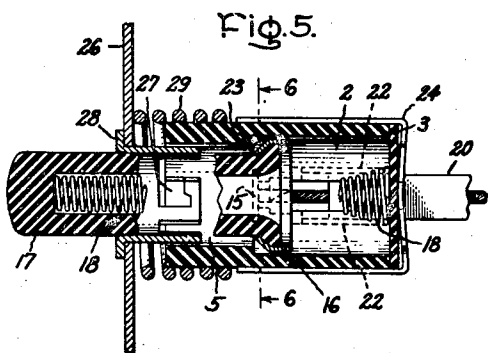
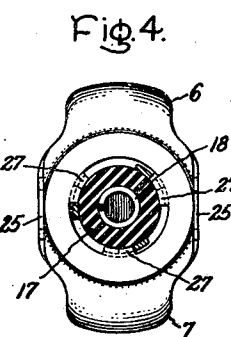
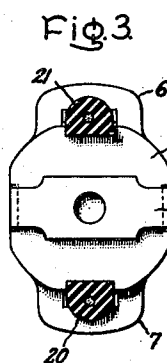
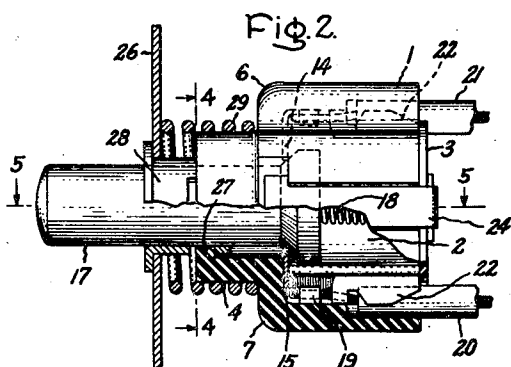
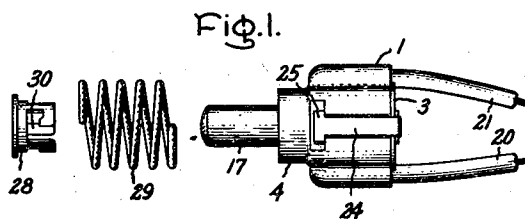
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PUSH-BUTTON SWITCH

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PUSH-BUTTON SWITCH

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3 Claims. (Cl. 200-168)

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The present invention relates to electric switches and more particularly to electric switches of the push button or plunger type. Still more particularly, the present invention relates to electric push button switches especially adapted for installation in or adjacent to a door frame for operation by the opening or closing of the door.

It is an object of my invention to provide a push button switch of the above type which shall be reliable in operation and which at the same time can be manufactured at a low cost. It is a further object of my invention to provide such a switch arranged for simple, effective and quick installation.

My invention will best be understood from the following description taken in connection with the accompanying drawing in which Fig. 1 shows an exterior elevation of my switch together with the mounting elements therefor separated from each other; Fig. 2 shows an enlarged view of my switch mounted in a panel with some parts in elevation and some parts in section; Fig. 3 is a rear end elevation of my switch; Fig. 4 is a transverse section taken along the line 4-4 in Fig. 2; Fig. 5 is a longitudinal section taken along the line 5-5 in Fig. 2; Fig. 6 is a transverse section taken along the line 6-6 in Fig. 5; and Fig. 7 is a perspective detail of the stationary contacts.

My switch comprises a housing 1 of insulating material having recesses 2, 8 and 9 therein closed by a cover plate 3. The housing 1 at the end opposite the recesses is shaped to provide a cylindrical neck portion 4, in the center of which is an aperture 5 communicating with recess 2 and axially aligned therewith. The main body of the housing 1 has a more or less cylindrical central portion and two oppositely disposed projections 6 and 7 (Fig. 6), which provide shoulders or abutments adjacent the neck 4. The recess 2 in the housing has a central circular portion communicating with rectangular recesses 8, 9 in the projections 6, 7 so that the housing wall on each side defines a pair of opposed, inwardly extending ridges 10, 11 and 12, 13 between the cylindrical and rectangular recesses.

Stationary contacts 14 and 15 formed of flat strip material are provided with slots which just fit over the ridges. The portions of the contacts 14 and 15 which project into the cylindrical recess are arcuate in shape so as to fit against the interior wall of the cylindrical recess and to present, toward the center of the recess, arcuate edges for contact by the movable contact element 16.

The movable contact 16 is a ring having a cy-

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lindrical portion and an inwardly extending frusto-conical portion. The ring is fitted over the enlarged and correspondingly shaped end of a plunger or push button 17.

The plunger 17 is adapted to fit rather loosely into the aperture 5 in the neck portion 4 of the housing and to project out of the same for the operation of the switch. The plunger 17 is axially recessed to accommodate a coil spring 18, the other end of which presses against the cover 3. The spring 18 thereby presses the movable contact 16 against the stationary contacts 14 and 15, whereby a circuit to which the stationary contacts may be connected is maintained normally closed.

Circuit connection to the switch is made to the contacts 14 and 15. These contact elements have portions extending at right angles to the contact portions provided with ears 19 into which the exposed ends of insulated conductors 20 and 21 are fastened, as by soldering. The right angle portions of the contact elements are further provided with ears 22 of greater width than the ears 19 and proportioned to fit closely into the rectangular apertures 8, 9, whereby support is obtained for holding the stationary contacts in place in the switch housing. The ears 22 on each contact element also form a channel which is adapted to receive a short insulated portion of the conductors 20 and 21.

In assembling my switch, the stationary contacts with the conductors attached are slid into the rectangular recesses 8, 9 in engagement with the ridges 10, 11 and 12, 13 and against the shoulders 23 at the bottom of the recesses. Then the plunger 17 is inserted through the recess 2 and into the aperture 5 in the neck 4. After the insertion of the coil spring 18 into the plunger, the cover 3 is placed over the recesses and the clip 24 snapped into place to hold the assembly together.

The cover 3 is held in place by a U-shaped clip 24 having T-shaped ends 25 which fit into a T-shaped depression in the outer surface of the housing 1.

For the mounting of my switch I provide two additional elements, a bayonet-slotted bushing 28 and a coil spring 29. The interior of the aperture 5 in the neck portion 4 of the housing is provided with a plurality of inwardly extending projections 27 which are adapted to be engaged by the bayonet slots 30 in the bushing 28. To mount the switch in any desired wall or panel 26, a hole is drilled in the panel 26 to have a diameter equal to the outside diameter of the

bushing 28 which fits over the plunger 17. The coil spring 29 is slipped over the neck 4 of the switch to abut the projections 6, 7 on the housing. The switch assembly, with the coil spring 29 in place, is mounted from the rear of the panel by passing the plunger 17 through the hole in the panel and then slipping the bushing 28 over the plunger 17 from the opposite side of the panel so that the bayonet slots of the bushing engage the projections 27. The assembly is locked into place by turning the bushing relative to the switch until the bayonet slots are locked around the projections 27.

It will be observed that by this simple mounting the switch is at all times held firmly in position. The spring 29 keeps a continuous tension on the bayonet lock so that vibration of the panel 26 will not cause a separation between the bushing and the switch. Moreover, the coil spring and bayonet-slotted bushing make it possible to accommodate a relatively large range of thicknesses of mounting panel 26.

It should also be noted that by reason of the design of my flat, arcuate, stationary contacts engaged by a movable contact in the form of a rather loosely mounted frusto-conical ring, no great accuracy is required in the position of the stationary contacts. Moreover, since the movable contact is in a form of a ring and since the plunger 17 is free to turn and will turn more or less when actuated, as by the opening and closing of a door, the movable contact will continually present a new contact surface to the stationary contacts.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical switch comprising a housing having a cylindrical recess in one end thereof and a plurality of substantially rectangular recesses disposed around the side wall of said cylindrical recess and communicating therewith by longitudinal slots, the walls of said housing forming longitudinal ridges between said cylindrical and said rectangular recesses, a plurality of stationary contacts positioned in said recesses, said contacts each having an arcuately shaped end concentrically disposed in said cylindrical recess, each of said contacts further having a portion shaped to fit into and being disposed within one of said rectangular recesses and around the corresponding ridges, whereby said contacts may be assembled on conductor wires and slid into position in said recesses, said rectangular recesses and said ridges forming a guide and support for the insertion and retention in proper position of said stationary contacts, said housing having in its other end an aperture merging with said cylindrical recess, a plunger having one end adapted to project through said aperture with its other end in said cylindrical recess, a frusto-conical movable contact mounted on said other end of said plunger for engagement with the arcuate surfaces of said stationary contacts, a plate closing said recesses, and spring means within said housing for pressing said movable contact against said stationary contacts.

2. An electrical switch comprising a housing having a cylindrical recess in one end thereof and a plurality of substantially rectangular recesses disposed around the side wall of said cylindrical recess and communicating therewith by longitudinal slots, the walls of said housing forming longitudinal ridges between said cylindrical and

said rectangular recesses, a plurality of stationary contacts positioned in said recesses, each contact being formed from a strip of sheet metal and comprising, a base, a portion of said base being formed into a channel which is adapted to receive the insulated portion of a conductor, means for securing the barred end of said conductor to said base, an end portion bent at approximately a right angle to said base and formed with an arcuately shaped tip concentrically disposed in said cylindrical recess, a plurality of oppositely disposed slots on both sides of said end and adjacent to said tip and shaped to fit around said ridges, whereby said contacts may be assembled on conductor wires and slid into position in said recesses, said rectangular recesses and said ridges forming a guide and support for the insertion and retention in proper position of said stationary contacts, said housing having at its other end an aperture merging with said cylindrical recess, a plunger having one end adapted to project through said aperture with its other end in said cylindrical recess, a frusto-conical movable contact mounted on said other end of said plunger for engagement with the arcuate surfaces of said stationary contacts, a plate closing said recesses, and spring means within said housing for pressing said movable contacts against said stationary contacts.

3. An electrical switch comprising a housing having a cylindrical recess in one end thereof and a plurality of substantially rectangular recesses disposed around the side wall of said cylindrical recess and communicating therewith by longitudinal slots, the walls of said housing forming longitudinal ridges between said cylindrical and said rectangular recesses, a plurality of stationary contacts positioned in said recesses, each contact being formed from a strip of sheet metal and comprising, a base, a portion of said base being formed into a channel which is adapted to receive the insulated portion of a conductor, means for securing the barred end of said conductor to said base, an end portion bent at approximately a right angle to said base and formed with an arcuately shaped tip concentrically disposed in said cylindrical recess, a plurality of oppositely disposed slots on both sides of said end and adjacent to said tip and shaped to fit around said ridges, whereby said contacts may be assembled on conductor wires and slid into position in said recesses, said rectangular recesses and said ridges forming a guide and support for the insertion and retention in proper position of said stationary contacts, said housing having at its other end an aperture merging with said cylindrical recess, and movable contact means in said recess to contact said stationary contacts.

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