

Feb. 21, 1967

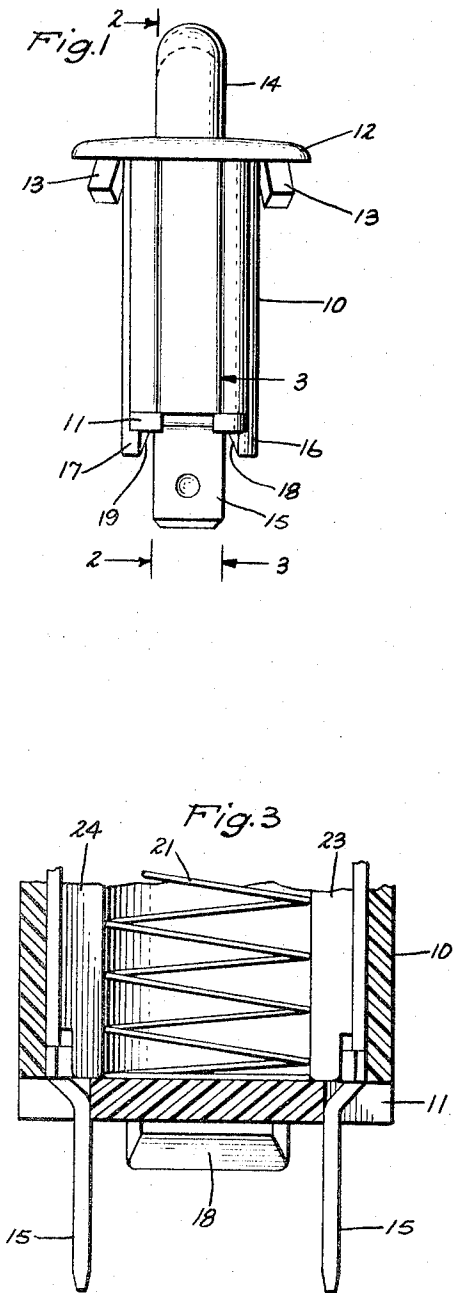
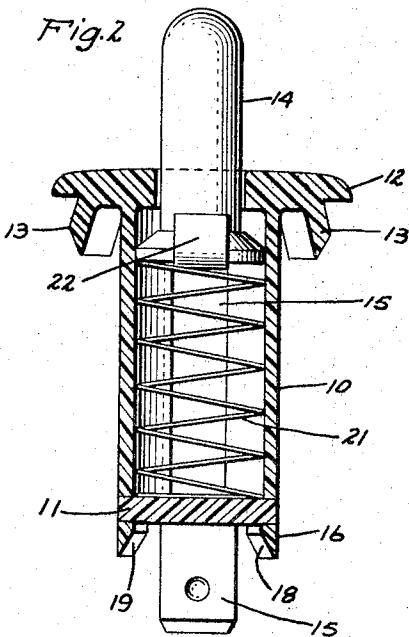
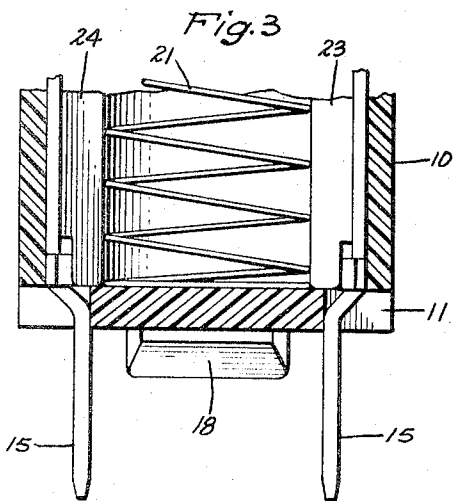
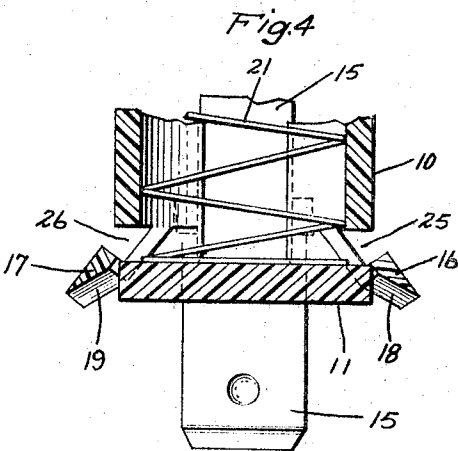
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3,305,658

ELECTRICAL SWITCH HOUSING

Filed Sept. 10, 1965

2 Sheets-Sheet 1



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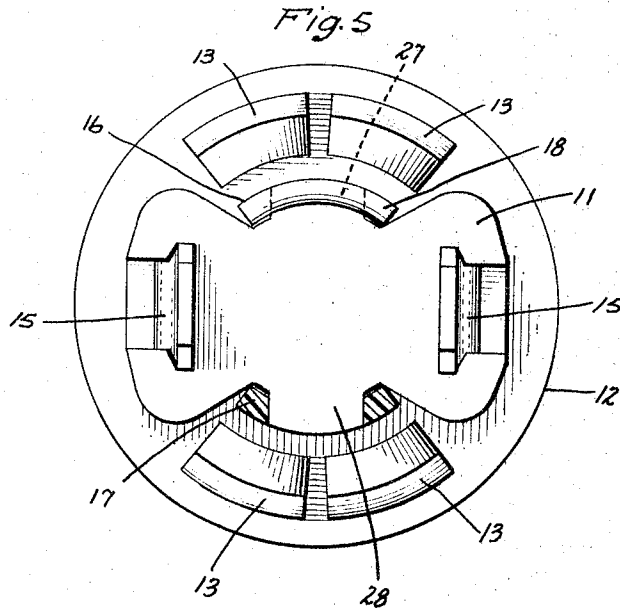
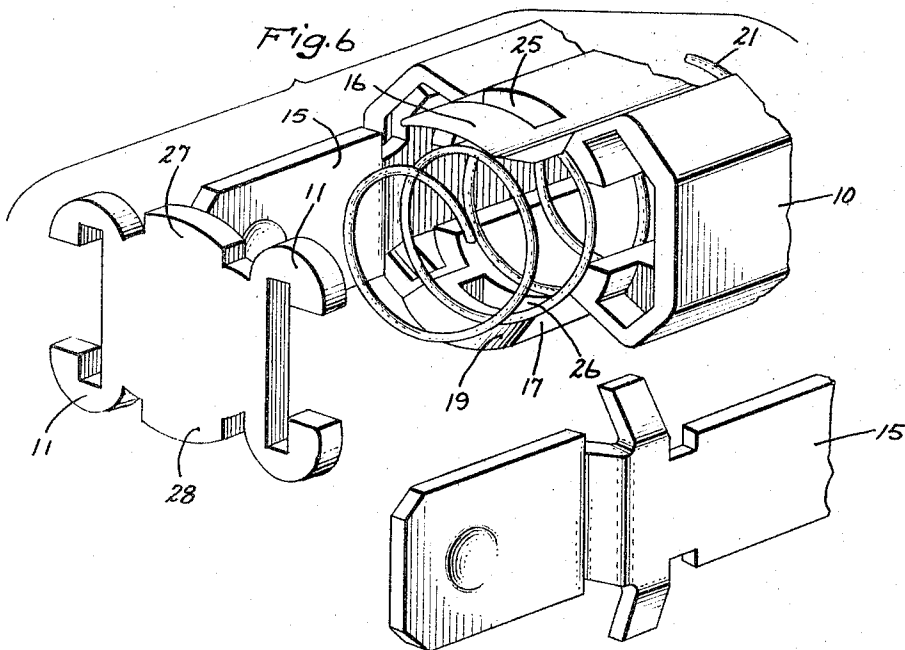
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ELECTRICAL SWITCH HOUSING

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2 Sheets-Sheet 2



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1

3,305,658

ELECTRICAL SWITCH HOUSING

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5 Claims. (Cl. 200-168)

The present invention relates to an improved housing for an electrical switch and more particularly to a novel molded switch body and backplate enclosing means which may be rapidly and economically assembled to one another to provide an enclosed switch housing.

The construction of appliances, automotive equipment, and many other devices presently manufactured in large quantity requires the utilization of many forms of electrical switch means. One form of switch means often required is of the plunger or pushbutton type which is changed from one condition to the other by the application or removal of pressure upon the plunger. This type of switch has become commonly referred to as a "door" switch because of its usage in automobiles, refrigerators, freezers, dryers, and similar applications to control lighting means and/or mechanism safety circuits when a door thereof is opened or closed. Such switches are usually mounted in an aperture of a supporting panel adjacent the door to enable the opening or closing of the door to actuate the switch.

It is desirable that the housing for a switch of this type be comprised of a minimum number of parts which are relatively inexpensive to manufacture. Also, the housing should be adapted to enable rapid, economical and positive assembly of the switch means therein. In addition, it is desirable that such switch housing be adapted to be disassembled rapidly and without destruction of any of the component parts of the housing or the switch means, to enable reassembly thereof after inspection or alteration of the switch means if necessary.

Accordingly, it is an object of this invention to provide an improved electrical switch housing having a minimum number of parts which are relatively inexpensive to manufacture and which may be economically, rapidly and positively assembled to enclose a switch means.

Another object of this invention is the provision of an electrical switch housing which may be easily and rapidly assembled, disassembled, and reassembled without the use of special tools or fixtures and without destroying or damaging any of its component parts.

In carrying out my invention, in one form thereof, I provide a unitary molded switch body of an insulating material having some resiliency and having a cavity therein for supporting and containing the elements of any desired switch means. The walls of this cavity may include molded channels or other means, as necessary, to retain and position the elements of the desired switch means in proper relation to one another. One end of the switch body, which may be considered to be the front end, has an opening to permit passage of the control element of the switch means therethrough, i.e., the plunger, pushbutton, etc. If it is desired to mount the assembled switch in a panel having a circular aperture, which is a common mounting position for "door" switches, this front end may also include an integrally molded flange to seat against the periphery of the panel aperture and integrally molded resilient fingers or retaining means for holding the switch in position after it is pressed into the aperture. The other end, or rear, of the switch body is open to allow the switch elements to be inserted in the cavity within the body, and includes a pair of integrally molded projections or extensions parallel to the axis of the switch body and opposite one another. Each of these projections has an aperture therethrough, and the inner surface of each projection is tapered. A back-

2

plate is provided for retaining and enclosing the switch elements within the cavity of the unitary switch body. This backplate in conjunction with the unitary switch body comprise the entire switch housing. The backplate may be punched from a suitable insulating material and its shape generally conforms to the outline of the rear of the switch body except that it has a pair of wing-like extensions located opposite one another and positioned so as to mate with the apertures in the pair of projections of the switch body. The backplate may include apertures, as necessary, to permit the passage of any terminals, wires, or switch elements which must be exposed. After the elements of the desired switch means have been placed within their respective positions in the cavity of the switch body, the backplate may be assembled thereto by simply placing the wing-like extensions of the backplate in contact with the tapered inner surfaces of the projections at the rear of the switch body and pressing. This force applied to the backplate will be transmitted through its wing-like extensions to these tapered surfaces causing the resilient projections of the switch body to spread, thereby allowing the extensions of the backplate to snap into the apertures of the resilient projections. When the backplate snaps into position, the force upon the tapered surfaces is relieved and the resilient projections return to their normal positions thereby locking the backplate to the switch body to provide enclosure of the switch means within the assembled housing. The switch housing may be disassembled if desired by merely spreading the resilient projections of the switch body until the wing-like extensions of the backplate are released from their associated apertures. The backplate may then be removed by merely lifting it away from the projections. The switch housing may be reassembled in the same manner as originally assembled. An improved electrical switch housing has thus been provided which may be rapidly assembled with a single pressing motion without a need for special tools and which may be disassembled without destruction to allow rapid reassembly when desired.

Further aspects of my invention will become apparent hereinafter and the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which I regard as my invention. The invention, however, as to organization and method of operation, together with other objects and advantages thereof, may best be understood by reference to the following description when taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a side elevational view of a push-button door switch embodying the improved electrical switch housing of this invention;

FIGURE 2 is an enlarged partially sectioned elevational view of FIGURE 1 showing the interior of the housing with a suitable switch means retained therein by the assembled body and backplate;

FIGURE 3 is an enlarged partial front elevational view sectioned to show the backplate assembled to the switch body and to show the contact elements extending through openings in the backplate;

FIGURE 4 is an enlarged partial side elevational view sectioned to show the switch body having its resilient projections spread as the backplate is assembled thereto;

FIGURE 5 is an enlarged bottom view showing the backplate assembled to the switch body and having one of the projections of the switch body sectioned at the aperture therethrough to show one of the wing-like extensions of the backplate; and

FIGURE 6 is an enlarged partially exploded perspective view of the rear of the switch body showing the backplate disassembled and one contact removed.

3

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in FIGURE 1 a pushbutton door switch having a housing including a body portion 10 which may be molded of a suitable insulating material having some resilience such as nylon, and a backplate 11 which may be stamped from suitable sheet insulating material. Switch body 10 may have a flange 12 and resilient fingers or retaining means 13 integrally molded therewith for mounting the switch body in a circular aperture of a panel. A push-button or plunger control element 14 protrudes from the top, or front end, of switch body 10, and terminal means 15 protrude through openings in backplate 11 (see FIGURE 3) at the bottom, or rear end, of the switch housing. Switch body 10 includes a pair of resilient molded projections or extensions 16 and 17 having tapered inner surfaces 18 and 19, respectively.

In the sectioned view of FIGURE 2 there are shown, in addition to those elements shown in FIGURE 1, elements of a suitable switch means which might be utilized in the housing of this invention including a biasing spring 21 and a contacting element 22 of a material for conducting electrical current. In the absence of external pressure on pushbutton 14, biasing spring 21 will hold pushbutton 14 and associated contacting element 22 in an uppermost position causing contacting element 22 to contact both terminals 15 simultaneously, thereby providing an electrical path from one terminal 15, through contacting element 22, and back through the other terminal 15. When external pressure is applied to pushbutton 14, it retracts into switch body 10 causing contacting element 22 to break contact with terminals 15, thereby opening the circuit. Biasing spring 21 is retained in switch body 10 by backplate 11.

FIGURE 3 shows more clearly the pair of terminals 15 extending through openings in backplate 11. Elements 23 and 24 represent walls of channels integrally molded in switch body 10 to retain and position terminals 15, spring 21, and contacting element 22 relative to one another. Projection 16 and its inner tapered surface 18 is shown below backplate 11 which is in its assembled position.

In FIGURE 4 the switch body 10 and backplate 11 are sectioned to show the relationship of the resilient projections 16 and 17 to backplate 11 as it is being assembled to switch body 10. As the wing-like extensions of backplate 11 (see elements 27 and 28 of FIGURES 5 and 6) are placed in contact with tapered inner surfaces 18 and 19 of projections 16 and 17 and pressure is applied to the backplate, projections 16 and 17 will be spread as depicted in FIGURE 4 until the extensions of the backplate 11 pass into apertures 25 and 26. Projections 16 and 17 will then "snap back" or return to their normal positions parallel to switch body 10, thereby retaining and locking backplate 11 in assembled position.

The bottom view of FIGURE 5 shows backplate 11 in assembled position with its wing-like extensions 27 and 28 locked in position by resilient projections 16 and 17. Projection 17 has been sectioned to more clearly show extension 28.

The partially exploded view of FIGURE 6 clearly shows the wing-like projections 27 and 28 of backplate 11 and their mating relationship to apertures 25 and 26, respectively, of resilient projections 16 and 17.

Thus, there has been shown and described an improved electrical switch housing embodying the invention including a unitary molded switch body 10 and a backplate enclosing means 11 which may be rapidly assembled to one another with a single pressing motion without a need for special tools and which may be disassembled without destruction to allow rapid reassembly when desired. In order to provide for such disassembly, the resilient end portions of the projections 17 and 18 permit the removal

4

of the back plate 11 as they may be easily spread or sprung apart and the back plate extensions 27 and 28 removed from the apertures 25 and 26 without injury to either the back plate 11 or to the switch body member 10. Although the invention has been described with reference to a pushbutton or "door" switch, it is to be understood that it may be utilized equally well with many other forms of electrical apparatus which have a need for a housing including a body member having a cavity therein for containing the apparatus and a backplate for closing the cavity.

While in accordance with the patent statutes, I have described what at present is considered to be the preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and I, therefore, aim in the following claims to cover all such equivalent variations as fall within the true spirit and scope of the invention.

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

1. A housing for electrical apparatus comprising, an elongate body member having a longitudinally extending cavity therein for containing and supporting elements of an electrical apparatus, said body member having an opening at one end into said longitudinally extending cavity to enable said elements of an electrical apparatus to be placed therein and having a pair of integral resilient projections, each said projection having one end located adjacent said opening and said projections extending outwardly from the one end of said body member, each of said resilient projections having an aperture therethrough, and closure means for enclosing and retaining said electrical apparatus in said cavity, said closure means having a pair of extensions each releasably positioned in one of said apertures in said resilient projections when said closure means is assembled with said body member thereby to enable said closure means to be nondestructively disassembled from said body member.

2. An improved housing for electrical apparatus comprising, a body member having a cavity therein for containing and supporting elements of an electrical apparatus, said body member having an opening into said cavity at one end to enable said elements of an electrical apparatus to be placed therein and having a pair of resilient projections positioned opposite one another adjacent said opening and extending outwardly beyond the one end of said body member, each of said resilient projections having a tapered inner surface and an aperture therethrough, and a closure means for enclosing and retaining said electrical apparatus in said cavity, said closure means having a pair of extensions releasably retained within said apertures in said resilient projections when said closure means is assembled with said body member whereby said closure means can be assembled with said body member by a single pressing motion and disassembled from said body member by prying apart said resilient outwardly extending projections.

3. An improved housing for electrical apparatus comprising, a molded body member of an electrical insulating material having a cavity therein for containing and supporting elements of an electrical apparatus, said body member having an opening at one end into said cavity to enable said elements to be placed therein and having a pair of oppositely disposed resilient projections extending longitudinally beyond the one end of said body member adjacent said opening, each of said resilient projections having a tapered inner surface and an aperture therethrough, and a closure means of an electrical insulating material for enclosing and retaining said electrical apparatus in said cavity, said closure means including a pair of oppositely extending portions releasably retained in said apertures in said resilient projections, said closure means thereby being mountable on said body member by a single pressing motion and removable therefrom by a

5

spreading apart of said resilient projections wherein said closure means can be removed from said body member without destroying either said closure means or said body member.

4. An improved housing for an electrical switch means comprising, a unitary molded switch body of an electrical insulating material having a cavity therein for containing and supporting elements of an electrical switch means, said switch body having an opening into said cavity to enable said elements to be placed therein and having a pair of integrally molded resilient projections positioned opposite one another substantially adjacent said opening, said projections extending outwardly beyond said opening and being generally parallel throughout their length, each said projection having a tapered inner surface adjacent the outer end thereof and an aperture therethrough inwardly of the outer end, and closure means for enclosing and retaining said elements of an electrical switch means in said cavity, said closure means having a pair of extensions releasably retained within said apertures in said resilient projections thereby enabling said closure means to be assembled to said switch body by a single pressing motion, and enabling nondestructive disassembly of said closure means by spreading said resilient projections sufficiently to allow said extensions to be removed from said apertures by a lifting motion.

5. An improved housing for an electrical switch means comprising, a unitary molded switch body of an electrical insulating material having a cavity therein for containing

6

and supporting elements of an electrical switch means, said switch body having an opening into said cavity to enable said elements to be placed therein and having a plurality of integrally molded resilient projections spaced around the periphery of said opening, each of said projections having a tapered inner surface and an aperture therethrough, and a backplate of an electrical insulating material for enclosing and retaining said elements of an electrical switch means in said cavity, said backplate having a plurality of extensions releasably retained within said apertures in said projections to enable said backplate to be assembled to said switch body by a single pressing motion, and means for permitting nondestructive disassembly of said backplate from said body means.

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