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P. HUTT

2,814,697

DOOR JAMB SWITCH

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Fig. 1.

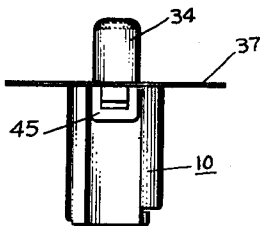


Fig. 2.

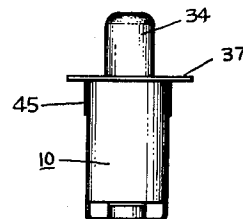


Fig. 3

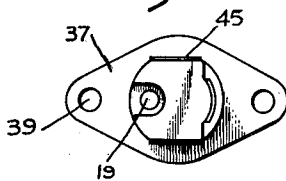


Fig. 4.

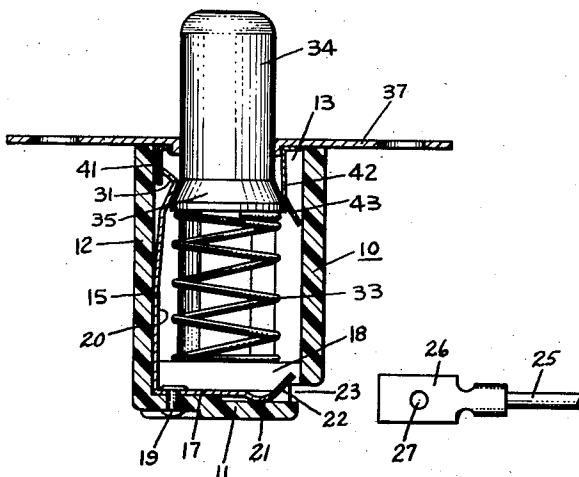
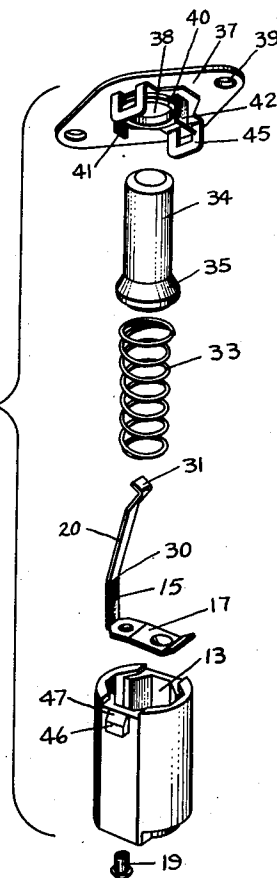


Fig. 5.



Inventor
Philip Hutt
by Allard A. Bradlock
His Attorney

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DOOR JAMB SWITCH

Philip Hutt, Milford, Conn., assignor to General Electric Company, a corporation of New York

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1 Claim. (Cl. 200—159)

This invention relates to an electric switch of the kind ordinarily mounted in door jambs, such a switch including a spring-pressed button which projects therefrom. In practice, such a switch is mounted in a door jamb so that the button is depressed by the edge of the door when the door is closed, and is allowed to project outwardly when the door is opened. The switch elements are so arranged with respect to the button that the switch is open when the button is pressed in, and closed when the plunger is allowed to project outwardly.

According to my invention, I have provided a normally closed push button switch intended for use as a door-operated light switch principally for automobiles, although it should be appreciated that it is not necessarily limited to such an application. The importance of this invention is primarily due to its extreme simplicity, minimum number of parts, and increased ease of manufacture. There is a growing trend at the present time for automobile manufacturers to install push button switches of the general type disclosed in several locations on all but their standard models. Each side door may have such a switch permanently installed in the door jamb; while additional switches are found to be useful in the trunk of the car, in the glove compartment, and under the hood.

The switch of the present invention has been developed with the above considerations in mind. In brief, it may be described in the following manner as comprising a hollow cylindrical housing of insulating material that is open at the top. An L-shaped contact member has its lower leg or terminal portion fastened to the bottom of the housing while the upright leg extends along the inner side wall of the housing to serve as the movable contact element of the switch. An opening is formed in the side wall of the housing to permit the entry of a male connector secured to the end of a lead wire so that it may be joined with the terminal portion of the switch contact. A coiled wire spring is supported in the housing for actuating a push button that extends through the open top of the housing. The bottom end of the button has an enlarged flange for cooperation with the movable contact since the movable contact is inherently biased inwardly from the side wall of the housing. The mounting plate of the switch is provided with an opening for receiving the push button therethrough. A metal ring is fixed on the underside of the mounting plate with a portion extending into the housing along one side wall thereof as the fixed contact of the switch. A lip member is also formed on the ring opposite the fixed contact so that it also extends into the housing and engages the enlarged flange of the push button when the button is in its outermost position for centering the button in the housing. A pair of outer lugs are formed on opposite sides of the housing near the top thereof so that the mounting strap may be attached to the housing as the final step in the assembly of the switch. The ring attached to the underside of the mounting strap has a pair of oppositely arranged clip members displaced from the

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beforementioned fixed contact and complementary lip member by an angle of 90°. These clip members are adapted to straddle the top of the housing and to engage behind the outwardly extending lug members.

The principal object of this invention is to provide a push button door jamb switch of simple design with a minimum number of parts by combining the fixed contact of the switch with the mounting strap, and incorporating a movable contact element of leaf spring material having at one end a terminal portion for making contact with the connector of a lead wire.

A further object of this invention is to provide a push button door jamb switch having a mounting strap with a lip member extending inwardly of the housing so that it centers the button while it is in its extended position.

A further object of this invention is to provide a push button door jamb switch where the mounting plate is provided with a fixed contact element, a lip member for holding the button in a centered condition, as well as spring clips for fastening the mounting plate on the switch housing.

My invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claim.

Fig. 1 is an elevational view of a push button door jamb switch embodying my invention.

Fig. 2 is a side view of the switch of Fig. 1.

Fig. 2 is a bottom plan view of the switch of Fig. 1.

Fig. 4 is an enlarged cross-sectional elevational view showing the principal features of the internal mechanism of the subject switch, as well as the connector end of a lead wire that is to be connected therein.

Fig. 5 is an exploded view showing in detail the individual parts which comprise the preferred embodiment of this invention.

Referring in detail to the drawing, and in particular to Figs. 4 and 5, there is shown a cylindrically shaped recessed housing 10 of suitable insulating material having a closed bottom wall 11, side walls 12, and an opening 13 in the top thereof. A generally L-shaped contact member 15 has its lower leg 17 seated in a recess 18 in the bottom of the housing 10. A small rivet 19 extends through the bottom wall 11 and is fastened to the leg 17 of the contact adjacent the corner where the lower leg 17 is joined with the upright leg or main portion 20 of the contact 15. The free end of the leg 17 is provided with a rounded embossment 21 on its underside while the leading edge 22 is slightly inclined upwardly. A notched opening 23 is made in the lower portion of the side of the housing adjacent the free end of the terminal leg 17 of the contact. Thus, a lead wire such as element 25 may be electrically connected with the contact 15 if the wire has fastened on its end a flat blade 26 with a detent opening 27 for mating engagement with the rounded embossment 21 of the terminal leg 17 of the contact.

The movable contact element of the switch is represented by the upright leg 20 that has a deformation 30 adjacent its mid-portion so that the free end of the movable contact normally extends inwardly from the side wall of the housing. The free end 31 of movable contact 20 is rounded on its inner side for reasons which will be explained hereinafter. A coiled wire spring 33 is supported in the housing 10 for actuating a push button 34 which is molded of a suitable insulating material. The lower end of the button is provided with an enlarged flange 35 of bell shape that diverges toward the end. Looking at Fig. 4 where the button is shown in its outermost position, it will be appreciated that the circuit through the switch is closed due to the force of the spring 33 urging the button outwardly of the housing so that

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the flange 35 of the button holds the movable contact 20 against the fixed contact 41. When the button 34 is depressed, its flanged end 35 moves toward the bottom of the housing and away from the curved end 31 of the movable contact to permit the movable contact to spring back from the fixed contact.

A mounting strap 37 is used to cover the top opening 13 of the housing. A central opening 38 is made in the strap of substantially the same cross-section as the main portion of the button 34 for receiving the button there-through. Mounting holes 39 are located on opposite ends of the strap for receiving suitable screw fastening means (not shown) to attach the switch in a door jamb. A ring 40 of thin strip material is permanently fixed to the underside of the strap 37 by bending or swaging the edges of the opening 38 in the strap downwardly and outwardly to be in mating engagement with the opening in the ring. The ring 40 is provided with four appurtenances which are arranged in two pairs around the opening 38 in the strap. One such member is a fixed contact 41 that extends down into the housing along one side wall as best seen in Fig. 4 to be engaged by the free end 31 of the movable contact 20. A complementary lip member 42 on the opposite side of the ring also extends into the housing so that its distal end 43, which is inclined toward the side wall of the housing, engages the flanged end 35 of the button to counteract an opposite force exerted on the button by the movable contact 20. Hence, the lip member 42 assists in holding the button in a central condition when the button is in its outermost position to prevent the button from being cocked at an undesirable angle and possibly becoming immovable.

The remaining two appurtenances formed as part of the ring 40 are in the form of a pair of spring clips 45 of generally U-shape which are arranged on opposite sides of the opening 38 in the strap in a plane disposed at an angle of 90° from the beforementioned pair of elements 41 and 42. As best seen in Fig. 5, a pair of outer lugs 46 are positioned on opposite sides of the housing near the top edge. Each lug has an inclined top surface 47 so that during assembly it is simply necessary to roughly center the mounting strap 37 over the top of the housing and bring the spring clips 45 so that they engage the inclined surfaces 47 of the lugs. Then by pressing the strap down onto the housing, the clips 45 will snap under the bottom of the lugs 46 as the final step in assembling the switch.

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Having described my invention of a novel push button door jamb switch for such use as in an automobile where the frame is grounded and the circuit to be controlled is carried through the mounting strap, it should be appreciated that although this design is simple in appearance having few parts, it is also low in cost of manufacture and reliable in operation. It is apparent that the ring 40 may be made with a different configuration and secured to the mounting strap as a single piece or in separate parts and that the mounting strap could be joined with the switch housing in a manner not disclosed herein although in an equivalent manner to the present invention. Modifications of this invention will occur to those skilled in this art and it is to be understood, therefore, that this invention is not limited to the particular embodiment disclosed but covers all modifications which are within the true spirit and scope of the claim of this invention.

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

An electric push button switch comprising a cylindrical housing that is open at the top, a movable contact member extending along the inner side of the housing and having its terminal end fixed to the bottom of the housing, said movable contact being inherently biased away from the side of the housing, a coiled spring member seated on the bottom of the housing and resiliently supporting a push button at its other end, said button having an enlarged inner end, and a mounting strap fixed over the top of the housing and having an opening for receiving the outer end of the push button therethrough, an annular member attached to the underside of the mounting strap and centered around the opening therein, one portion of the annular member extending into the housing along one side wall surface thereof for cooperation with the movable contact thereby serving as the fixed contact of the switch, and an opposite lip member supported from the said annular member also extending into the housing to engage the enlarged inner end of the button when the button is in its outermost position and the said flange holds the movable contact in engagement with the fixed contact, whereby the circuit is open when the push button is depressed and the movable contact is free to retract from the fixed contact.

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