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Parlato et al.

[11] **3,775,575**

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[54] **SWITCH FOR CONNECTING WINDOW FOIL WITH A BURGLAR ALARM SYSTEM**

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[21] Appl. No.: **267,901**

[52] **U.S. Cl.**..... **200/61.71,** 200/61.93, 340/274

[51] **Int. Cl.** **H01h 3/16**

[58] **Field of Search**..... 340/274; 116/86; 200/16 R, 16 A, 16 D, 61.71, 61.72, 61.76, 61.81, 61.84

[56] **References Cited**

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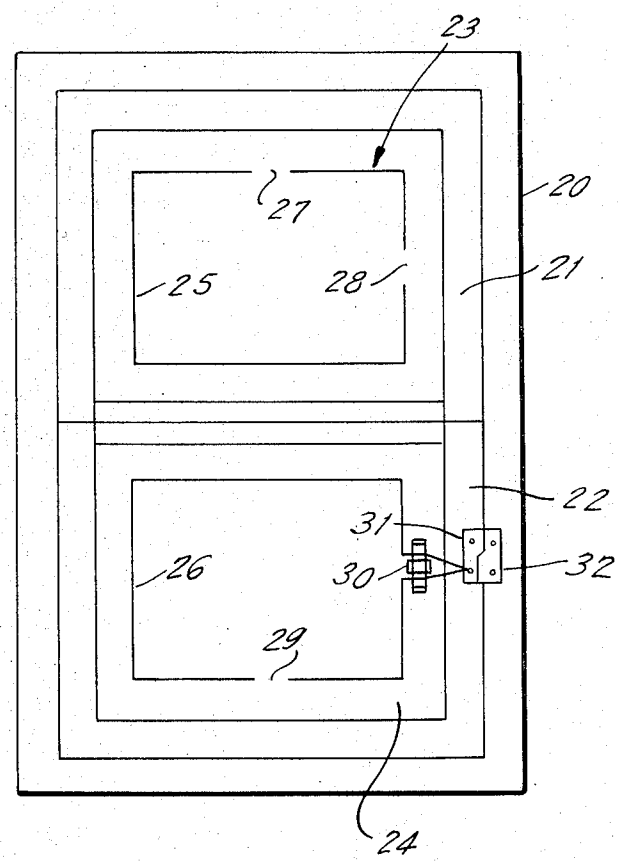
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Assistant Examiner—Gerald P. Tolin
Attorney—Sidney G. Faber et al.

[57] **ABSTRACT**

A foil window switch consists of two assemblies carrying respective elongated sliding contacts. One assembly is stationarily mounted and the other is mounted on a window or other access opening to a building, and terminals on the movable assembly are connected to a conventional conductive foil on the window. Movement of the window by some distance greater than a preset distance opens the connection between the sliding contacts to initiate an alarm. The assemblies are capable of top, bottom or side installation in the window.

8 Claims, 10 Drawing Figures



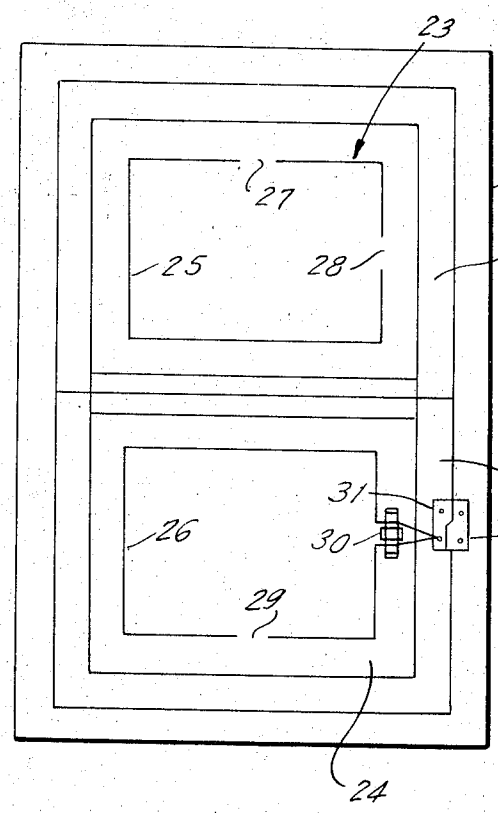


FIG. 1.

FIG. 2.

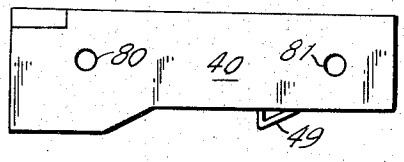


FIG. 6.

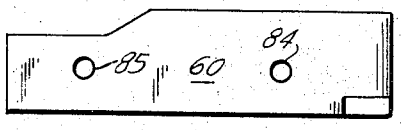


FIG. 3.

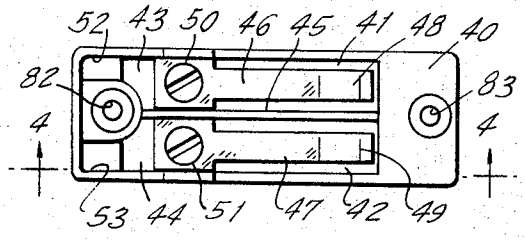


FIG. 7.

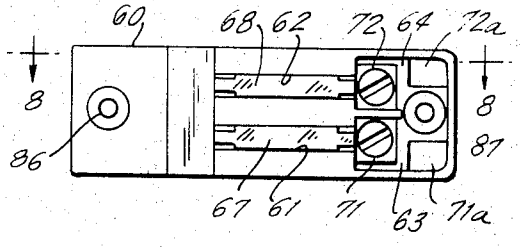


FIG. 4.

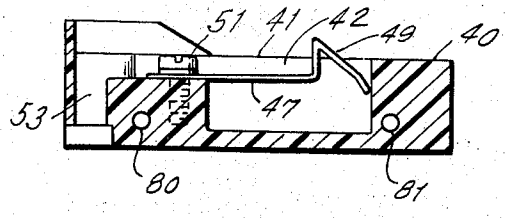
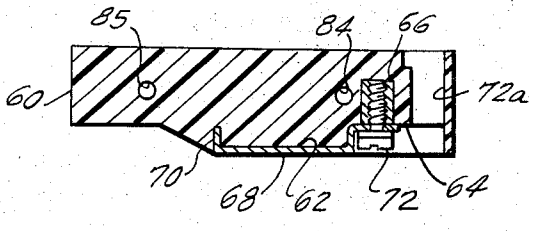


FIG. 8.



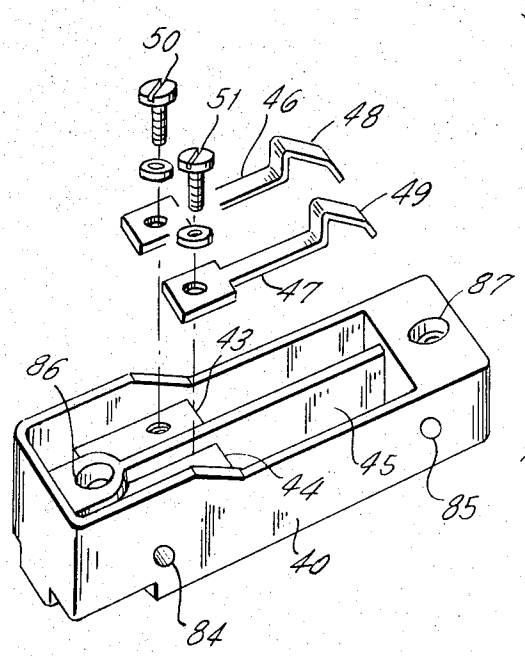


FIG. 5.

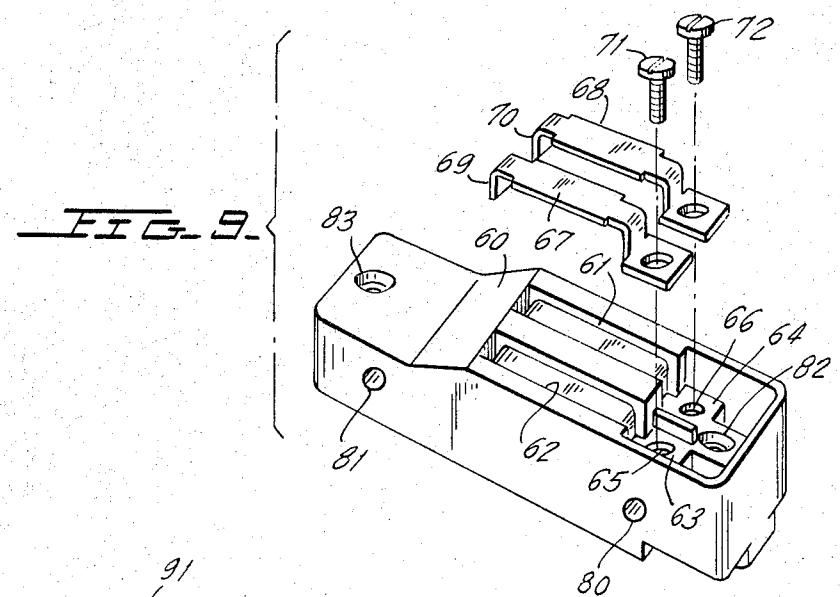


FIG. 9.

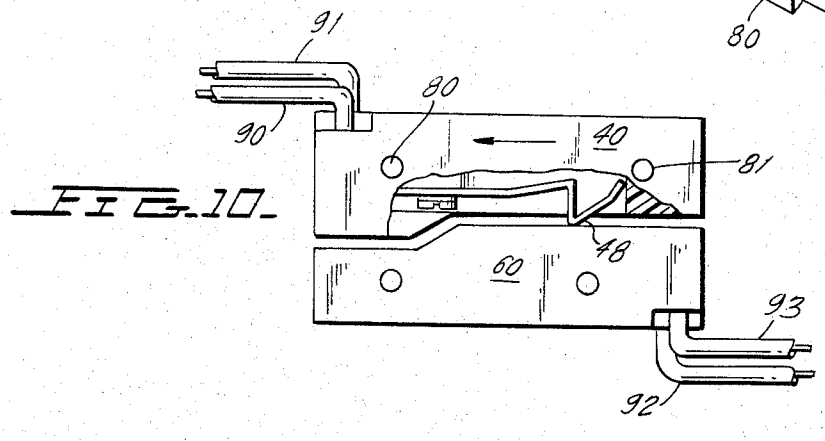


FIG. 10.

SWITCH FOR CONNECTING WINDOW FOIL WITH A BURGLAR ALARM SYSTEM

BRIEF SUMMARY OF THE INVENTION

This invention relates to a burglar alarm switch and more specifically relates to a novel two-part switch structure for use in connection with window foil conductors. Windows protected by foil conductors are generally fixed in place and cannot be opened since electrical conductors, which are fixed in place, extend from the window foil to other portions of the alarm circuit. These connections would be torn apart if the window were moved. The novel switch of the invention allows the movement of windows having foil conductors without tearing the foil or other fixed wiring circuits, so that windows can be conventionally opened for ventilation or cleaning, or the like. The novel two-part switch structure is simply fashioned and is adapted for either window top, window bottom or window side installation and includes two pairs of sliding contacts which are respectively connected to the two open ends of a conductive window foil. The movement of the window or some similar building entry structure will cause the separation of the sliding contacts contained in the two housing sections, thereby to open a normally closed electrical circuit which in turn initiates the operation of a burglar alarm system.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates a typical window containing foil strips with the novel foil window switch of the invention mounted on the window side;

FIG. 2 is a side plan view of one of the switch housings of the invention;

FIG. 3 is a bottom view of the housing of FIG. 2;

FIG. 4 is a cross-sectional view of FIG. 3, taken across the section line 4—4 in FIG. 3;

FIG. 5 is an exploded perspective view of the switch housing of FIGS. 2, 3 and 4;

FIG. 6 is a side plan view of the second switch housing of the invention;

FIG. 7 is a bottom plan view of FIG. 6;

FIG. 8 is a cross-sectional view of FIG. 7, taken across the section line 8—8 in FIG. 7;

FIG. 9 is an exploded perspective view of the second switch housing of FIGS. 6, 7 and 8; and

FIG. 10 is a side plan view, illustrating the engagement position between the two housings of FIGS. 5 and 9.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates an elevational view of a window comprised of a main frame 20, and upper and lower movable portions 21 and 22 respectively, each of which contains glass panes 23 and 24 respectively. Panes 23 and 24 are then provided with conventional conductive foils 25 and 26 which normally function to define a continuous electrical circuit which can produce a burglar alarm type of signal if the foil is interrupted, due to breakage or entry through the window pane that would interrupt the foil conductor.

The foils 25 and 26 in FIG. 1 are shown with several interruptions. In practice, only one such interruption would be present. The interruption 27 at the top of foil 25 or interruption 28 at the side of foil 25 can be connected in a continuous circuit through the foil window switch of the invention, as will be described hereinafter, to enable the opening and closing of the window without breaking a continuous conductor. Interruptions 27 and 28 are shown at the top and side of the window, to illustrate that the foil window switch of the invention could be mounted at the top or side of the window so that an open circuit is created if the upper window 21 is moved downward or opened outwardly while the burglar alarm circuit is energized. The lower foil 26 is shown with a gap 29 to illustrate that the novel foil circuit switch of the invention could be mounted on the bottom of the window in order to create a burglar alarm type signal if the bottom window 22 is opened upwardly.

In the particular embodiment shown herein, the foil window switch is connected to the side of the lower window 22. Thus, the two ends of a gap formed in the side of the foil layer 26 are connected to a foil terminal block 30. Terminal leads are then connected to a first foil window switch member 31 which is securely mounted to the frame of movable window portion 22. Member 31 then cooperates with a second switch member 32 which is fixedly mounted to the stationary portion of the window 20. As will be seen more fully hereinafter, the movement of window 22 will cause an electrical discontinuity, due to the separation of contacts of members 31 and 32, which then can initiate a burglar alarm.

FIGS. 2, 3, 4 and 5 show the first window switch member 31. It will be seen that the members 31 and 32 are interchangeable. Referring to FIGS. 2–5, the member 31 consists of a molded nylon housing 40 or any other suitable insulation molding, and contains two elongated channels 41 and 42 which terminate at one end at raised platforms 43 and 44 respectively. A central rib 45 divides the channels 41 and 42 and serves as an insulation spacer between elongated electrical contact strips 46 and 47 which have re-entrantly shaped ends 48 and 49 respectively, which define sliding contacts, as will be described more fully hereinafter.

Each of bases 43 and 44 receive suitable threaded brass inserts which may be molded with the molded housing 40. The brass inserts threadably receiving brass screws 50 and 51 respectively extend through respective openings in the ends of contact strips 46 and 47 to support contact strips 46 and 47 in cantilever so that the strips can flex in and out of their respective channels 41 and 42. Note that contact strips 46 and 47 may be made of a thin phosphor bronze and that screws 50 and 51 will serve as an electrical terminal for contact strips 46 and 47. Electrical conductors from the terminal block 30 of FIG. 1 to the contact strips 46 and 47 are threaded through openings 52 and 53 (FIGS. 3 and 4) in the base of housing 40, so that access can be had to terminal screws 50 and 51 so long as the housing assemblies 31 and 32 are not engaged (FIG. 10).

The other housing member 32 of the foil circuit switch of FIG. 1 is shown in detail in FIGS. 6–9. Referring now to FIGS. 6–9, the second housing member includes an insulation housing 60 which may again be of nylon and which has an open side which is complementary in shape to the open side of housing 40 of FIG. 2. Thus, as is shown in FIG. 10 and as will be later described, the open sides of housings 40 and 60 of FIGS. 2 and 6 respectively are enclosed when the foil window switch is closed, so that access cannot be had to the internal circuitry of the switch. The housing 60 contains two shallow channels 61 and 62 which lead to lower

pedestals 63 and 64 respectively which, in turn, receive threaded brass inserts 65 and 66 respectively. Two pairs of elongated copper contacts 67 and 68 are fitted within channels 61 and 62 respectively and are positioned, in part, by downwardly extending leg portions 69 and 70 which fit into small notches at the right-hand end of channels 61 and 62 respectively. Conductive terminal screws 71 and 72 are then fitted through openings in the opposite ends of contact strips 67 and 68 and are threaded into brass inserts 65 and 66 respectively in order to secure the strips 67 and 68 in place. Screws 71 and 72 also serve as terminals for connection to circuitry which is associated with the alarm system being controlled. Two openings 71*a* and 72*a* extend through the bottom of the housing 60 to permit the passage of wire leads through the housing 60 and to the terminal screws 71 and 72.

As pointed out previously, the switch assembly units can be mounted in any desired manner and by way of example can be mounted at the top, bottom or sides of windows 21 and 22 of FIG. 1. When mounted on the sides of the windows, the assemblies are secured to the relatively movable portions of the windows as by connecting the assemblies in place through screws passing through the mounting openings and into the window portions. To this end, the switch member housing 40 of FIGS. 2–5 contains mounting openings 80 and 81 to enable the side mounting of the member as well as countersunk openings 82 and 83 which enable the flush mounting of the switch member. Similarly, the switch member of FIGS. 6–9 contains side mounting openings 84 and 85 and flush countersunk openings 86 and 87.

FIG. 10 shows the assembly of the switch members in which housing 40 and housing 60 are positioned relative to one another so that the contacts are in their closed position. That is, in FIG. 10 the phosphor bronze spring contacts 48 and 49 of FIG. 5 are in engagement with the right-hand end of copper contact strips 67 and 68 respectively of FIG. 9 when the housings 40 and 60 are in the position shown. Note that sufficient contact pressure is obtained by causing the re-entrantly bent end of contact strips 48 and 49 to project sufficiently above the adjacent side walls of housing 40 that these strips will be bent inwardly and into their chambers 41 and 42 when they engage the stationarily positioned contact strips 67 and 68.

FIG. 10 also shows two leads 90 and 91 extending through housing 40 with the ends of these leads being connected to terminal screws 50 and 51. Note that leads 90 and 91 may be the conduct leads extending from the terminal block 30 of FIG. 1. In a similar manner two leads 92 and 93 extend into the housing 60 and are connected to terminal screws 71 and 72.

In operation, and assuming that housing 60 is stationarily mounted to a window frame while housing 40 is mounted on a movable window portion, the opening of the window will cause contact members 48 and 49 to slide along the length of contact strips 67 and 68 for the length of these strips which might be about 1 inch. Thereafter, contact strips 48 and 49 move off of contact strips 67 and 68, so that the electrical circuit between conductors 90 and 91 with conductors 92 and 93 respectively is opened, thereby to cause an alarm signal following the opening of the window by some amount greater than the predetermined amount. Clearly, the window can be conventionally opened for ventilation or cleaning when the burglar alarm circuit is deactivated.

Although the present invention has been described in connection with a preferred embodiment thereof, many variations and modifications will now become apparent to those skilled in the art. It is preferred, therefore, that the present invention be limited not by the specific disclosure therein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A burglar alarm switch for interconnecting window foil conductors with an alarm circuit comprising:
- a first switch member adapted to be mounted on a movable window;
- a second switch member adapted to be mounted on a fixed surface adjacent to the movable window;
- said first switch member comprising a first housing having an open side, first contact means supported within the housing and exposed through the open side thereof, and means to electrically connect said first contact means with the ends of a conductive foil carried on said movable window;
- said second switch member comprising a second housing having an open side, second contact means supported within the housing and exposed through the open side thereof, and means to electrically connect said second contact means with a burglar alarm circuit;
- said first and second contact means being constructed to engage so as to form a continuous circuit from said window foil to said burglar alarm circuit only when said open side of said first housing is contiguous with said open side of said second housing.

2. The switch of claim **1** wherein said open sides of said first and second housings are enclosed when said open sides of said housings are contiguous with one another.

3. The switch of claim **1** wherein said first and second contact means each comprise first and second contact members insulated from one another.

4. The switch of claim **2** wherein said first and second contact means each comprise first and second contact members insulated from one anohter.

5. The switch of claim **3** wherein said means to electrically connect said first contact means with said window foil comprises a first and second conductor connected to said first contact means and adapted to be connected to opposite ends of a gap in said conductive foil.

6. The switch of claim **4** wherein said means to electrically connect said first contact means with said window foil comprises a first and second conductor connected to said first contact means and adapted to be connected to opposite ends of a gap in said conductive foil.

7. The switch of claim **6** wherein each of said first and second contact means of said first and second housings consist of elongated contact members adapted for sliding contact engagement.

8. The switch of claim **6** wherein said first and second contact means of one of said first and second housings comprise spring-type contacts which produce contact pressure when engaging the said first and second contact means of the other of said first and second housings.

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