

March 16, 1965

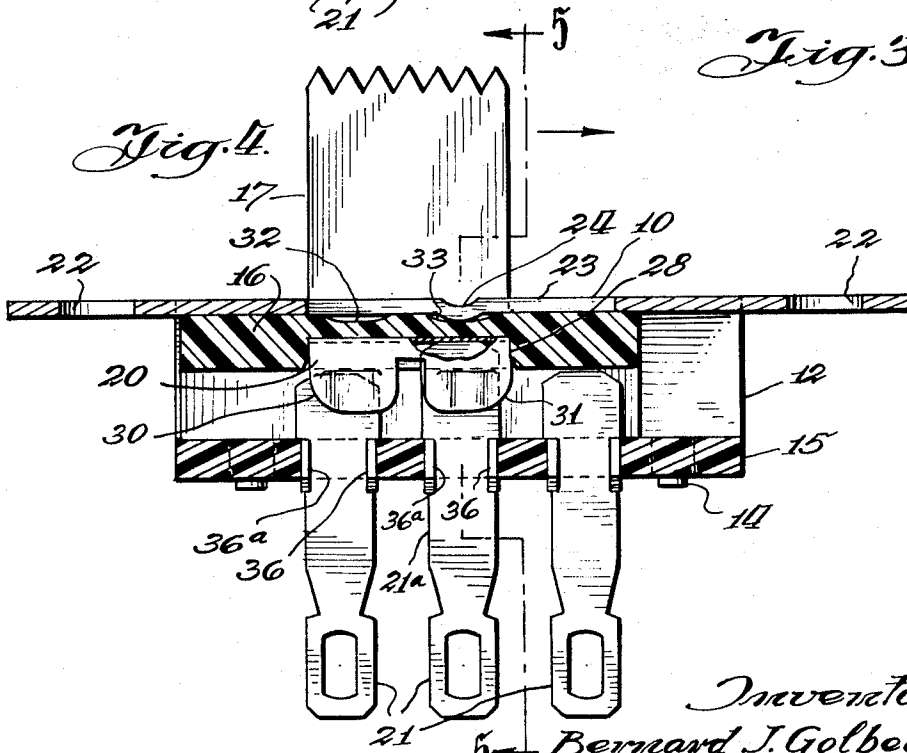
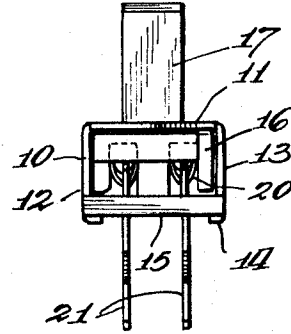
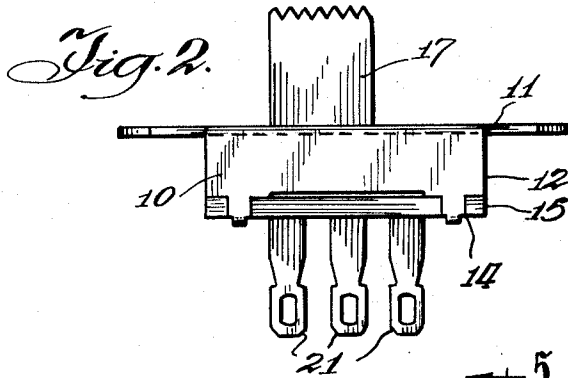
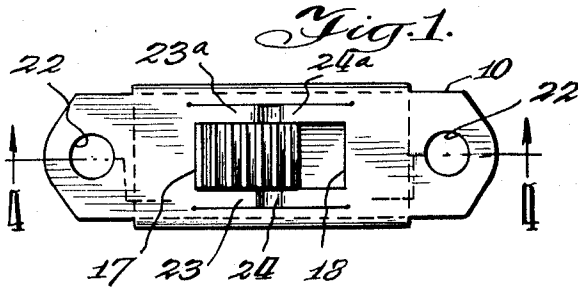
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3,174,002

SPRING DETENT AND TERMINAL STRUCTURE IN A SLIDE SWITCH

Filed March 1, 1962

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5.

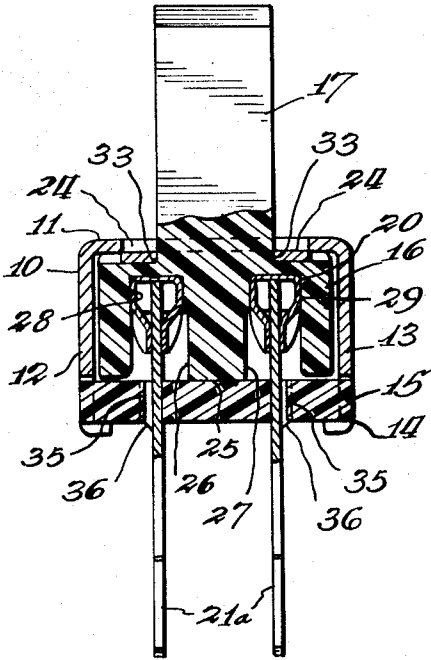


Fig. 6.

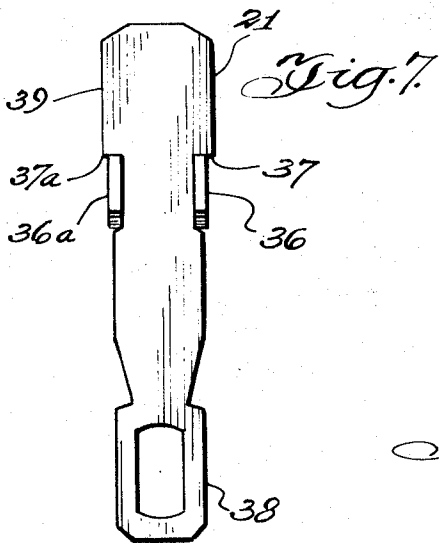
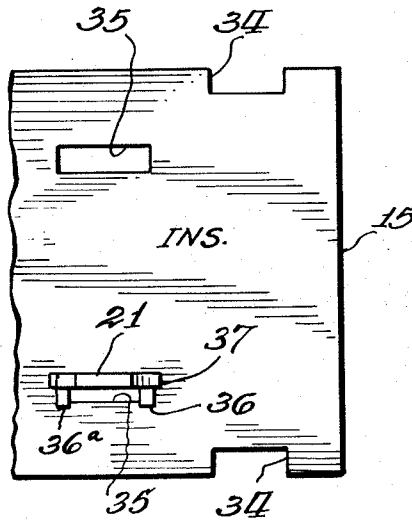
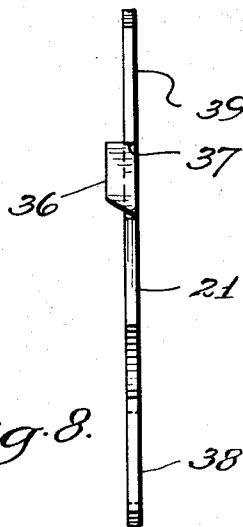


Fig. 8.



3,174,002

SPRING DETENT AND TERMINAL STRUCTURE IN A SLIDE SWITCH

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This invention relates to switches and more particularly to a slide switch for use in an electric circuit.

Modern electric equipment is often designed for use in compact units or designed to be controlled by switches located in a limited space. To this end it is often desirable that such switches be as small as possible without losing the desirable properties of economy of production, quality of construction, and safety features necessarily inherent therein. Present switches designed for use in compact areas often achieve their minute size at the expense of mounting the terminals with their posts extremely close to each other. Moreover, these terminals are often mounted by expensive means, as by riveting to a terminal board. Other common expensive features of such small switches are the formation of elements of the switches as separate structures rather than as an integral component of the switch.

It is a primary object of this invention to provide a new and improved slide switch device.

It is another object of this invention to provide a new and improved slide switch which is smaller, sturdier, and more economical to produce than present switches.

It is a further object of this invention to provide a new and improved slide switch wherein the terminals are mounted farther apart in a smaller switch than present switches.

It is a yet further object of this invention to provide a new and improved slide switch including means formed integrally with the switch casing for locking the switch button in position.

It is still another object of this invention to provide a new and improved method of mounting a terminal to a terminal board which does not require the use of a separate fastener to secure the terminal to the terminal board.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIGURE 1 is a top plan view of an embodiment of this invention;

FIGURE 2 is a side elevational view of the device shown in FIGURE 1;

FIGURE 3 is an end elevational view of the device shown in FIGURE 1;

FIGURE 4 is a section taken along the line 4-4 of FIGURE 1;

FIGURE 5 is a section taken along the line 5-5 of FIGURE 4;

FIGURE 6 is a fragmentary view of a portion of the device of this invention;

FIGURE 7 is a front elevational view of a component of this invention; and

FIGURE 8 is a side elevational view of a component of this invention.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

The device of this invention includes a body 10 which is an elongate rectangular generally tray shaped member or rigid material. The body 10 includes a top 11 and a pair of depending side walls 12 and 13. Extending downwardly from the side walls 12 and 13 are a pair of lugs, indicated generally at 14, which are foldable to grippingly secure an insulating terminal board 15 within the body 10. The terminal board 15 is a generally rectangular member of plastic material. The board 15 has notches, indicated generally at 34, formed at each corner to receive the lugs 14 which pass downwardly therethrough and fold under the board 15. A series of terminal receiving means, or apertures 35 are formed in the board to receive the terminals which are secured thereto.

Also encased within the body 10 is a switch carrier means or button 16 having its manually engageable surface or finger grip 17 extending upwardly through a rectangular slot 18 formed in the top 11 of the body 10. The slot 18 is so formed as to allow lateral movement of the finger grip 17, and consequently the button 16, within the body 10 to effectuate selective positioning within the switch. The movable switch members or contact shoes 20 are enclosed within the body 10 and are carried by the switch carrier means 16. The switch means or shoes 20 are made of conductive material such as spring metal. They are flared at either end to encourage the shoes to be guided onto the terminals in their lateral path of travel in the switch.

Partially enclosed within the body 10 are the conductive members or terminals 21 which are secured to the terminal board 15. The terminals 21 are thin elongate bars of conductive material which have fastening means or barbs 36 and 36a formed intermediate thereof and extending normal to the faces thereof for piercing the terminal board and locking the terminals therein. Shoulders 37 and 37a are formed on either side of the terminal above the barbs 36 and 36a and outwardly project normal thereto to position the terminals 21 in the board 15. This method of making the terminal allows a relatively large slot to be blanked in the terminal board which means that sturdy punches may be used to form the apertures 35. This type of terminal also allows the switch to be made smaller even though the terminals are spaced farther apart because the fastening surface of a terminal is extremely narrow. Formed at opposite ends of the terminals are contact means 38 and post means 39 for facilitating the appropriate electrical connections.

The button 16 is formed of rigid insulating material. It is disposed for slidable movement within the body 10 and is tightly embraced therein. A pair of channels 26 and 27, are formed on either side of a central rib 25 to allow free passage of the button 16 over the top of the terminals 21. Recesses 28 and 29 are formed in channels 26 and 27, respectively, for retaining the contact shoes 20 which are carried in the button 16. The recesses 28 and 29 retain the shoes 20 against lateral movement. The shoes are held in the channels and are prevented from dropping therefrom by the center terminal 21a which extends upwards a greater distance than the terminals on each side thereof. Depending upon the selected position of the switch, either of the ears 30 and 31 of the shoes 20 will always be in contact with the terminal 21a, thus constantly retaining the shoe 20 within the recess 28 or 29 of the channels 26 and 27, respectively.

A pair of resilient members or springs 23 and 23a are integrally formed in the top 11 of the body 10. These springs are formed contiguous with the slot 18 and along the longitudinal extent thereof. Each spring 23 and 23a has a resilient locking surface or locking portion 24 and 24a, respectively, for locking the switch in a selected po-

sition. A pair of detents, 32 and 33 are formed on a top surface of the button 16 on each side of the finger grip 17 for cooperating with the locking portions 24 and 24a of the springs 23 and 23a, respectively, to retain the switch in one of two selected positions. When it is desired to change the position of the switch, the springs 23 and 23a will allow the locking portions 24 and 24a to rise out of the detent 33 in response to lateral movement of the button 16 (in the direction indicated by the arrow in FIGURE 4) and cause the locking portion 24 to be urged downward into the detent 32, thus locking the switch in its alternate position.

To secure the terminals to the terminal board the terminals are passed lengthwise through one of the apertures 35. In so doing, the projections 36 and 36a, which are thicker than the width of the apertures, are caused to pierce the terminal board and lock the terminal thereto. The shoulders 37 and 37a, which extend beyond the length of the apertures, limit the travel of the terminal through the terminal board. When the terminal is inserted in the terminal board to the point where the shoulders 37 and 37a of the terminal board are in facial relation to the terminal board, the terminal is then properly positioned within the terminal board.

The device of this invention provides a new and improved slide switch which is adapted to be used in smaller spaces but which incorporates features that make the switch inherently safer. Because the terminals are so constructed that they may be mounted to the terminal board without the use of independent fastening means this switch may be made of a narrow width with the advantageous feature that the terminal posts are spaced farther apart. The slots formed in the board are larger which means that sturdier punches may be used. Moreover, this device may be more economically produced due to the method in which the terminals are mounted to the terminal board which eliminates a step in the manufacturing process, as does the fact that the spring means in this device are formed integrally with the body member rather than being an independent structure.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A terminal adapted to be mounted in a terminal board, comprising: a substantially thin, flat, elongate member of conductive material; fastening means formed intermediate the ends of said member including piercing surfaces formed on each side of said terminal extending outwardly therefrom and normal to one face thereof, said surfaces adapted to pierce the terminal board and maintain the terminal thereon; means for limiting the travel of the terminal through the terminal board including a pair of shoulders positioned above said piercing surfaces and only slightly projecting outward from each side of the member generally normal to said piercing surface and being spaced above the top of said piercing surface a distance less than the thickness of the terminal board in which said terminal is to be mounted.

2. A terminal adapted to be mounted in a terminal board, comprising: a thin, flat, elongate member of conductive material, fastening means formed intermediate the ends of said member comprising portions of either side of said member bent upon the member to provide small projections extending generally normal to one face of the member, said portions adapted to pierce the terminal board and maintain the terminal thereon; and means for limiting the travel of the terminal through the terminal board including a pair of shoulders projecting only slightly outward from either side of said member, said shoulders comprising the remainder of either side of said member above the bent portions thereof.

3. In a slide switch having a body with terminals mounted thereon, switch means, comprising: a movable switch member adapted for selective engagement with said terminals, switch carrier means having the switch member carried in channels therein, said switch carrier means including a manually engageable surface projecting from a portion of said switch carrier for moving the switch carrier to selectively engage said switch member with said terminals, cover means enclosing the switch carrier means in said body, said cover having a slot formed therein for allowing linear travel of said manually engageable surface and therefore said switch carrier means, said cover means including a pair of springs formed therein along the longitudinal extent of each side of said slot and contiguous therewith, each spring adapted to bear against a portion of said switch carrier means below said cover to maintain said switch member in the channels in said switch carrier means and in contact with said terminals.

4. The switch of claim 3 wherein each spring has a notch formed intermediate the ends thereof projecting below the plane of the cover, and the switch carrier means has detent surfaces formed on the top thereof for mating with the notches in the springs to maintain the carrier in preselected switching positions.

5. In a slide switch having a body with terminals mounted thereon, switch means, comprising: a movable switch member adapted for selective engagement with said terminals; switch carrier means having channels facing the terminals and recesses in the channels with the switch member mounted in said recesses, said switch carrier means including a manually engageable surface projecting from a portion thereof; cover means holding the switch carrier means in said body, a slot formed in said cover for allowing linear travel of said manually engageable surface, a pair of slits in said cover adjacent either said of said slot and generally coextensive with the longitudinal extent thereof forming leaf springs in said cover contiguous therewith, said springs adapted to bear against a portion of the switch carrier below the cover to maintain the switch in the recess of the channels of said switch carrier and in electrical contact with the terminals as said switch carrier is moved to preselected switching positions.

6. A slide switch for use in electrical circuits having a body with a terminal board mounted thereon, comprising: a plurality of terminals mounted on said terminal board, said terminals comprising thin, flat, elongate members of conductive material and having fastening means formed intermediate their ends including piercing surfaces formed on each side of said terminals extending outwardly therefrom and normal to one face of said terminals, said surfaces being adapted to pierce the terminal board and maintain said terminals thereon; means for limiting the travel of the terminals through the terminal board including a pair of shoulders positioned above said piercing surfaces and only slightly outwardly projecting from each side of the member; a movable switch member for operatively connecting selected pairs of terminals, said switch member comprising a generally U-shaped member having a relatively wide flat base with two pairs of mutually cooperating downwardly projecting ears, said pairs of ears being bent closely adjacent each other and having flared ends to permit said switch member to seat in sliding engagement with the terminal ends; switch carrier means having the switch member mounted thereon, said switch carrier means including a manually engageable surface, said switch carrier means having downwardly facing U-shaped channels for receiving said switch members and positioning said switch members in electrical contact with selected pairs of terminals; cover means for holding the switch carrier means in said body, a slot formed in said cover means for allowing linear travel of said manually engageable surface, said slot including a pair of springs formed contiguous with said

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slot and along the longitudinal extent thereof, each spring having a locking surface formed intermediate the ends thereof and extending downward relative to said cover to bear against said switch carrier means to urge the switch member into electrical contact with the terminal; and a pair of detent surfaces formed on said switch carrier means on each side of said manually engageable surface, said detent surfaces operably associated with said spring means locking portion to maintain said switch carrier in a preselected position.

7. The switch of claim 6 wherein said terminal piercing surfaces comprise portions of either side of the terminal member bent upon the member to provide small projections extending generally normal to one face of the member and said terminal shoulders comprise the

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remainder of either side of the member above the bent portions thereof.

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