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ELECTRIC SWITCH WITH TERMINAL ASSEMBLY ESPECIALLY ADAPTED FOR CONNECTION TO PRINTED CIRCUITS

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Fig. 1.

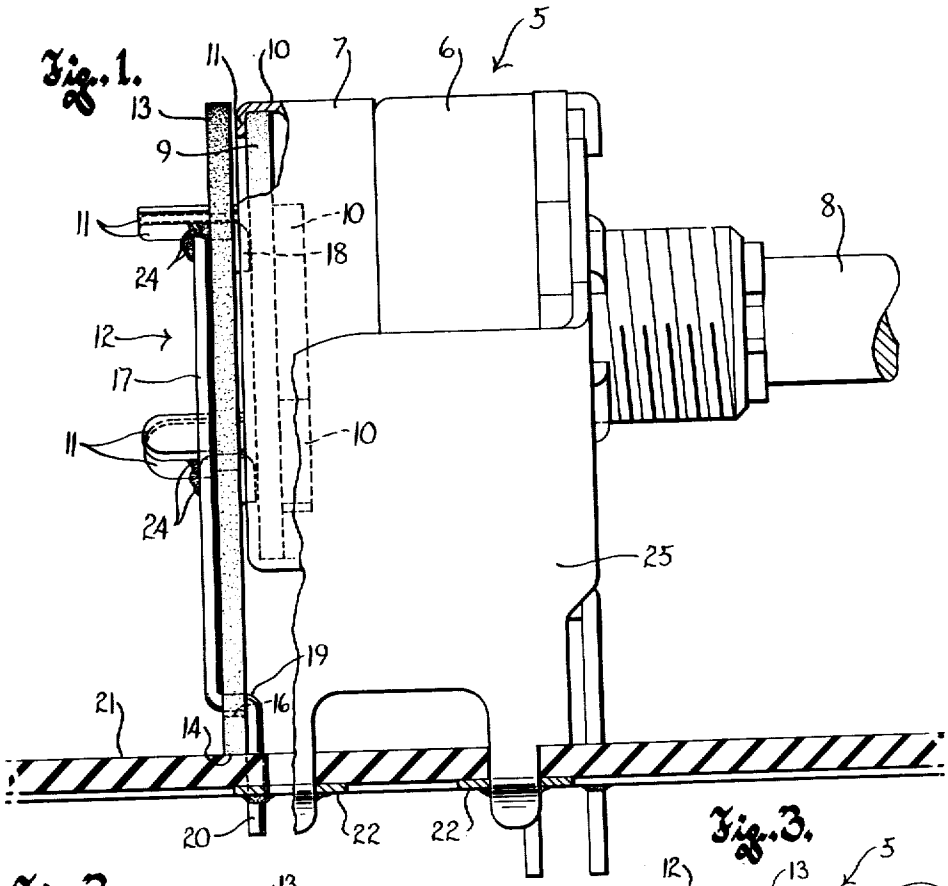


Fig. 2.

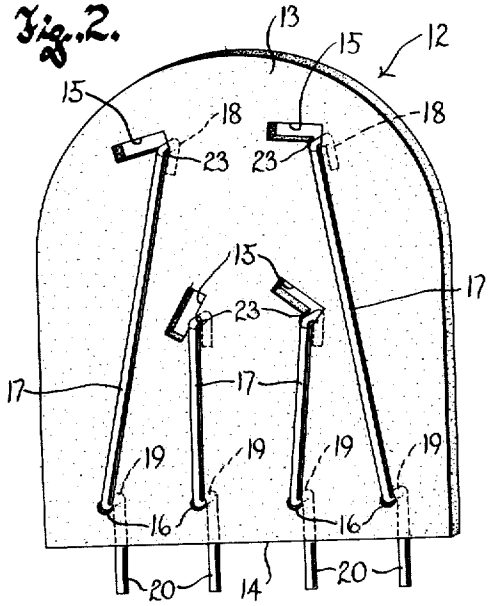
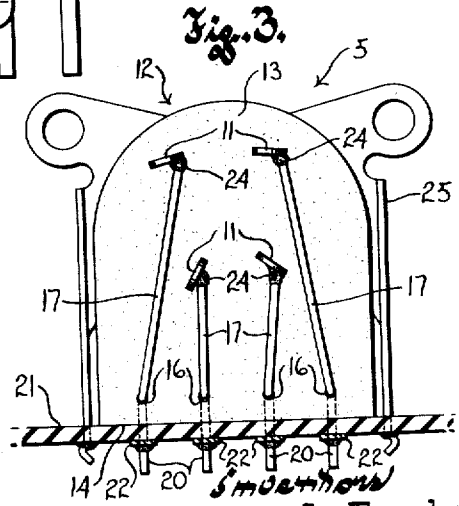


Fig. 3.



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ELECTRIC SWITCH WITH TERMINAL ASSEMBLY ESPECIALLY ADAPTED FOR CONNECTION TO PRINTED CIRCUITS

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2 Claims. (Cl. 200—166)

This invention relates to electric switches of the type used in radio and television receivers and generally mounted on the back of a variable resistor to be operable by the control shaft of the resistor, as in the combination control of the copending application Serial No. 403,401, filed January 11, 1954, now Patent #2,765,384, October 2, 1956 by Mervin B. Arisman to which the present invention is closely related.

The object of the invention is to provide a simple, inexpensive way of adapting such a switch for convenient connection into a printed circuit.

A more specific object of the invention is to provide an inexpensive terminal assembly securable to the back of the switch, which not only adapts the switch to easy and quick connection into a printed circuit, without necessitating any change in the switch from the design and construction found desirable through years of experience, but in addition provides an added support for the switch and the variable resistor with which the switch may be associated, and also suitably insulates the terminals by which the switch is connected in the printed circuit from the metal cover or housing of the switch.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates one complete example of the physical embodiments of the invention constructed according to the best mode so far devised for the practical application of the principles thereof and in which:

Figure 1 is a side view of a combination resistor and switch of the type to which this invention pertains equipped with the terminal assembly of this invention and mounted on a printed circuit panel;

Figure 2 is a perspective view of the terminal assembly per se; and

Figure 3 is a gear view of the switch with the terminal assembly mounted thereon.

Referring now particularly to the accompanying drawing, the numeral **5** designates generally a combination control consisting of a variable resistor **6** and an electric switch **7** mounted on the back of the resistor with the two components arranged in tandem and operable by a common control shaft **8**. The instrumentalities of the resistor and of the switch form no part of this invention, and hence have not been illustrated, but it should be observed that the switch has a housing comprising a flat rear end wall **9** of insulating material and a cylindrical metal side wall **10** having an inturned flange **11** overlying the rear face of the end wall **9**. The end wall **9** constitutes the base of the electric switch which may be of the type forming the subject matter of Patent No. 2,660,634 issued November 24, 1953. Hence

the stationary contacts **10** of the switch are mounted on the inner face of the end wall **9**, and have terminal extensions **11** projecting rearwardly through the end wall. Each stationary contact of the switch of course has its own terminal extension and in a double pole single throw switch there are four contacts and four terminal extensions.

All of the terminal extensions **11** must be connected to their respective leads of the printed circuit, and to facilitate making these connections, a terminal assembly indicated generally by the numeral **12** is provided. This assembly comprises a plate of insulating material **13** of a size to overlie the entire rear of the switch and to project a substantial distance in one direction beyond one side of the switch housing. Preferably the plate has a generally inverted U-shaped formation with a width at least equal to the diameter of the switch housing and a length or height about one and one-half times the diameter of the switch housing. At its upper edge the plate is round to follow the contour of the cylindrical side wall but the bottom edge **14** of the plate is straight and provides a locating surface.

The plate **13** has a plurality of slots or rectangular holes **15** in the portion thereof which overlies the rear wall **9** of the switch, and a row of holes **16** spaced a short distance in from the edge **14**. The rectangular holes **15** are so located and positioned as to align exactly with the terminal extensions **11**, and when the terminal assembly is in place on the switch the extensions **11** protrude through these holes **15**.

Extending from each of the holes **15** to one of the holes **16** is a terminal member **17** of novel very inexpensive construction. These terminal members **17** are all formed of wire, and one end of each has a hook **18** which is hooked around an edge of its respective hole **15** with the end of the hook at the inner face of the plate to be positioned between the plate and the end wall **9** and the main body of the terminal member overlying the outer face of the plate. Each wire terminal member also has an offset portion **19** which passes through one of the holes **16** and an outer end portion **20** which overlies the inner face of the plate and projects beyond the edge **14**. The end portions **20** constitute the actual terminals by which the switch is connectible to the conductors of the printed circuit panel. Accordingly, the end portions **20** are parallel with one another and project substantially the same distance beyond the edge **14** to extend into holes in the printed circuit panel **21** when the locating edge **14** is seated on the panel.

The panel **21** has the circuit leads **22** printed on the underside thereof and the terminal portions **20** of the switch as well as the terminals of the resistor are soldered to their respective conductors.

The holes **15** in the plate are preferably of a size and shape to rather snugly receive and fit their respective terminal extensions **11**, but it is desirable that the hook portions **18** of the wire terminal members which pass through the plate **13** have physical contact with the adjacent terminal extensions, without, however, interfering with easy reception of the terminal extensions in the holes **15**. Accordingly, the hooks **18** are received in notches **23** in an edge of each hole **15**. These notches have a depth substantially equal to the diameter of the wire terminal members and rather snugly receive the hook portions **18** to hold the same against displacement before and during attachment of the terminal assembly to the switch.

Upon attachment of the terminal assembly to the switch the entire back of the assembly may be dipped into a solder bath to thereby solder the terminal extensions **11** to the adjacent hook portions **18**; as at **24**; and upon the completion of these soldered connec-

tions 24 the terminal members 17 are not only electrically connected to their respective terminal extensions and consequently the stationary contacts of the switch, but in addition, the terminal assembly is securely held in position on the back of the switch.

Attention is directed to the fact that the locating edge or surface 14 of the terminal assembly, by virtue of its being seated upon the printed circuit panel, provides a rear support for the switch and the resistor to which it is connected and thus cooperates with a mounting bracket 25 fixed to the front of the resistor in providing a firm stable support and mounting for the control, with the control properly positioned and held with respect to the panel.

From the foregoing description taken in connection with the accompanying drawing it will be readily apparent to those skilled in this art that this invention provides a very inexpensive but entirely practicable manner of connecting an electric switch of the type used in radio and television receivers into a printed circuit, and that its adaptation to this new technique involves no departure from well established design principles for switches of the type here under consideration.

What is claimed as our invention is:

1. An electric switch having a housing comprising a flat end wall of insulating material and a metal side wall provided with an inturned flange overlying the outer face of the marginal portion of the end wall, and having contacts mounted on the inner face of the end wall with terminal extensions projecting through the end wall, characterized by a terminal assembly to facilitate connecting the switch into a circuit printed on a mounting panel, said terminal assembly comprising: a plate of insulating material flatwise overlying the outer face of said end wall and the inturned flange with a portion of the plate projecting beyond the side wall of the switch housing to provide a support for the switch, the edge of said plate portion remote from the side wall providing a locating surface engageable with the printed circuit panel to space the switch a predetermined distance from the panel, said plate having holes in line with the terminal extensions of the contacts and through which said

extensions pass, and having a row of other holes adjacent to the edge of the plate which provides said locating surface; a wire terminal member for each of said terminal extensions, said wire terminal members overlying the outer face of the plate and each having a hook at one end thereof engaged over an edge of one of the terminal extension receiving holes with the end of the hook positioned between the plate and the housing end wall; and each of said wire terminal members having an offset near its opposite end received in one of said row of holes so that the end portion of the wire beyond the offset is at the inner face of the plate; said end portions of the wire terminal members being substantially parallel with one another and projecting beyond the locating edge on the plate to protrude into holes in the mounting panel when the locating edge of the plate bears against the panel; and a soldered connection between each terminal extension and the hooked end of the wire contiguous thereto, said soldered connections holding the terminal assembly in place on the switch.

2. The structure of claim 1 further characterized by the fact that the holes in said plate which receive the terminal extensions are of a size and shape to snugly fit said extensions; and further characterized by the fact that each of the wire terminal members has that portion of its hook which passes through the plate received in a notch opening to the adjacent hole in the plate, and said notches being of a depth substantially equal to the diameter of the wire terminal members so that the presence of the wire terminal members does not interfere with free insertion of the terminal extensions into their respective holes, while at the same time physical contact between the terminal extensions and their respective wire terminal members is assured opening to the adjacent terminal extension receiving hole.

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