

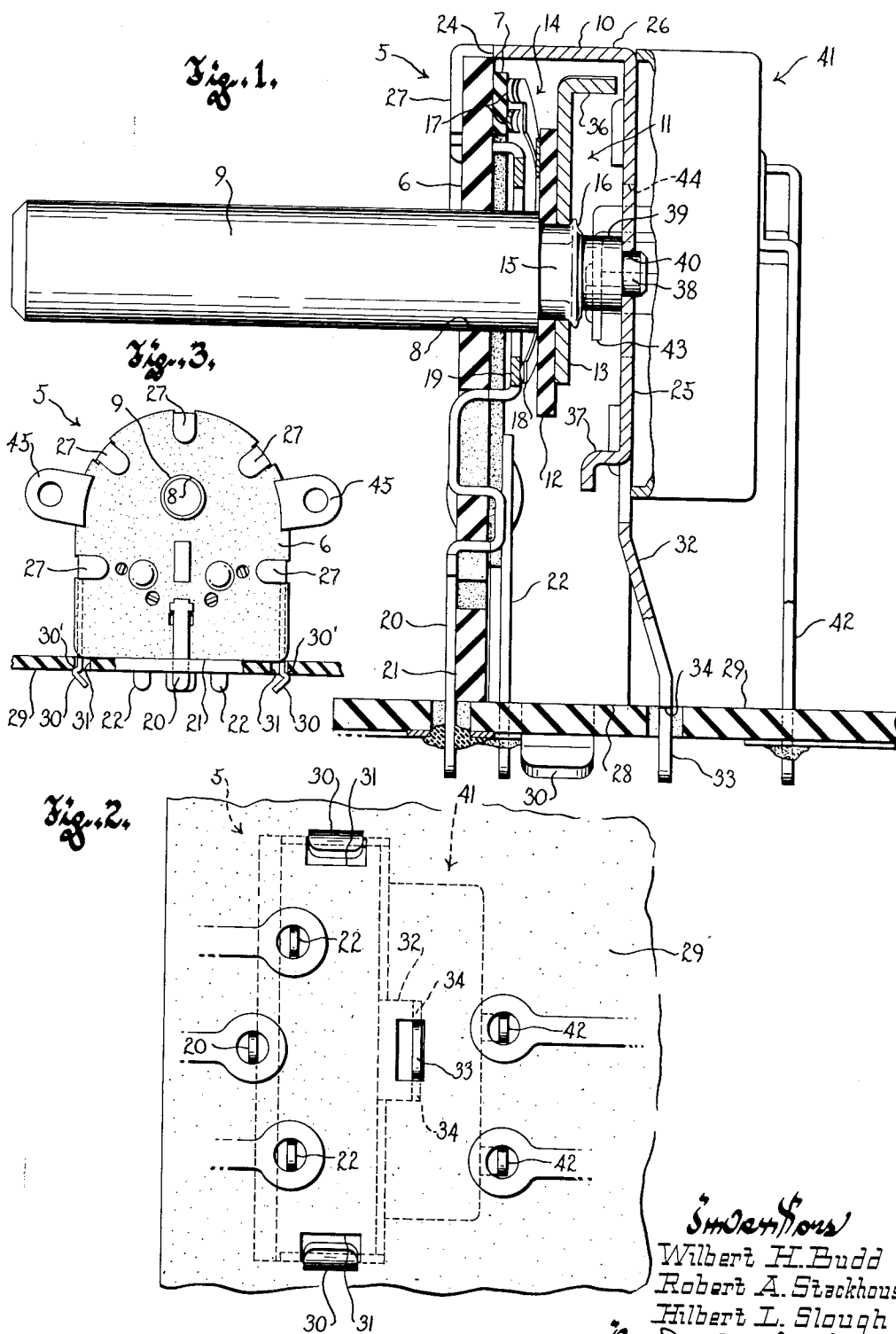
March 27, 1956

W. H. BUDD ET AL
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AND SIMILAR RADIO AND TELEVISION CONTROLS

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2 Sheets-Sheet 1



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Fig. 4.

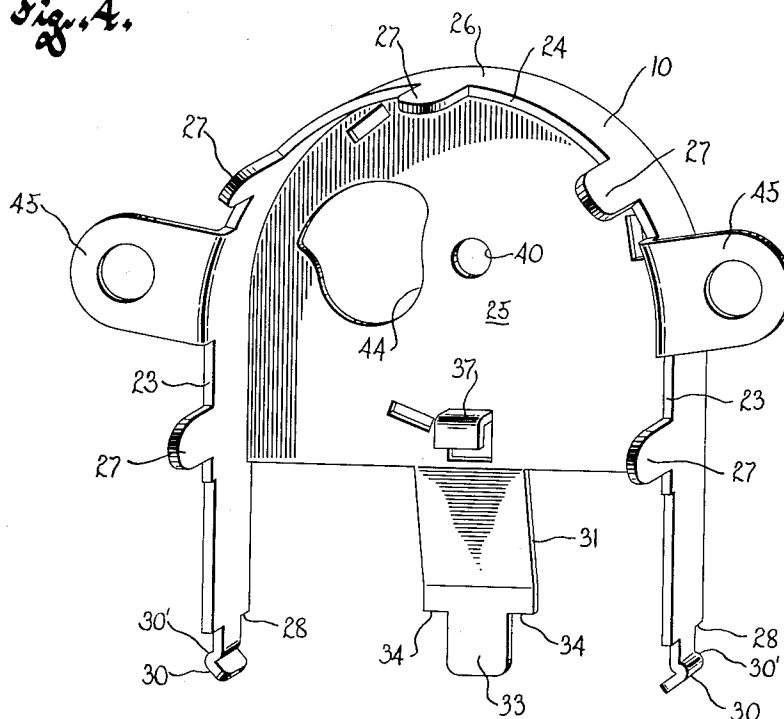
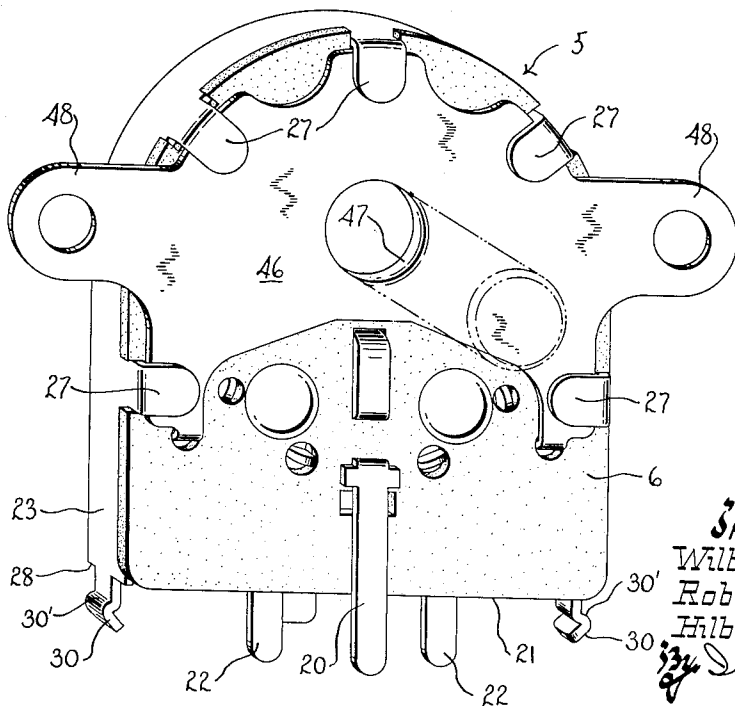


Fig. 5.



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COMBINED HOUSING AND MOUNTING FOR VARIABLE RESISTORS AND SIMILAR RADIO AND TELEVISION CONTROLS

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11 Claims. (Cl. 201—48)

This invention relates to variable resistors and similar controls used in radio and television receivers and refers more particularly to a control of this type especially adapted for use with printed circuitry.

The advent of printed circuitry and its increasing adoption by the radio and television industry has necessitated the development of new ways of mounting and attaching the controls and other circuit components upon their supporting panels.

This invention is directed to this general purpose and has as its object to provide a simple self-aligning, self-holding mounting means integral with the housing of the control and by which the control may be quickly and easily snapped into position on a mounting panel and held there during the soldering of the printed leads to the terminals of the control.

More specifically it is an object of this invention to provide a variable resistor having a housing so designed and constructed that it not only encloses the operating instrumentalities of the control but also serves to firmly mount the control upon a panel with the control shaft substantially parallel to the panel and spaced a definite distance from the panel.

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 drawings illustrate two complete examples of the physical embodiments of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a longitudinal sectional view through a control embodying this invention, illustrating the same mounted upon a printed circuit panel;

Figure 2 is a bottom view of the panel with the control thereabove shown in dotted lines;

Figure 3 is a front view of the control on a smaller scale;

Figure 4 is a perspective view of the stamped metal cover or shell which forms part of the control housing; and

Figure 5 is a perspective view of the complete control showing the same from the front and illustrating a slight modification in the specific construction thereof.

Referring now particularly to the accompanying drawings, the numeral 5 designates generally a variable resistor of the type having a flat base 6 of insulating material, the inner surface of which has an arcuate resistance element 7 thereon concentric to a hole 8 in the base. A control shaft 9 passes through and is journaled in this hole.

The inner end of the shaft, which is located inside the housing of the control formed jointly by the base 6 and

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a stamped metal shell or cover 10, mounts a rotatable contactor assembly 11. This assembly comprises a drive arm 12 of insulating material, a stamped metal stop plate 13 and a contactor 14. The insulated drive arm 12 and the metal stop plate 13 are fitted, in overlying relationship, onto a non-circular end portion 15 of the shaft and are secured in this position by having part of the shaft staked over the plate 13 as at 16.

The contactor 14, as is customary, is mounted on the drive arm 12 and has spring contact fingers 17 bearing against the resistance element and other spring contact fingers 18 bearing upon a collector ring 19. The collector ring 19 is mounted on the inner face of the base 6 concentrically to the control shaft and the arcuate resistance element and has a terminal 20 extending outwardly therefrom and secured to the base with its outer end portion overlying the outer face thereof and projecting downwardly beyond the lower edge 21 of the base.

The terminals 22 for the ends of the resistance element are secured to the base in the customary manner with parts thereof in good electrical contact with the resistance element, and like the terminal 20 have their end portions projecting straight down beyond the bottom edge 21 of the base. Attention is directed to the fact that the end terminals 22 are on the inner face of the base and thus lie substantially entirely within the housing of the control.

The control housing, which as indicated, is formed jointly by the base 6 and the stamped metal cover 10, is of novel shape and design. Instead of the customary cylindrical formation which heretofore has characterized controls of this type, it is of inverted U shape. Thus, the perimeter of the front wall of the housing which is defined by the base 6, in addition to its flat bottom edge 21 has opposite parallel side edges 23 perpendicular to the bottom edge 21 and extending upwardly therefrom to merge with a semi-circular top edge 24.

The stamped metal cover 10 has a flat end wall 25 which provides the rear of the housing and a side wall 26, the front marginal edge of which is connected to the base 6 in the customary manner by ears 27 extending forwardly from the side wall to be received in notches in the edge of the base and clinched over the front face thereof.

The cover conforms in shape to the base so that its side wall has an upper semicylindrical portion merging with straight flat parallel downwardly extending portions which may be said to provide supporting legs. The bottom edges 28 of these supporting legs lie in the plane of the bottom edge 21 of the base and coact with the bottom edge of the base to provide a firm footing for the entire control and by which it stands upon a panel 29 with the terminals 20 and 22 projecting through appropriately located holes in the panel.

Spring detent fingers 30 projecting down from the bottom edges 28 of the legs provided by the housing side walls are adapted to pass through appropriately located and shaped slots or holes 31 in the panel and to engage over the edges of these holes or slots and thus hold the control on the panel solidly enough to permit the soldering of the terminals to their respective leads printed on the underside of the panel. It is, of course, to be understood that the locations of the holes 31 and particularly the spacing therebetween is such that the spring fingers 30 must be sprung together during their insertion into the holes so that the wedging action of the inclined portions 30' of the spring fingers bearing against the adjacent edges of the holes 31 will be available to draw the control down onto the panel. In order for the fingers to have the proper resiliency, the flat end wall 25 of the cover terminates a distance upwardly from the lower ends of the side walls as best shown in Figure 4.

Added rigidity is given the mounting by a center leg 32 extended down from the lower edge of the rear wall and inclined slightly rearwardly. This center leg has a tongue 33 flanked by a pair of panel engaging shoulders 34, the latter lying in the common mounting plane so that the tongue may project down through a hole in the panel. In the permanent securement of the control to the panel this tongue 33 is preferably soldered to a ground lead or merely provided with a soldered enlargement overlying the adjacent underside of the panel.

As will be readily apparent the distance between the mounting plane defined by the bottom edge 21 of the base and the shoulders 28 and 34, from the axis of the control shaft determines the location of the shaft with respect to the panel, and as will also be readily apparent this distance depends upon the design of the equipment in which the control is to be used.

The limits of rotation of the rotatable contact assembly are defined in the customary manner by cooperating stop lugs 36 and 37 on the stop plate 13 and end wall 25, respectively.

As pointed out hereinbefore, the control shaft is journaled in the hole 8 in the base which provides the front wall of the housing. The shaft is also supported against side thrust by a pilot pin 38 projecting from the end 39 of the shaft and journaled in a hole 40 in the end wall 25 of the cover. The rearward end thrust imparted to the rotatable contactor assembly by its spring contact fingers is carried by the end wall 25 to which it is transferred by the end 39 of the shaft.

If desired, the resistor may be combined with a switch indicated generally by the numeral 41 and which is mounted upon the rear wall 25 in the customary manner. So located the switch terminals 42 may extend straight down through the panel 29 to be soldered to their respective printed leads. Actuation of the switch mechanism is accomplished in the usual manner during part of the rotation of the control shaft by the coaction of a lug (not shown) on the drive arm 13 and an actuating unit or cam 43 projecting forwardly from the switch mechanism into the resistor housing through a hole 44 in its rear wall 25.

For situations where the control is to be mounted on the back of a panel or other support through which the shaft 9 passes, oppositely directed mounting ears 45 are formed integrally with the side wall of the cover as best shown in Figure 4. These ears may be secured to the back of the panel.

That embodiment of the invention illustrated in Figure 5 is identical with that described except that a ground plate 46 is provided. This ground plate overlies the front of the base and is held in place by the ears 27 which are clinched thereover. The ground plate may have a bearing 47 extruded rearwardly therefrom to project into the shaft hole in the base which in this instance is slightly larger. Mounting ears 48 similar to the ears 45 are also formed on the ground plate to extend in opposite directions therefrom.

From the foregoing description taken in connection with the accompanying drawings it will be readily apparent to those skilled in the art that this invention achieves a desirable simplification in the mounting of such circuit components as variable resistors and that it adapts such components admirably well to use with printed circuitry.

What we claim as our invention is:

1. A variable resistor having a rotatable contactor assembly driven by a control shaft, and having a housing comprising a stamped metal shell providing back and side walls: characterized by the provision of spaced leg portions on the housing comprising integral extensions of the side walls projecting a distance beyond one peripheral portion of the back wall in a direction laterally with respect to the control shaft, said leg portions having bearing surfaces on their outer end portions facing away from the control shaft axis and lying in a common plane substantially parallel to the shaft axis to engage one side of

a panel upon which the resistor is to be mounted to position the resistor on said panel with the axis of its shaft substantially parallel to the panel and spaced a definite distance therefrom.

2. The variable resistor of claim 1 further characterized by the provision of detent means on the outer ends of said leg portions, integral therewith and projecting from said bearing surfaces thereof, and adapted to pass through holes in a panel upon which the resistor is mounted for engagement with the other side of the panel to thereby securely but detachably hold the resistor on the panel.

3. The variable resistor of claim 1 further characterized by the provision of a front wall on the housing substantially parallel to the back wall thereof and spaced therefrom; and by the provision of spaced coaxial bearings on said front and back walls in which the control shaft is journaled and held with its axis substantially parallel to a panel upon which the resistor is mounted.

4. In a variable resistor: a housing comprising a flat front wall of insulative material and a stamped metal shell secured to the front wall and providing a substantially flat back wall and a substantially U-shaped side wall integral with the back wall and extending between the front and back walls to hold the same spaced apart, said housing being partially open at its side remote from the bight of the U-shaped side wall and said front wall having a hole therethrough; a control shaft projecting through and rotatable in said hole in the front wall; integral opposite leg portions provided by said U-shaped side wall and projecting laterally from the housing in a direction crosswise of the control shaft, and beyond the back wall of the housing; bearing surfaces on the outer ends of said leg portions lying in a common plane substantially parallel to but facing away from the axis of the control shaft; and spring detent fingers on said leg portions formed as reduced extensions of the outer ends of the leg portions, said fingers extending from and beyond said bearing surfaces to project through holes in a panel upon which the resistor is to be mounted with said surfaces bearing against one face thereof, said detent fingers being engageable with the edges of the holes through which they pass to hold the resistor on the panel with its open side substantially closed by the panel and with its control shaft parallel to the panel.

5. The variable resistor of claim 4 further characterized by the provision of terminals secured to the front wall of the housing and extending along the inner face thereof substantially parallel to and between said leg portions of the housing side wall, said terminals projecting out through the open side of the housing and beyond the common plane of said bearing surfaces to project through holes in the mounting panel.

6. The variable resistor of claim 5 further characterized by the provision of another terminal secured to the front wall of the housing and projecting laterally therefrom in the same direction as said first designated terminals in spaced substantially parallel relation thereto, said other terminal having its outer end portion overlying the exterior surface of the front wall and also extending beyond the plane of said bearing surfaces to project through a hole in the panel.

7. The variable resistor of claim 4 further characterized by the fact that the front wall of the housing extends all the way to the plane of said bearing surfaces and has an edge portion thereon lying in said plane and which coacts with said bearing surfaces to properly space the control shaft of the resistor from a panel upon which the resistor is mounted and to lend stability to the resistor when mounted on said panel.

8. The variable resistor of claim 4 further characterized by the provision of another leg portion on the housing extending from the back wall of the stamped metal shell substantially parallel to and in the same

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direction as the leg portions provided by the housing side walls, said other leg portion having a shoulder thereon facing away from the control shaft axis and lying in the common plane of said bearing surfaces to likewise engage said face of the panel upon which the resistor is mounted, and said other leg portion also having a tongue extending beyond said shoulder for entry into a hole in the mounting panel.

9. As an article of manufacture, a housing section for a variable resistor comprising: a sheet metal stamping having a flat back wall, the perimeter of which defines a lower edge and an inverted U having its bight opposite said lower edge, said stamping having a side wall extending perpendicularly from that portion of the perimeter of the flat back wall which defines the legs and bight of the inverted U, so that said side wall also defines substantially an inverted U, said side wall having its leg portions extended downwardly below the lower edge of the back wall with the bottom edges of said leg portions substantially normal to the straight portions of the side walls and providing bearing surfaces facing

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away from the bight of the U; and reduced spring detent fingers integral with and projecting down from said side wall extensions below the bearing surfaces provided by the bottom edges thereof.

10. The housing section of claim 9 further characterized by the provision of a supporting leg integral with the back wall and extending downwardly from its lower edge, said leg having a shoulder thereon lying in the plane of the bottom edges of the side wall extensions and having a tongue thereon extending below said shoulder.

11. The housing section of claim 9 further characterized by the provision of mounting ears integral with the side wall and extending laterally outwardly from the marginal edges thereof remote from the back wall.

References Cited in the file of this patent

UNITED STATES PATENTS

1,926,196	Da Costa	Sept. 12, 1933
2,096,319	Churchill	Oct. 19, 1937