

March 9, 1954

A. J. VAKSVIK ET AL
COMBINED CONTACT AND TERMINAL POST
FOR ELECTRICAL INSTRUMENTALITIES

2,671,841

Filed July 10, 1953

3 Sheets-Sheet 1

Fig. 1.

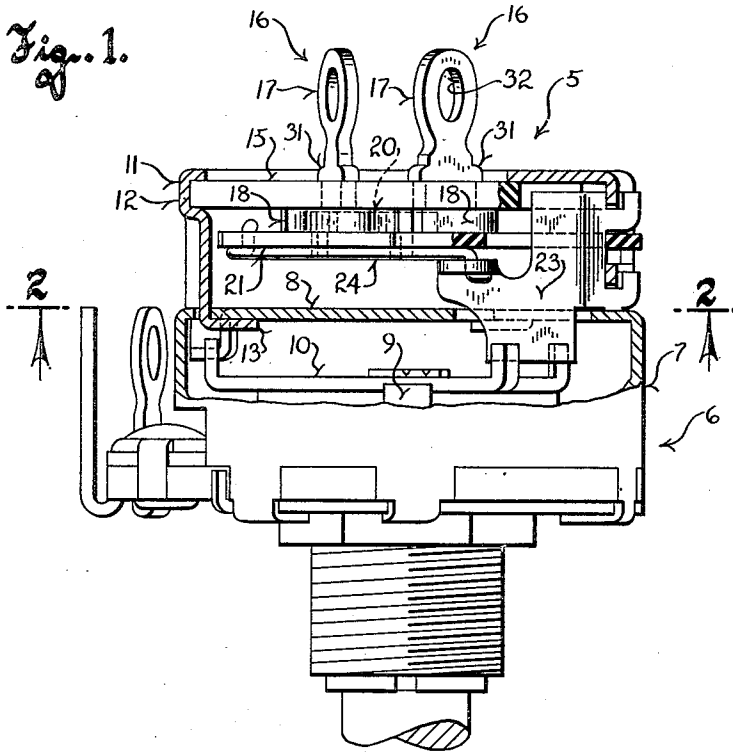
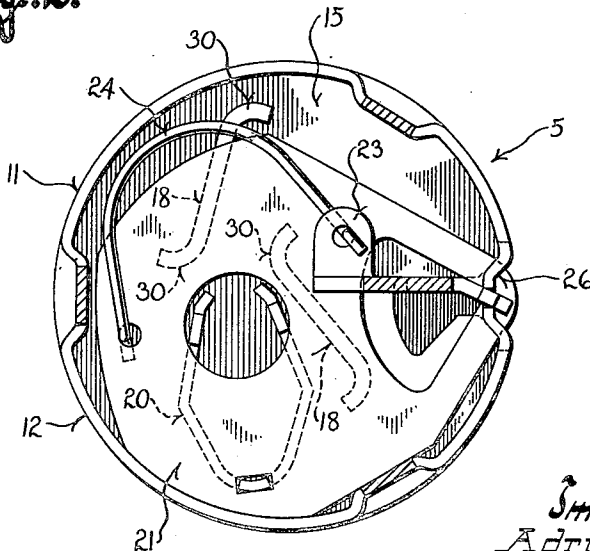


Fig. 2.



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3 Sheets-Sheet 2

Fig. 3.

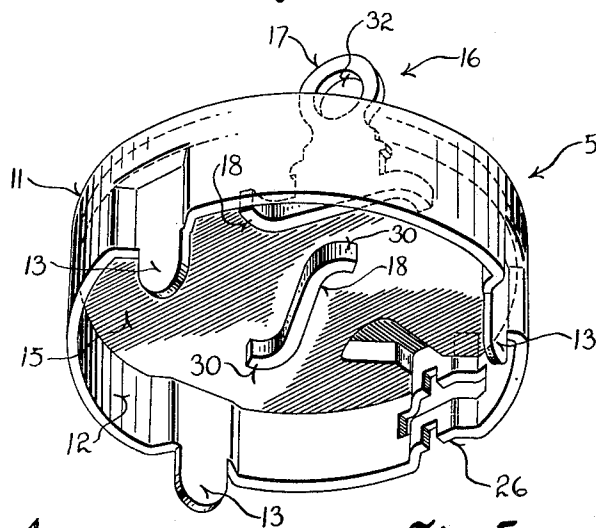


Fig. 4.

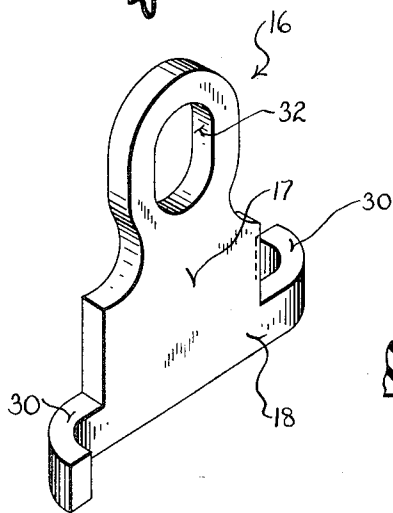
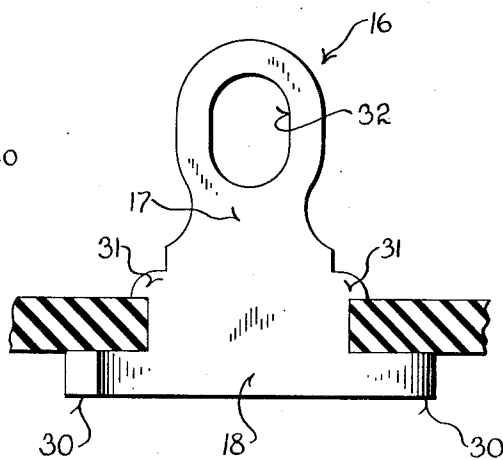


Fig. 5.



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3 Sheets-Sheet 3

Fig. 6.

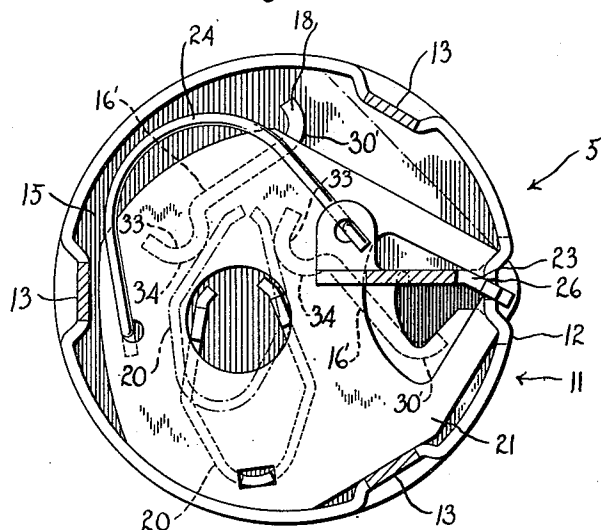


Fig. 7.

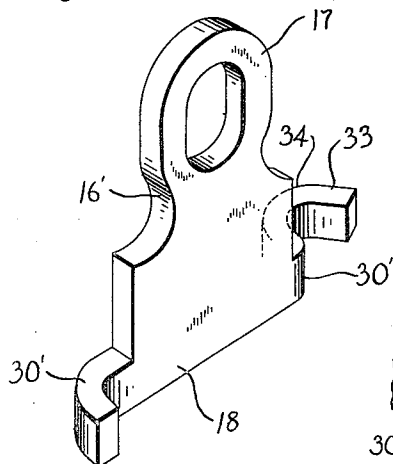
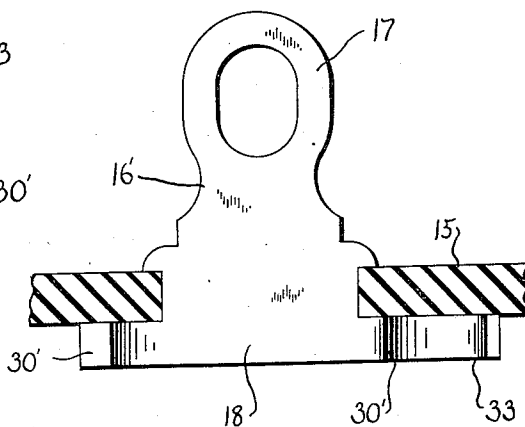


Fig. 8.



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UNITED STATES PATENT OFFICE

2,671,841

COMBINED CONTACT AND TERMINAL POST
FOR ELECTRICAL INSTRUMENTALITIES

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Application July 10, 1953, Serial No. 367,128

5 Claims. (Cl. 200—166)

1

This invention relates to electrical instrumentalities such as switches, and has more particular reference to a combined contact and terminal post particularly adapted for use in electric snap switches of the type shown in Patent No. 2,529,716 issued November 14, 1950 upon application, Serial No. 37,724, filed July 8, 1948. The present application is a continuation-in-part of application Serial No. 184,952 which was filed September 15, 1950 now abandoned as a division of the application which became Patent No. 2,529,716.

As brought out in the aforesaid patent, snap switches of this type may be employed in many different types of apparatus but by reason of their compactness are particularly adapted for use with small radio receivers. Besides compactness, therefore, simplicity of design and assembly and low manufacturing costs are the major prerequisites of control instruments of the type here in question and consequently these features are also prerequisites of the components of such switches, such as contacts and terminal posts.

Hence, it is an object of the present invention to provide a combined contact and terminal post for an electric switch or other electrical instrumentality which will be unusually compact and inexpensive to manufacture and simple to assemble into the electrical device of which it forms a part.

Another object of this invention resides in the provision of a combined or one piece contact and terminal post for a switch mechanism or similar instrumentality which is of improved design and which may be secured to an insulating terminal plate of a switch mechanism or other electrical instrumentality without the use of the customary rivets and without danger of the post tilting.

An important feature of the one piece contact and terminal post of this invention resides in the fact that it assures a stable low resistance connection between its contact and terminal portions despite great changes in ambient temperatures; whereas in the more conventional construction in which a rivet passes through the switch base to mount the contact and terminal and also electrically connect the same, expansion and contraction differences often result in a loose connection and unstable contact resistance.

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 particu-

2

larly 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 view partly in side elevation and partly in section illustrating a combination switch and volume control having one form of the combined contact and terminal posts of this invention mounted thereon;

Figure 2 is a cross sectional view through Figure 1 taken on the plane of the line 2—2 and looking into the interior of the switch housing from the open end thereof, the component parts of the switch mechanism being shown in switch "off" position;

Figure 3 is a perspective view of the switch housing looking into the interior thereof and showing the combined contact and terminal posts employed in the switch shown in Figure 1 mounted on the terminal plate of the switch;

Figure 4 is an enlarged perspective view of the form of the combined stationary contact and terminal post employed in the switch shown in Figure 1;

Figure 5 is an enlarged sectional view through the base or terminal plate and showing the combined stationary contact and terminal post illustrated in Figure 4 mounted thereon;

Figure 6 is a view similar to Figure 2 but illustrating a slightly modified one piece contact and terminal post;

Figure 7 is a perspective view of the modified form of contact and terminal post; and

Figure 8 is an enlarged sectional view through the base or terminal plate of the switch with the modified contact and terminal post mounted thereon.

Referring now particularly to the accompanying drawings, in which like numerals designate like parts, the numerals 5 and 6 designate the switch and volume control units, respectively, of a combined switch and volume control instrumentality of the type which is especially adapted for use with small radio receivers.

The volume control unit 6 forms no part of the present invention and for that reason has not been shown in detail. It is sufficient to note that the rheostat mechanism (not shown) is mounted within a substantially cup-shaped housing 7 having a back or end wall 8 and that the

common operating shaft 9 of the instrumentality projects from the front of the housing 7 and carries a driver 10 on its inner end inside the housing 7.

The switch mechanism is contained within another cup-shaped housing 11 having a cylindrical side wall 12; and the switch unit is attached to the back of the volume control housing as by means of tangs 13 formed on the side wall 12 of the switch housing and projecting through suitable apertures in the end wall 8 of the rheostat housing and bent over against the inner surface of the same.

The side wall 12 of the switch housing is a metallic shell closed at its front end by the wall 8 of the rheostat housing, and closed at its rear by a flat end wall or base 15 normal to the axis of the shell. The base 15 comprises the terminal plate of the switch and is provided by a disk of insulating material fixed to the side wall in any suitable manner. The combined stationary contact and terminal posts 16 of this invention are mounted on the base 15 with their terminal ends 17 exteriorly of the switch housing, behind the base, and their contact portions 18 inside the housing.

The contact portions 18 are positioned directly adjacent to the inner surface of the base 15, and are arranged to be bridged by movement of a hairpin type bridging contactor 20 between them. The contactor 20 is carried to and from its contact bridging position by a flat toggle actuated disk-like switch arm 21 which constrains the contactor to back and forth motion along an arcuate path parallel to the base 15 of the switch. The manner in which the switch arm, and consequently the contactor carried thereby, is snapped from one position to the other to effect opening and closing of the switch is described in detail in the aforesaid Patent No. 2,529,715. Suffice it to say, therefore, that the switch arm is operated through a toggle mechanism comprising a toggle lever or actuator 23 pivotally supported by the side wall 12 of the switch housing, and connected with the switch arm by means of a bowed spring 24; the toggle lever projecting into the rheostat housing for engagement by the driver 10 on the control shaft 9. The switch arm and the toggle lever swing on axes normal to the base 15 and directly adjacent to the side wall 12 of the switch housing at an indented area 26 thereof.

The combined contacts and terminal posts 16 are of novel construction and as best seen in Figure 4 each of the posts comprises a substantially T-shaped metal stamping. The stem of this T-shaped stamping provides the terminal portion 17 while its head provides the contact portion 18. The stem projects through a close fitting rectangular perforation in the base or terminal plate 15 and the undersides of the arms 30 of the head of the T which lie in a common plane normal to the longitudinal axis of the stem seat on the adjacent face of the terminal plate.

The arms 30 are bent or curved about bend lines parallel to the longitudinal axis of the stem and in opposite direction so that the head of the T defines substantially an S-curve and its arms engage the adjacent face of the terminal at areas spaced outwardly of each face of the stem as well as each side edge thereof.

The stamping is secured in position on the terminal plate by having portions of its stem at opposite side edges thereof swedged as at 31 against the outer face of the insulating plate

to clamp the same between the swedged portions and the oppositely curved arms 30. This construction forms an exceptionally rigid anchorage for the combined contact and terminal posts since the engagement of the oppositely curved arms with the inner face of the insulating base at areas spaced a distance outwardly from each face of the stem as well as from each side edge thereof supports the posts against tilting in any direction.

The terminal posts are anchored in the insulating base 15 in such positions that the curled end of one contact head is opposite one of the curled ends of the other contact head, as best seen in Figures 2 and 3, and with these adjacent curled ends substantially remote from the indentation 26 in the side wall 12, but substantially in line with said indentation, so that the opposite legs of the bridging contactor can be smoothly cammed toward one another, against their natural outward bias, to thus make firm contact with the adjacent curled ends of the contacts as the bridging contactor is carried to its bridging, or switch "on," position by the switch arm. The curled end portions of the contacts thus not only support the terminal post against tilting and endwise displacement but also provide excellent contact surfaces for engagement with the movable bridging contactor.

The outer end of each stem 17 may be provided with any suitable conformation which will enable a wire conductor to be readily secured to it, as for example a hole 32 which facilitates a solder connection.

The modified contact and terminal 16' illustrated in Figures 6, 7 and 8 is very much like the unit 16, differing therefrom only in the shape of one of the arms provided by the head of the T. Thus one of the arms 30' in addition to being curved about bend lines parallel to the longitudinal axis of the unit and in a direction opposite the other arm 30, is also curved back upon itself as at 33, to provide a semi-cylindrical contact surface 34 which is perpendicular to the base or terminal plate when the post is mounted thereon. This not only adds to the stability of the post, but also provides a better contact surface.

From the foregoing description taken together with the accompanying drawings it will be readily apparent that this invention provides a combined contact and terminal post for an electrical switch or other instrumentality which is compact and inexpensive, simple and easy to assemble onto the electrical device of which it forms a part, and which at all times assures a desirably low and stable contact resistance between its contact and terminal portions.

What we claim as our invention is:

1. In an electric switch: a plate of insulating material having a rectangular perforation; a combined contact and terminal post comprising a substantially T-shaped metal stamping having its stem projecting through the perforation and beyond one face of the plate, and having the undersides of the arms of its head portion abutting the other face of the plate, said arms being curved in opposite directions about bend lines parallel to the longitudinal axis of the stem so that the arms engage the plate at areas spaced in opposite directions from the plane of the stem, one of said curved arms providing a curved contact surface perpendicular to the plate; and portions of the stem at opposite side edges thereof being swedged over the first designated face of

the plate to clamp the plate between the undersides of the arms and said swedged portions.

2. In an electric switch: a plate of insulating material having a pair of rectangular perforations spaced apart both sidewise and lengthwise with the long sides of one of the perforations defining an angle to the long sides of the other perforation; a combined contact and terminal post mounted in each of said perforations and each of said posts comprising a substantially T-shaped metal stamping having its stem projecting through its respective perforation and beyond one face of the plate and the undersides of the arms of its head portion abutting the other face of the plate, said arms being curved in opposite directions about bend lines parallel to the longitudinal axes of the stems so that the entire head of each post defines substantially an S-curve and the arms thereof engage the plate at areas spaced in opposite directions from the plane of the stem, the convex faces of said curved arms providing curved contact surfaces perpendicular to the plate, the endwise spaced relation of the perforations locating the posts in such relative positions as to dispose the convex face of one of the curved arms of one post opposite the convex face of the oppositely curved arm of the other post to provide spaced stationary contacts; and means co-acting with the undersides of said arms for securing the combined contact and terminal posts in their respective perforations.

3. A one piece combined switch contact and terminal post adapted to be mounted upon a flat switch base with its contact portion on one side and its terminal portion projecting through the base and beyond the other side thereof, said post comprising: a substantially T-shaped metal stamping having a flat stem and a head the medial portion of which is coplanar with the stem and the arms of which are curved in opposite directions about bend lines parallel to the longitudinal axis of the stem so that the entire head defines substantially an S-curve, the undersides of the arms of the head lying in a common plane normal to the longitudinal axis of the stem and providing supports for the post spaced in opposite directions from the plane of the stem and the medial portion of the head as well as from the side edges of the stem, the convex faces of the curved arms being perpendicular to the plane common to the undersides of the arms and providing curved contact surfaces perpendicular to said plane; and shoulders on the opposite side edges of the stem equispaced from the undersides of the arms, said shoulders being adapted to be swedged over the base to secure the stamping to the base.

4. In an electric switch: a plate of insulating material having a pair of rectangular perforations spaced apart with the long sides of one of the perforations defining an angle to the long sides of the other perforation; a combined contact and terminal post mounted in each of said perforations and each of said posts comprising a substantially T-shaped metal stamping having its stem projecting through its respective perforation and beyond one face of the plate and the undersides of the arms of its head portion abutting the other face of the plate, said arms being curved in opposite directions about bend lines parallel to the longitudinal axes of the stems so that the arms thereof engage the plate at areas spaced in opposite directions from the plane of the stem, one arm of each post being curved back upon itself so as to provide a substantially semi-cylindrical convex contact surface, the said spaced relation of the perforations locating the posts in such relative positions as to dispose the convex contact surface of one post opposite the convex contact surface of the other post to provide spaced stationary contacts; and means coacting with the undersides of said arms for securing the combined contact and terminal posts in their respective perforations.

5. A one piece combined switch contact and terminal post adapted to be mounted upon a flat switch base with its contact portion on one side and its terminal portion projecting through the base and beyond the other side thereof, said post comprising: a substantially T-shaped metal stamping having a flat stem and a head the medial portion of which is coplanar with the stem and the arms of which are curved in opposite directions about bend lines parallel to the longitudinal axis of the stem, the undersides of the arms of the head lying in a common plane normal to the longitudinal axis of the stem and providing supports for the post spaced in opposite directions from the plane of the stem and the medial portion of the head as well as from the side edges of the stem, one of the arms being curved back upon itself so as to provide a substantially semi-cylindrical convex contact surface perpendicular to the plane common to the undersides of the arms; and shoulders on the opposite side edges of the stem equispaced from the undersides of the arms, said shoulders being adapted to be swedged over the base to secure the stamping to the base.

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No references cited.