

[54] **VARIABLE POTENTIOMETER**

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[22] Filed: **Aug. 23, 1971**

[21] Appl. No.: **173,993**

[30] **Foreign Application Priority Data**

Sept. 7, 1970 France 7032440

[52] U.S. Cl. 338/174, 338/162

[51] Int. Cl. H01c 9/02

[58] Field of Search 338/162-175,
190, 191; 29/610, 621

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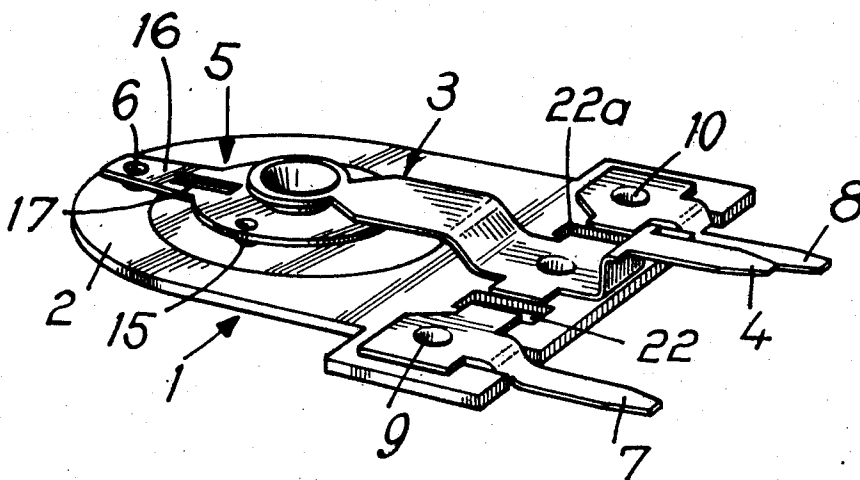
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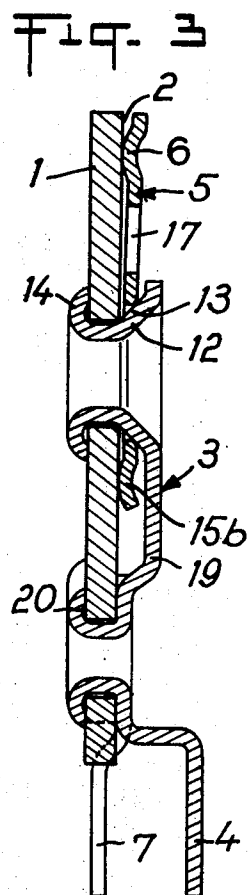
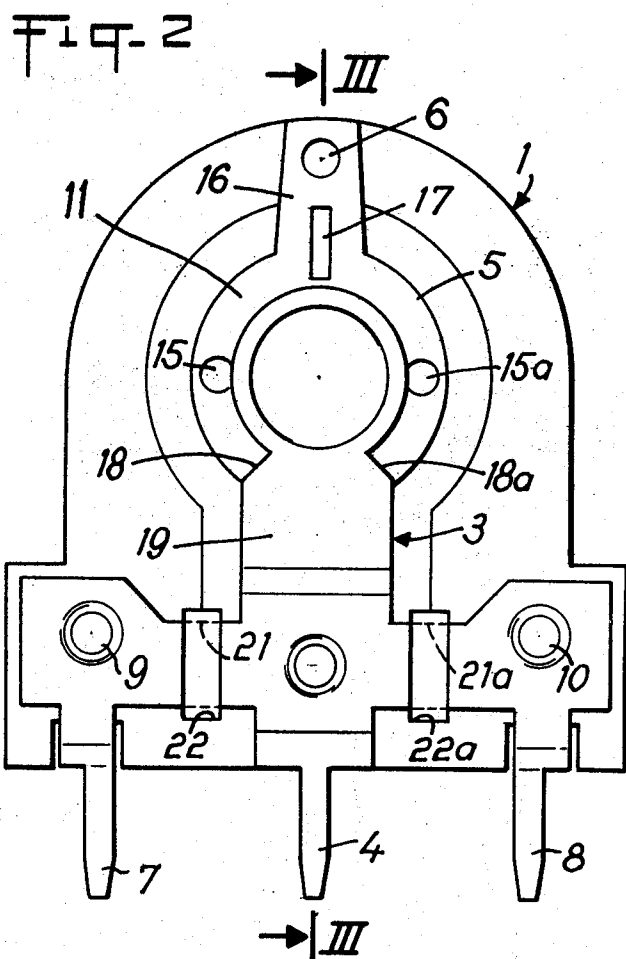
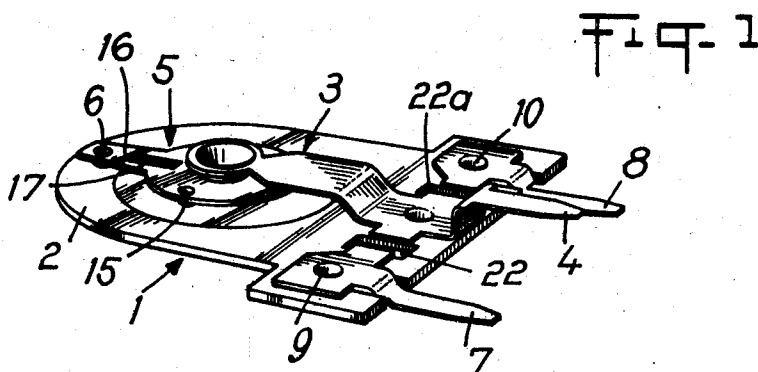
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ABSTRACT

The invention relates to a variable potentiometer comprising an insulating base with a resistive track connected to terminal tags. A slider carrying a contact stud in engagement with the track is rotatable about an annular surface of a collector, the latter being secured to the base by a central annular portion of eye-let form. The slider is movable between limit stops on the collector.

9 Claims, 9 Drawing Figures





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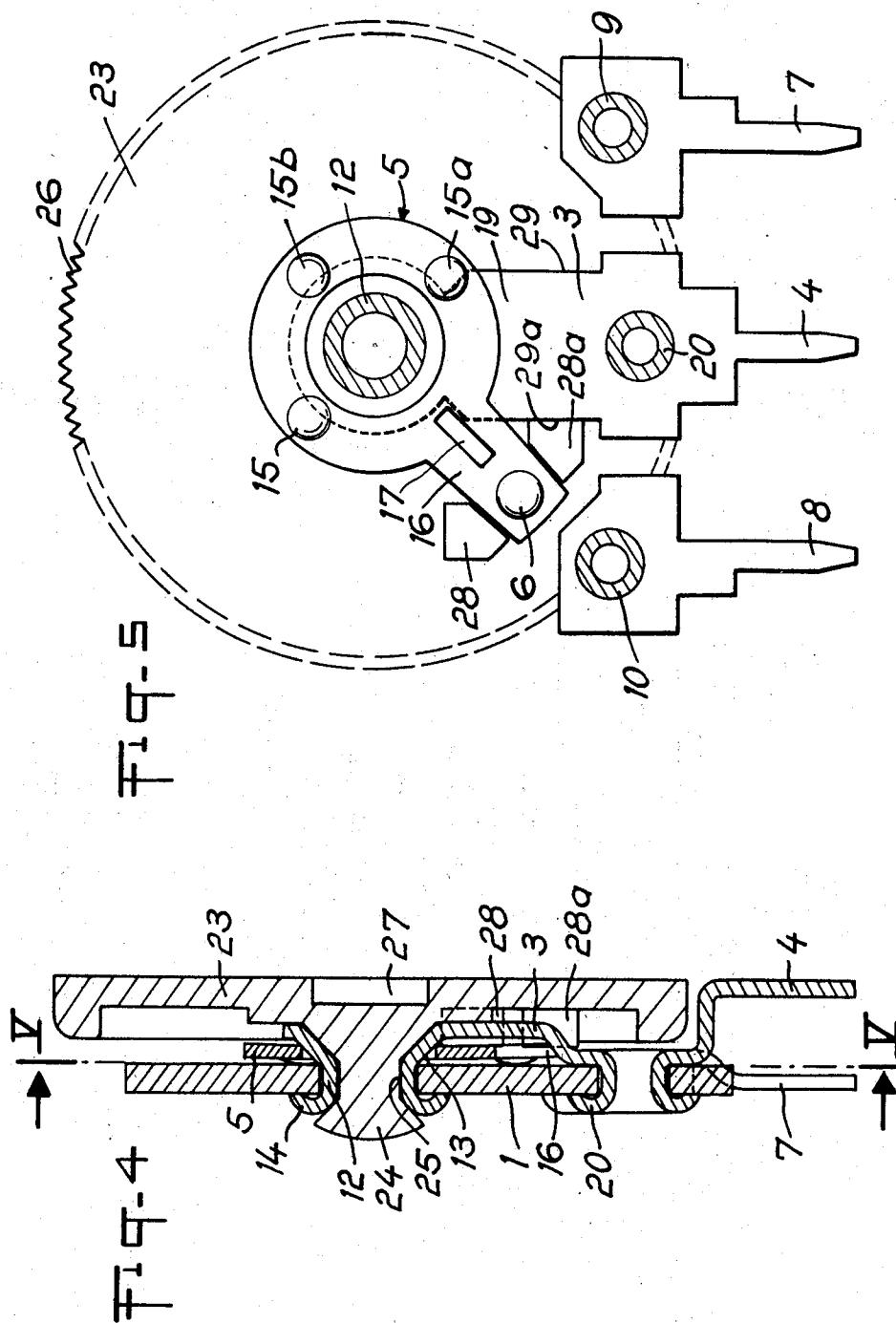


Fig. 6

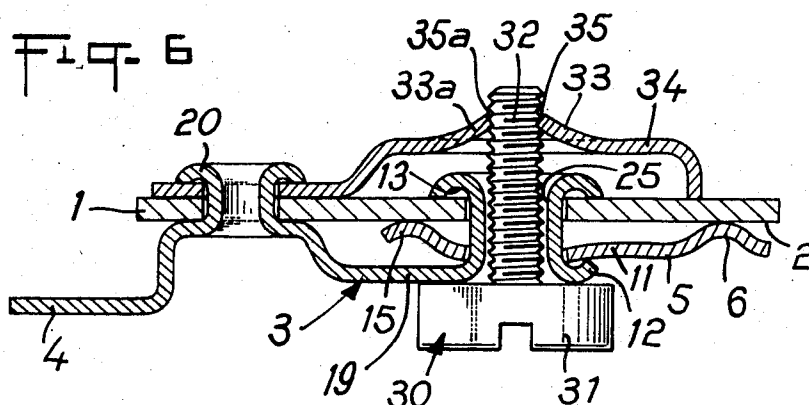
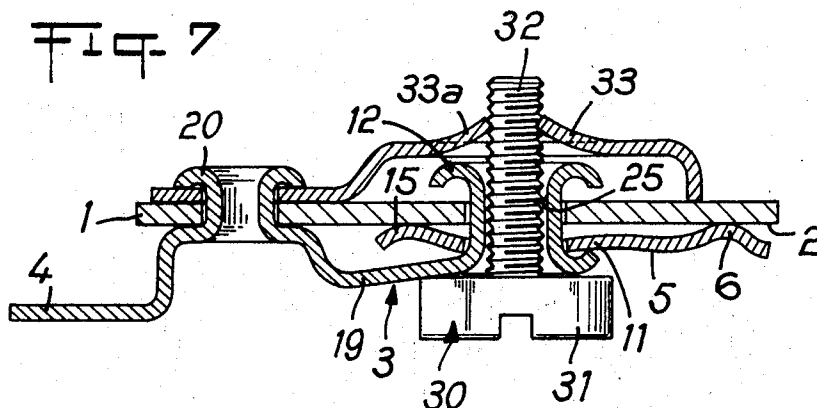
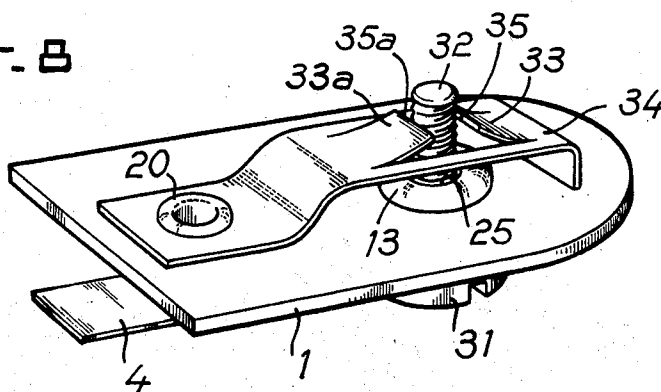


Fig. 7

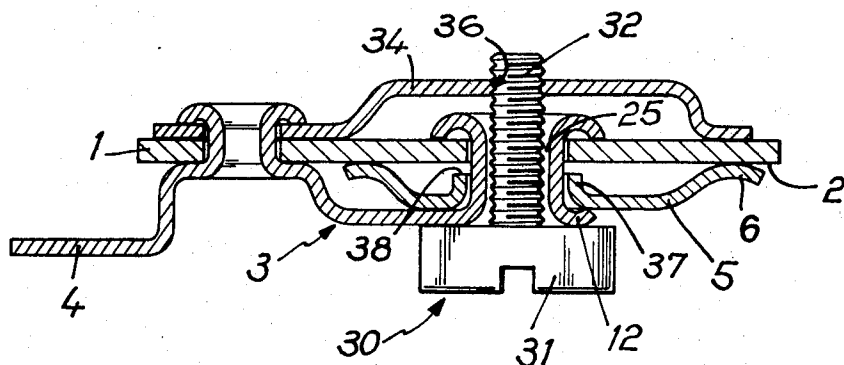


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FIG. 9



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VARIABLE POTENTIOMETER

BACKGROUND OF THE INVENTION

1. Field of the invention

This invention relates to variable potentiometers.

2. Description of the prior art

Variable potentiometers intended primarily for mounting on printed circuit boards are of small dimensions and consist of very few components, highly simplified, for rapid assembly, so as to produce a low-cost piece of equipment.

It is an object of the present invention to provide an improved variable potentiometer.

SUMMARY OF THE INVENTION

According to the present invention there is provided a variable potentiometer comprising a base of insulating material, a resistive track mounted on the base, a collector having an annular portion, a connecting tag electrically connected to the collector and fixed to the base, a slider, a stud carried by the slider and contacting the resistive track, and two further connecting tags electrically connected to respective ends of said track, said slider being rotatably mounted on said annular portion of the collector, the axis of which annular portion acts as the axis of rotation of the slider.

Where the potentiometer is made in three parts, a slot is provided in the slider, to accommodate the end of a screwdriver, which, at the ends of its travel, comes up against stop faces on opposite sides of the collector. This arrangement enables any strain on the slider to be avoided.

Finally, the collector and the three connecting tags may be made in one piece, the two end tags are separated from the collector by the provision of cutouts after assembly, on the same side of the equipment as the crimping of the eyelets, which makes for rapid assembly without needless manipulation of the equipment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one form of variable potentiometer with an uninsulated control means;

FIG. 2 is a plan of the potentiometer shown in FIG. 1;

FIG. 3 is a sectional view of the potentiometer, taken along the line III—III in FIG. 2;

FIG. 4 is a sectional view of an embodiment of potentiometer in accordance with the invention equipped with an insulated control knob;

FIG. 5 is a plan, partly in section, of the potentiometer at the plane of the line V—V in FIG. 4;

FIG. 6 is a longitudinal section of a further embodiment of a potentiometer in accordance with the invention, a slider thereof being in position for adjustment;

FIG. 7 is a similar sectional view of the potentiometer of FIG. 6, with the slider in the locked position;

FIG. 8 is a perspective view of the potentiometer of FIGS. 6 and 7 as seen from the side opposite to the track; and

FIG. 9 is a longitudinal section of a still further embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1, 2 and 3 show an embodiment of a variable potentiometer with uninsulated control means, the po-

tentiometer consisting of a base 1, made of insulating material, on which is printed a resistive track 2, a collector 3, with its connecting tag 4, and a slider 5, fitted with a stud 6, for contact with the track 2, the two ends of which track are joined to connecting tags 7 and 8, fixed to the base 1 by eyelets 9 and 10.

The slider 5 has a ring-shaped portion 11, by which it is rotatably mounted on an annular portion 12, of the collector 3, this portion 12 having a frusto-conical face 13. The annular portion 12 of the collector is fixed to the base 1 by a bent-over end portion 14, which is shaped to form an eyelet, and it presses on the ring-shaped portion 11 of the slider, which has three shallow projections 15, 15a and 15b, in contact with one face of the base 1, thus producing sufficient friction to retain the slider in the position chosen for the potentiometer setting.

The slider 5 has a tongue 16, extending radially from the ring portion 11 and bearing the stud 6, which is in contact with the resistive track. In this tongue 16 and in the ring portion 11 of the slider, there is a slot 17, into which the end of a screwdriver blade can be inserted for moving the slider. At the limits of travel of the slider, the screwdriver abuts against stop-faces 18 and 18a on a bridge-piece 19, of the collector 3, so as to determine the limit positions of the stud 6.

The collector 3 comprising the annular portion 12, which is joined to the tag 4 by the bridge-piece 19, is secured to the base 1 by the bent-over end portion 14 of the portion 12 that it is shaped to form an eyelet, and by another eyelet 20, situated near the tag 4.

The bridge-piece 19, in addition to its role as a stop, serves to stiffen the assembly, and the eyelet 20 prevents the collector from being rotated by the annular portion 12.

The collector 3 and the tags 4, 7 and 8 are stamped out in a single piece; after assembly, the tags 7 and 8 are separated from the collector 3 by cutting away the portions 21 and 21a by means of two blades introduced through the rectangular openings 22 and 22a provided in the base 1.

Referring now to FIGS. 4 and 5, insulated control means takes the form of a knob made of insulating material 23, and is rotatably mounted about a stem 24, within an aperture 25, in the annular portion 12 of the collector 3, to which it is secured by its expanded end, which bears against the bent-over end portion 14 of the portion 12 of the collector.

The circumference of the control knob 23 carries serrations 26, while the centre of the knob is slotted at 27 to accommodate the end of a screwdriver.

That face of the knob 23 which opposite the base bears two protruberances 28 and 28a, between which the contact tongue 16 engages with only slight play, to enable the slider 5 to be rotated by the knob 23.

The protruberances 28 and 28a also act as stops when they come up against the edges 29 and 29a of the collector 3.

A simple means of locking the slider in position, to prevent it from turning owing to shock or vibration is incorporated in the potentiometer shown in FIGS. 6, 7 and 8, like parts of which to those of the first embodiment are given the same reference numerals.

Fitted into the aperture 25 in the portion 12 of the collector 3 is a screw 30, the head 31 of which abuts against the collector 3 and the screw-threaded shank 32 of which is engaged between two springy tabs 33

and 33a, cut out of a small plate 34, fixed to the base 1 on the side away from the slider, being anchored, for example, by means of the eyelet 20 by which the collector is held in place.

The tips 35 and 35a of the springy tabs 33 and 33a are set into turns of thread on the screw-threaded shank 32 of the screw.

As shown in FIG. 6, the screw 30 is slack, so that its head 31 is exerting only slight pressure on the collector 3 and the slider 5 can rotate freely with low torque, enabling the slider to be adjusted and brought to a predetermined position.

To lock the slider 5, that is to say to obtain sufficient torque to prevent any movement of the zone of contact between slider and track owing to shock or vibration, the screw 30 needs to be tightened, so that it moves towards the base 1 (FIG. 7).

The screwhead 31 presses on the bridge-piece 19, which flexes, and the frusto-conical face 13 thereupon presses against the ring portion 11 of the slider, thereby increasing the slider torque.

The two springy tabs 33 and 33a enable crushing of the central ring portion 11 to be avoided, by virtue of the fact that, as the screw 30 advances, the tabs 33 and 33a rise, their tips 35 and 35a moving clear and dropping back on the preceding turn of the thread.

In the preceding embodiment, it was found in the course of experiment that with such an arrangement the small plate did not yield and, if the slider were over-tightened, it might result in deformation thereof. In order to limit this tightening, in the embodiment illustrated in FIG. 9, the central part of the slider has been provided with a stamped collar, the edge of which can come up against the base at the end of the screw tightening movement.

The screw 30 is disposed within the opening 25 in the central portion of the collector 3, the head 31 of which bears against the collector 3 and the screw-threaded shank 32 thereof is engaged in a screw-threaded hole 36, in a small, rigid, plate 34 fixed to the base on the face away from the slider.

The slider 5 is provided with a stamped collar 37, the edge 38 of which can come to bear against the base 1 when the screw 30 reaches the end of its tightening movement.

What is claimed is:

1. A variable potentiometer comprising
 - a base of insulating material supporting a resistive track having connecting tags electrically connected to the respective ends thereof,
 - a collector fixed to the base and having an annular portion including a frustoconical face, said collector being provided with a further electrical connecting tag,
 - a slider rotatably mounted on the annular portion of the collector contacting the frustoconical face, said annular portion constituting an axis of rotation for the slider, said slider being compressed by the annular portion against said base and supporting a stud for contact with the resistive track.
2. A potentiometer as claimed in claim 1, in which the slider has a slot for the insertion of an adjusting means, said collector having stop-edges defining the

limits of travel of the slider.

3. A potentiometer as claimed in claim 1 wherein the slider comprises

- a ring portion which includes projections in contact with the face of the base,
- a tongue extending radially from the ring portion, said stud in contact with the resistive track and carried by said tongue, and

said potentiometer includes

- a control knob having two protuberances on one face thereof, and
- a stem mounting the knob and passing through the annular portion, said tongue of the slider fitting with slight clearance between said protuberances.

4. A potentiometer as claimed in claim 3, in which the control knob has a central slot intended to receive the end of a screwdriver blade.

5. A potentiometer as claimed in claim 3, wherein the collector has two stop edges, said protuberances engaging one of the stop edges at each limit of travel of the collector.

6. A potentiometer as claimed in claim 1, comprising a screw,

- a plate fixed to the base on the side thereof facing away from the slider and having a tapped aperture therein, the head of said screw abutting against the collector and the shank being engaged in the tapped bore of the plate, said screw serving to apply pressure to the slider.

7. A potentiometer as claimed in claim 6, in which the plate has two springy tabs disposed symmetrically about the centre of the screw and having their tips engaging in the threads thereof.

8. A potentiometer as claimed in claim 6, in which the annular portion of the slider has a stamped collar, the edge of which abuts the base at the termination of the screw tightening movement.

9. A variable potentiometer comprising

- a base of insulating material supporting a resistive track having connecting tags electrically connected to the respective ends thereof,

a collector fixed to the base and having an annular portion including a frustoconical face, said collector being provided with a further electrical connecting tag, said collector and the connecting tags being initially made in one piece and subsequently separated from the collector by a cutting out operation, the base of insulating material having two openings disposed one on each side of the tag of the collector, said openings enabling the other tags, one of which is disposed on each side of the collector tag, to be electrically separated from the collector, and

a slider rotatably mounted on the annular portion of the collector contacting the frustoconical face, said mounting arrangement on said collector constituting an axis of rotation for the slider, said slider being compressed by the annular portion against said base and supporting a stud for contact with the resistive track.

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