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RHEOSTAT OR ADJUSTABLE RESISTANCE AND POTENTIOMETER WITH CONTACT MEMBERS

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Fig. 1

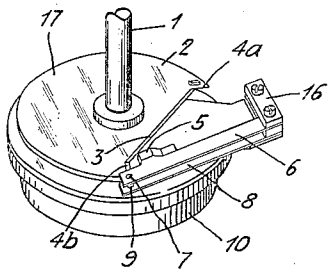
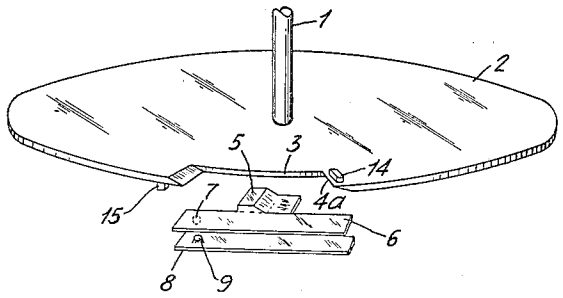


Fig. 2



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RHEOSTAT OR ADJUSTABLE RESISTANCE AND POTENTIOMETER WITH CONTACT MEMBERS

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3 Claims. (Cl. 201—48)

This invention relates to rheostats or adjustable resistances and potentiometers with contact members, which are controlled by the displacement of the operating shaft. These contact members form in combination a switch, which is actuated after passing the contact arm over a certain amount of the resistance unit.

According to one form of the invention a disk is fixed on the rotating shaft of the resistance. This disk is preferably built of insulating material, such as hard rubber, fibre, moulded material such as "bakelite" or "condensite" and the like and bears on its circumference several grooves for making and breaking contact. To effect this the disk is located between contact springs, movably arranged in a normal direction to this disk. The contact springs are pressed against one another or are opened by the radial edges of the groove in the disk. The radial edges are oblique in an opposed sense to one another, so that one of the contact springs during each new revolution of the disk is situated above or below the disk, i. e. it touches the other contact spring or is separated therefrom.

Another object of the present invention is to provide a novel construction of the variable resistance, in which an operation of the switching mechanism takes place, when the adjustable contact of the potentiometer or the like is situated near one of the two ends of the resistance element.

The invention possesses the advantageous feature, that additional operating knobs for switches for instance on receivers for wireless signaling and the like are abolished. For instance it is possible for the enlargement of the volume control of a receiver, to connect in series or parallel to the variable resistance another fixed resistance by the new switching mechanism.

For an illustration of some of the various forms this invention may take, reference is to be had to the accompanying drawing, in which Fig. 1 is a perspective view of one form of my invention.

Fig. 2 is an enlarged view showing further details of the new contact mechanism.

In Fig. 1 the new arrangement of the contact springs on a variable resistance or potentiometer is shown. On the rotatably mounted shaft 1 of the resistance unit is fixed a disk 2 of insulating material, which is provided with a groove or recess 3. The radial edges 4a and 4b of this opening 3 are beveled in opposite directions. During rotation of the disk 2 with the shaft 1 these edges 4a and 4b lower or raise a projection 5, which is situated on a side of the upper contact spring 6. This spring 6 bears on the one end a contact pin 7 and is on the other end screwed on the holder 16, which is fixed in any way to the casing 10 of a variable resistance or potentiometer. This resistance unit is situated on the lower end of the shaft 1 and below the disk 2.

Another contact spring 8 is mounted upon the holder 16 below the spring 6 and bears the contact pin 9. The two contact springs 6 and 8 are insulated from one another. The projection 5 is S-shaped and therefore depressed if it is touched by the edge 4a, which forms a sharp angle with the surface 17 of the disk 2. By this manipulation a desired circuit is closed by the springs 6 and 8.

The projection 5 with spring 6 is lifted, if the edge 4b of the disk 2 passes below it. In this case the circuit is opened. The edge 4b forms a sharp angle with the lower face of disk 2.

Without further explanation it is evident that the projection 5 is sliding in the first case on the lower surface of disk 2, but in the latter on its upper surface.

The movement of the shaft 1 with disk 2 and a contact arm may be limited to a range of about three hundred degrees by stops, which are placed in the resistance unit 10. In this case the projection 5 is situated either before the edge 4a or 4b corresponding to the end positions of disk 2. This arrangement is shown in Fig. 1. It will therefore be understood that by reversing the direction of rotation, if the disk has reached its end position, a switching is effected, i. e. the two contact springs 6 and 8 are pressed against one another or are separated.

In a modification the stops are mounted on the disk 2, secured to the rotatable shaft 1. These stops have the form of cams and noses and are situated near the edges 4a and 4b of the opening 3 on the surface or rear of disk 2, but always on that side of disk 2, which forms the acute angle with the corresponding edge.

This modification is shown in Fig. 2, but without a resistance unit and mounting for the contact springs. Ordinarily the contact spring 6 is not touching with its contact pin 7 that of contact spring 8, but during movement of disk 2 contacts 6 and 8 are pressed to one another. This is effected by the edge 4a, which presses downward the contact spring 6 by the projection 5. Near the edge 4a is secured to the surface of disk 2 the stop 14. The spring 6 keeps its position during a movement of the disk 2 over a range

of about three hundred degrees in the same direction. In the end position the disk 2 is stopped by an abutment, not shown, touched by the stop 15. After moving the disk in the reverse direction the contact pins 7 and 9 are separated in the opening 3, shown in the Fig. 2. Continuing this direction of movement the edge 4b lifts spring 6, sliding therefor on the surface 17 of the disk 2, which is stopped finally by the stop 14. Now a rotation of the resistance can only take place in that direction, firstly named, while the switch is held open.

In another modification of the new resistance unit the contact springs may be situated with their large dimension in radial direction to the disk, in which case the contact pins are positioned in the opening or groove of this disk, preferably on its middle plane. Careful performance of all parts is necessary in this case.

It will be understood, that the invention is susceptible of various changes and modifications without departing from the spirit thereof and it is not, therefore, desired to limit or restrict the same.

What I claim is:

1. A combined resistor and switching device comprising the combination of a casing, a rotatable shaft passing into said casing, a resistor element within said casing, an arm carried by said shaft and in contact with said resistor, an insulating disc carried by said shaft and having a slot in its periphery, the radial bounding edges of said slot forming oppositely disposed acute angles with reference to the respective upper and lower surfaces of said disc, a movable contact member having a projecting portion disposed within said slot, a single fixed contact member which is normally out of contact with said movable contact member when said projecting portion is in engagement with the upper surface of said disc during a large angle of rotation of said shaft and contact arm, said movable contact member being in contact with said fixed contact member when said projecting portion is in engagement with the lower surface of said disc during a large angle of rotation of said shaft and contact arm.

2. In an electrical control device, the combination of a variable resistor, a shaft, an arm secured to said shaft and engaging said resistor, a flat disc secured to said shaft and having an opening formed near its periphery, upper and lower contact springs mounted near said opening, said upper spring having a projecting portion arranged to lie in said opening and so shaped as to be moved into engagement with the upper face of said disc when said shaft is rotated in one direction to open said contact springs and maintain them open while said shaft is moved through an angle of more than 180° in said direction and to be moved into engagement with the lower face of said disc upon movement of said shaft in the opposite direction to close said contact springs and maintain them closed while said shaft is moved through an angle of more than 180° in said opposite direction.

3. The combination defined in the preceding claim in which a member is secured to each face of said disc near the opposite ends of said opening, said members cooperating with the projecting portion of said spring to limit the rotation of said shaft.

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