Sept. 29, 1970 M. W. BANG 3,531,756

VARIABLE RESISTOR WITH TILTING CONTACT FOR TIME ADJUSTMENT

Filed May 5, 1969

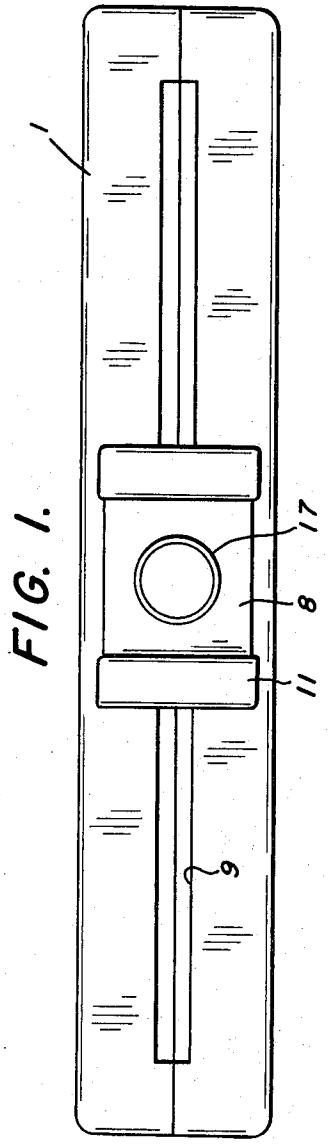

FIG. 1.

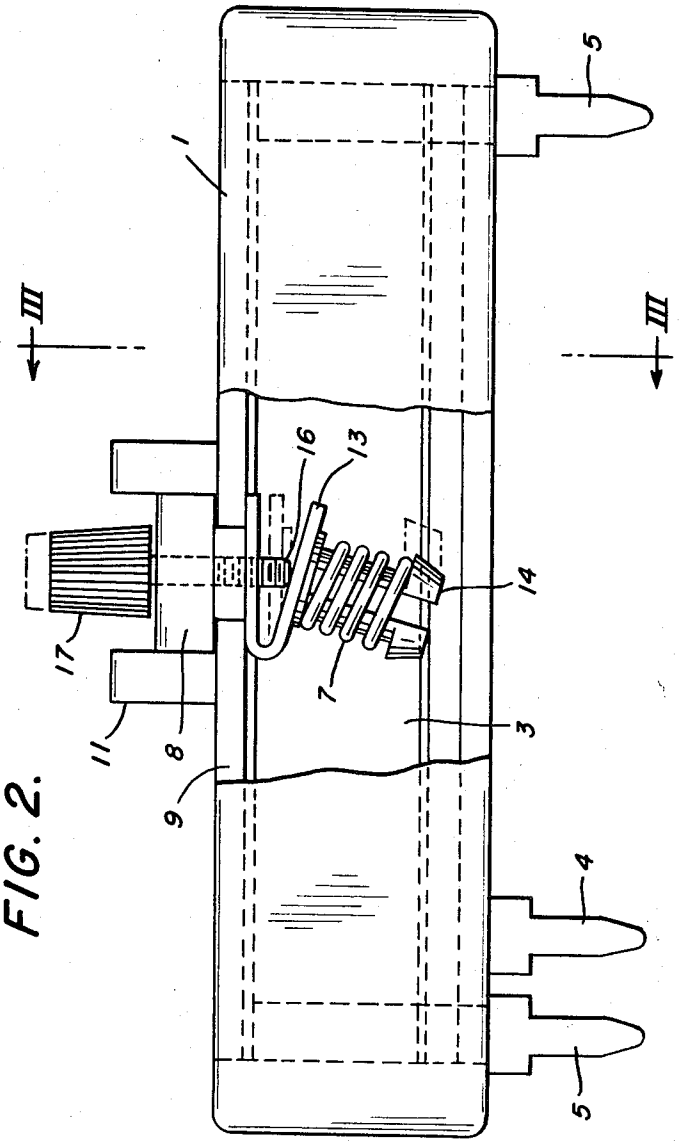

FIG. 2.

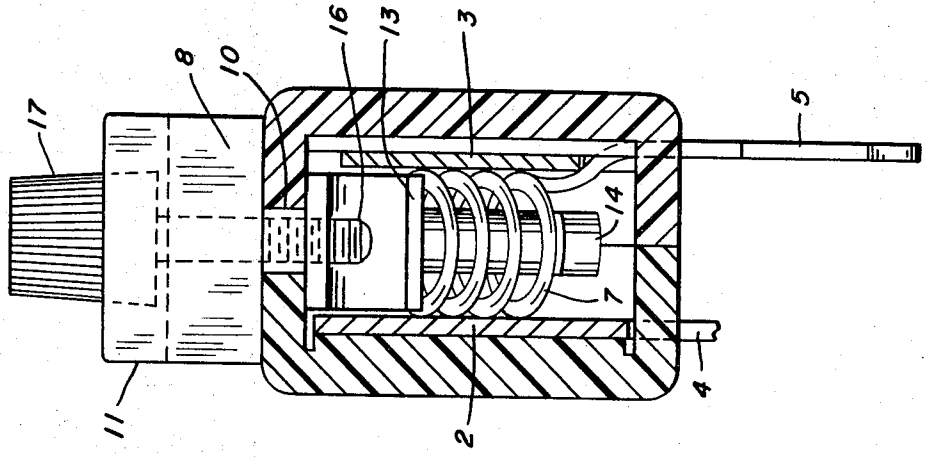

FIG. 3.

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VARIABLE RESISTOR WITH TILTING CONTACT FOR FINE ADJUSTMENT

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U.S. Cl. 338—181 6 Claims

ABSTRACT OF THE DISCLOSURE

An actuator is movable alonge the edges of parallel resistance and collector strips mounted in a case. Inside the case behind the actuator there is a plate that has one end resiliently connected to one end of the actuator. This plate holds a rewardly extending bridging contact between the strips. Threaded in the actuator is a screw that has an inner end pressing against the plate and that can be turned to tilt the plate away from the actuator to move the bridging contact lengthwise of the strips slightly.

Linear motion variable resistors, such as potentiometers, are well known and are provided with actuators or slides that adjust contacts along resistance elements. In some cases it is desirable to be able to make finer adjustments than can be accomplished conveniently by normal movement of the actuators. It is therefore among the objects of this invention to provide a linear motion variable resistor in which coarse and fine adjustments can be made by separate adjustments, and in which the fine adjustments can be made quickly and easily after any coarse adjustment.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

FIG. 1 is a front view of a potentiometer;

FIG. 2 is a side view thereof with part of it broken away; and

FIG. 3 is an enlarged cross section taken on the line III–III of FIG. 2.

Referring to the drawings, the long rectangular case **1** of a variable resistor, such as a rheostat or potentiometer, may be formed from a molded plastic or other suitable rigid material. The case preferably is made from two molded half sections that have meeting edges extending from front to back across the end walls of the case and lengthwise along its back or base. The half sections are joined tightly together in any suitable manner. Inside the case a metal collector strip **2** and an electrical resistance strip **3** are mounted at the opposite sides and are parallel. The collector strip is provided with an integral terminal **4** that extends through the back of the case, while each end of the resistance strip is connected to a metal terminal **5** likewise extending through the back.

Between the two strips there is a bridging contact **7** that engages both of them. This contact can be moved lengthwise of the strips by an actuator that is movable along the front edges of the strips. For example, the actuator may be a slide **8** that is slidably mounted in a central solt **9** extending lengthwise of the case in its front or top. The slide has laterally opening grooves **10** in its opposite sides receiving the side walls of the slot to hold and guide the slide. The ends of the outer side of the slide may be provided with projections **11** for moving the slide lengthwise back and forth along the slot by hand.

It is a feature of this invention that the bridging contact is not connected directly to the actuator or slide, but to a small plate **13** behind the slide. This plate normally is parallel to the slide as shown in dotted lines in FIG. 2, and one of its ends is resiliently connected to the corresponding end of the slide. Preferably, the plate and

slide are molded in one piece from a synthetic plastic, although they could be metal or at least the connection between plate and slide could be metal. The bridging contact extends rearwardly from the plate, by which it is supported. The bridging contact **7** may take various forms, such, for example, as a wire coil, the axis of which is substantially perpendicular to the plate. A convenient way of connecting the coil to the plate is to provide the plate with a central post **14**, on which the coil is mounted. This post may be integral with the plate. When the plate is in its normal dotted line position, the post and bridging contact will extend across the resistance and collector strips at right angles thereto.

The central portion of the slide is provided with a threaded opening through it, in which an adjusting screw **16** is mounted. The inner end of the screw presses against the central portion of plate **13**. The outer end of the screw is provided with means, such as a knob **17**, for turning it so that the screw can be screwed inwardly to tilt the plate away from the slide as shown in full lines in FIG. 2. This will, by changing the angle of the bridging contact with the resistance strip, move the contact along the strip a slight distance and thereby change the adjustment of the potentiometer. Since the angle will be changed very slightly, even when the screw is turned a full 360°, it will be seen that it is easy to make extremely fine changes or adjustments by turning the knob a few degrees after the slide has been moved to an approximately correct position. If the screw has previously tilted plate **13** away from the slide, reversing the screw will allow the plate to spring back toward its original unstressed position parallel to the slide.

I claim:

1. A linear motion variable resistor comprising an elongated case, parallel resistance and collector strips mounted therein at its opposite sides and extending lengthwise thereof, said strips having front and rear edges, an actuator movable along the strips at their front edges, a plate inside the case behind the actuator with one end resiliently connected to one end of the actuator, the plate extending lengthwise of the case, a bridging contact extending rearwardly from the plate and engaging both of said strips, means supporting said contact from the plate to move the contact lengthwise of the strips with the actuator, and an adjusting screw threaded in the actuator and having an inner end pressing against the plate, the screw being adapted to be turned from its outer end in order to tilt the plate away from the actuator for fine adjustment of the resistor.

2. A linear motion variable resistor according to claim **1**, in which said plate normally is parallel to the slide.

3. A linear motion variable resistor according to claim **1**, in which said plate is integral with the actuator.

4. A linear motion variable resistor according to claim **3**, in which said actuator and plate are a synthetic plastic.

5. A linear motion variable resistor according to claim **1**, in which said supporting means is a post, and said bridging contact is a wire coil encircling the post.

6. A linear motion variable resistor according to claim **5**, in which said actuator and plate and post are an integral synthetic plastic unit.

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