Oct. 8, 1929. J. DE GIOVANNI 1,731,003

ELECTRIC CIRCUIT CONTROL DEVICE

Filed Feb. 2, 1927

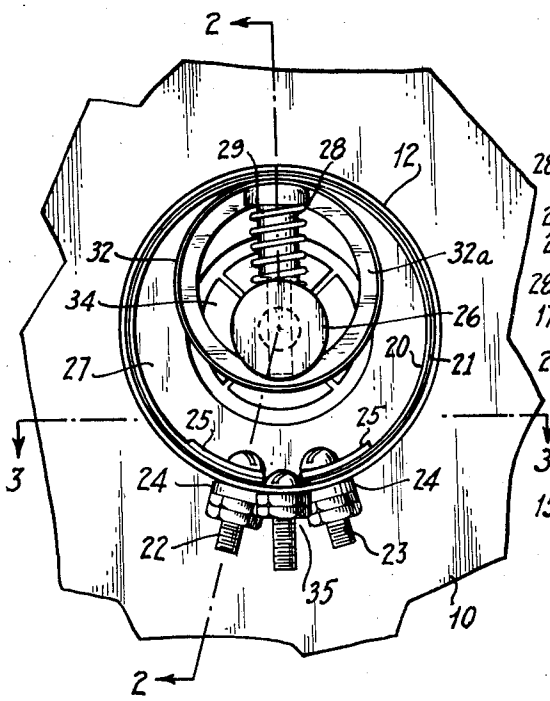


Fig. 1

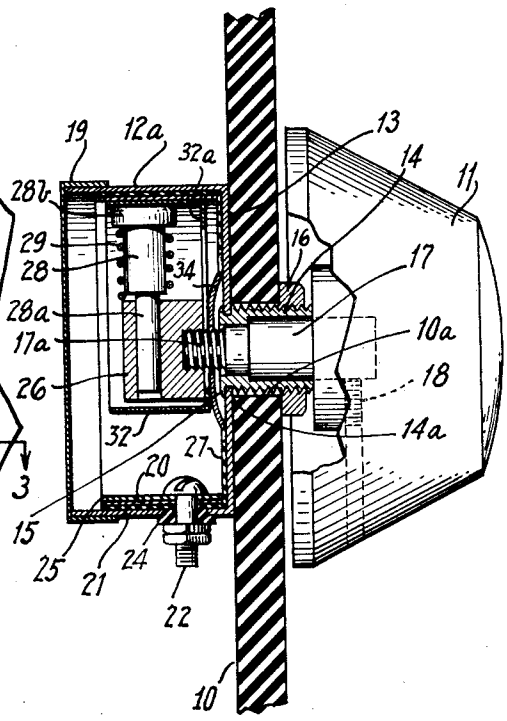


Fig. 2

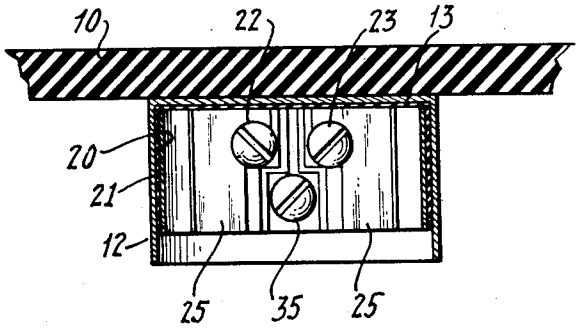


Fig. 3

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UNITED STATES PATENT OFFICE

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ELECTRIC-CIRCUIT-CONTROL DEVICE

Application filed February 2, 1927. Serial No. 165,447.

This invention relates to electric circuit control devices.

An object of the invention is to provide a device of the character described of improved construction having incorporated therein a novel form of resistance element and adjustable contacting means cooperating therewith.

Another object of the invention is to provide a device of the character described in which the parts are combined in an improved manner to provide a small, compact, enclosed structure.

Still another object of the invention is to provide an improved device of the character described which shall comprise few and simple parts, which are easy to assemble, be rugged in construction yet neat in appearance, cheap to manufacture, and practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a rear elevational view of a device embodying the invention shown mounted on a panel board, with the casing closure removed to expose the interior construction.

Figs. 2 and 3 are views with the cover in place corresponding to cross-sections taken on lines 2—2 and 3—3, respectively, of Fig. 1.

Referring now more specifically to the drawings, the invention is shown as being mounted upon a suitable support, as against the rear side of a panel board 10. For operating the device preferably a knob 11 is provided.

The device includes a casing 12 which may be made of metal, and is preferably of curved or cylindrical form. Said casing has a closed side 13 preferably formed integral with the wall portion 12^a thereof, said side serving as a base for abutting the panel board. A sleeve 14 is rigidly secured to extend outwardly from the side 13 in any suitable manner, as by providing a shoulder portion 14^a having an annular end flange 15, the latter being overturned to clamp said side 13 between said flange and the shoulder portion 14^a as shown in Fig. 2. The sleeve 14 projects through an opening 10^a in the panel board, and is locked thereto by a nut 16 threaded on said sleeve. The control knob 11 is mounted on one end of a shaft 17 which is journaled in the sleeve 14, a set screw 18 serving to fixedly secure the knob to the shaft end. The other end 17^a of the shaft projects into the casing and has a head or stud 26 threaded thereon which carries an arm 28 movable transversely of said shaft under the compression of a spring 29. Said arm is provided at one end with a pin portion 28^a which is adapted to slidably engage the head 26, the other end 28^b of said arm being enlarged to form a shoe against which said spring acts, as is clearly shown in Figs. 1 and 2. A contact roller 32 is rotatably mounted in the casing eccentrically with respect to the axis of the shaft 17 and is actuated by the arm 28. Said roller is formed of a cylindrical shell structure having an annular inturned flange 32^a along one peripheral edge thereof, said flange being adapted to engage the head 26 when assembled, as shown in Fig. 2.

An electrical resistance member or element 20 is supported by the walls of the casing perferably within the interior thereof. Said electrical resistance member 20 may be of any suitable construction and as here shown consists of a flexible fibrous strip of resistance material such as described in my co-pending application, Serial No. 164,128, filed Jan. 27, 1927, said member being positioned in curved or circular manner on the interior wall portion 12^a of the casing. A flexible strip of insulating material 21 is interposed between the resistance member 20 and said wall portion 12^a, both the resistance member and insulating strip being anchored at their ends to a portion of said casing wall by terminals or binding posts 22 and 23, said posts being insulated from the casing by bushing 24. The insulating strip and resist-

ance member are preferably firmly attached in a suitable manner, as by means of an adhesive, to the wall 12ª of casing 12. A disc 27 made of a sheet of insulating material may be provided to lie against the casing side 13 serving as a liner between the latter and the inner edge of the resistance element 20.

As seen from Fig. 2, the arm 28 bears internally on the roller 32 to resiliently press the latter into contact with the resistance member 20 and also causes said roller to smoothly ride over the member 20 on manipulation of the knob 11 to rotate said arm. Thus, it is seen that the rotation of the roller 32 provides a non-abrasive, relatively large contact with the resistance member since the latter may be formed of substantially wide and flat sheet material.

A resilient means such as a spring washer 34 mounted within the casing on the shaft end 17ª and acting between the casing side 13 and flange 32ª insures good electrical contact between the roller 32, the casing side 13 and the head 26, and serves also to take up any play or possible looseness due to wear between said head and casing side.

Terminal plates 25 overlie the ends of strip member 20 and are held in position by screws of the terminal posts 22 and 23, said plates serving to contact the roller 32 on movement thereof to its extreme rotated clockwise and counter-clockwise positions for directly connecting the roller and casing circuit portions of the device with an external circuit (not shown) through said terminal posts.

The casing which forms a current carrying portion of the device carries a suitable terminal 35 to facilitate connecting the casing in circuit.

A removable cap 19 may be provided to enclose the resistance member and the movable parts coacting therewith within the casing.

The device can be used as a rheostat or a potentiometer by connecting it in circuit in the well understood manner. When used as a rheostat, the terminal post 35 is connected to either of the terminal posts 22 and 23, and when used as a potentiometer a source of current is connected between terminal posts 22 and 23 and the circuit through the device tapped at the post 36.

It will be noted that the device forms a very small, compact, and relatively inexpensive piece of apparatus in which the movable parts may be enclosed to guard them against accidental injury.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a device of the character described, the combination with an electrical resistance member, of means for making contact therealong including a shell roller having an inwardly extending annular rim flange, a stud extending within the roller, the stud having a shoulder portion to engage said flange, and an arm extending from the stud to contact the roller, said arm serving to press the roller against the resistance member and having a slidable engagement with said roller to permit the latter to rotate on turning said arm.

2. In a variable resistance unit of the character described, having a roller contact member, actuating means for said roller housed within said roller, said means comprising a stud extending within said roller, and a spring pressed plunger having a portion slidably received in said stud.

3. In a variable resistance unit of the character described, a roller contact member having an inwardly extending flanged portion, actuating means for said roller comprising a stud extending within said roller, and a spring pressed plunger mounted on said stud, said plunger contacting said roller and said stud engaging said flange.

4. In a variable resistance unit of the character described, having a roller contact member, said member comprising a shell having an inwardly extending annular flange, an actuator for said member having a portion engaged by said flange, and a spring on said actuator maintaining said actuator and said flange in close contact.

5. In a variable resistance unit, a casing, a resistance strip mounted in said casing and insulated therefrom, a flanged roller for contacting said strip, means for moving said roller comprising a shaft extending within said roller, an element on said shaft for engaging said roller, and resilient means for pressing said element and roller into electrical contact, said shaft having a portion engaging said flange.

In testimony whereof I affix my signature.

JOHN DE GIOVANNI.