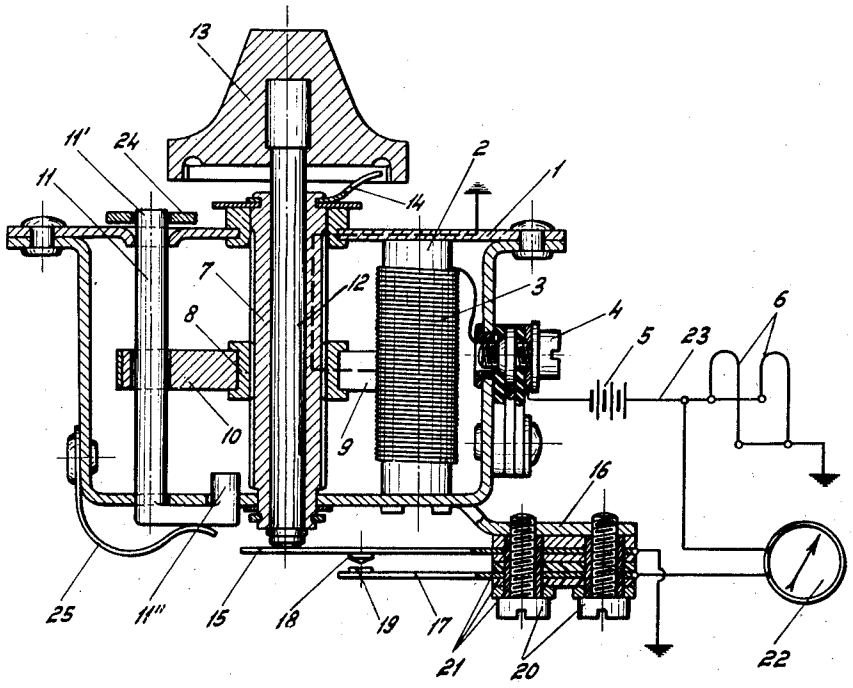
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VOLTAGE CONTROL DEVICE

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VOLTAGE CONTROL DEVICE

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2 Claims. (Cl. 201—48)

This invention relates to devices for voltage control in electric circuits and is primarily concerned with a device of this class which is particularly adapted for radio receivers operated from primary or secondary batteries.

The device of this invention includes, in addition to means for gradually inserting a resistor into the circuit to be controlled, a member which is influenced by the control means for said resistor in such manner as to be moved into a determined position when said resistor is entirely inserted into the circuit.

Accordingly, by using said member to lock a part adapted to prevent the removal of the supply battery, the result is that an exhausted battery may be removed and a fresh or charged battery substituted therefor only when said resistor has been entirely inserted into the circuit.

In this manner any possibility of injury to the circuit elements is obviated.

An embodiment of the device of this invention is shown by way of example in the single figure of the annexed drawing, said figure illustrating the device in section and inserted in a circuit which includes a battery, filaments to be operated therefrom, and a voltage meter and a switch therefor, these several parts being shown diagrammatically.

The device includes a casing 1 of conducting material in which an insulating former 2 is mounted and carries a resistor wire 3 coiled thereon; said wire 3 having one end connected with an insulated terminal 4 which in turn is connected with one terminal of a battery 5 whose opposite terminal is connected to one end of each of filaments 6. The opposite ends of said filaments and said casing 1 are also grounded as shown diagrammatically on the drawing.

A screwthreaded hollow spindle 7 is mounted to rotate in the casing 1 and a nut 8 is mounted on the spindle. The said nut 8 carries a brush 9 adapted to move along and in contact with said coiled resistor wire 3 and has an arm 10 slidably embracing a rod 11 secured to the casing 1 to prevent said nut 8 from rotating. The brush 9 is grounded through conducting nut 8, spindle 7 and casing 1. A stem 12 extends through said hollow spindle 7 and carries a manipulating knob 13 at one end. To effect engagement of the knob 13 with the spindle 7, this latter has a resilient arm 14 fast therewith and arranged to frictionally engage the opposed surface of the knob 13.

A blade spring 15 is mounted on an extension 16 of the casing 1 and has its end in engagement with the end of the stem 12 opposed to the end thereof which carries the knob 13, said spring acting to hold the knob 13 normally spaced from the resilient arm 14. A second blade spring 17 is mounted on the extension 16 and is insulated therefrom, cooperating contacts 18, 19 being located on springs 15 and 17. The blade springs 15, 17 are secured to casing extension 16 by means of screws 20 and insulating parts 21.

The adjustment of springs 15, 17 is such that their contacts 18, 19 are spaced from each other when the spring 15 has its normal configuration and position in which it holds the stem 12 and knob 13 in a longitudinal position with the knob 13 disengaged from arm 14 of spindle 7.

A voltage meter 22 is in circuit across the lead 23 connecting the battery 5 with filaments 6 and the insulated contact spring 17.

The rod 11 extending in the casing 1 parallel with the spindle 7 is mounted to move longitudinally thereof in the casing 1 and its end portion 11' adapted to engage a part 24 of a cover (not shown) of a box in which the battery 5 is enclosed. A spring 25 resiliently holds said rod 11, 11' in the position in which its end portion 11' engages said part 24.

Said rod 11 also carries a finger 11'' arranged in the path of the nut 8 and adapted to be shifted by said nut 8 when this latter reaches the lower end of its movement along the spindle 7.

The screw threads of the spindle 7 and nut 8 preferably have a very short pitch so that a very short displacement of the nut 8 and brush 9 is caused by each revolution of the spindle 7, this arrangement making the voltage adjustment very gradual, for the above stated purpose.

As above described the manipulating knob 13 is usually free from the spindle 7 due to the action of the spring 15 on the knob stem 12. To operate the same, the operator is required to exert a longitudinal pressure on the knob 13 and stem 12 at the time he rotates it, to cause said knob 13 to engage the resilient arm 14 of spindle 7 and drive this spindle with the nut 8 and brush 9. The said manipulation causes the spring 15 to carry its contact 18 into engagement with contact 19 of the spring 17 and thus the meter is inserted in circuit across the battery 5 and ground at the time the device is manipulated.

A reading of the battery voltage is thus secured each time a manipulation is started and such a reading continues throughout the entire operation, while the meter 22 is automatically cut out of the battery circuit during the time

the device is not manipulated, to avoid undue consumption of energy from the battery 5.

Having in mind that the battery voltage is decreasing during the time of operation of the set, the manipulation of the device consists in causing the brush 9 to move gradually towards the end of resistor wire 3 which is connected with terminal 4 and battery 5 in order to reduce the resistance inserted by the device into the battery circuit. Consequently at the time a fresh battery is required to be substituted for the exhausted one and the resistor 3 is substantially out of circuit, the nut 8 is at the end of its movement spaced from the finger 11'' or at least this finger is released from said nut 8 owing to the described relationship of parts. Under the above stated conditions, the part 24, which is assumed to be connected with the cover of the battery box, is engaged by the portion 11' of the rod 11 and the operator is prevented from substituting a fresh battery for the exhausted one.

To replace the exhausted battery by a new one, the operator is required to manipulate the knob 13 and spindle 7 in a direction to shift the nut 8 and brush 9 towards finger 11'' thus causing the full resistor wire 3 to be put into the circuit preparatory to the insertion of a fresh battery in the circuit.

What I claim as my invention and desire to secure by United States Letters Patent is:

1. A rheostat comprising a resistor member, a brush movable with respect to and in contact with said resistor member, means comprising a hollow screw threaded rotatable spindle and a nut engaged with said screw threaded spindle to be reciprocated therealong to actuate said brush, a manipulating knob cooperating with said brush actuating spindle for the drive thereof, a locking member movable to take a retracted and a projecting position to release and engage an associated part, and means biasing said locking member in projecting position, said locking member having a portion which extends in the path of said nut at one end of the stroke thereof for being moved by said nut into retracted position when said nut reaches the said stroke end.

2. A rheostat comprising a resistor member, a brush movable with respect to and in contact with said resistor member, means comprising a hollow screw threaded rotatable spindle and a nut engaged with said screw threaded spindle to be reciprocated therealong to actuate said brush, a stem loose and axially movable within said hollow spindle, a manipulating knob fast on said stem, a resilient arm fast on said spindle and extending transversely therefrom to frictionally engage the surface of said knob in front thereof when said knob is moved towards said spindle, means biasing said stem and knob into a position with said knob released from said spindle arm, a locking member movable to take a retracted and a projecting position to release and engage an associated part, and means biasing said locking member in projecting position, said locking member having a portion which extends in the path of said nut at one end of the stroke thereof for being moved by said nut into retracted position when said nut reaches the said stroke end.

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