

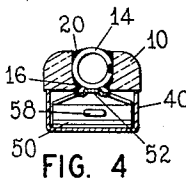
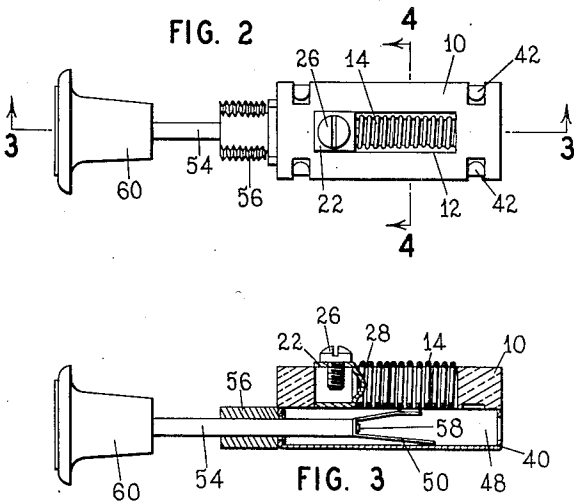
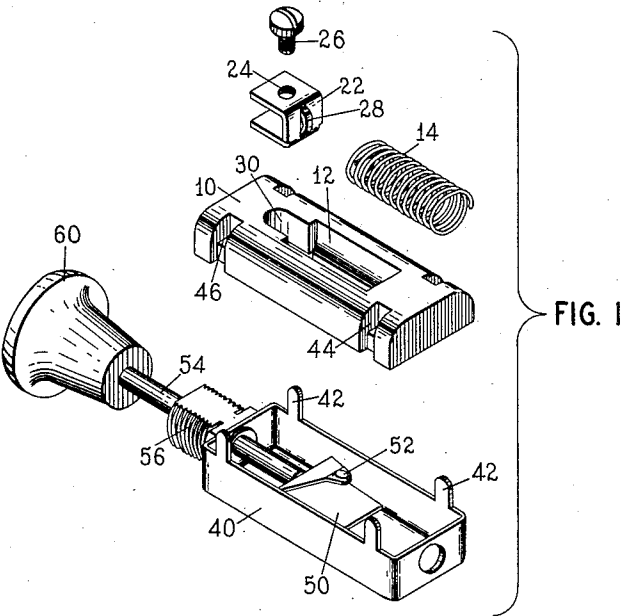
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PUSH-PULL RHEOSTAT

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PUSH-PULL RHEOSTAT

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This invention relates to rheostats of the push-pull type wherein a contact element is pushed or pulled along a coil of resistance wire to any desired position, the contact element and an end of the resistance coil being connected to leads from an electric circuit, whereby any desired number of turns of the resistance coil can be cut into or out of the circuit.

An object of the invention is to provide a rheostat which is simple and rugged in structure and which is made of parts which are easily and cheaply made and assembled. As hereinafter described in more detail, a rheostat is provided in which a helical resistance coil is embedded and secured in a slot which extends through an insulating housing member which is a rectangular block about as thick as the diameter of the coil. To this block is attached a box-like member of sheet metal or any other suitable material, thus forming an enclosure in which a contact member is movable in contact with successive turns of the coil, a portion of each turn being exposed through the slot in the insulating block.

For a more complete understanding of the invention reference may be had to the following description thereof and to the drawing of which:

Figure 1 is an exploded view of a rheostat embodying the invention;

Figure 2 is a plan view of the same;

Figure 3 is a section on the line 3-3 of Figure 2; and

Figure 4 is a section on the line 4-4 of Figure 2.

The rheostat illustrated in the drawing includes a housing comprising a top member or block 10 which is preferably of suitable refractory material. This top member is of substantial thickness and is provided with a central longitudinal slot 12 extending through the member from top to bottom. This slot is of sufficient width to receive a helical coil 14 of resistance wire, the diameter of this coil being substantially equal to the width of the slot, the length of the coil being substantially equal to the length of the slot. The walls of the slot converge slightly toward each other near the bottom thereof, as indicated at 16 in Figure 4. Thus, when the coil 14 is inserted in the slot 12, it does not fall through but is caught by the converging lower portions of the side walls. In order to maintain the coil permanently in place, a layer of refractory cement 20 is applied to each of the side walls of the slot. The portions of the turns of the coil 14 which bear against the side

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walls of the slot are embedded in the cement 20, the latter gripping the coil firmly when it hardens. Since the cement is restricted to the side walls of the slot, portions of the coil remain exposed at the top of the member 10 and also at the bottom of the slot 12. Before the coil 14 is inserted in the slot 12 in the course of assembling the rheostat, an end thereof is secured to a terminal member 22. As indicated in Figures 1 and 3, this member may conveniently be made of a strip of metal such as copper or brass bent to a U shape. One leg of the U is punched and tapped to form a threaded hole 24 to receive a binding screw 26 by which the end of a wire can be attached to the terminal 22. The mid-portion of the terminal 22 is provided with a struck-up strip 28 under which an end of the coil 14 is thrust. The struck-up element 28 is then pressed down to pinch the wire and thus to make a good electric connection between the coil 14 and the terminal 22. The terminal and coil can then be inserted as a unit in the member 10, the slot 12 being provided with an extension 30 of reduced width to accommodate the screw 26 when the terminal is assembled with the block 10 as indicated in Figure 3.

The other member of the housing is a box-like receptacle 40 of sheet metal such as soft steel which is pressed into suitable shape as shown in Figure 1. The receptacle 40 is preferably provided with a number of up-standing ears 42 adapted to be bent into recesses 44 in the sides of the block 10 so as to overlap shoulders 46 in the recesses 44. These ears, when thus bent, hold the housing members 10 and 40 in assembled relationship in which they enclose a chamber 48 which is ventilated through the slot 12.

Slidable in this chamber is a contact member 50 which has an element 52 arranged to engage the portion of the coil 14 exposed through the bottom of the slot 12. The element 52 is resiliently pressed against the coil 14 by any suitable means. For this purpose, the contact member 50 may be made of spring metal such as brass and be bent into U shape, one leg of which presses against the floor of the receptacle 40, which is opposite to the bottom of the block, the other leg of the member 50 terminating in the element 52 which is pressed against the coil 14. The contact member 50 is attached to the end of a stem 54 which slides through a bearing member 56 at one end of the receptacle 40. The end of the stem 54 may conveniently be secured to the contact member 50 by peening a reduced end

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55 of the stem after it has been inserted through a hole in the mid-portion of the contact member 50. A finger knob 60, preferably of insulating material such as a synthetic resin is mounted on the other end of the stem 54 to facilitate manipulation thereof.

In operating the rheostat, the stem 54 is pushed or pulled to move the contact element 52 along the coil 14 where it is exposed through the bottom of the slot 12. The element 52 thus moves from turn to turn of the coil. Since the element 52 and the terminal 22 are connected in an electric circuit, such movement results in cutting in or cutting out successive turns of the coil 14, thus increasing or decreasing the electrical resistance in the circuit in the usual manner. In the rheostat illustrated on the drawing, the bearing member 55 is grounded, the terminal 22 being adapted to be connected to the charged wire of the circuit.

I claim:

1. A rheostat having a housing which includes a block of insulating material having a longitudinally extending slot therethrough, said slot being slightly narrowed at the bottom thereof, a helical coil of resistance wire secured in said slot, the diameter of said coil being substantially equal to the width of the slot, said housing also including a conducting member spaced below the bottom of said slot, a contact element slidable in said housing with a portion resiliently pressing against the portion of the coil exposed through the bottom of said slot and a portion pressing against said conducting member, and a terminal mounted on said block and electrically connected to an end of said coil.

2. A rheostat having a housing which includes an elongated block of insulating material having a longitudinal slot therethrough, said slot being slightly narrowed at the bottom thereof,

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said housing also including a box-like sheet metal member secured to the block and forming a chamber therewith, a helical coil of resistance wire secured in said slot, said coil having a length and diameter substantially equal to the length and width respectively of said slot, a contact member slidable in said chamber in simultaneous contact with the portion of the coil exposed through the bottom of said slot and with said sheet metal housing member, an operating stem attached to said contact member and projecting out through an end of said sheet metal member, and a terminal on said block electrically connected to an end of said coil.

3. In a rheostat, an elongated block of refractory material having a longitudinally extending slot therethrough from top to bottom, said slot being slightly narrowed at its bottom, a helical coil of resistance wire in said slot, said coil having a diameter substantially equal to the width of said slot whereby said coil seats against the side walls of the slot where it narrows at its bottom, a layer of refractory cement on each side wall of said slot in which adjacent portions of the turns of said coil are embedded to anchor the coil in the slot, and a terminal member mounted on said block and electrically connected to an end of said resistance wire.

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