Dec. 12, 1950 A. SHARENOW 2,533,519

CARBON RESISTOR RHEOSTAT

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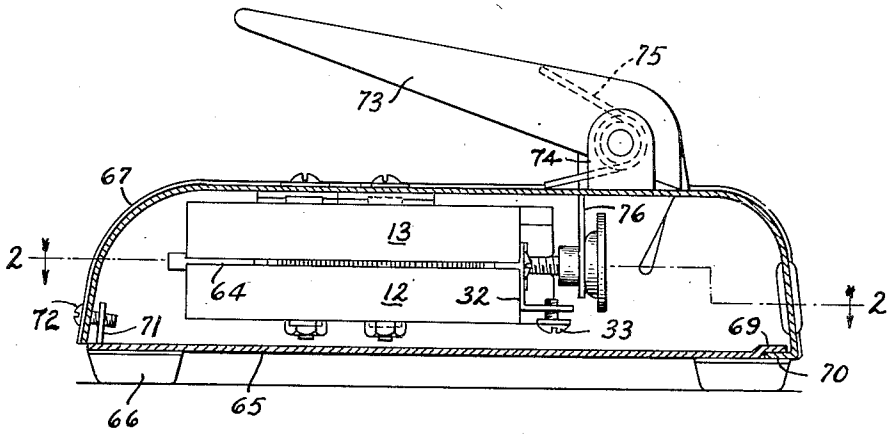



FIG. 1

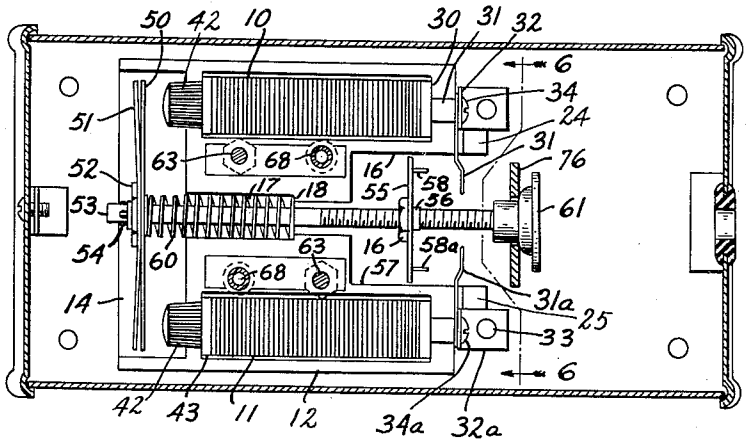



FIG. 2

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FIG. 4

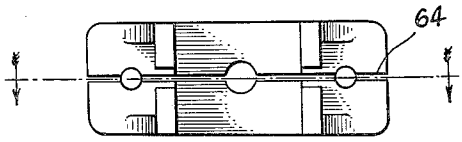



FIG. 5

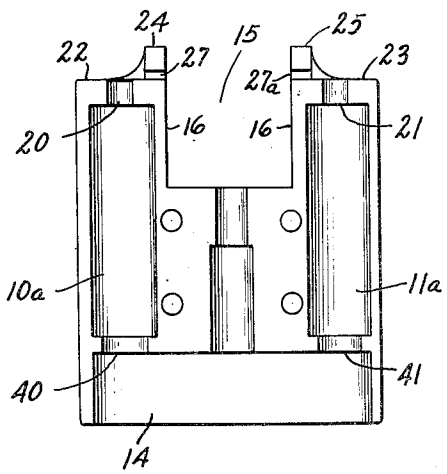
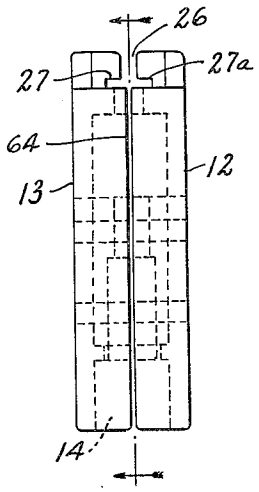



FIG. 3



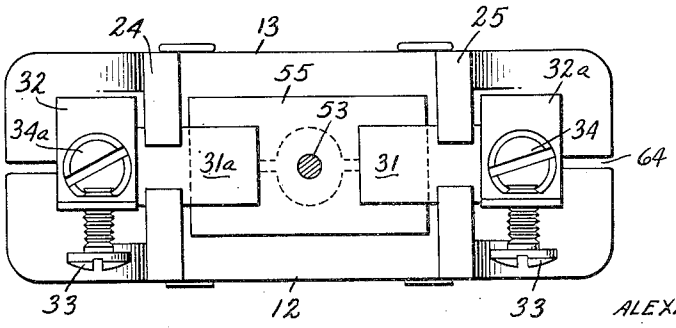




FIG. 6

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## CARBON RESISTOR RHEOSTAT

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Application October 15, 1948, Serial No. 54,658

3 Claims. (Cl. 201—48)

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The subject of this invention relates to carbon disc rheostats, such as are intended particularly for regulating the voltage in motor circuits and especially those of fractional horsepower by the compression of said discs.

My invention has for its object to provide a carbon disc controller of an improved construction in which it is possible to obtain a gradual controllable resistance operating over a wider range of current variation without overheating.

Another object of my invention is to provide certain improvements in the construction of carbon disc current controllers whereby the various parts may be readily assembled and those which are subjected to resistance heating are readily ventilated to prevent them from overheating due to the resistance interposed in a power circuit in which the rheostat is placed.

A still further object of my invention is to provide a special casing and the mounting therein of a resistance of the type aforementioned in conjunction with an operating treadle by means of which the voltage in an electric circuit may be regulated to a nicety.

To these and other ends my invention comprises further improvements and advantages as will be further described in the accompanying specification, the novel features thereof being set forth in the appended claims.

In the drawings:

Figure 1 is a side elevation of a resistor unit embodying my invention showing the same mounted in its casing, the latter being shown as it appears in section longitudinally.

Figure 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1.

Figure 3 is a side elevation of the two part porcelain casing containing the circuit control elements.

Figure 4 is a top plan view of the casing as seen in Fig. 3.

Figure 5 is an interior view of one of the two similar sections of the casing as seen when viewed along the line 5—5 of Fig. 3, and

Figure 6 is an enlarged end view similar to Fig. 4 as seen when looking in the direction indicated by the section line 6—6 of Fig. 2.

Similar reference numerals, in the several figures, indicate similar parts.

In carrying out my invention I provide a controller having two parallel piles of carbon resistance discs 10 and 11 as shown in Fig. 2. Each pile is composed of a large number of discs which being very thin are difficult to handle without injury. In addition to this I have learned in practice that in transmitting current there is often a tendency for certain of the discs, or the pile as a whole, to become overheated. Therefore, in order to aid in the assembly of the piles and prevent overheating of the discs I provide a special form of mounting for them.

The mounting proper comprises duplicate parts

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arranged face to face in spaced relation and which may be defined as a lower or bottom member 12 and an upper or top member 13, each being of insulating material, preferably moulded porcelain. The mounting as a whole is generally rectangular in outline. At its rear end is a transversely extending recess 14 and at its forward end is a throughway opening 15 having spaced parallel walls 16. At the bottom of said opening there is a passage 17 connecting it with the recess 14. The two ends of this passage are of different diameters thus providing it midway with a shoulder 18.

Referring now to Fig. 5 which is an interior view of one of the members of the mounting, said members being duplicates, the above described features will be seen in addition to which there are shown the parallel semi-circular grooves or depressions 10a—11a for the reception of the disc piles 10—11. At the forward end of these grooves are apertures 20—21 which terminate in the outer flat end faces 22—23 of the mountings from which there extend outwardly short projections 24—25 one edge of each of which forms an extension for one of the side walls of the recess 15. The extensions 24—25 on the respective members 12 and 13 do not meet on their proximate edges, but are separated, as indicated at 26 in Fig. 3, and at their bottoms each is recessed in line with the end faces 22—23, as shown at 27—27a.

The purpose of the described construction of the forward ends of the members 12—13 is as follows: In the ends of the grooves 10a—11a I provide contact elements against which one end of the disc piles are compressed. They are of metal and comprise flat circular heads 30 having on their outer sides short necks 31 lying in the recesses 20—21. Extending inwardly on each of the faces 22—23, bridging the parting line between the members 12—13 of the mounting, and projecting through the recesses 27—27a are flat plates 31—31a, the proximate free ends of which form circuit contact members. Terminals for an electric circuit comprise other plates 32—32a having fastening portions extending at right angles to the plates 31—31a lying in close engagement with the outer edges of the projections 24—25 and having outwardly bent ends carrying binding parts such as screws 33. The respective pairs of contact plates and terminals are each secured to the necks 31 by screws 34—34a which are threaded into said necks.

The opposite ends of the pile grooves are also apertured, as indicated at 40—41 in Fig. 5, for the reception of the bodies 42 or carbon buttons (Fig. 2) which serve as the pile compressors. Each of these buttons, it will be observed in Fig. 2, is provided with a flange 43 which limits it outward movement.

Compression of the discs composing the piles 10—11 and a circuit established through them

is accomplished by means of a cross piece lying in the recess 14. It comprises an inner contact strip 50 of copper and an outer stiffener or backing plate 51, these two plates being united rigidly at the center by a tubular bushing 52. The latter is of such diameter as to add to the stiffness of the backing plate 51 and prevent its distortion in the area of the perforation in which the bushing is mounted. This contact-compression element is loosely mounted on an operating rod 53 the extremity of which projects through said bushing and is circumferentially upset in a series of points 54 to bear against it.

The forward end of rod 53 extends through the central opening in the mounting, as shown in Fig. 2, to a point well beyond the contacts 31—31a and is threaded. At an intermediate point on this threaded end there is a rectangulare plate 55 guided at its ends by the faces 16 of the recess 15 of the mounting and having a central threaded hub 56 for facilitating its adjustment or initial setting by rotating the rod in which position it is secured by a lock nut 57. Plate 55 has two upturned ears 58—58a which at the time the rod is moved forwardly to compress the disc piles will engage the contacts 31—31a which latter although they have a slight spring action are limited in their movement by the recesses 27—27a so that no strain is imparted to their fastenings 34—34a. Rod 53 is normally held in its retracted, open circuit position by a coil spring 60 which is compressed between the cross piece 50 and the shoulder 18 in the control opening in the mounting.

On the free end of rod 54 there is a threaded knob or head 61 of insulating material the adjustment of which regulates the throw imparted by the movement of the operating treadle.

In assembling the above described parts the lower member 12 of the mounting is placed in a horizontal position on the work bench and the disc piles with their end contact members and compressing buttons are placed, as shown in Fig. 2, in the respective recesses 19a, 20 and 40. It is also convenient at this stage to assemble on the rod 53 the various parts carried thereby and lay these in the mounting member.

There are four bolt holes in the members 12 and 13 (Figs. 2 and 5) two for bolts for initially securing said members together, the others for use in mounting the assembly within a casing. Perforated gasket pieces 62 are laid in registration with the first mentioned bolt holes and the other member 13 is superposed thereon and secured by two through bolts 63. The gaskets in this assembly hold the faces of the members 12 and 13 separated to provide a ventilating opening, such as indicated by 64 in Figs. 1 and 3, through which air may circulate for the purpose of cooling the disc piles.

The rheostat herein set forth is finally mounted in a casing as shown in Fig. 1 which is a rectangular framework comprising a base 65 having rubber foot pieces 66 at the corners and carrying a cover 67 to which the rheostat is rigidly attached as by bolts 68 passing through the parts 12—13.

As a convenience in attaching the cover to the base I provide at one end of the base an offset lip 69 beneath which an inwardly extending flange 70 on the cover can be hooked. At the opposite end of the base there is struck up a projection 71 for receiving the threaded end of a screw 72 on the cover.

A treadle 73 is pivoted between ears 74 on the top of the cover and is yieldingly held in a normally inoperative position by a coil spring 75. The treadle carries on the underside an arm 76, the lower bifurcated end of which straddles the hub of the knob 61 of the rheostat. It will be seen that upon depressing the treadle the rod 53 will be drawn forwardly against the tension of its spring 60 to establish a circuit across the terminals 31—31a and that the cross arm 51 will simultaneously compress the disc piles to a greater or less degree depending upon the arc through which the treadle is depressed.



I claim:

1. A casing for a carbon disc rheostat comprising a pair of two rectangular members of insulating material of given thickness, length and width, placed face to face, each of said members having two lengthwise grooves in their proximate faces extending parallel to each other and spaced apart to furnish control areas in the members, said groove being in mating relation and adapted to house piles of carbon discs therein, fastening means extending through said central areas for securing the pair of members together, and spacers for holding the proximate faces of the members apart.

2. In a carbon disc rheostat, a casing comprising two similar members of insulating material having flat faces adapted to be juxtaposed, each member having on its face two semi-circular longitudinally extending parallel semi-circular grooves spaced apart and in mating relation, said member also having longitudinal mating cavities located between the grooves for receiving piles of carbon discs, the ends of said grooves being of reduced cross section and opening at opposite ends of the members, one end of the members adapted to have stationary contact members in the reduced portions thereof, the other ends of the members adapted to have movable contacts in the reduced portions, and means for securing the members together.

3. In a carbon disc rheostat mounting of insulating material, a casing comprising a two part rectangular body having at its forward end a flat face and a centrally located inwardly extending cut out with parallel side walls and provided with a longitudinal cavity leading from the bottom of the cut out, outwardly projecting fingers on the face in line with said faces of the cut out which are undercut to form openings in line with said end face, said body parts being further provided with mating semi-cylindrical grooves adapted to receive piles of carbon discs arranged therein, and means for securing said part together in spaced mating relation.

ALEXANDER SHARENOW.


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