Mar. 20, 1923.

1,449,249.

J. T. RHAMSTINE.

RHEOSTAT.

FILED AUG. 8, 1922.

Fig. 1

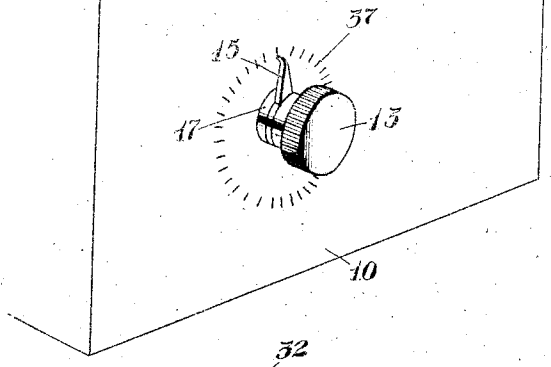


Fig. 2

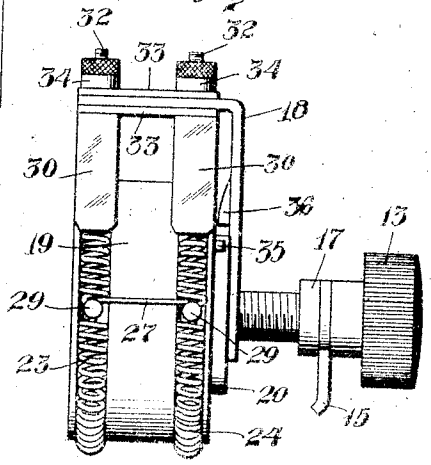


Fig. 3

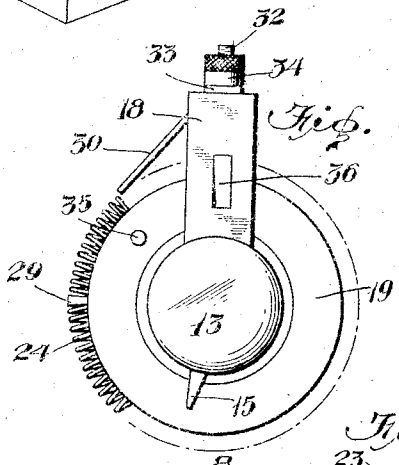


Fig. 5

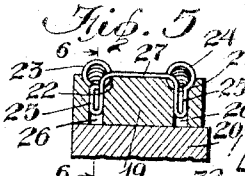


Fig. 6

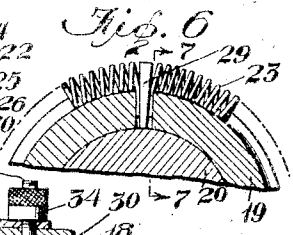


Fig. 7

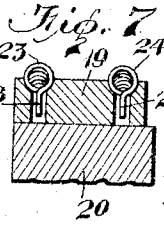
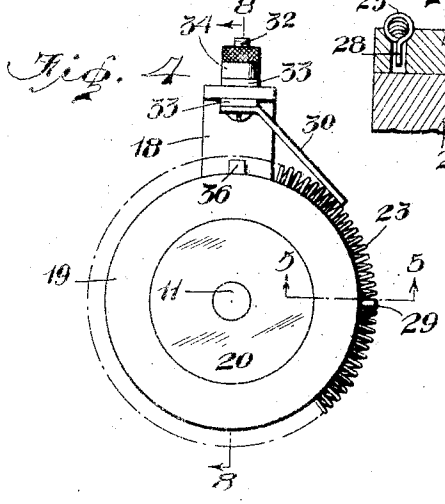


Fig. 4



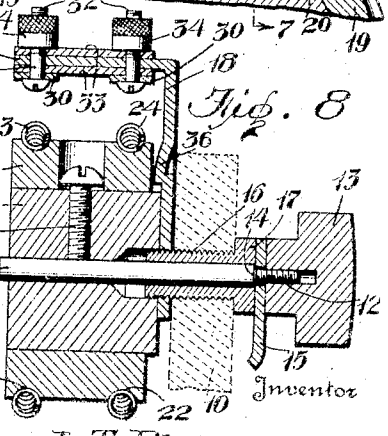


Fig. 8

Inventor

J. T. Rhamstine,

By F. A. Colford,

Attorney

Patented Mar. 20, 1923. 1,449,249

UNITED STATES PATENT OFFICE.

JOHN THOMAS RHAMSTINE, OF DETROIT, MICHIGAN.

RHEOSTAT.

Application filed August 8, 1922. Serial No. 580,477.

To all whom it may concern:

Be it known that JOHN THOMAS RHAMSTINE, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, has invented certain new and useful Improvements in Rheostats, of which the following is a specification.

The present invention relates to rheostats, and more particularly to a device of this character for use on panel boards of radio apparatus.

An object of this invention is to provide a rheostat which requires but one opening in the panel; wherein the resistance element is rotated while the contact brushes are held stationary, insuring a better and more secure connection to the wires which lead into and from the rheostat.

Another object of the invention is to provide a drum or revolvable member which is relatively small in size so as to occupy but little space at the back of the panel, and to so peculiarly arrange a resistance element upon the relatively small drum as to obtain the desired range of resistances by the usual minute adjustment of the handle and to offset to a large extent inductance which might otherwise be produced and affect adjacent parts of the apparatus.

The invention still further aims at the provision of a compact device having a relatively wide range of adjustment and which may be quickly and easily mounted upon a panel board or the like in a relatively small opening in the board and which admits of the proper adjustment of the index arm or finger and the limiting of the device for turning in the necessary direction.

The above, and various other objects and advantages of this invention will in part be described in, and in part be understood from, the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing wherein:

Figure 1 is a perspective view of a panel board having a rheostat constructed according to the present invention applied thereto.

Figure 2 is an enlarged side elevation of the rheostat removed.

Figure 3 is a front elevation of the rheostat.

Figure 4 is a rear elevation thereof.

Figure 5 is a fragmentary longitudinal section on line 5—5 of Figure 4 through a portion of the drum, showing the connection between the resistance coil elements.

Figure 6 is a fragmentary sectional view taken at right angles to Figure 5 substantially on the line 6—6.

Figure 7 is a view similar to Figure 5 but taken on the line 7—7 of Figure 6, and

Figure 8 is a longitudinal sectional view taken through the rheostat, and showing in dotted lines a portion of the panel upon which the rheostat may be mounted.

Referring to the drawing 10 designates a panel board, which may be the side of a casing or any other suitable structure upon which the rheostat may be supported, the term panel being used generically throughout as a suitable support for the rheostat.

As best seen in Figure 8, the rheostat comprises a shaft 11 of suitable length and having a smooth cylindrical surface for the major portion of its length, and having at its outer end a reduced threaded stem 12 upon which is detachably threaded a handle or knob 13. The stem 12 terminates at its inner end in a tapering shoulder 14 which merges into the shaft 11 and against which is bound an index finger or pointer 15 which is flat, apertured at its inner end to loosely receive the stem therethrough, and which at its outer end is provided with a tapering index finger which may be slightly curved or rounded inwardly away from the handle 13. The handle 13 is adapted to be turned up upon the stem and against the pointer 15 for binding the latter against the shoulder 14 after the pointer has been adjusted. The shaft 11 is provided with a freely rotatable bushing 16 provided upon its outer end with a flanged head 17 adapted to engage the outer side of the panel 10, and the bushing is externally threaded for engagement through an opening in the panel to firmly support the bushing when it is screwed into the opening. The bushing 16 carries a bracket 18 which is in the form of a flat arm having a screw threaded opening at its inner end to receive the bushing 16, the bushing being adapted to be turned through the bracket to bind the latter against the inner side of the panel 10 for firmly locking and holding the bushing 16 in the panel.

Detachably mounted upon the shaft 11 is a drum 19 of electric nonconducting mate-

rial, the drum having a preferably metallic core 20 adapted to fit the shaft 11 and fixed thereon by a set screw 21 threaded through one side of the core 20 to bind against the shaft, the set screw having its head countersunk in one side of the drum 19.

The drum 19 is provided in its peripheral surface with a pair of spaced apart annular grooves 22 semicircular in cross section. A resistance coil mounted on the drum 19 is made up of spaced apart sections 23 and 24, each section extending around the drum and seated in a groove 22. The sections 23 and 24 are made from any suitable resistance wire and are coiled with their helices of uniform height. The sections 23 and 24 at one end are anchored to the drum 19 by loops 25 which project inwardly into the drum in openings 26 thereof and the returned ends of the loops 25 are joined together by a bridge piece 27 formed of a portion of the wire of the resistance coil which integrally connects the adjacent ends of the sections 23 and 24.

The other ends of the coil sections 23 and 24 terminate in depending lugs 28 which also projects into the openings 26 of the drum, and insulating pins 29 are driven radially into the opening 26 of the drum between the anchoring members 25 and 28 of the coil sections for not only spacing the same apart in insulated relation to one another but for also binding the same firmly in the drum to hold the resistance coil from displacement. Of course the sections 23 and 24 of the coil are drawn taut around the drum so as to bind the sections in their grooves 22 and thus yieldingly hold the sections in place. The pins or keys 29 project above the drum a distance sufficient to hold a pair of spring contacts 30 out of engagement with the sections of the coil when the drum is turned to bring the resistance element into a position to break the circuit. The spring contacts 30 are of the leaf type and are anchored at their inner ends upon the bracket 18. The bracket is provided with an overhanging arm 31 which is spaced from the drum 19 and carries bolts 32 the heads of which engage the spring contacts 30 to bind them to the arm 31. Insulating strips 33 may be interposed between the contacts 30 and the arm and binding nuts 34 which are mounted upon the outer ends of the bolts 32. The binding nuts 34 are adapted to receive therebeneath wires or the like so that a current may come in at one bolt or post 32, pass through the resistance coil when the device is adjusted, and thence outwardly through the other bolt or post 32.

The drum 19 is provided upon its inner end with a stop pin 35 adapted to travel in a circular path upon rotation of the drum and which is arranged to strike a detent or shoulder 36 pressed outwardly from the bracket 18 for bringing the drum to a stop when the insulating pins 29 are beneath the spring contacts 30. This determines a zero or open position of the device, and turning of the drum to such position may be effected only in one direction for gradually diminishing the resistance between the contacts 30. When the drum is turned in such direction throughout substantially a complete turn, the stop pin 35 engages the other side of the shoulder 36 and holds the drum from further turning in such direction and positions the contacts 30 so that less resistance is offered to the passage of electricity between the contacts 30.

The panel 10 may be provided with a suitable graduated scale 37 arranged concentrically about the opening through the panel and over which the pointer 15 is adapted to traverse when the handle 13 is turned. The pointer 15 thus determines the position of the drum 19 and consequently it can be readily determined the length of the coil which is interposed between the contacts 30 to offer the desired resistance according to the reading on the scale of graduations 37. It will be noted that when current comes in through one spring contact 30 the coil section, such as 24, creates an inductance in one direction while the current in passing across the bridge piece 27 and into the opposite coil section 23 produces a counter or neutralizing inductance as the current passes to the other contact 30.

It will be noted that for each advanced step of the drum there will be two sections of the coil included between the contacts 30 so that but slight advancement of the drum is necessary to close a material length of the resistance coil in the circuit, or to cut out a material length of the coil, depending upon the direction of movement of the drum.

It is of course understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

What is claimed is:

1. A rheostat comprising a pair of parallel resistance elements interconnected at one end, and a pair of relatively fixed contacts one for each resistance element and arranged to simultaneously traverse their respective elements, whereby upon the advancement of the contacts through a relatively short distance a relatively large resistance may be included.

2. A rheostat comprising a rotatable member, a pair of parallel resistance elements arranged peripherically on the member and interconnected at one end and a pair of fixed contacts arranged in spaced re-

lation and adapted to bear against said resistance elements for traversing the same upon the turning of said member.

3. A rheostat comprising a drum, means for turning the drum, a pair of parallel coil sections of resistance material arranged upon the periphery of the drum and interconnected at one end, a fixed bracket, a pair of spaced contacts carried by the bracket and bearing against said resistance elements for simultaneously traversing the same upon rotation of the drum.

4. A rheostat comprising a bushing adapted to be secured through a support, a bracket carried upon the inner end of the bushing, a shaft mounted to turn in the bushing, a drum on the inner end of the shaft adjacent the bracket, a handle on the outer end of the shaft for turning the same, a resistance coil having parallel sections secured in spaced relation about the drum and interconnected at one end, and a pair of spaced apart contacts mounted on the bracket in position to traverse the sections of the coil upon the turning of the drum.

5. A rheostat comprising a threaded bushing to be secured through a panel and having a head on its outer end for engagement against the outer face of the panel, a bracket threaded upon the inner end of the bushing and adapted to be bound against the inner side of the panel and having an overhanging arm on its outer end, a shaft mounted to turn in the bushing, a handle on the outer end of the shaft, a pointer carried upon the outer end of the shaft adapted to traverse the panel, a drum detachably mounted upon the inner end of the shaft, a pair of coil sections arranged in spaced relation about the drum and interconnected at one end, insulating means on the drum between the opposite ends of each coil section, spring contacts carried by the overhanging arm of said bracket adapted to traverse the coil sections and to engage with said insulating means upon the turning of the drum, and stop means carried upon the bracket and the drum for arresting the movement of the latter to hold the contacts upon said insulating means.

6. In a rheostat, a drum having spaced apart peripheral grooves extending thereabout and having in one side radial openings leading from the grooves, coil sections seated in the grooves and having anchoring means at opposite ends adapted to engage in said radial openings and said coil sections being interconnected at one end, insulating pins mounted in said openings of the drum between the anchoring devices of said coil sections for binding the anchoring devices in the drum and for insulating the free ends of said coil sections, and a pair of spaced apart spring contacts adapted to traverse the coil sections and arranged to engage said insulating pins for holding the contacts out of engagement with said coil sections.

7. In a rheostat a pair of spaced contacts, a pair of coil sections arranged to traverse the contacts and interconnected at one end, and means for relatively moving the coil sections and the contacts for increasing and decreasing resistance of the coil sections between the contacts.

8. In a rheostat, a pair of resistance coil sections arranged in parallel and interconnected at one end, a pair of contacts arranged to traverse the coil sections, and means for relatively moving the coil sections and contacts.

In testimony whereof I affix my signature.

JOHN THOMAS RHAMSTINE.