

May 5, 1925.

1,536,710

A. E. GREENE

RADIORHEOSTAT

Filed Dec. 15, 1923

FIG. 1.

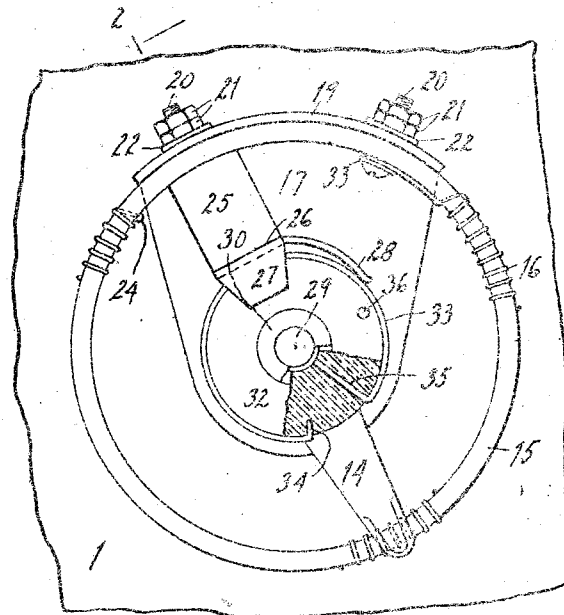
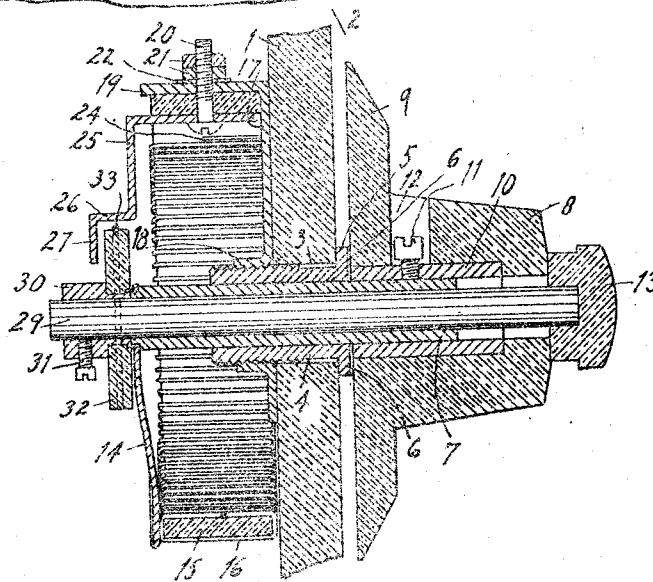


FIG. 2.



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UNITED STATES PATENT OFFICE.

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RADIORHEOSTAT.

Application filed December 15, 1923. Serial No. 680,977.

To all whom it may concern:

Be it known that I, AUGUSTINE E. GREENE, a citizen of the United States of America, and a resident of Willimantic, in the county of Windham and State of Connecticut, have invented a new and useful Radiorheostat, of which the following is a specification.

My invention relates to rheostats especially designed for use in the radio art, and consists in general of a main resistance element, a bracket for such element, said bracket being provided with terminals, a hollow, externally screw-threaded member upon which said bracket is mounted and by means of which the same is held in place, a second bracket supported with said element from the first, said second bracket being provided with a vernier brush and stop, a hollow shaft carrying a contact arm for said element, said shaft being journaled in said hollow member, an operating member or knob for said shaft, a shaft or spindle rotatably arranged in said hollow shaft, a vernier secured to said spindle in contactual relationship with the brush carried by said second bracket, said vernier having a stop member to cooperate with the stop carried by said second bracket, and an operating member or knob for said spindle, together with such other parts and members as may be necessary or desirable in order to render the rheostat complete and serviceable in every respect, all as hereinafter set forth.

One object of my invention is to produce a comparatively simple yet highly efficient radio rheostat, wherein a single nut or screw is employed for supporting all of the other parts and members in and from a panel, which screw affords convenient and safe means for securing and holding said parts and members in place.

Another object is to provide a radio rheostat with a vernier, whereby it is possible to obtain very fine adjustment of amounts of resistance beyond anything that can be obtained with or through the main resistance element alone, or, in other words, to regulate the resistance with great nicety or exactness.

A further object is to construct a rheostat in such a manner that the parts and members thereof can be readily assembled.

Other objects and advantages will appear in the course of the following description.

I attain the objects and secure the advantages of my invention by the means illustrated in the accompanying drawings, in which—

Figure 1 is a rear elevation of a radio rheostat which embodies a practical form of my invention, portions of the vernier being broken away to disclose the construction thereof, and, Fig. 2, a section through said rheostat, taken on lines 2--2, looking in the direction of the associated arrow, in Fig. 1.

In the drawings a fragmentary portion of a support or panel, such as is commonly used in the construction of radio sets, is represented at 1. The panel 1 has an opening 3 bored through the same. A horizontal nut or screw 4 is provided to fit within the opening 3.

The supporting screw 4 is externally screw-threaded, has a head 5 in which are screw-driver slots 6--3, and is hollow. The screw 4 is inserted in the opening 3 from the front side of the panel 1 and the head 5 bears against said side. A hollow shaft 7 passes through the screw 4 and is adapted to be rotated therein. A large knob 8, having a dial 9 and provided with a bushing 10, is mounted in front of the head 5 on the forward terminal of the shaft 7, a set-screw 11 being employed to secure said bushing to said shaft. The screw 11 is received in a radial opening 12 in the knob 8, and said screw is tapped into the bushing 10 and bears at its inner end on the shaft 7. Generally, the knob 8 with its dial, and a knob 13 presently to be described, are of usual and well-known construction.

Secured to the rear terminal of the hollow shaft 7 is a resilient contact arm 14. The arm 14 at its free end contacts with a main resistance element consisting of a strip of insulating material in the form of a ring, band, or annulus 15, and a wire coil 16 on said annulus. This resistance element is supported by and from a bracket 17.

The bracket 17 may be stamped out of sheet-metal, and has a hub 18 below and a flange 19 above, said hub being internally screw-threaded to receive the screw 4. Both the hub 18 and the flange 19 extend rearwardly from the vertical part of the bracket 17, and said flange is arcuate in its lengthwise direction to receive the upper portion

of the band 15, which portion is between the ends of the coil 16, and at the underside of said flange, the flange and band being concentric. The band 15 is secured to the flange 19 by means of two screws 20, two pairs of nuts 21, and a pair of washers 22. The screws 20 pass upwardly through the band 15 and the flange 19 to receive the washer 22 and the nuts 21 above said flange. One terminal of the coil 16 is attached to one of the screws 20, between the band 15 and a washer 23 interposed between said band and the head of said screw. The other terminal of the coil 16 is attached at 24 to the band 15. An angular, vernier stop and brush bracket 25 is secured to the flange 19 by means of the other screw 20, said bracket having a horizontal part that is received between the band 15 and the head of said screw. The screws 20 with their nuts 21 form the terminals of the rheostat and serve as binding-posts for the wires (not shown) leading from and to the source of electric energy.

The bracket 25 has at its lower terminal a rearward extension 26 and a downward extension 27 therefrom, said last-named extension forming a stop. One edge of the horizontal extension 26 is continued to form a brush 28, said brush being resilient inasmuch as the material of which the bracket 25 is constructed is resilient.

A horizontal shaft or spindle 29 extends through and is adapted to be rotated in the hollow shaft 7, and the knob 13 is secured to the forward terminal of said spindle. The spindle 29 is out of contact with the bushing 10 and the knob 8. The knob 13 is immediately in front of the knob 8, which latter or its dial is immediately in front of the head 5 of the screw 4. A vernier collar or hub 30 is mounted on the rear terminal of the spindle 29 directly behind the shaft 7, said hub being secured to said spindle by means of a radial set-screw 31 tapped into and through the hub to engage with its inner end said spindle.

The vernier consists of a disc 32 of insulating material mounted on and secured to the hub 30, and a wire 33 having one terminal secured, as at 34, to said disc, and passing part way around the periphery of said disc to within a short distance of said terminal, and then having a length, as 35, thrust through said disc radially into engagement with said hub. The brush 28 is in position to bear from above on the wire 33, and said wire is prevented from passing from beneath said brush by means of a stop pin 36 and the stop 27. The pin 36 projects rearwardly from the disc 32, and the stop 27 is positioned in the path of said pin and through its rotation of the disc 32 in either direction. The relative movements of the stop 27, pin 36,

terminals of the wire 33 on the periphery of the disc 32, and the contacting end of the brush 28 are such that said disc, when rotated in either direction, is stopped before that portion of said periphery which is between said terminals arrives at said end of said brush, cessation of rotation being produced by said pin when it encounters the edge of said stop that is in the immediate path of the pin.

When the parts are assembled, the screw 4, which supports the bracket 17, is rotated to draw said bracket tightly against the back side of the panel 1, thus not only supporting but securing said bracket in place.

The hollow shaft 7 is held against appreciable endwise movement by the bushing 10 and the dial 9 which bear against the head 5 of the screw 4, at one end, and by the resilient arm 14 which bears at its free terminal against the rear edge of the main resistance element or of the coil 16 of such member, at the other end. The spindle 29 is held against endwise movement by the knob 13 which bears against the knob 8, at one end, and the vernier hub 30 which bears against the hollow shaft 7, at the other end.

Forming the circuit between the binding-posts (20—20) are the bracket 17, the screw 4, the hollow shaft 7, the arm 14, and the resistance coil 16, also the bracket 25, the brush 28, the vernier resistance wire 33, and the hub 30, and the spindle 29, together with said hollow shaft, said arm, and said coil.

By turning the knob 8 the contact arm 14 is moved, through the medium of the bushing 10 and the hollow shaft 7, to different positions on the main resistance element, and correspondingly different amounts of resistance are thereby produced in the circuit between the binding-posts, in the manner well understood by those skilled in the art. And by turning the knob 13 the vernier is rotated to present the wire 33 at different points to the brush 28, and accordingly finer gradations of amounts of resistance are produced in said circuit, such resistance being increased as the terminal 34 of said wire approaches the brush 28, and decreased as the length 35 of said wire approaches said brush. Motion is imparted to the vernier disc 32 and its resistance wire, when the knob 13 is rotated, through the medium of the spindle 29 and the hub 30. As previously observed, the stop 27 and the pin 36 limit the rotation in either direction of the disc 32, and prevent the brush 28 from becoming disengaged from the wire 33, or, in other words, prevent that part of the periphery of said disc which is between the terminal 34 and the length 35 of said wire from passing beneath the free or bearing terminal of said brush.

In practice, the arm 14 is first set to throw

in approximately the desired amount of resistance, and then the vernier is set to increase or decrease said resistance in some slight degree; or said vernier may be set at a point which produces the desired result even when the position of said arm is subsequently changed.

More or less change in the shape, size, construction, and arrangement of some or all of the parts of this rheostat may be made without departing from the spirit of my invention or exceeding the scope of what is claimed.

What I claim is my invention, and desire to secure by Letters Patent, is—

1. The combination, in a rheostat, with a hollow threaded member having a head, of a bracket having a hub tapped to receive said member, and also having a flange, a main resistance element and a vernier brush and stop bracket secured to said flange, a hollow shaft in said first-named member, a contact arm secured to said shaft for said element, a spindle in said shaft, a collar secured to said spindle, a vernier disc of insulating material secured to said collar, said disc being provided with a stop pin, and a vernier wire carried by said disc, one end of said wire being in circuit-forming relation with said collar, and the other end being remote from the first.

2. The combination, in a rheostat, with a main resistance element, supporting means for said element, said supporting means being provided with binding-posts, a contact arm for said element, and means to operate said arm, of a spindle, a vernier disc of insulating material mounted on said spindle and provided with a stop pin, a vernier wire carried by said disc, one end of said wire being electrically connected with said spindle, and the other end being remote from the first, a brush for said wire, said brush being electrically connected with one of said binding-posts, and a stop in the path of said pin to prevent said wire from being actuated out of contact with said brush.

3. The combination, in a rheostat, with a hollow threaded member having a head to contact with one side of a panel in which such member may be inserted, of a bracket having a hub which is tapped to receive said member, and also having a flange, said bracket being adapted to contact with the other side of such panel, and with said head secure said member and the other parts of the rheostat to the panel, binding-post members carried by said bracket, a main resistance element and a vernier brush and stop bracket secured to said flange by said binding-post members, a hollow shaft in said first-named member, a contact arm secured to said shaft for said element, a spindle in said shaft, a collar secured to said spindle, a vernier disc of insulating material secured

to said collar, said disk being provided with a stop pin, and a vernier wire carried by said disc, one end of said wire being in circuit-forming relation with said collar, and the other end being remote from the first.

4. The combination, in a rheostat, with a hollow threaded member having a head, of a bracket having a hub which is tapped to receive said member, and also having a flange, binding-post members carried by said bracket, a main resistance element and a vernier brush and stop bracket secured to said flange by said binding-post members, a hollow shaft in said first-named member, a contact arm for said element secured to said shaft, a spindle in said shaft, a collar secured to said spindle, a vernier disc of insulating material secured to said collar, said disc being provided with a stop pin, a vernier wire carried by said disc, with one end in circuit-forming relation with said collar, and the other end remote from the first, said vernier brush bearing on said wire, and said pin being so located that said wire is prevented thereby and by said stop bracket from passing out of contact with said brush.

5. The combination, in a rheostat, with a hollow externally threaded member having a head, of a bracket having a hub tapped to receive said member, and also having a flange, a main resistance element comprising a band of insulating material and a coil, a second bracket, screws and nuts by means of which said band and said second bracket are secured to said flange, and with one of which screws one terminal of said coil is connected, a hollow shaft in said member, a contact arm carried by said shaft for said resistance element, a spindle in said shaft, a collar secured to said spindle, a vernier disc of insulating material secured to said collar, a vernier wire carried by said disc and having one end in circuit-forming relation with said collar and the other end at a point remote from the first, and a brush extending from said second bracket to bear on said wire.

6. The combination, in a rheostat, with a hollow externally threaded member having a head, of a bracket having a hub tapped to receive said member, and also having a flange, a main resistance element comprising a band of insulating material and a coil, a second bracket, screws and nuts by means of which said band and said second bracket are secured to said flange, and with one of which screws one terminal of said coil is connected, a hollow shaft in said member, a contact arm carried by said shaft for said resistance element, a spindle in said shaft, a collar secured to said spindle, a vernier disc of insulating material secured to said collar, and provided with a pin, a vernier wire carried by said disc and hav-

ing one end in engagement with said collar and the other end at a point remote from the first, and a brush extending from said second bracket to bear on said wire, and a stop supported by said second bracket in the path of said pin to limit the movement of said disc in both directions, said pin being so located that said wire is prevented from passing out of contact with said brush.

APOLISTINE E. GREENE.

Witnesses.

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C. C. WEST.