Sept. 23, 1930. T. RHODUS 1,776,664

RHEOSTAT

Filed Nov. 4, 1926

FIG. 1.

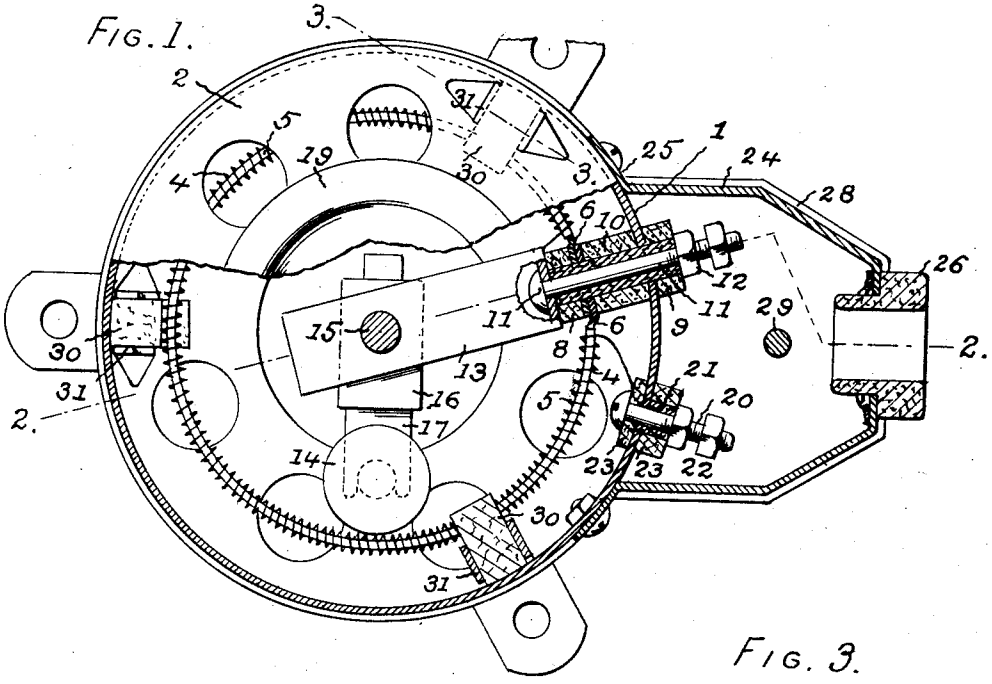


FIG. 3.

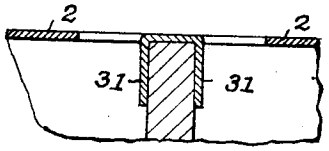
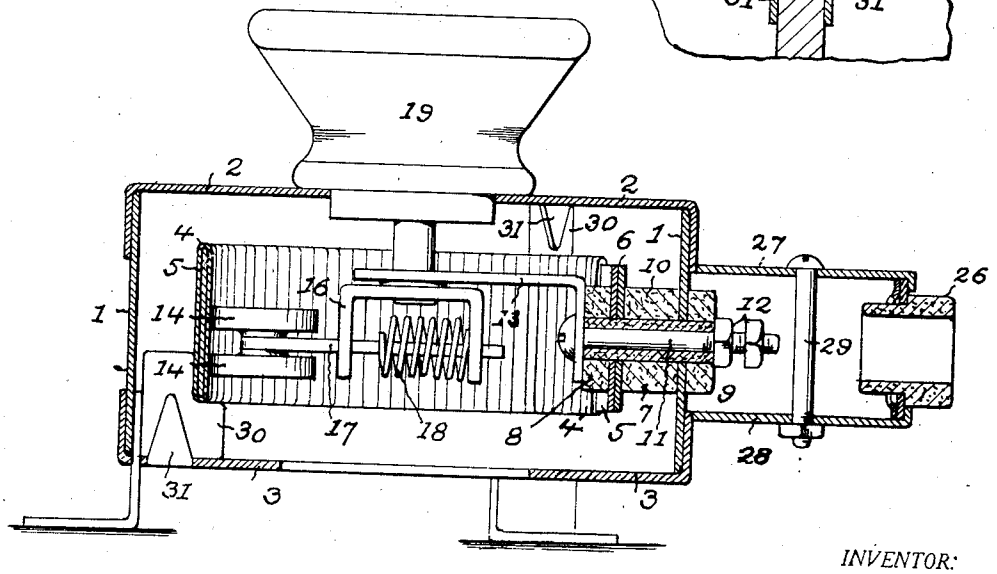


FIG. 2.



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UNITED STATES PATENT OFFICE

THOMAS RHODUS, OF CHICAGO, ILLINOIS

RHEOSTAT

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This invention relates to that type of rheostats in which a curved core supports a spiral winding of resistance wire to constitute the stationary member of the appliance, with the companion adjustable contact member having movement in a curved path and in contact with such winding, an example of which is shown and described in my former application Serial No. 76,141, filed Dec. 18, 1925. And the various objects of the present improvements are:—

To provide a structural formation and combination of parts whereby the curved supporting core with its winding of resistance wire has supporting connection with a wall of the enclosing casing in a simple, substantial and insulated manner.

To provide a simple and effective formation and association of parts, wherein the curved supporting core with its windings of resistance wire is held in its proper and normal position within the enclosing casing and in proper operative relation to the companion movable contact member.

To provide a simple and effective formation and association of parts wherein the curved supporting core of the resistance wire and the wall of the enclosing casing of the rheostat are penetrated in an insulated manner by the current carrying means and held thereby in working relation.

To provide a simple and effective formation and association of parts, wherein the resistance member comprising a curved supporting core and its windings of wire is held in proper and normal position and in proper insulated operative relation to the companion movable contact member, all as will hereinafter more fully appear.

In the accompanying drawing:—

Fig. 1 is a top or plan view of a rheostat embodying the invention, with parts of the enclosing casing broken away and with parts in section.

Fig. 2, is a sectional elevation on line 2—2 Fig. 1.

Fig. 3, is a detail section on line 3—3 Fig. 1.

Like reference numerals indicate like parts in the different views.

In the construction shown, the enclosing shell or casing affords an enclosure and the sole supporting means for the rheostat parts, and to such end preferably comprises a circular wall 1 to the upper and lower ends of which are secured orificed closure heads 2 and 3 adapted to protect the rheostat parts and afford proper ventilation. In the present improvement the rheostat parts are mounted in said enclosing casing and are of a detail construction as follows.

The stationary resistance element is preferably of the formation described in my prior Patent No. 1,230,221, of June 19, 1917, and comprises a series of open and flat spiral windings 4 of wire wound upon a curved insulating core 5 preferably of the split ring type, with the ends 6 thereof formed to overlap and having aligned orifices for the passage of the screw bolt 11 which in the preferred construction is a terminal post and the holding and current carrying means of the present improvement. Insulating material is arranged between the outer face of the overlap ends 6 of the core 5 and the inner face of the circular wall 1 of the enclosing casing and preferably of the form of an intervening orificed block 7.

Insulating material is arranged in aligned relation to said block 7 and in bearing contact with the inner face of the overlap ends 6 of the supporting core 5 aforesaid and preferably in the form of an inner block 8 of a counterpart orificed formation to that of the block 7 aforesaid. Insulating material is arranged in aligned relation with blocks 7 and 8 and in bearing contact with the outer face of the wall 1 of the enclosing casing of the rheostat and preferably in the form of an outer block 9 of a counterpart orificed formation to the blocks 7 and 8 aforesaid.

In the construction shown, the bolt 11 is insulated from the wall 1 of the casing and from the curved core 5 of the resistance element, and in the preferred construction, a tubular sleeve 10 of high insulating material extends through the orifices of the plurality of blocks 7, 8 and 9 and through orifices of the wall 1 and of the overlap core ends 6, to provide an insulating encasement for preferably the shank of a screw bolt 11, by which

the parts are drawn and firmly secured together.

In the preferred construction, the screw bolt 11 constitutes both a holding means and a current carrying means: the outer end of the screw bolt 11 carries the usual pair of adjustable nuts 12 for effecting the usual tightening or clamping action of the bolt, and in addition constitutes the attaching terminal or terminal post for one of the line wires of the circuit in which the rheostat is used; and the inner end of the bolt 11 is provided with the usual fixed head adapted to secure the journal and supporting bracket 13 of the movable contact member of the rheostat in place upon the inner face of the aforesaid insulating block 7, with the said fixed head of the bolt 11 in electric contact with the adjacent portion of said bracket 13.

The journal and supporting bracket 13 above referred to is preferably formed from a strip of plate metal and bent to an angular form, with its respective arms formed with orifices. One of said orifices is adapted to receive the shank of the screw bolt 11 aforesaid, while the other orifice, which is positioned in central relation to the curve of the core 5 aforesaid, provides a journal bearing for the carrying shaft of the movable contact member now to be described.

The said movable contact member of the rheostat is preferably in the form of a revoluble roller 14, resiliently mounted on a central carrying shaft 15 journalled in the above described orifice in the bracket 13, and with such mounting preferably comprising a guide head 16 fixed on the end of the shaft 15 and having guide ears for a sliding arm 17 on the outer end of which is journalled the aforesaid contact roller 14. Associated with said guide head 16 and sliding arm 17, is a compression spring 18, the tendency of which is to move the arm 17 outwards and maintain the roller 14 in contact with the resistance winding 4 of the stationary resistance member of the rheostat, and in such construction the contact roller 14, guide head 16 and arm 17 are formed of metal or like conducting material.

At its other and upper end the carrying shaft 15 is provided with an operating handle or knob 19 the lower end of which is preferably formed with a reduced circular neck adapted for bearing engagement in a central orifice in the upper head 2 of the enclosing casing of the rheostat.

The other and companion terminal post for the attachment of the other line wire of the circuit in which the rheostat is arranged, is of a substantially counterpart construction to the terminal post 11 above described and has adjacent relation thereto as shown, and preferably comprises a screw bolt 20 provided with an insulating sleeve 21, and a pair of adjustable nuts 22, which in connection with a pair of orificed abutment blocks 23, and an orifice in the wall 1 of the enclosing casing through which the said sleeve 21 passes, provides an insulating mounting for such companion terminal post with its screw bolt 20 electrically connected to the end of the resistance winding 4 opposite to the end of such winding which has connection with the first mentioned terminal post.

Another part of this invention involves an enclosing means for the above described terminal posts, adapted to afford ready and convenient access to the same and to such end comprises a wall 24 of preferably plate material of preferably an approximately U shape, provided with attaching flanges 25 at its respective ends by which it is secured by screw bolts or like fastening means to the wall 1 of the enclosing housing of the rheostat. The wall 24 and preferably the crown portion of said U shaped wall 24 is formed with a receiving orifice through which the cable carrying the line wires of the circuit passes for connection with the terminal posts and preferably insulated from said wall 24 by a thimble 26 of insulating material. As so constructed the wall 24 provides a containing chamber, open at top and bottom, and closed by preferably marginally flanged top and bottom closure plates 27 and 28 removably clamped in place by preferably a centrally arranged screw bolt 29 as shown.

Another part of this invention involves means for supporting the carrying core 5 and its windings 4 of resistance wire in proper position with relation to the enclosing casing and the movable contract member of the rheostat, and to such end comprises preferably a plurality of blocks 30 having recesses of insulating material and preferably L shaped, arranged in the upper and lower corners of the enclosing casing of the rheostat, with the recesses of said blocks forming saddles or rests and abutments for the core 5 and its windings aforesaid. In the construction shown, a pair of said saddle blocks of insulating material engage the upper edge of the core 5 and a single saddle block in staggered relation to said pair of blocks, engages the lower edge of the core 5.

Lateral shift or displacement of the saddle blocks 30 is prevented preferably by a pair of holding prongs 31 to each block 30, with said prongs preferably formed by slitting the plate metal heads 2 and 3 of the enclosing casing to form said prongs, which are then bent into parallel relation to receive a saddle block between them.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a rheostat, the combination of an enclosing casing having a side wall formed with an orifice, a stationary resistance mem-

ber of a curved shape and having an orifice, an orificed block of insulating material arranged between the orificed part of the resistance member and the orificed side wall of the enclosing casing, a second orificed block of insulating material arranged on the inner side of the orificed part of the resistance member, a third orificed block of insulating material arranged on the outside of the orificed side wall of the enclosing casing, an L shaped bracket, one arm of which has contact with the second orificed block aforesaid and is formed with an orifice, a screw bolt passing through said orifices and attaching the said parts together, a sleeve of insulating material encasing a portion of the shank of said bolt, an adjustable current carrying contact member making contact upon the stationary resistance member, an orifice in the other arm of the aforesaid bracket, and an operating shaft for said adjustable contact member having bearing in said last mentioned orifice.

2. In a rheostat, the combination of a resistance member of a curved shape and having an orifice, a current carrying bracket having two arms one of which has an orifice, a terminal screw bolt passing through the aforesaid orifices and attaching said parts together, a movable contact member making contact with said resistance member, a guide member comprising a central portion and two arms, said movable contact member being supported by said guide member, and a carrying shaft associated with the other arm of the aforesaid bracket and having contact with the center portion of said guide member at a point between the inner ends of the arms of said guide member, the arms of said guide member extending parallel to said shaft.

Signed at Chicago, Illinois, this 1st day of November, 1926.

THOMAS RHODUS.