

T. RHODUS.

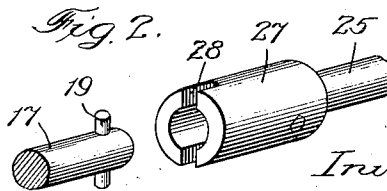
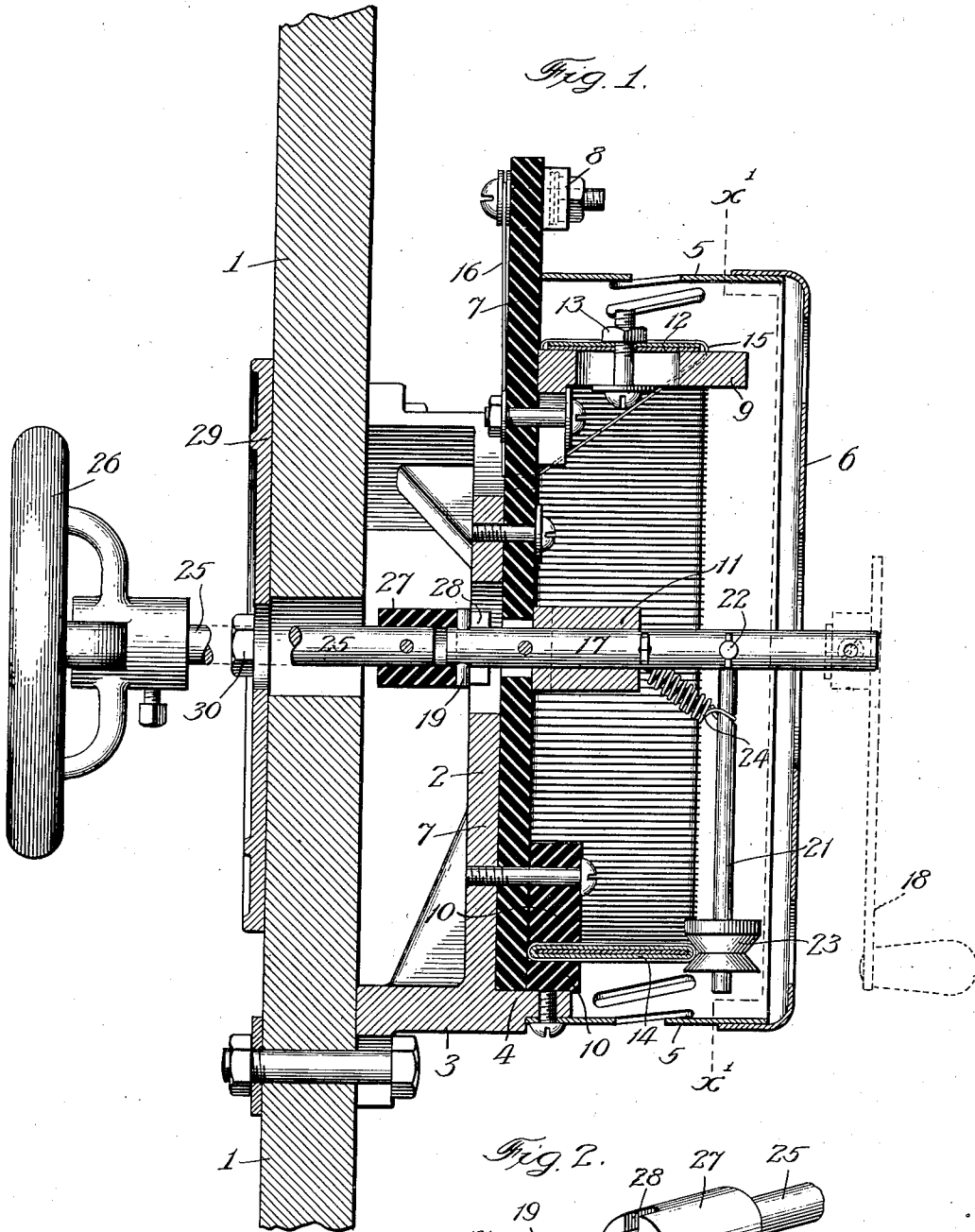
RHEOSTAT.

APPLICATION FILED MAY 10, 1912.

1,053,219.

Patented Feb. 18, 1913.

2 SHEETS-SHEET 1.



Attest:

Chas. H. Buell

Henry Mor.

Inventor:

Thomas Rhodes,

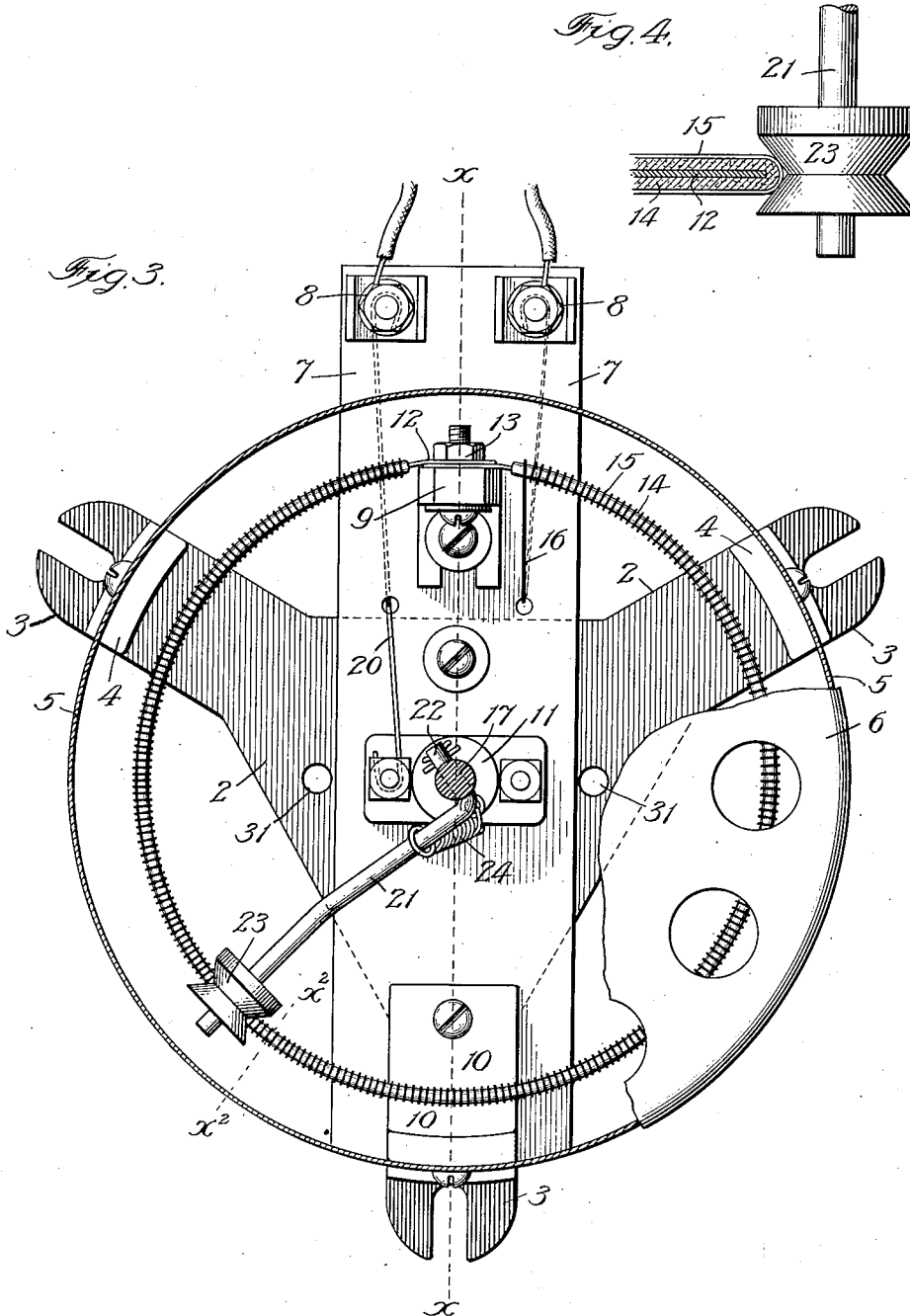
By Robert Burns, Atty. #

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Attest:
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UNITED STATES PATENT OFFICE.

THOMAS RHODUS, OF CHICAGO, ILLINOIS.

RHEOSTAT.

1,053,219.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed May 10, 1912. Serial No. 696,330.

To all whom it may concern:

Be it known that I, THOMAS RHODUS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to that class of rheostats in which a series of spiral windings or convolutions of wire wound upon a suitable insulating core or support, and circularly disposed, constitutes the stationary electrical resistance element of the apparatus, and is electrically engaged by a movable element or contact which is shiftable in a circular path corresponding with the circular disposition of said stationary resistance element to increase or diminish the amount of electrical resistance in the circuit. And the present improvement has for its object to provide a simple and durable structural formation and arrangement of parts whereby an extended and efficient surface contact between the stationary resistance and the movable contact element is attained with an avoidance of friction and wear between the same.

A further object is to provide an economical and compact structural arrangement and combination of the rheostat parts adapted to afford ease in operation, efficient electrical contact with a minimum degree of friction and wear, and ample ventilation to dissipate the heat generated in the resistance element, all as will hereinafter more fully appear.

In the accompanying drawings, Figure 1, is a central sectional elevation of the present apparatus, taken on line $x-x$ of Fig. 3. Fig. 2, is a detail perspective view showing the engaging end of the operating shaft, the actuating stem and coupling sleeve, in detached relation. Fig. 3, is a front elevation, with parts of the inclosing casing in section on line $x'-x'$, Fig. 1. Fig. 4, is an enlarged detail sectional elevation on line x^2-x^2 , Fig. 3, of the resistance and contact elements.

Similar reference numerals indicate like parts in the several views.

Referring to the drawings, 1 represents the usual carrying plate or board upon which the rheostat is mounted in connection with other usual recording and indicating apparatus, and said plate or board may have the usual vertical or horizontal ar-

rangements as required in the varied uses of the apparatus.

2 is a supporting spider having a plurality of angularly disposed feet 3 by which it is attached to the plate or board 1, and with a series of circularly disposed lugs 4 to which the inclosing shell or cover of the mechanism is attached.

5 is the skirt portion of the shell or cover above referred to, preferably of a cylindrical shape adapted to encircle and be attached to the lugs 4 of the supporting spider 3 aforesaid. Said skirt portion is open at its inner end and closed at its outer end by a head or cap 6, and both skirt and head are formed with suitably arranged orifices or reticulations to provide ventilating passages for the atmosphere, to dissipate the heat generated by the resistance element in actual and continued use.

7 is a longitudinal bar of insulating material, disposed diametrically of the supporting spider 2, secured to the outer face thereof as shown, and adapted to support in proper insulated relation the active elements of the rheostat.

8 is a pair of binding posts arranged at one end of the bar 7 and adapted for the attachment of the line wires of the circuit, and having connections as hereinafter described with the resistance element and the movable contact member thereof.

9 is a supporting bracket attached to the plate 7, and adapted in turn to support the resistance element hereinafter described, and 10 are coacting outer and inner blocks of insulating material, also carried by the bar 7 and adapted to maintain said resistance element in proper relation to the other parts of the apparatus.

11 is a bearing bracket or hub secured centrally to the bar 7 aforesaid, and adapted to provide a bearing and support for the axially arranged operating shaft of the apparatus.

The resistance element above referred to, is circular in form, arranged concentric with the axis of the spider 2 aforesaid, and comprises the usual open band ring or core of metal or other suitable material, the respective ends of which are made to overlap and are secured to the aforesaid supporting bracket 9, by an attaching bolt 13, as shown in Figs. 1 and 3. Inclosing said ring or core 12, with the exception of its attaching ends aforesaid, is a sheath 14 of insulating

material, upon which the windings or convolutions of resistance wire 15 are wound in the usual spiral manner, and as usual in the present type of rheostats one end of the resistance wire 15 is preferably left unconnected electrically, while the other end is electrically connected by an intermediate conductor 16 with one of the terminal or binding posts 8 of the apparatus, as illustrated in Figs. 1 and 3.

17 is the axially arranged operating shaft of the apparatus, journaled in any suitable manner in the bearing bracket or hub 11 aforesaid, with its outer end extending out through an enlarged central orifice in the head 6 of the inclosing shell or casing, for the attachment of an operating arm or crank 18, when it is desired to manipulate the apparatus from the front, and as illustrated in dotted lines in Fig. 1. The inner end of said shaft projects through enlarged central orifices formed in the insulating bar 7 and spider 2, and is provided near its extreme inner end with a non-circular connecting means, preferably a cross-pin 19 as shown, for the attachment of the removable rearwardly arranged actuating means herein-after described.

20 is an intermediate conductor extending from another of the terminal or binding posts 8, to the bearing bracket 11, to connect said bracket and the operating shaft 17 in the electric circuit.

21 is a carrying arm or rod formed at its inner end with an angularly disposed cylindrical extension 22 by which it is journaled in a transverse orifice in the operating shaft 17 aforesaid.

23 is a grooved contact sheave journaled on the outer end of the carrying rod or arm 21 and adapted to have rolling contact upon the edge of the convolutions or windings of the resistance wire 15 before described. A material feature of the present invention comprises the formation of the groove in the contact sheave of a V shape as shown, in that it coöperates with the rounded edges of the flattened ovaliform windings of the wire 15 to afford a very extended electrical contact, without friction or tendency to "bottom" after ordinary wear. In the present construction it is preferable to bend the outer end of the carrying arm or rod 21, so that its outer sheave carrying portion will be radial to the axis of the operating shaft 17, and in order that the groove of the sheave 23 will travel in a true concentric path.

24 is an obliquely disposed coil spring attached at one end to the operating shaft 17, and at its other end to the carrying arm or rod 21, with a normal tendency to force the sheave 23 into contact with the resistance wire 15 aforesaid.

25 is an actuating stem or rod provided

with an operating handle or wheel 26, on its rear end. Said stem or rod is disposed in longitudinal alinement and adapted for operative engagement with the operating shaft 17 aforesaid.

27 is a coupling sleeve formed of insulating material, secured to the forward end of the actuating stem 25 and projecting therefrom to provide a receiving socket for the adjacent end of the operating shaft 17 aforesaid. Said coupling sleeve is formed with open ended longitudinal slots 28, adapted for operative engagement with the aforesaid cross-pin 19 of the operating shaft 17 in the assembled relation of the parts. With the described construction a readily detachable connection is provided and in which the actuating rod and its handle is at all times insulated from the operating shaft. When so desired the stem 25 and sleeve 27 may be integrally formed of insulating material.

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

1. In a rheostat, the combination of a resistance wire formed into a series of convolutions, and a revoluble contact member formed with a peripheral groove the walls of which groove bear upon the surface of the convolutions at opposite sides of the transverse axes of the same.

2. In a rheostat, the combination of a resistance wire formed into a series of convolutions of a flattened ovaliform, and a revoluble contact member formed with a peripheral groove the walls of which have bearing on an edge of said convolutions.

3. In a rheostat, the combination of a resistance wire formed into a series of convolutions of a flattened ovaliform, and a revoluble contact member formed with a peripheral groove the walls of which are inclined toward each other and have bearing on an edge of the said convolutions.

4. In a rheostat, the combination of a resistance wire formed into a series of convolutions, and a revoluble contact member formed with a V shape peripheral groove the walls of which have bearing on the outer surface of said convolutions.

5. In a rheostat, the combination of a supporting spider having a plurality of circularly disposed lugs, a reticulated inclosing shell attached to said lugs, a longitudinal bar of insulating material secured to said spider, a ring shaped resistance element, movable contact member and electrical connections mounted on said bar, the movable contact member comprising in part a centrally arranged operating shaft, and a radial carrying arm secured thereto, and means for manually rotating said shaft.

6. In a rheostat, the combination of a supporting spider having a plurality of circularly disposed lugs, a reticulated inclosing

shell attached to said lugs, a longitudinal bar of insulating material secured to said spider, a ring shaped resistance element, movable contact member and electrical connections mounted on said bar, the movable contact member comprising a centrally arranged shaft, a radial carrying arm pivoted thereto and a coiled spring intermediate the shaft and arm, and means for manually rotating the shaft.

7. In a rheostat, the combination of a supporting spider having a plurality of circularly disposed lugs, a reticulated inclosing shell attached to said lugs, a longitudinal bar of insulating material secured to said spider, a ring shaped resistance element, movable contact member and electrical connections mounted on said bar, the movable contact member comprising in part a centrally arranged operating shaft, and a radial carrying arm secured thereto, and means for manually rotating said shaft, the same comprising an actuating stem arranged in longitudinal alinement with the operating shaft and provided at one end

with an operating means and at the other end with a sleeve of insulating material the end of which is longitudinally slotted for operative engagement with lateral projections on the end of the operating shaft.

8. In a rheostat, the combination of a supporting spider having a plurality of circularly disposed lugs, a reticulated inclosing shell attached to said lugs, a longitudinal bar of insulating material secured to said spider, a ring shaped resistance element, movable contact member and electrical connections mounted on said bar, a supporting bracket attached to said bar, the resistance element comprising in part an open band ring or core the ends of which overlap, and a bolt attaching said ends to the bracket aforesaid.

Signed at Chicago, Illinois, this 7th day of May 1912.

THOMAS RHODUS.

Witnesses:

ROBERT BURNS,
HENRY MOE.