C. R. MESTON & H. I. FINCH.

RHEOSTAT.

APPLICATION FILED APR. 23, 1909.

928,394.

Patented July 20, 1909.

FIG. 1.

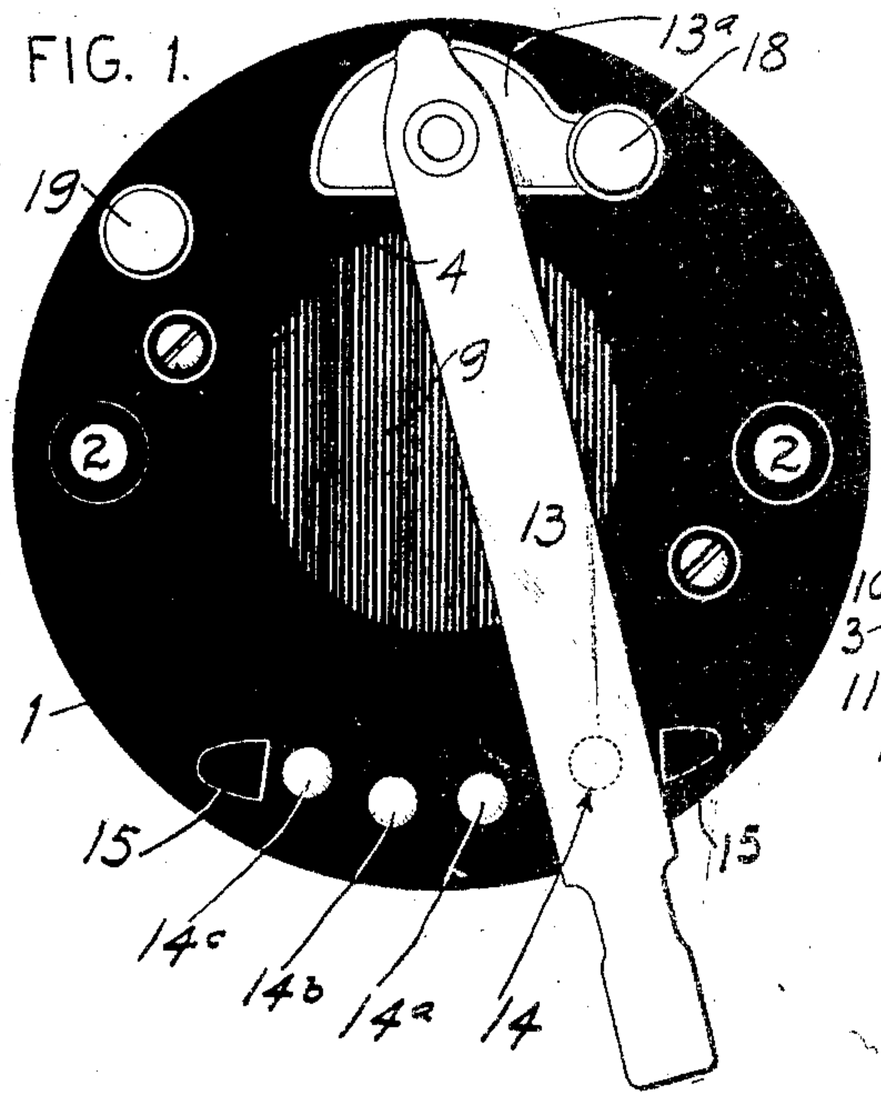


FIG. 2

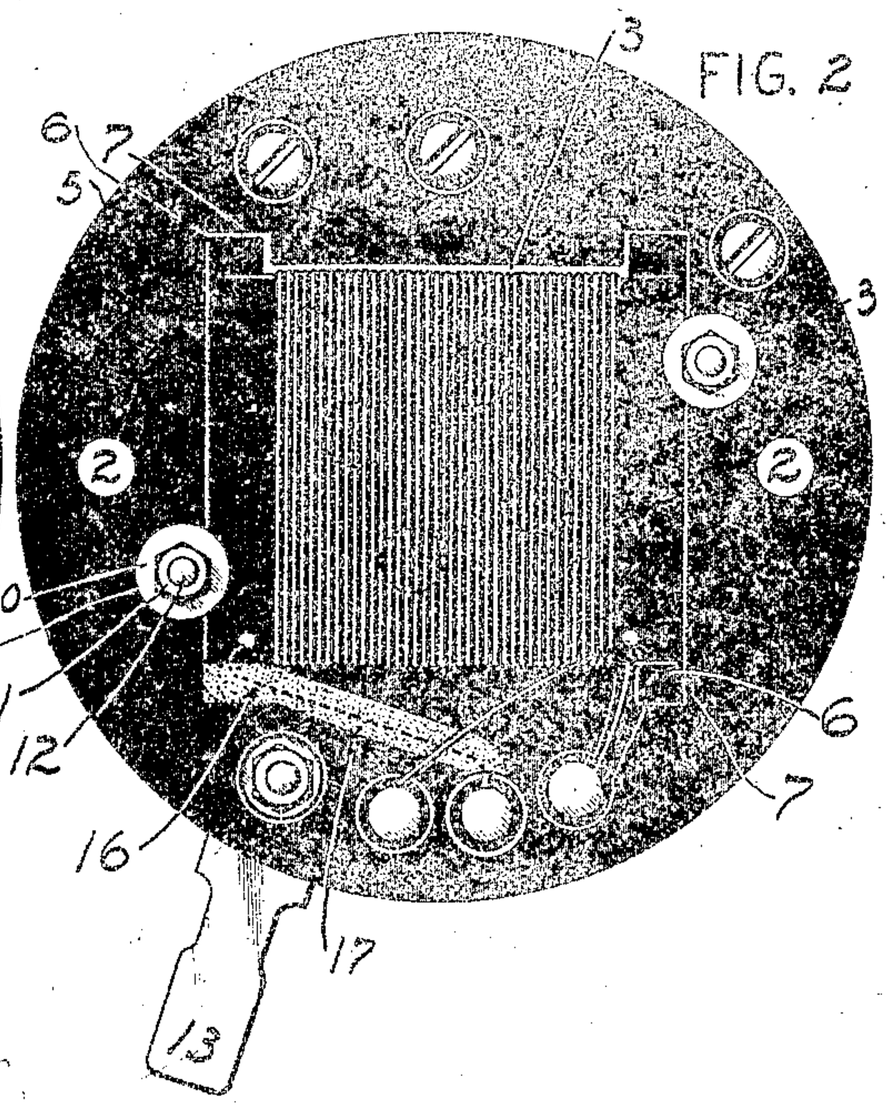


FIG. 3.

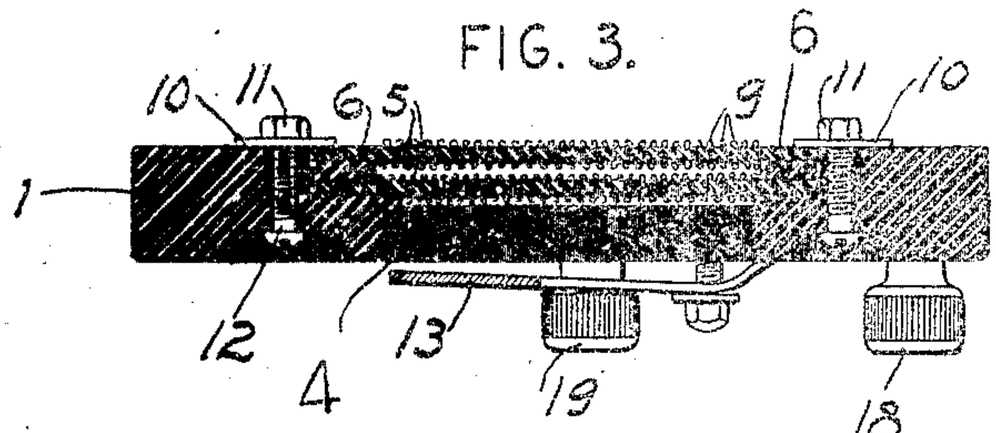


FIG. 4.

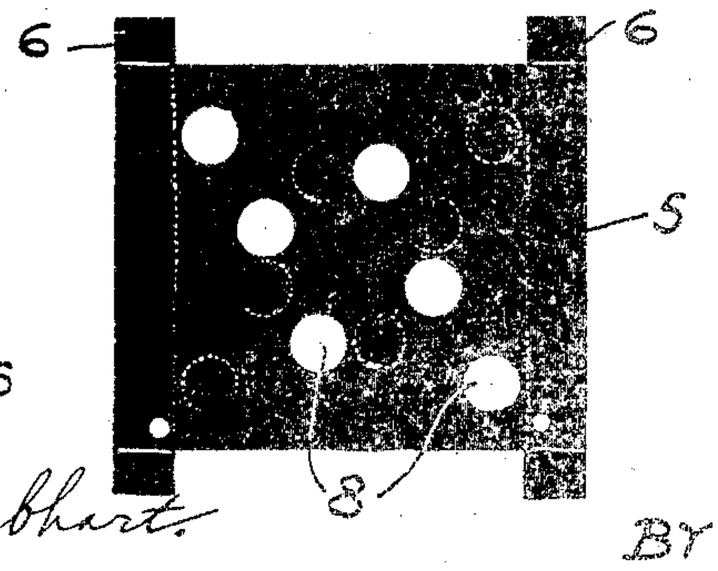
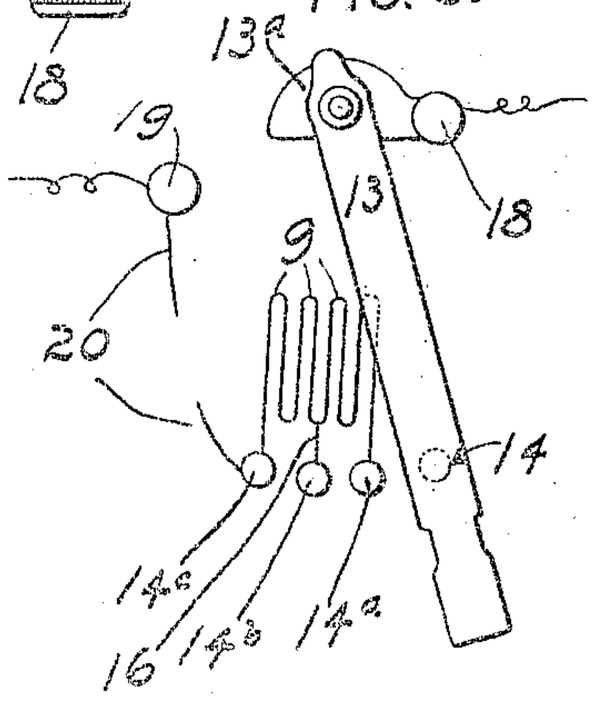


FIG. 5.



WITNESSES

Wm. J. Janns.

Alma Siebhart.

INVENTORS

CHARLES R. MESTON

HERBERT I. FINCH

BY F. R. Gwinnell

ATT'Y

UNITED STATES PATENT OFFICE.

CHARLES R. MESTON AND HERBERT I. FINCH, OF ST. LOUIS, MISSOURI, ASSIGNORS TO EMERSON ELECTRIC MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

RHEOSTAT.

No. 926,394. Specification of Letters Patent. Patented July 20, 1909.

Application filed April 23, 1909. Serial No. 491,687.

To all whom it may concern:

Be it known that we, CHARLES R. MESTON and HERBERT I. FINCH, citizens of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Rheostats, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan or top view of a rheostat of our improved construction; Fig. 2 is a view looking against the under side of the rheostat; Fig. 3 is a cross section taken on the line 3—3 of Fig. 2; Fig. 4 is a plan view of the two plates on which the resistance wire is wound; Fig. 5 is a diagrammatic view illustrating the electrical connections and the contact handle of the rheostat.

Our invention relates to rheostats of the type usually employed on electric motors, the object of our invention being to construct a simple, compact rheostat which may be readily applied to motors, the resistance coils of which rheostat are so formed and arranged as that they are thoroughly ventilated and air-cooled, thereby preventing excessive head in said rheostat.

To the above purposes, our invention consists in a suitable base of insulation in which are detachably positioned one or more perforated plates which receive the resistance wire, there being a series of contact points provided on the base, which contact points are properly connected to the line and resistance wires, and there being a contact handle pivotally mounted on the base and adapted to engage the contact points.

Referring by numerals to the accompanying drawings, 1 designates the base of the rheostat, which is preferably in the form of a disk of porcelain or analogous insulating material, and formed through said disk adjacent its edge is a pair of oppositely arranged apertures 2 which receive screws or like fastening devices utilized for attaching the rheostat to the motor. Formed in the under side of the base 1 is a rectangular recess 3, and formed through the center of the base is a large aperture 4. The members which receive the resistance wire comprise a pair of rectangular plates 5 of suitable insulation, which are of such size as to snugly fit within the aperture 3, said plates being spaced apart by means of strips 6 of insulation arranged between the side edges of said plates and the ends of said strips occupying suitably formed recesses 7 arranged at the corners of the recess 3. The plates 5 are each provided with a series of perforations 8, and the perforations of one plate are preferably staggered or off-set relative to the perforations in the opposite plate. The wire 9 forming the resistance coils is wound upon the plates 5 in such a manner as to leave a slight space between the convolutions of the winding, and said construction, together with the perforations 8 permits air to pass between the coils and between the plates, thereby permitting a free radiation of the heat generated in the coils while the same are in use, and consequently maintaining a comparatively low degree of temperature in said rheostat. The plates 5 are held in position in the recess 3 by means of washers 10, the same being located beneath nuts 11, which in turn are arranged on the threaded ends of screws or bolts 12, which pass through apertures formed through base 1, adjacent the sides of the recess 3.

Fixed in any suitable manner on top of the base 1 and above the opening 4 is a plate 13^a, to which is pivotally connected one end of a contact handle 13, the same extending across the top of the base 1 and being adapted to engage upon any one of a series of contact points 14, 14^a, 14^b and 14^c. Lugs 15 are formed integral with the top of the base 1 adjacent the ends of this series of contact points, and which lugs act as stops to limit the swinging movement of the handle 13. One end of the wire 9 which forms the resistance coils is connected to the contact point 14^a, the opposite end of said wire being connected to the contact point 14^c. Connecting the contact point 14^b with the wire 9 at an intermediate point, or at a point between the plates 5, is a short wire 16 which in the present instance is located in a groove 17 formed in the under side of the base 1 being embedded in a suitable insulating cement or compound which fills said groove. One terminal of the main line or conductor is connected to a binding post 18 located on the

plate 13ª, and the opposite terminal of this main line or conductor is connected to a binding post 19 suitably located on the base 1. Leading from this binding post 19 to the contact point 14ᶜ is a suitable conductor 20.

Where a rheostat so constructed is used upon an ordinary motor, for instance an electric fan motor, the conductor 20 is broken and the ends thereof are properly connected to the terminals of the motor. When our improved rheostat is in use and the handle 13 occupies the position shown in Fig. 1, or in engagement with the contact point 14, the line is open and therefore the resistance is not in service. When the handle 13 is shifted on the contact point 14ª the entire resistance is in service, and when said handle is shifted on to the contact point 14ᵇ one half of the resistance is cut out, owing to the connection 16, which leads from the contact point 14ᵇ to a point approximately halfway between the ends of the wire 9 forming the resistance. When the handle is shifted on to the point 14ᶜ, the entire resistance is cut out and the full power of the current passes from the terminal connected to the binding-post 18, through the plate 13ª, handle 13, contact point 14ᶜ, conductor 20, and from thence to the line conductor connecting to the binding-post 19.

A rheostat of our improved construction is comparatively simple, comprises a minimum number of parts, is very compact, and can therefore be advantageously employed in connection with all forms of small electric motors, and as the resistance coils are ventilated and therefore air-cooled, the heat generated in the coils of the rheostat is readily radiated and disseminated.

We claim:

1. In a rheostat, a base in which is formed a recess, a plurality of perforated plates removably positioned in said recess, means whereby said plates are held spaced apart, and a resistance wire wound upon said plates.

2. In a rheostat, a base in which is formed a recess, a plurality of perforated plates removably positioned in said recess, which plates are spaced apart, a resistance wire wound upon said plates, and there being spaces between the convolutions of the winding of said resistance wire.

3. In a rheostat, a base through which is formed an opening, there being a perforated plate applied to the base over said opening, a resistance wire wound upon said plate, and there being spaces formed between the convolutions of the winding of said resistance wire.

4. In a rheostat, a base through which is formed an opening, a plurality of perforated plates removably positioned on the plate over said opening, which plates are spaced apart, and a resistance wire wound upon said plates.

5. In a rheostat, a base through which is formed an opening, a plurality of perforated plates removably positioned on the plate over said opening, which plates are spaced apart, a resistance wire wound upon said plates, and there being spaces formed between the convolutions of the winding of said resistance wire.

6. In a rheostat, a base in which is formed a recess, there being an opening formed through the base communicating with said recess, a plurality of perforated plates removably positioned in the recess, spacing strips arranged between the ends of said plates, and a resistance wire wound upon said plates.

7. In a rheostat, a base in which is formed a recess, there being an opening formed through the base communicating with said recess, a plurality of perforated plates removably positioned in the recess, spacing strips arranged between the ends of said plates, a resistance wire wound upon said plates, and there being recesses formed in the base at the corners of the first-mentioned recess for the reception of the ends of the spacing strips.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses, this 19th day of April, 1909.

CHARLES R. MESTON.
HERBERT I. FINCH.

Witnesses:
F. R. CORNWALL,
LENORE CLARK.