

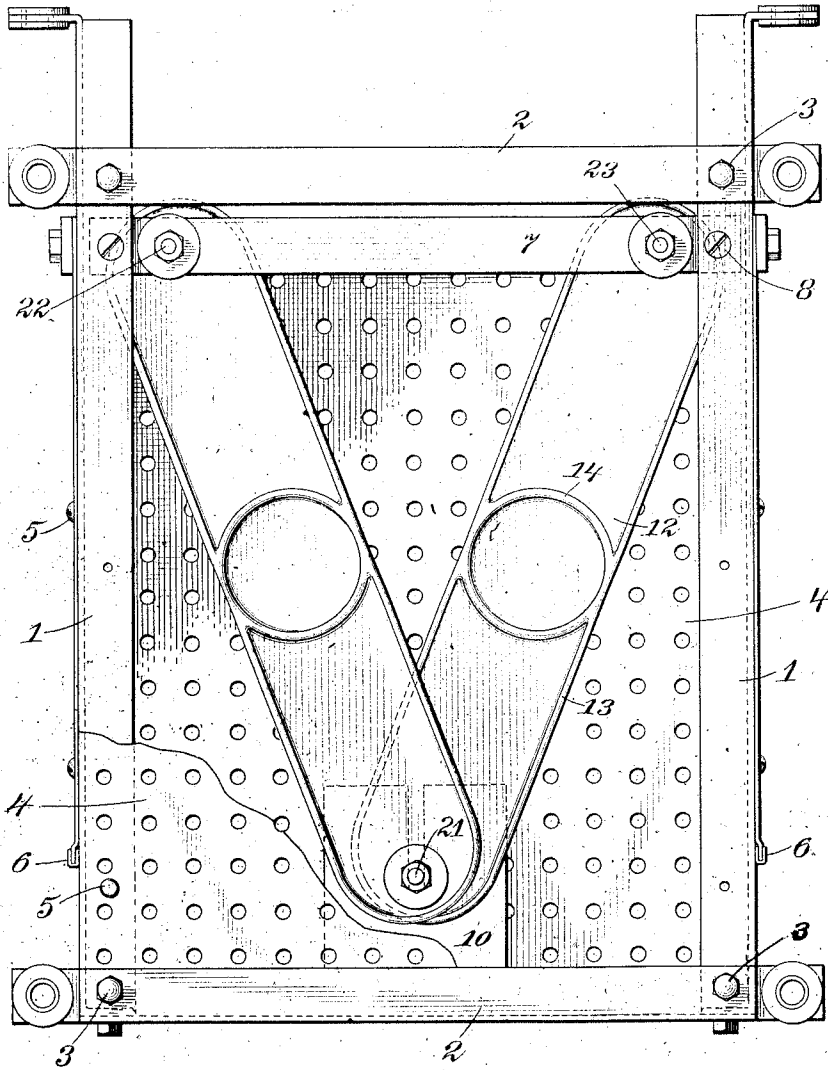
H. J. WIEGAND.
RHEOSTAT.
APPLICATION FILED MAR. 29, 1909.

949,923.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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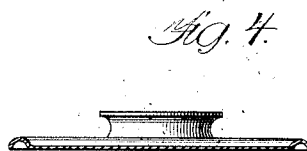
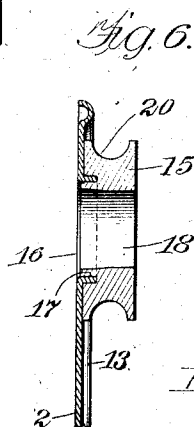
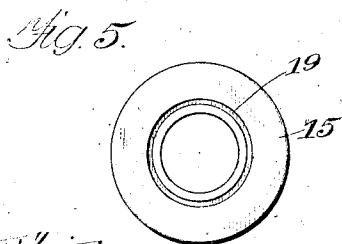
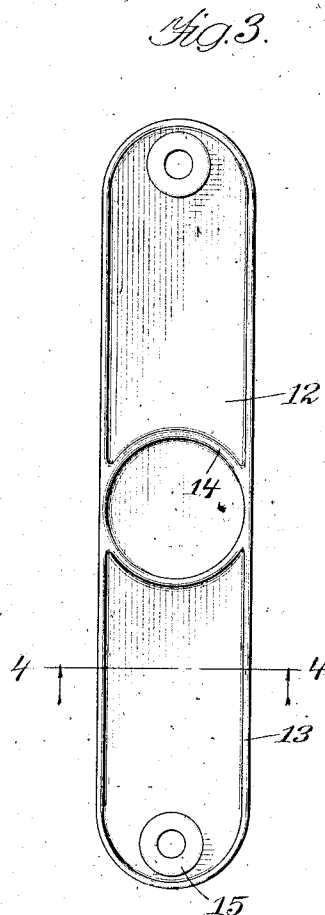
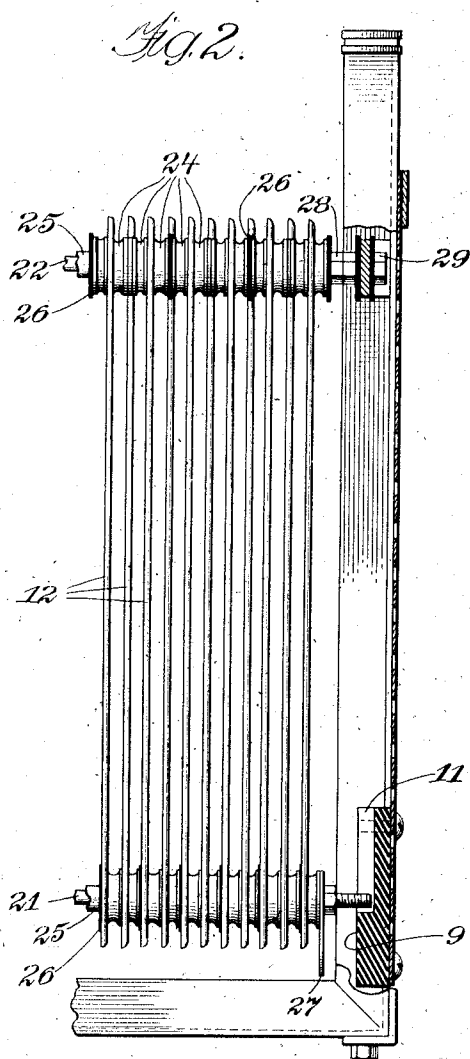
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949,923.

Patented Feb. 22, 1910.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HENRY J. WIEGAND, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE CUTLER-HAMMER MFG. CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

RHEOSTAT.

949,923.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed March 29, 1909. Serial No. 486,514.

To all whom it may concern:

Be it known that I, HENRY J. WIEGAND, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Rheostats, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in rheostats, and more particularly to resistance units and to the method of mounting the same.

One object of my invention is to so form a resistance unit from a thin sheet of suitable resistance material as to obtain the requisite rigidity of the same.

A further object of my invention is to mount the units so as to secure the best possible ventilation thereof.

A further object of my invention is to provide terminals on the resistance units which will properly space adjoining units when assembled in a rheostat.

A still further object of my invention is to provide means for securely fastening the terminals on the units.

In order that my invention may be more thoroughly understood, I have illustrated one embodiment of the same in the accompanying drawings.

In the accompanying drawings,—Figure 1 is an elevation of a rheostat embodying my invention, a portion of the front being broken away; Fig. 2 is a side elevation of the rheostat shown in Fig. 1 with the casing removed and parts of the device being shown in section; Fig. 3 is a plan view of one of the resistance units; Fig. 4 is a sectional view of the unit shown in Fig. 3, as seen on line 4—4; Fig. 5 is a bottom plan view of one of the spacing terminals, and Fig. 6 is a central sectional view of a portion of one of the resistance units and its spacing terminal.

In the embodiment of my invention shown, I have provided a supporting frame consisting of vertically arranged bars 1, and horizontally arranged bars 2, secured together by means of bolts 3. The bars 1 and 2 are preferably formed of angle iron, as by such construction a very light and rigid frame may be secured. A casing 4 preferably formed of foraminous material, is secured to the frame in any preferred manner,

as by screws 5. The sides of the casing are preferably made shorter than the frame so as to leave openings at the lower ends thereof. Where such a construction is used, binding strips 6 are preferably disposed over the lower end of the sides, as otherwise a ragged edge would be left. A pair of supporting members 7, for the resistance units, are oppositely disposed near the upper ends of the bars 1 and secured thereto in any preferred manner, as by means of bolts or screws 8. Oppositely disposed blocks 9 and 10, preferably of insulating material, having grooves 11 in one face thereof, are secured near the lower end of the frame for a purpose hereinafter set forth. When it is desired to suspend the frame from the ceiling, the bars 1 are extended and provided with means whereby the same may be fastened in place. If it is desired to fasten the frame against a wall, the ends of two of the side bars are extended and provided with like fastening means.

In the embodiment of my invention, shown in the drawings, I employ resistance units 12 which are formed of a thin sheet of suitable material. German-silver provides an efficient material for such units, but, of course, other materials may be used. Usually such a construction would be impractical, as the units would be so flimsy as to be liable to buckle when heated and cause short circuits in the rheostat. To obviate this danger I provide the units with suitable strengthening beads or ribs. As illustrated, I have provided a continuous bead 13, extending around the outer edge of each unit. This bead strengthens the unit, both longitudinally and transversely. In addition to the bead 13, I preferably provide curved beads 14, which also act to strengthen the units both longitudinally and transversely. It should be understood, however, that the ribs or beads may be of any preferred form and located as desired. Terminals 15 are secured to each resistance unit at the ends thereof, by means of which the units may be mounted in a rheostat and electrically connected in circuit. The resistance units are provided at opposite ends with openings 16. Surrounding the openings 16 are collars 17, which may be struck up from the units, or formed in any other suitable manner. The terminals 15, preferably constructed of sufficient height to act as spacing

washers, have an opening 18 therethrough. Each of the terminals is provided with an annular groove 19 adapted to receive a collar 17 therein. The material forming the inner wall of the groove is then spread outwardly by means of a suitable punch, so as to tightly impinge the collar between the walls of the groove, thus securely fastening the terminals in position. The terminals 15 are preferably formed with a groove 20 around the edge thereof, whereby a terminal of light weight, but with a large contact surface, is secured.

I have shown my preferred manner of mounting the resistance units in a rheostat whereby they will be cooled to the best advantage. The units are mounted in substantially V-shape. One terminal of each of the units is mounted upon a rod 21. The opposite ends of the units are alternately mounted on supporting rods 22 and 23, extra spacing washers 24 being disposed between the succeeding units on each of said rods 22 and 23, to maintain all of the units in parallel relation. The rods 21, 22 and 23, carry insulating sleeves 25, and insulating disks 26 are interposed between certain of the units so as to control the path of the current therethrough. The insulating washers may be interposed between the units in any preferred manner to direct the flow of current therethrough. In Fig. 2, of the drawings, I have shown the units arranged in series, the path of the current from the terminal 27 being traced through the first unit to the third unit, thence through the second unit to the fourth unit, and so on. However, it will be understood that the units may be connected in various other ways. When the units have been properly mounted upon the rods they are secured in place by nuts 28, and the rods 22 and 23 are secured in the supporting members 8 by means of nuts 29, or in any desired manner, and are preferably insulated therefrom. The ends of the rod 21 are designed to extend into the grooves 11 in the blocks 9 and 10. The grooves will maintain the units in proper relation in the rheostat, but will allow the rod to move therein to compensate for any expansion or contraction of the units during service.

While I have described the preferred form of my invention, I desire it to be understood that various modifications may be made therein without departing from the scope of my invention.

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

1. A rheostat, comprising a plurality of elongated resistance plates divided into groups disposed obliquely in opposite directions.

2. In a rheostat, in combination, a plu-

rality of elongated resistance elements, a single supporting member for one end of each element, and a plurality of supporting members, each connected to the opposite end of a plurality of said elements.

3. In a rheostat, in combination, a pair of supporting rods arranged substantially parallel and in substantially the same plane, and another rod arranged substantially midway between said first-mentioned rods and in a different plane therefrom, and a plurality of elongated resistance plates, each having one end secured to the last-mentioned rod and its opposite end connected to one of the other of said rods.

4. In a rheostat, in combination, a pair of supporting rods arranged substantially parallel in the same horizontal plane, an additional supporting rod arranged below and substantially equidistant from said first-mentioned rods, and a plurality of resistance units formed from a thin sheet of material and each having a pair of terminals, one terminal of each unit being arranged on the lower rod, and the other terminals of said units being arranged on one of said pair of rods.

5. In a rheostat, in combination, a frame, a plurality of resistance units, each formed from a thin sheet of material, said units being arranged in groups disposed obliquely in opposite directions.

6. In a rheostat, in combination, a frame, a plurality of resistance units, each formed from a thin sheet of material and having a strengthening bead formed thereon, said units being arranged in groups, disposed obliquely in opposite directions.

7. In a rheostat, in combination, a frame, a plurality of resistance units, a single supporting member for the lower end of all of said units, a pair of supporting members for the upper ends of said units, the adjoining units being alternately supported by said pair of supporting members, the two groups of resistance units being disposed obliquely in opposite directions.

8. In a rheostat, in combination, a frame having a pair of guiding blocks arranged near the lower portion thereof, a plurality of resistance units each formed from a thin sheet of material and having terminals at opposite ends thereof, a rod extending through the lower terminals of all of said units, a pair of rods, each passing through the upper terminals of a portion of said units, said pair of rods being supported by said frame, and the other rod having its ends disposed in the guiding blocks.

9. A resistance unit formed from a thin sheet of material, said sheet of material having an endless strengthening bead struck from its surface at the edge thereof.

10. A resistance unit formed from a thin sheet of material, said sheet of material

having strengthening beads struck from the surface thereof, one of said beads being endless and formed at the edge of said sheet of material.

5 11. A resistance unit formed from a thin sheet of material, said sheet of material having a strengthening bead struck from its surface and at the edge thereof, and also transversely extending strengthening beads.

10 12. A resistance unit formed from a thin sheet of material, said sheet of material having longitudinal and transverse strengthening beads struck from the surface thereof.

15 13. A resistance unit, formed from a thin sheet of material, having a continuous strengthening bead formed around the edge thereof, and also transversely extending strengthening beads.

20 14. A resistance unit, formed from a thin sheet of material, having a struck-up portion and a terminal adapted to be clamped to the struck-up portion thereof.

25 15. A resistance unit, formed from a thin sheet of material, said resistance unit having an aperture therein, and a collar around said aperture, a terminal for said unit having a groove therein for receiving said collar, said terminal being adapted to be clamped onto said collar.

30 16. A resistance unit, formed from a thin sheet of material, said resistance unit having apertures in its ends and collars around said apertures, terminals for said unit, each terminal having a groove therein adapted to receive one of said collars, the walls of said groove being impinged against the collars.

35 17. A resistance unit, formed from a thin sheet of material, having apertures therein

and collars formed around said apertures, terminals having an aperture therethrough and having a groove formed around said aperture for receiving a collar therein, the aperture in each terminal being expanded whereby the walls of the groove will im- 45
pinge said collar therebetween.

18. A resistance unit, formed from a thin sheet of material, a strengthening bead formed around the edge thereof, and strengthening beads formed transversely 50
thereof, said unit having an aperture at each end and collars formed around said aperture, a terminal for each end of said unit, said terminals having a groove for receiving a collar therein, the walls of said groove 55
being forced together to impinge the collar therebetween.

19. In a rheostat, in combination, a supporting frame, a plurality of resistance units, means for rigidly securing one end 60
of all of said units in said frame, and means for loosely supporting the opposite ends of said units in said frame.

20. In a rheostat, in combination, a supporting frame, a plurality of elongated re- 65
sistance units having terminals at opposite ends thereof, means for rigidly securing one terminal of all of said units in said frame, and means for loosely supporting the opposite terminals of said units in said frame. 70

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HENRY J. WIEGAND.

Witnesses:

S. W. FITZ GERALD,
F. H. HUBBARD.