No. 652,116. Patented June 19, 1900.

T. F. JORDAN.

RHEOSTAT.

(Application filed Mar. 20, 1900.)

(No Model.)

Fig: 1.

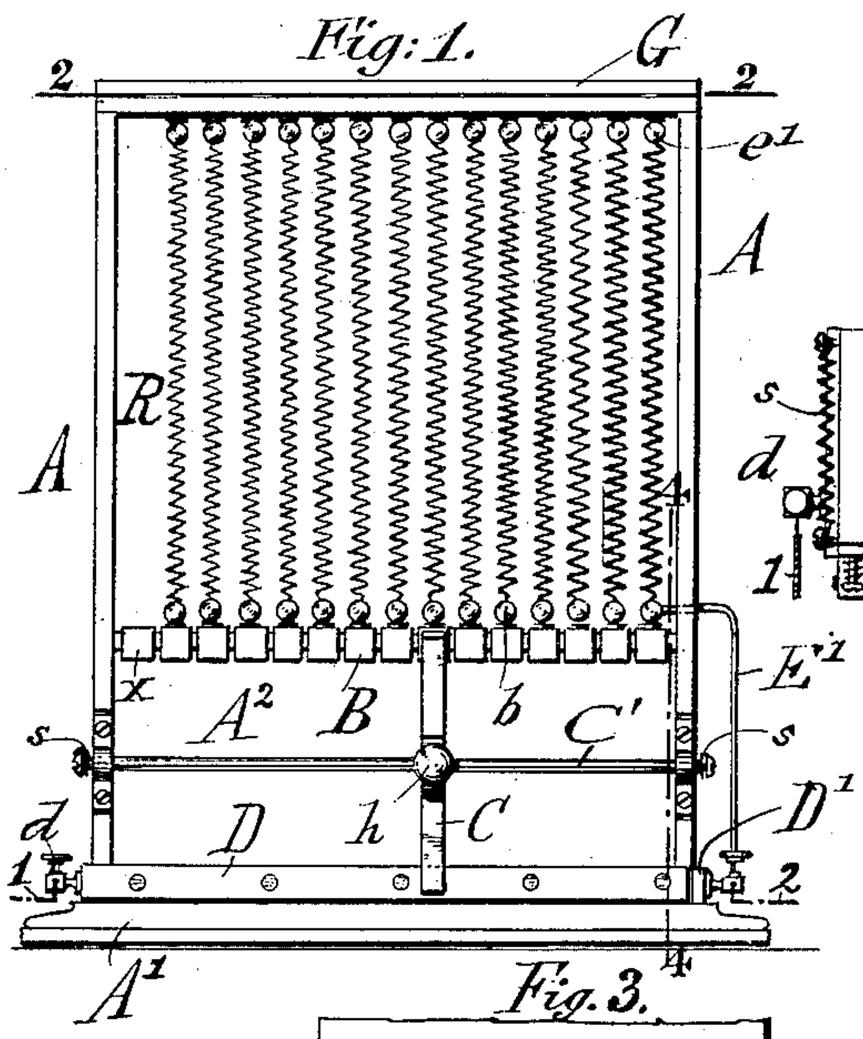


Fig: 2.

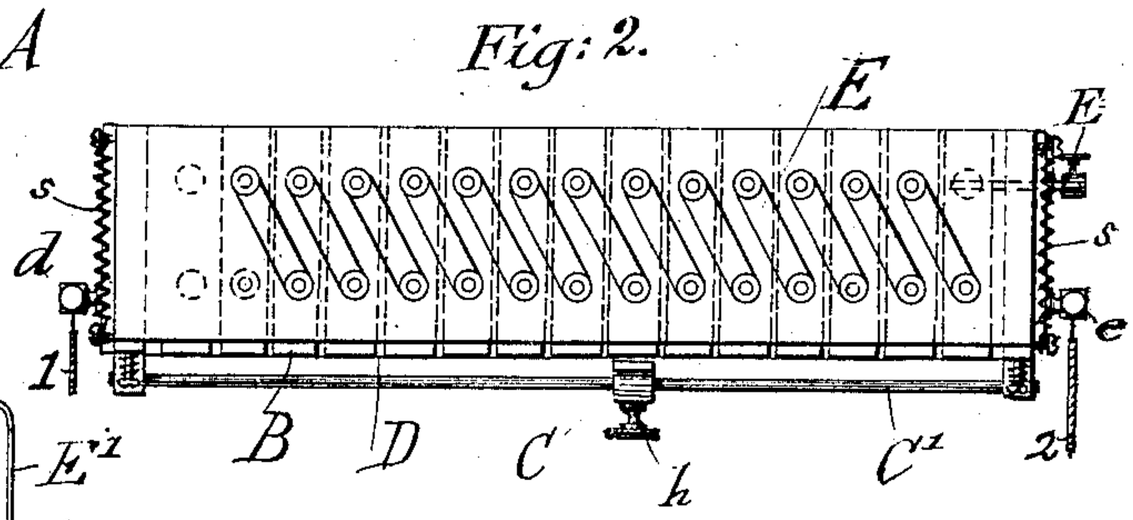


Fig. 3.

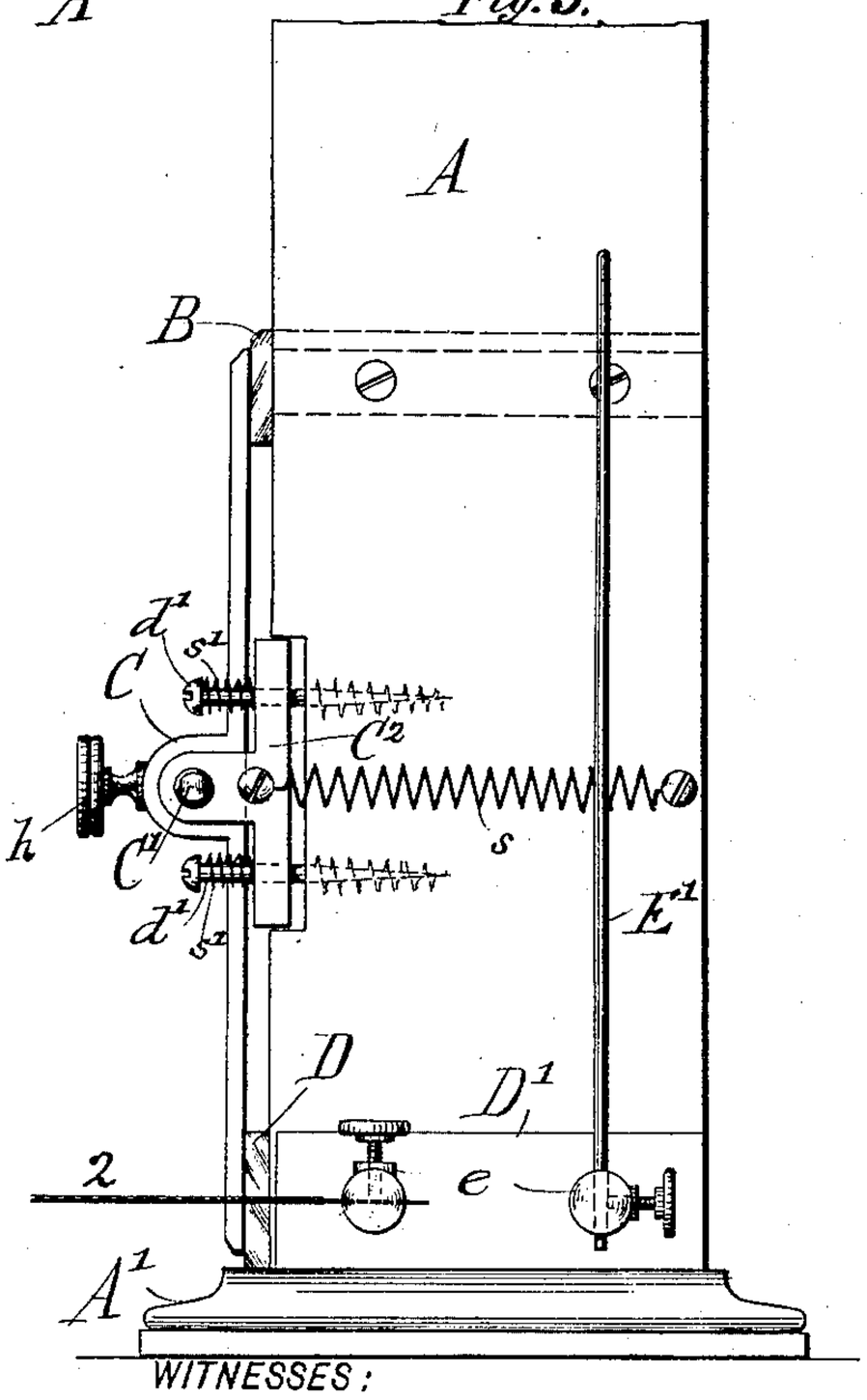
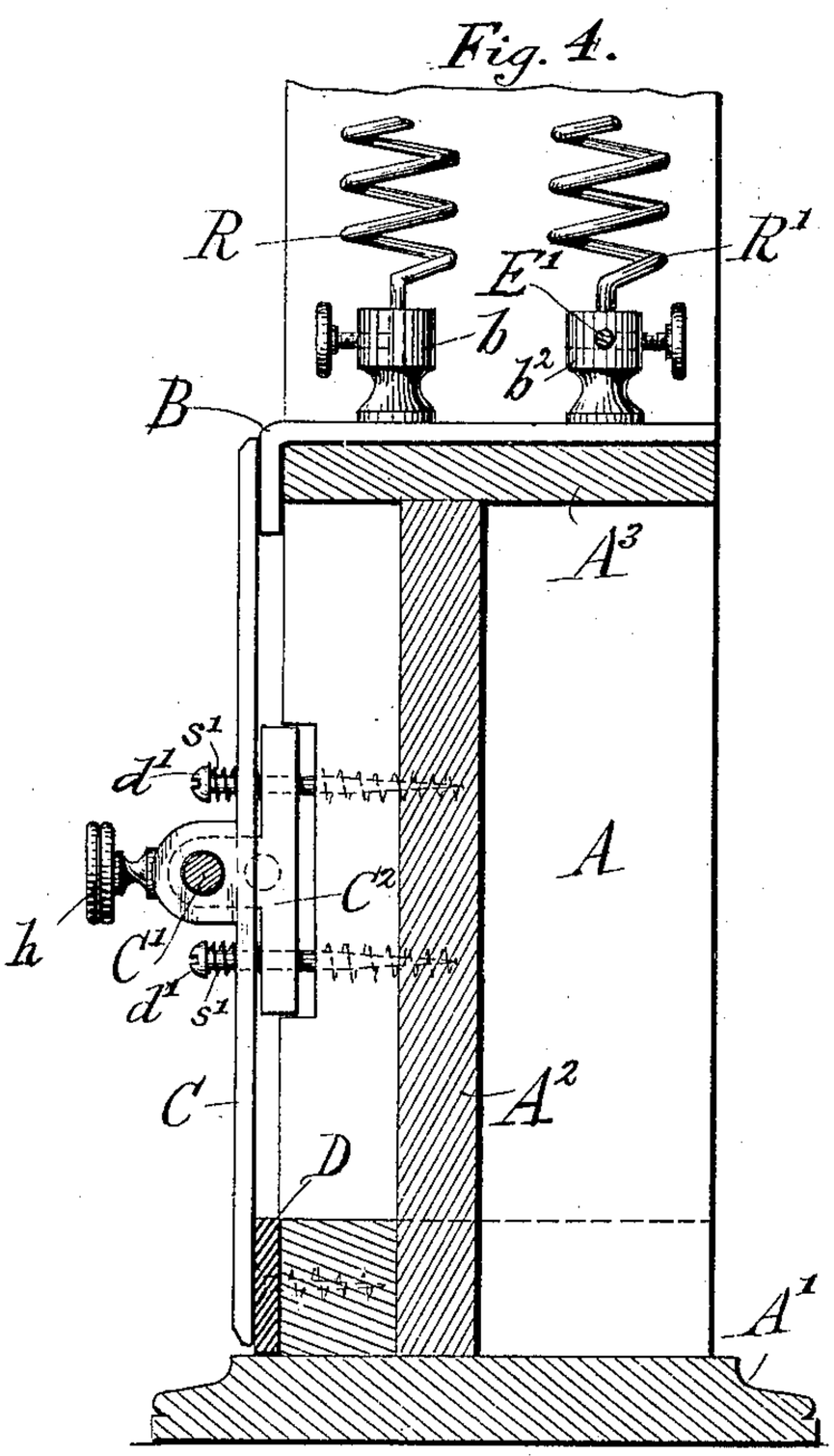


Fig. 4.



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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 652,116, dated June 19, 1900.

Application filed March 20, 1900. Serial No. 9,353. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. JORDAN, a citizen of the United States, residing in the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

This invention relates to improvements in rheostats of that class which are adapted for controlling the electric current in electroplating and galvanoplastic operations; and the object of the invention is to provide a rheostat having a considerable range of resistance and in which the coils are so secured as to permit of ready removal and replacing and which are so arranged as to permit a free circulation of air about the same.

The invention consists of a rheostat which comprises a plurality of resistance-coils of varying resistances arranged in a series, means for supporting said coils and connecting the same at their upper ends, contact-plates connecting the coils at their lower ends, a conducting-bar, and a switch-block guided in contact with said contact-plates and conducting-bar.

The invention consists, further, of certain details of construction and combinations of parts, which will be more fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a front elevation of a rheostat embodying my improvements. Fig. 2 is a top view with the part G removed, as indicated by line 2 2, Fig. 1. Fig. 3 is a side view, on a larger scale than Fig. 1, of the lower part of the rheostat; and Fig. 4 is a vertical transverse section on line 4 4, Fig. 1.

Similar letters and numerals of reference indicate corresponding parts.

Referring to the drawings, A represents an upright supporting-frame, which is preferably made of oblong shape and of slate or other suitable non-conductor. The frame A is secured to the base A′, which is also made of non-conducting material. Within the frame is arranged a partition A^2 of similar material, and at the top of the same and secured thereto and to the frame sides is a horizontal plate A^3, on which are mounted strips B of metal, preferably copper, which are insulated from each other, said strips B being provided with binding-posts *b* for firmly attaching the lower ends of a plurality of resistance-coils R R′, of iron or other metal, having a low conductivity. In contact with the downwardly-bent front portions of the strips or plates B is placed the upper end of a switch-block C, which is guided on a horizontal rod C′, supported in movable blocks C^2 of the frame A. The slide-block C is provided with an insulated operating-handle *h* and is made of sufficient length to extend from the insulated contact-plates B to a metallic conducting-bar D, which is secured to the base A′. At one end of the conducting-bar is arranged a binding-post *d* for attaching the conducting-wire, by which the current is conducted into the rheostat. The ends of the slide-block C are pressed into frictional contact with the contact-plates B and bar D by means of springs *s*, each of which is secured at one end to one of the supporting-blocks C^2 of the guide-rod C′, as shown in Fig. 3, and at the opposite end to the frame. The blocks C^2 are attached to the frame by means of bolts or screws *d′*, between the heads of which and the blocks are interposed pressure-springs *s′*. A reliable frictional contact of the slide-block with the front conducting-bar D and contact-plates B is thereby produced. At one end of the base is arranged a conducting-plate D′, provided with binding-posts *e*, to one of which is secured one end of a leading-out wire E′, which is connected at its opposite end by the binding-post b^2 with the first contact-plate B.

At the upper part of the upright frame A are arranged connecting-strips E, which are provided with binding-posts *e′* for clamping the upper ends of the resistance-coils R R′. The connecting-plates E may be attached to the inside of the frame or to the outside of the same, as shown, in the latter case a strip G of insulating material or other protecting means being secured in position over the plates E to protect the same, so as to obviate accidental short-circuiting. The resistance-wires R R′ are of varying diameters and resistances and are arranged successively in pairs, according to resistance, preferably in two parallel lines, as shown, from one side of the frame to the

other, the coils of each pair being connected at their upper ends by a connecting-plate E and each pair being connected with the adjacent pair by a contact-plate B. The coils thereby form a connected series from one side of the frame to the other, one end of the series being connected with the wire E′. The opposite end terminates without outside connection, and a blank contact *x*, which is not connected with the coils and which acts simply as a rest for the switch-block C, is arranged at this end of the series.

When the slide-block is in the position shown in Figs. 2 and 3, the course of the current is as follows: from the dynamo or other source of electricity successively through the wire 1, bar D, switch-block C, plate B in contact with the switch-block, up through the coil R′, connected with said plate, then through the plate E, down coil R, into the following plate B, and so on successively up one coil and down the other of a pair, and then into the next pair, and finally into the wire E′, plate D′, and wire 2 to the plating-bath or other place of use. The coil R′ (shown in Fig. 4) is not connected with the binding-post b^2, as might appear, but is the coil R′ of the next preceding contact-plate B. When the switch-block is in contact with the plate B, with which the wire E′ is connected, the current does not pass through any of the coils, but directly through bar D, switch-block C, plate B, wire E′, and wire 2, and the entire current undiminished passes to the bath. On the contrary, when the switch C is placed in contact with the plate *x* no current can pass, the circuit being broken. By shifting the block so that it rests upon any one of the contacts between these two the current may be caused to pass through any desired number of pairs of coils, and thereby regulated at will according to the requirements of the bath. Each step, however, comprises two coils, and to provide for finer graduations of the current strength or for higher resistances one or more additional sets of coils having resistances suitable for the purpose desired are supplied. The removal of one set and replacing of another requires but a short time, and thus any desired resistance may by the use of different sets of coils be obtained.

The advantages of my improved rheostat are as follows: First, a considerable range of resistance is secured, so that the current at hand may be regulated without the use of extra coils for all ordinary plating purposes with great facility; second, the facility with which the individual coils can be replaced with new ones in case of injury by the current, or any particular pair or single coil removed and replaced by others or another of different resistance for any special resistance desired; third, the simplicity of construction and ease with which it can be cleaned and kept free from dust or metallic particles liable to cause short-circuiting; fourth, the unlimited range of resistance readily obtainable by the use of different sets of coils, thereby rendering the rheostat of universal application, and, fifth, the open construction by which the air is permitted to circulate freely about the coils, thereby keeping the same cool and less liable to injury by the current.

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

1. A rheostat, consisting of a plurality of resistance-coils arranged in pairs, means for supporting the same, connecting-plates connecting the coils of each pair, contact-plates connecting the successive pairs, a switch-block, a conducting-bar, and means for guiding said switch-block along the contact-plates and conducting-bar, substantially as set forth.

2. A rheostat, consisting of an upright supporting-frame of non-conducting material, a plurality of resistance-coils arranged in pairs, means for connecting the coils of each pair, contact-plates connecting each pair with the next, a conducting-bar, and a sliding switch-block guided at the lower part of the frame and connecting the contact-plates with the conducting-bar, substantially as set forth.

3. A rheostat, consisting of an upright supporting-frame of non-conducting material, a plurality of resistance-coils of varying resistances arranged successively in pairs in said frame, connecting-plates connecting the upper ends of the coils of each pair, contact-plates connecting the lower end of one coil of each pair with a coil of the next pair, a conducting-bar, a switch-block, means for guiding said switch-block over the contact-plates and conducting-bar and means for holding said switch-block in frictional contact with the contact-plates and conducting-bar, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

THOMAS F. JORDAN.

Witnesses:
PAUL GOEPEL,
J. H. NILES.