No. 725,196. PATENTED APR. 14, 1903.

J. P. BALL.

RHEOSTAT.

APPLICATION FILED APR. 7, 1902.

NO MODEL.

FIG. 1.

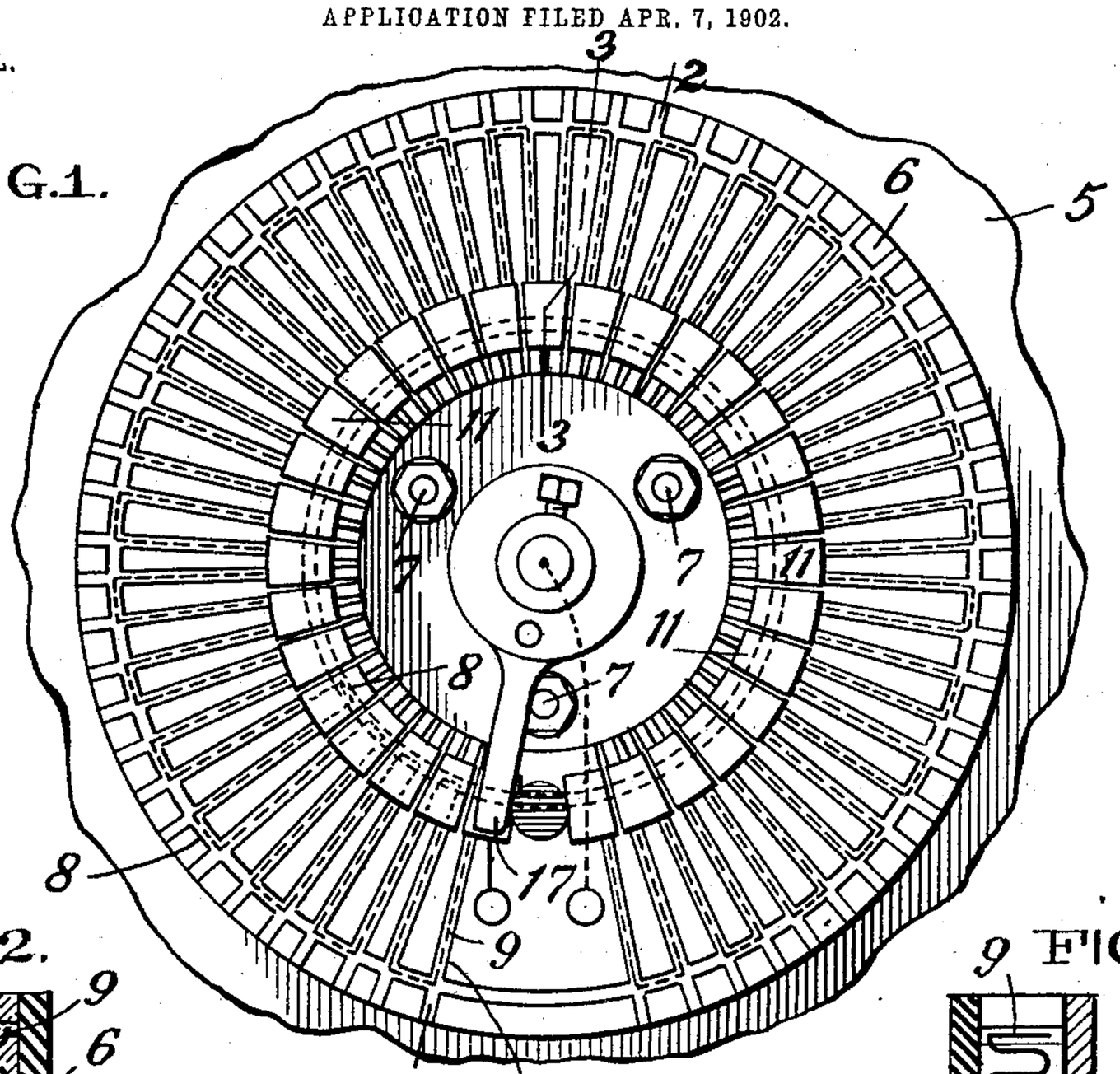


FIG. 2.

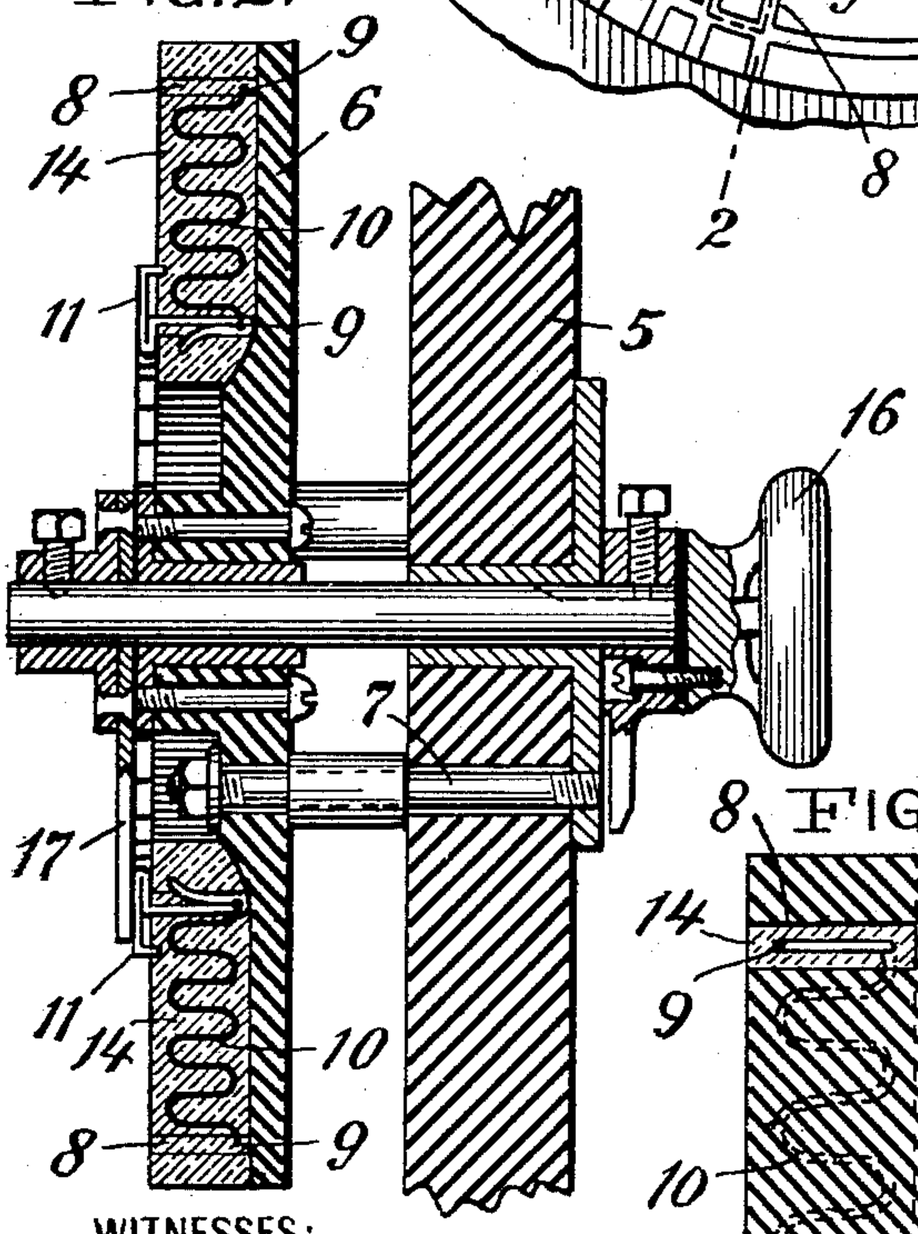


FIG. 3.

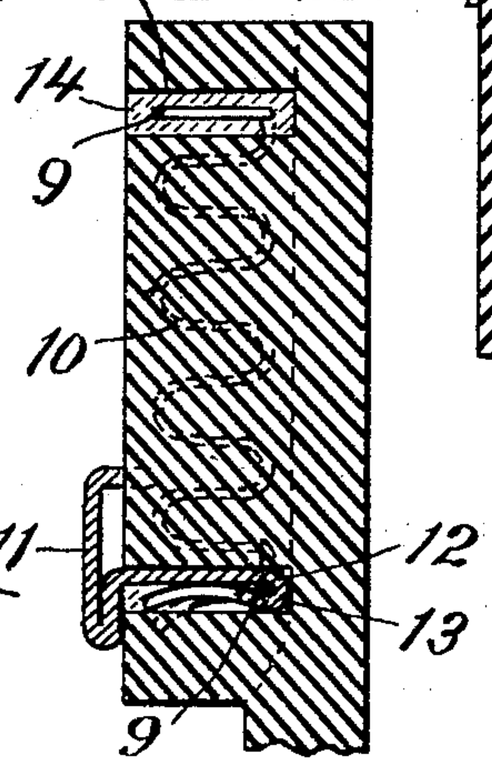
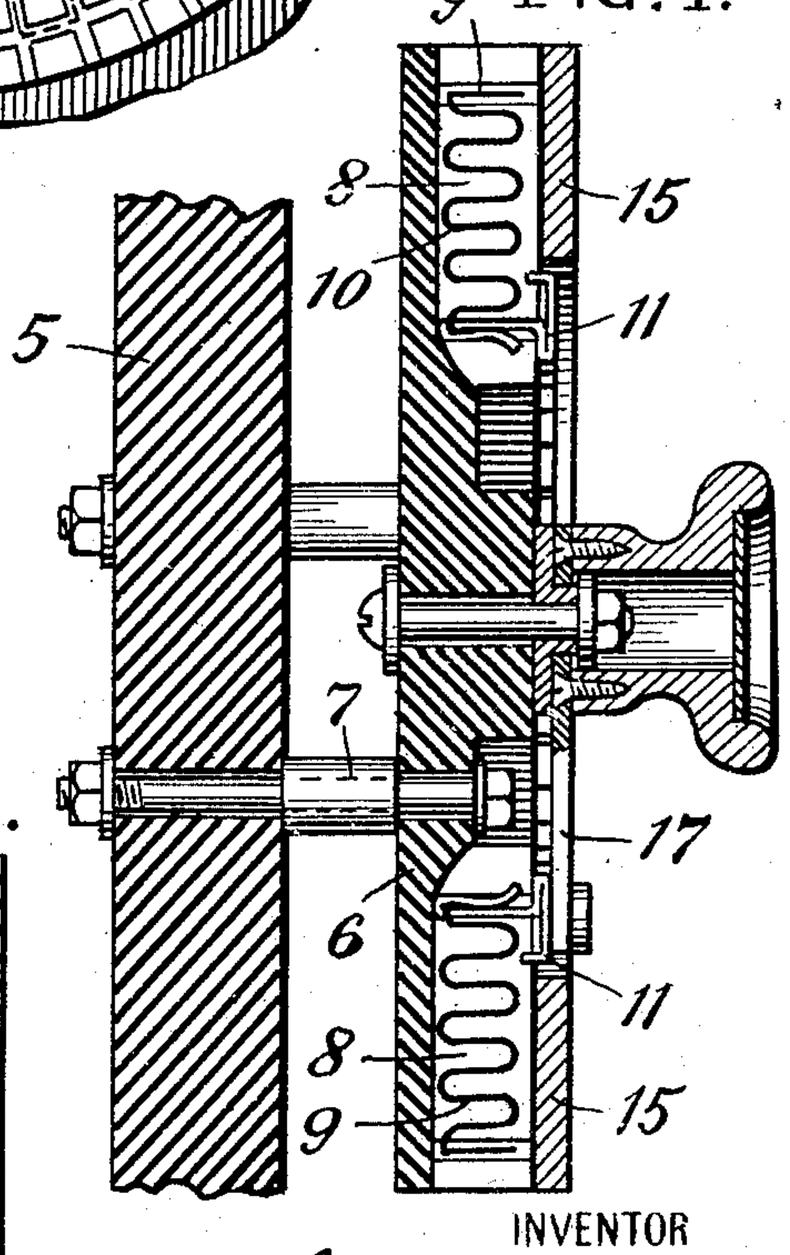


FIG. 4.



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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 725,196, dated April 14, 1903.

Application filed April 7, 1902. Serial No. 101,762. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. BALL, a citizen of the United States, residing at Frankford, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Rheostats, of which the following is a specification.

My invention relates to rheostats of the type wherein the resistance employed is located in a series of adjacent slots formed in the body of the supporting-plate of the rheostat.

In a former patent, No. 558,252, granted to me April 14, 1896, I have described a rheostat wherein the resistance employed is located in a series of slots formed in the body of the supporting-plate of the rheostat in the form of a wire bent upon itself to form convolutions and held in place within the slots by the frictional relation existing between the walls of the slots and the body of the wire. My present construction differs from that described in such patent in that the resistance employed is held within the slots by means independent of the resistance—such, for instance, as a body of cement, a suitable covering-plate, or a covering means, such as sand, and a covering-plate.

The object of my invention is to construct a rheostat wherein the resistance employed will be securely held in place and in such manner as not to be subjected to mechanical injury; further, to provide means whereby the heat generated in the resistance will be absorbed by the covering-body of the resistance and by the body of the rheostat from which it will be radiated, thereby greatly increasing the surface from which radiation may take place over that which the resistance itself would have if supported in the air apart from the covering-body and the rheostat; further, to provide means in the nature of a covering material, as well as the supporting-body for the rheostat, having a great specific capacity for heat, so that the sudden fluctuations of current passing the rheostat and which produce heat in proportion to the square of the current will be rapidly absorbed, thereby preventing injury to or destruction of the rheostat.

The accompanying drawings will serve to illustrate my invention.

Figure 1 is a back view of the rheostat looking from the left of Fig. 2. Fig. 2 is a section taken on the line 2 2 of Fig. 1 and shows the rheostat mounted on the back of the switchboard. Fig. 3 is a section taken on the line 3 3 of Fig. 1. Fig. 4 is a vertical section showing a modification of the rheostat shown in Fig. 2 with the rheostat mounted on the front of the switchboard.

In the drawings, 5 indicates a switchboard. Secured to the back or front of the switchboard, as shown, respectively, in Figs. 2 and 4, is a plate of insulating material 6, which may be formed of glass, lava, porcelain, slate, soapstone, or other suitable material, preferably material which may be readily worked and which has a considerable capacity for heat. The plate of insulating material 6 may be secured to the switchboard by means of bolts 7 or other suitable devices. The plate of insulating material has formed within it a series of slots 8, which may be given any shape, but preferably with the greatest dimension perpendicular to the plane of the rheostat, and within these slots is located the resistance 9. The resistence employed may be any form now known in the art—such, for instance, as a metallic wire, strip, or plate, a carbon wire, strip, or plate, a mixture of graphite, or other material in the form of a powder or granulated mass. In the drawings and for the purposes of illustration I have shown a wire. The resistance-wire located in each slot may be a straight wire or provided with a series of convolutions 10 in the direction of its length, as shown in Figs. 2, 3, and 4, and connected to this wire at equidistant points are a series of contact-plates 11. The wire 9 is shown as secured to the contact-plates 11 by clamping the wire between the arms 12 13 of the contact-plate, Fig. 3.

In order to maintain the resistance within the grooves 8 of the plates 6, I may fill the grooves flush with the surface of the plate, after the resistance has been inserted, with a body of cement, enamel, sand, or other substance 14 which will not be decomposed when the wire is heated and which preferably has a large capacity for absorbing heat. Instead of using cement or other substances applied

in a fluid or semisolid state and which will subsequently harden and contract I may cover the conducting material within the grooves with any insulating-powder or granular material, such as sand, and then apply a plate 15, as shown in Fig. 4, or I may omit the sand and apply merely the plate.

16 represents a handle for operating the contact-sector 17, which in Fig. 2 is on the back of the switchboard and in Fig. 4 on the front of the switchboard. This contact-sector sweeps over, when moved, the contact-plates 11 and operates to alter the resistance in circuit in a manner well understood.

I have described in this specification several means of securing the resistance employed within the slots. I wish to have it understood, however, that I do not limit myself to the means described, as any means may be employed apart from that shown in my former patent which will serve to hold the resistance in the slots and preferably possessing a great specific capacity for heat.

Having thus described my invention, I claim—

1. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance located in said slots, and independent means for holding said resistance in said slots.

2. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance located in said slots, consisting of a wire bent upon itself to form a series of convolutions, and independent means for holding said resistance in said slots.

3. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance located in said slots, and a removable means for holding said resistance in said slots.

4. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance located in said slots, a series of contact-plates connected to said resistance, and independent means for holding said resistance in said slots.

5. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance located in said slots, a series of contact-plates connected to said resistance, a contact-sector adapted to coöperate with said contact-plates, and independent means for holding said resistance in said slots.

6. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance in said slots, independent means for securing said resistance in said slots, a series of contact-plates connected to said resistance at equidistant points and secured in a circle to said insulated plate, a contact-sector adapted to coöperate with said contact-plates and means for moving said sector.

7. The combination with a switchboard, a rheostat mounted on the back of the switchboard, said rheostat comprising an insulated plate provided with a series of radially-arranged slots, a resistance formed as convolutions located in said slots, independent means for holding said resistance in position in said slots, a series of contact-plates connected to said resistance, a contact-sector coacting with said contact-plates, and means for moving said contact-sector from the front of the switchboard.

8. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a resistance formed from the convolutions of a wire located in said slots, the axis of said convolutions being at right angles to the axis of the slots, and independent means for holding said resistance in said slots.

9. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a convoluted resistance located in said slots, and means for holding said resistance in said slots.

10. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots and a series of annularly-arranged slots, a resistance located in said slots, and independent means for holding said resistance in said slots.

11. A rheostat comprising a circular plate of insulating material provided with a series of radially-arranged slots and a series of annularly-arranged slots, a resistance located in said slots, and a series of contact-plates arranged over the inner series of annular slots and in electrical contact with the resistance in said slots.

12. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, a pair of concentric annular slots respectively connecting the inner and outer ends of the radial slots, a resistance located in said radial slots and in a portion of said annular slots, and means for holding said resistance in position.

13. A rheostat comprising a plate of insulating material having a series of radially-arranged slots, a series of circularly-arranged contact-plates located near the inner end of said slots, resistance in said slots, and a movable contact-arm adapted to be rotated over said contact-plates.

14. A rheostat comprising a plate of insulating material having a series of radially-arranged slots, a series of circularly-arranged contact-plates located near the inner end of said slots and having contact-surfaces which project above the level of the insulating-plate, resistance in said slots in circuit with said contact-plates, and a movable contact-arm adapted to be rotated over said contact-plates.

15. A rheostat comprising a plate of insulating material provided with a series of radially-arranged spaced slots, a series of contact-plates arranged in a circle and having their

contact-surfaces each arranged to lap two slots, and a contact-arm adapted to be moved over said contact-plates.

16. A rheostat comprising a plate of insulating material provided with a series of radially-arranged slots, resistance in said slots, a series of contact-plates arranged in a circle and each contact-plate in circuit with the resistance in the slot and having its contact-surface arranged to lap the inner end of two slots, and a contact-arm adapted to move over said contact-plates.

17. In combination with a switchboard, a rheostat comprising a plate of insulating material provided with a series of radial slots on one face, resistance in said slots, a series of annularly-disposed contact-plates in circuit with said resistance, a contact-arm adapted to sweep over said contact-plates, means for supporting said rheostat upon said switchboard, and means for actuating the contact-arm of the rheostat from the front of the switchboard.

In testimony whereof I affix my signature in the presence of two witnesses.

JOSEPH P. BALL.

Witnesses:
MARY P. JACKSON,
SARAH P. BALL.