

No. 687,044.

Patented Nov. 19, 1901.

F. MACKINTOSH.
RHEOSTAT.

(Application filed Apr. 22, 1901.)

(No Model.)

Fig. 1

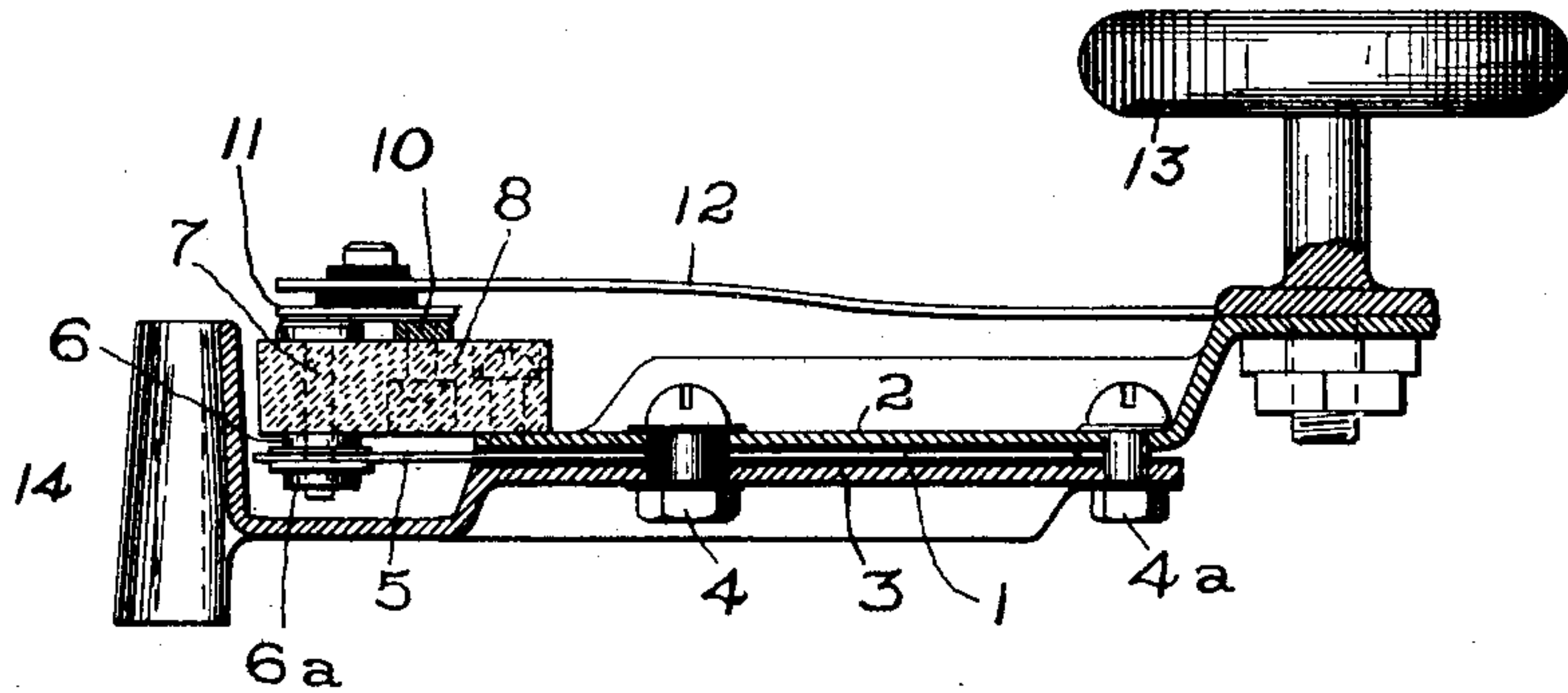
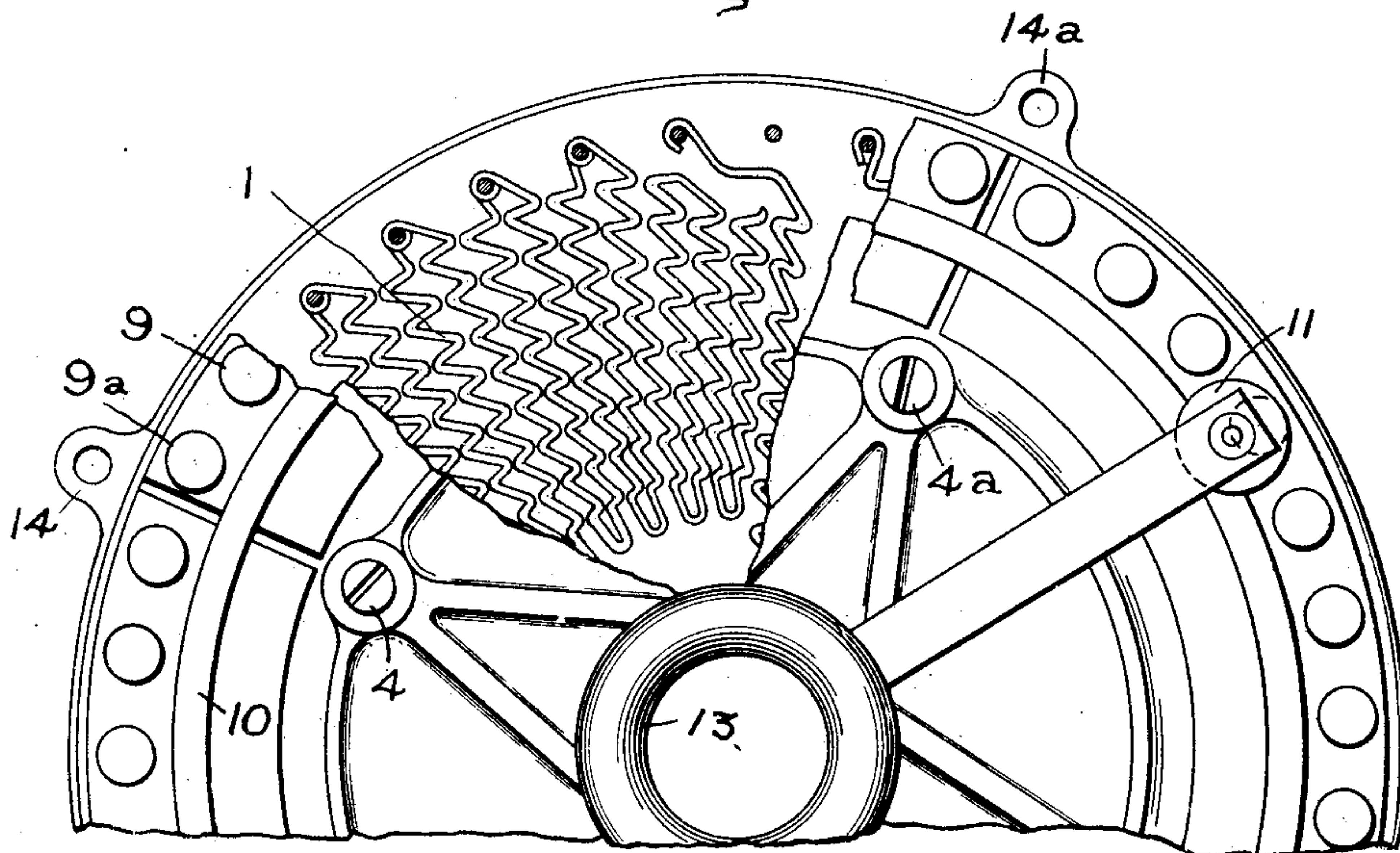


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

FREDERICK MACKINTOSH, OF SCHENECTADY, NEW YORK, ASSIGNOR TO
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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 687,044, dated November 19, 1901.

Application filed April 22, 1901. Serial No. 56,817. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MACKINTOSH, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Rheostats, (Case No. 1,734,) of which the following is a specification.

This invention relates to rheostats, the object being to provide a device of this character strong and simple in construction and having large heat-dissipating capacity.

In carrying out the invention I form the resistance material of wire, crimped into zigzag form and firmly supported between metal plates, the contact-faces of which are coated with enamel or similar tenacious insulating refractory material, loops of the resistance-wire being permitted to project from the supporting-plates for connection with a range of studs or contacts by which the length of resistance-wire in circuit may be varied. The wire is first passed through a crimping-machine and is then folded back and forth upon itself in annular or other form with intervening air-spaces and submitted to heat and pressure between metallic plates in order to prevent it springing and is then placed between the enameled plates and connected with the studs on the rheostats.

The several features of novelty of the invention will be hereinafter more fully described and will be definitely indicated in the claims accompanying this specification.

In the drawings, Figure 1 is a sectional detail of a rheostat embodying my improvements, and Fig. 2 is a partial plan view of a rheostat with parts broken away.

1 represents a metallic wire, which may be of any metal suitable for resistance-boxes or rheostats, crimped by preliminary treatment in a crimping-machine and then folded back and forth in zigzag form in annular or other shape and pressed and heated between metal plates. It is then clamped between metal plates 2 3, the opposing faces of which are covered with an insulating-enamel, the plates being held together by bolts or set-screws 4 4^a. The wire, of course, may be arranged in other form than that shown, the essential feature being that the main part of it is firmly held

between plates which conduct away and dissipate the heat generated in the wire. The outer ends of the folds are permitted to project beyond the plates, as indicated at 5, and are held between metal washers 6 6^a, screwed firmly on a pin 7, passing through an annulus of porcelain 8, the upper ends of the pin being headed to form contact-studs 9 9^a, &c. The number of extended loops of the resistance-wire may be varied according to the fineness of resistance graduation in the several steps. As shown in the drawings, each loop is taken out to a separate resistance-stud, though of course every second, third, or fourth loop may be taken out, if desired.

The ends of the wire may be connected in any usual manner with respect to the circuit, one terminal of which may be placed on an insulated post for the operating-handle, if desired; but I prefer to mount a conducting-ring 10 on the porcelain ring 8 and employ a bridging contact 11, carried by and insulated from a spring-arm 12, attached to the operating-handle 13.

The plates 2 3 may be formed so as to constitute the frame of the rheostat, as will be evident from the drawings, the plate 2 being a disk dished at the center and plate 3 an annulus dished at the circumference and provided with lugs 14 14^a to form feet for the rheostat. The loops of resistance-wire projecting from beneath the plates are thus suspended in an air-space, across which extends the porcelain ring 8, thus permitting free ventilation and facilitating cooling of the wire, while the surface of the metal plates 2 3 is in open exposure to the air and rapidly carries away the heat of the wire.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A rheostat having a length of resistance-wire bent back and forth upon itself, and mounted between insulated heat-conducting plates, a number of bends of the wire being permitted to project from the edges of the plates, and contact-studs connected with said bends.

2. A rheostat having a plurality of folds of resistance material clamped between metal plates coated with insulating heat-refractory material, a number of folds projecting from

the edges of the plates and connected with contact-studs.

3. A rheostat having a resistance in zigzag form and clamped between insulated metal
5 plates having projecting loops intermediate the ends for effecting contact.

4. A rheostat comprising a crimped resistance-wire clamped between insulated metal plates, a range of insulated contact-studs connecting with different parts of resistance-wire,
10 a conductor arranged adjacent to, but insulated from said studs and a bridging contact to connect the two.

5. A rheostat comprising a folded wire
15 clamped between enameled metal plates, a ring of insulating material carrying a range of contact-studs connecting with successive parts of resistance-wire, a metal ring mounted on the insulating-ring adjacent to the studs
20 and forming one terminal of the circuit, and a bridging contact secured to an operating-

handle to connect the several studs with the metal ring.

6. A rheostat comprising a crimped resistance-wire folded in zigzag form and clamped
25 between enameled metal plates, loops of the wire projecting from the plates at intervals and surrounded by an air-space, a porcelain ring carrying contact-studs connected with the projecting loops and a movable switch
30 adapted to sweep over the contact-studs.

7. A rheostat having a continuous integral length of conductor clamped between insulated metal plates and having integral loops
35 extending from the plates and contact-studs connecting with said loops.

In witness whereof I have hereunto set my hand this 20th day of April, 1901.

FREDERICK MACKINTOSH.

Witnesses:

BENJAMIN B. HULL,
MARGARET E. WOOLLEY.