

H. GERNSBACK.
ELECTRORHEOSTAT REGULATOR.
APPLICATION FILED SEPT. 1, 1908.

948,275.

Patented Feb. 1, 1910.

Fig. 1

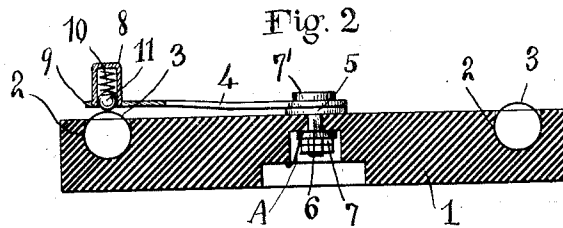
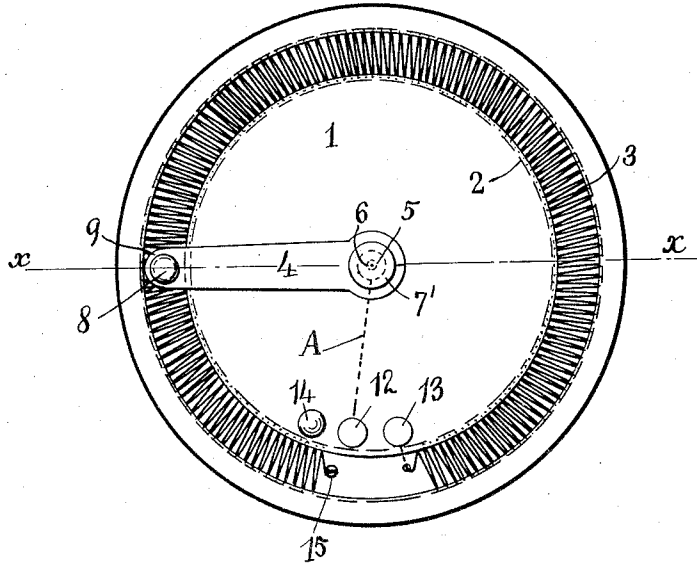
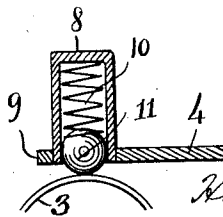


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

HUGO GERNSBACK, OF NEW YORK, N. Y.

ELECTRORHEOSTAT-REGULATOR.

948,275.

Specification of Letters Patent.

Patented Feb. 1, 1910.

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To all whom it may concern:

Be it known that I, HUGO GERNSBACK, a subject of the Grand Duke of the Grand Duchy of Luxemburg, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electrorheostat-Regulators, of which the following is a full, clear, and exact specification.

My invention relates to electro-rheostat regulators and the provision of means for carefully and accurately regulating the flow of current in any electric circuit by gradually cutting in and out part of a resistance coil composed of numerous convolutions of wire, and in which resistance coil a variation is obtained by means of a movable spring-seated ball bearing contact point, which engages the upper exposed surface of the resistance coil with a minimum amount of friction. My invention, however, is more particularly directed to the form and construction of the base and in the manner of holding the resistance coil in place by means of an uninterrupted annular undercut retaining groove with a sufficient opening at the top thereof to enable the coil to be sprung lengthwise into position lengthwise.

Among the objects of my invention is the provision of a simple, efficient, small-sized and compact rheostat, in which there are no concealed parts and which by reason of its construction and mode of operation will insure a gradual and almost imperceptible regulation of current. My improved rheostat possesses great current capacity, and produces little or no heating because the parts are open to the air and are therefore air cooled.

Another object is to provide a resistance coil composed of numerous convolutions of wire and which coil is hollow. The resistance coil has an extremely wide range of resistance in a very small space, and is of simple, practical and inexpensive construction and by reason of being hollow produces a maximum amount of ventilation and reduces the heat to a minimum.

Another object is to provide spring-seated ball bearing contact means for engaging the upper exposed surface of the resistance coil and which contact is moved backward and forward to the desired strength of current with little or no friction.

These and other objects of my invention

will be understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of my improved rheostat in its preferred form; Fig. 2 is a view in cross-section, partly in elevation on the line $x-x$, Fig. 1; and Fig. 3 is a detail, in vertical section, of the spring-seated ball bearing contact means.

The base of the rheostat is preferably made of a single piece of wood, slate or other insulating and heat absorbing material, and is shown in the drawings at 1. In the base there is formed an uninterrupted annular undercut retaining groove 2, which groove is open at the top thereof a predetermined distance to permit of springing lengthwise into place the resistance spiral or coil 3. This coil 3 is held in place without the use of shellac, cement or other adhesive substance and is prevented from falling out of the groove due to the manner in which the groove is formed and because the opening of the groove is of less diameter than the resistance coil. For making contact with the coil there is provided the contact arm 4, mounted in the center of the base on the pivot 5 by means of a spindle 6, held in place by a nut 7 and cap 7'.

At the outer end 9 of the arm 4 is provided a knob 8 held in place by solder or by friction, or otherwise. The knob 8 is hollow and contains a coiled spring 10 suitably fastened at the inner end of the knob; the free end of the spring abuts a metal or carbon ball 11, which engages the individual coils of the resistance conductor, and may be moved backward or forward over the exposed surface of the conductor so as to obtain an almost imperceptible variation in current strength. This great advantage makes my improved rheostat regulator indispensable to physicians and dentists, who require accurate variations in current strength; also to electricians, in connection with the dimming down or brightening up of incandescent electric lamps for the purpose of producing electrical effects for theatrical productions. My improved rheostat regulator is also of especial value in the wireless telegraph art, where it may be used as inductance, the wire of the inductance coil in this instance being of copper, to change the length of waves on aërials; and it may also be used in the wireless art as a potentiometer, where a gradual increase or

decrease of resistance is most essential, and for the same reason my improved rheostat regulator is invaluable in connection with electroplating, where fine work is desired.

5 It will of course be understood that the spring-seated ball bearing contact means may be used to equal advantage in rheostats in which the resistance coils lie in either vertical or longitudinal grooves of the same
10 construction as the uninterrupted annular undercut retaining groove 2 above described, and in cases of this kind the knob 8 is mounted on a rod held in position by posts or terminals, so that the spring-seated ball
15 bearing contact means may be moved up and down or backward and forward in sliding engagement with the resistance coils, according as to whether the said coils lie in vertical or longitudinal grooves.

20 The current from the generator or source of supply (not shown) enters the rheostat by means of the wire A to and through the binding post 12, spindle 6, handle or contact arm 4, knob 8 and resistance coil 3, and
25 leaves the rheostat by means of the resistance coil 3, to and through the binding post 13, back to the source of supply.

The resistance coil 3 at one end thereof near the "off" button 14 is fastened by a
30 small screw 15, or other suitable fastening means, and extends all the way around the groove to the binding post 13. The terminals 12 and 13 are fastened to the base 1 by screws, or otherwise, and are connected
35 at the underside of the base by the wire A.

It is to be understood that I do not limit myself to the circular arrangement of the retaining groove, and that my invention may be embodied in various other forms and

40 modifications not herein shown or described, without departing from the scope thereof, and I do not wish to be considered as confining myself to the exact construction, instrumentalities or materials shown, described and referred to above.

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

As a new article of manufacture, a rheostat comprising a one-piece base of insulating material and having an uninterrupted
50 annular undercut retaining groove with an opening at the top thereof of a predetermined diameter, a hollow resistance coil of greater diameter than the predetermined
55 diameter of the opening of said retaining groove and composed of a series of convolutions, said resistance coil being adapted to be sprung lengthwise into place in said
60 groove and held in position by the walls and undercut edges of said groove, a movable contact arm mounted in the center of the base and provided at its outer end with a hollow knob containing a coiled spring fastened at the inner end of said knob, a metal
65 or carbon ball abutting the free end of said coiled spring, said ball being adapted to engage one convolution of said resistance coil at a time for obtaining an almost imperceptible variation in electric current
70 strength.

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

HUGO GERNSBACK.

Witnesses:

E. D. JUNIOR,
DENA DORAN.