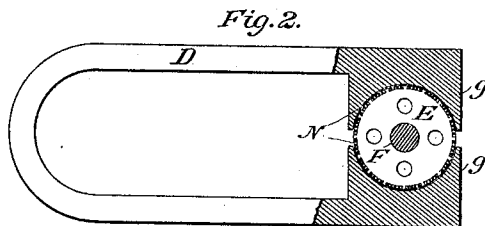
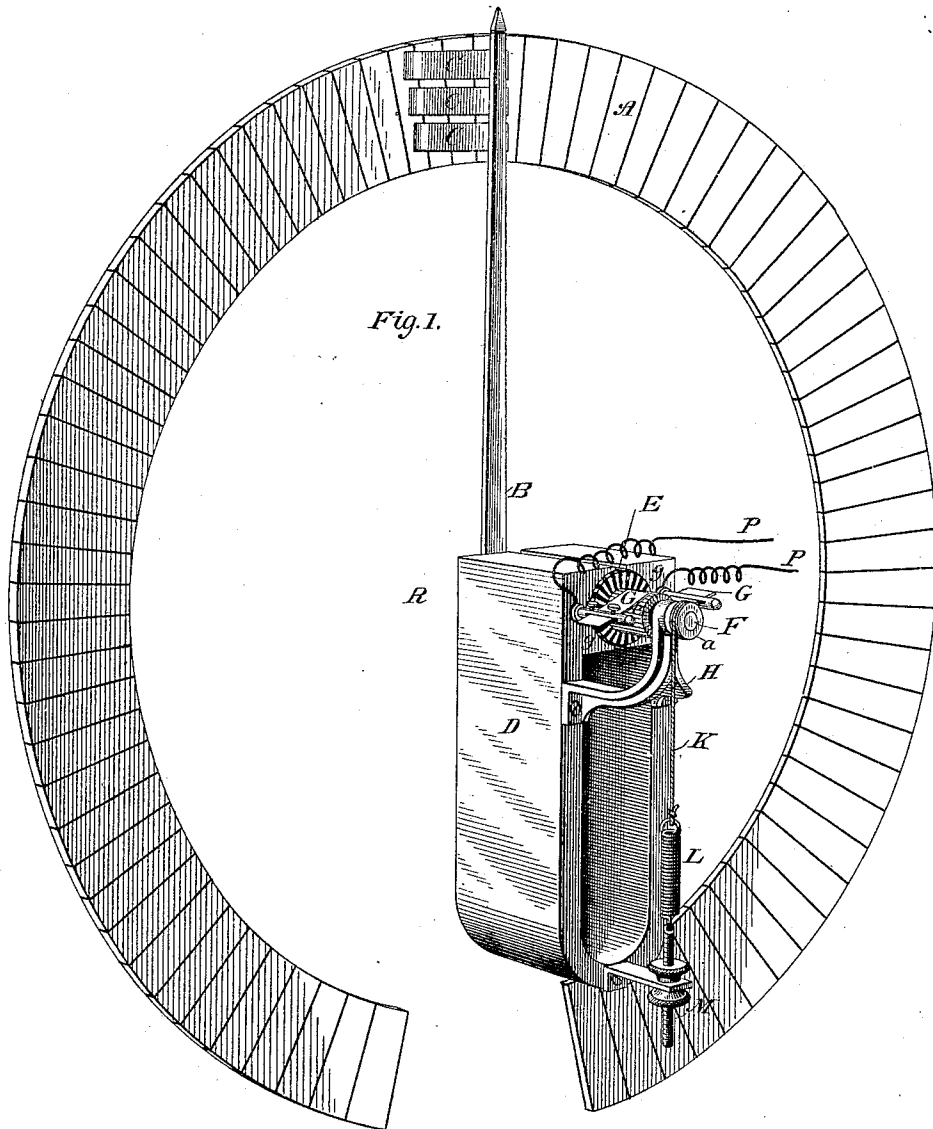


(No Model.)

E. WESTON.
ELECTRIC REGULATOR.

No. 301,028.

Patented June 24, 1884.



Attest:
Raymond T. Barnes.
W.H. Doaggett.

Inventor.
Edward Weston
By Park & W. Page atty

UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

ELECTRIC REGULATOR.

SPECIFICATION forming part of Letters Patent No. 301,028, dated June 24, 1884.

Application filed December 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electric Regulators, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention relates generally to that class of regulators in which a rheostat or variable resistance is operated through the instrumentality of one or more electro-magnets, the improvements comprised in said invention being more especially applicable to those rheostats that are provided with a circular series of plates with which the brushes or springs of a revolving arm move in contact. Heretofore rheostats of this character have been operated usually by hand, or by some motive power the action or effect of which is controlled by the varying attraction of an electro-magnet, or by the resultant action of two opposed magnetic systems, such as electro-magnetic motors.

The object of my invention is mainly to operate the rheostat directly by a single magnet or magnetic system, and in such manner that the resistance interposed will be at all times proportional to the current influencing the magnetic system. For this purpose I employ, in conjunction with a rheostat having a circular series of terminal plates, an armature capable of a certain degree of rotation, and mounted between magnets or magnetic poles, the contact-arm being fixed to the shaft of the armature, whereby a given movement of the latter causes a corresponding variation in the resistance in the circuit in which the rheostat is or may be included.

The invention, of which the chief elements are thus generally described, embraces other features of novelty, the nature of which will be indicated in the specification and summarized in the subjoined claims.

In the drawings, Figure 1 is a view in perspective of the devices comprising my invention. Fig. 2 is a part sectional view of the magnetic system separate from the other parts.

Let A designate the circular series of terminal plates of any ordinary rheostat, which is to be operated by an electro-magnet. In prox-

imity to the rheostat is mounted, in a convenient manner, one or more permanent horseshoe-magnets, D, with pole-pieces *g*, between which is mounted, on a shaft, F, a cylindrical armature, E, of the kind commonly employed in electrical generators and motors. One end of the shaft F has a bearing in a bracket, H, secured to the magnet D, the other in the support or base R in the center of the circular series of plates A. To the shaft F is secured the arm B, carrying brushes or springs C, that bear upon the plates A, and upon another part of the shaft is fixed a grooved wheel, *a*, around which passes a cord, K, connected with a spring, L, and adjusting-screw M. The core of the armature E is wound with a series of coils, N, forming a closed circuit, from which loops are taken off to the segments of a commutator, *e*. Upon the commutator press brushes G, connected with a circuit, P, by the current in which the rheostat is to be operated.

The operation of the apparatus is as follows: When a current flows through the circuit P, it traverses the coils of the armature E, magnetizing its core, and imparting to it a rotary movement, which is, however, opposed and limited by the cord K and spring L. This movement of the armature, and with it the arm B, varies to an extent proportional to its movement the resistance interposed by the rheostat, and so likewise any movement of the armature from a given position in either direction produces a corresponding variation in such resistance.

By using a cylindrical armature, an opposing-spring, and field-magnet constructed substantially as described, movements of the arm B practically proportional to the strength of the current passing in the circuit P are obtained, for the magnetism of the core varies in proportion to the current which passes through the coils upon it. The armature remains always at the same distance from the poles of the field-magnet, and the strength of the latter remains nearly the same.

This apparatus is applicable to many purposes, though in practice I insert the rheostat in the derived circuit field of a dynamo-machine, of which the circuit P is the armature-circuit, including also arc-lamps or like devices in series. This system of regulation has been explained by me in Patent No. 278,640.

The specific character of the elements comprised in this apparatus may be varied in many ways. For example, the obvious substitution of an electro-magnet for the permanent magnet
5 D may be made without materially affecting the results, though a permanent magnet would be preferable. So, too, the magnetic system may be permanently connected with or independent of the rheostat, and many other modifications
10 of a like nature may be made without departure from the invention.

Without, therefore, confining myself to the specific construction or arrangement of the parts herein described, what I claim as the
15 subject of this application is—

1. The combination, with a rheostat having a circular series of contact-plates, of a magnet, a rotary armature, a spring for opposing its movement, and a contact-arm connected with
20 and operated by the armature, as set forth.
2. The combination, with a rheostat having

a series of contact-plates, of a magnet or magnets, a cylindrical armature mounted between the poles of the same, a spring opposing the movement of the armature, and a contact-arm
25 connected with and operated by the said armature, as set forth.

3. The combination, with a rheostat having a circular series of contact-plates, a permanent magnet or magnets, a rotary armature wound
30 with coils, as described, and mounted between the poles of the magnet, a spring for opposing its movement, and a contact-arm connected with and operated by the armature, as set forth.

In testimony whereof I have hereunto set my
35 hand this 21st day of December, 1883.

EDWARD WESTON.

Witnesses:

HENRY S. LOWE,
R. W. BLOEMER.