

No. 789,456.

PATENTED MAY 9, 1905.

G. H. RUPLEY.
AUTOMATIC RHEOSTAT.
APPLICATION FILED SEPT. 20, 1901.

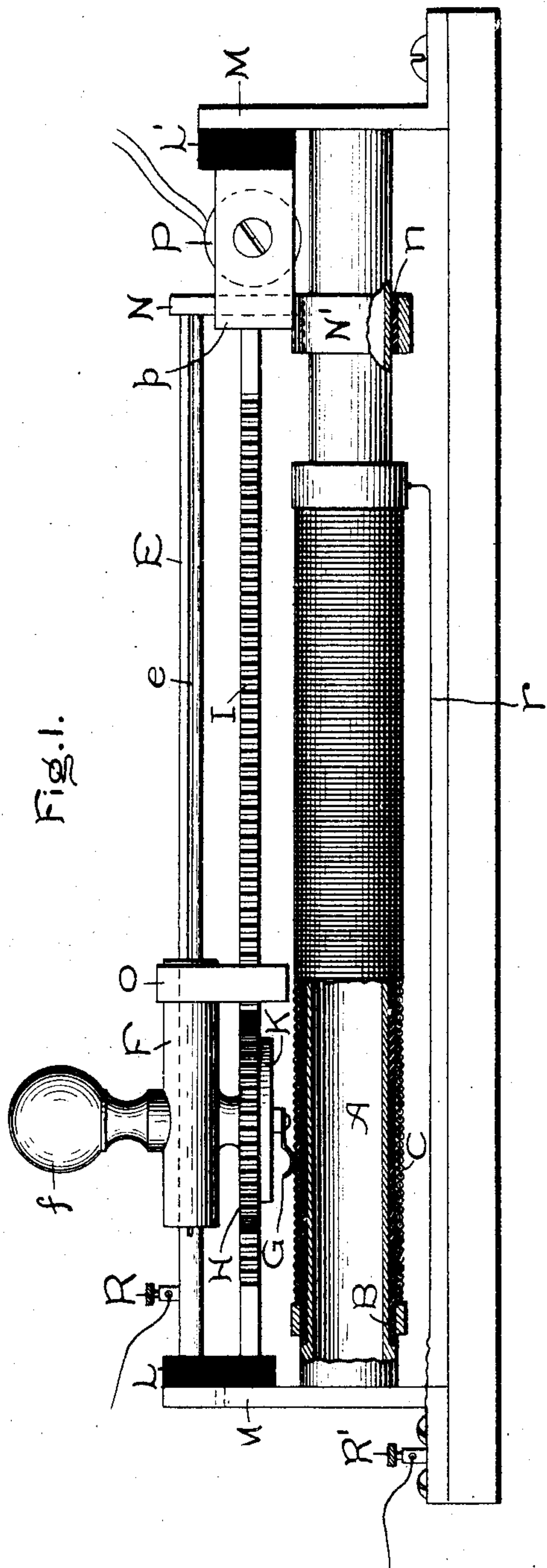


Fig. 1.

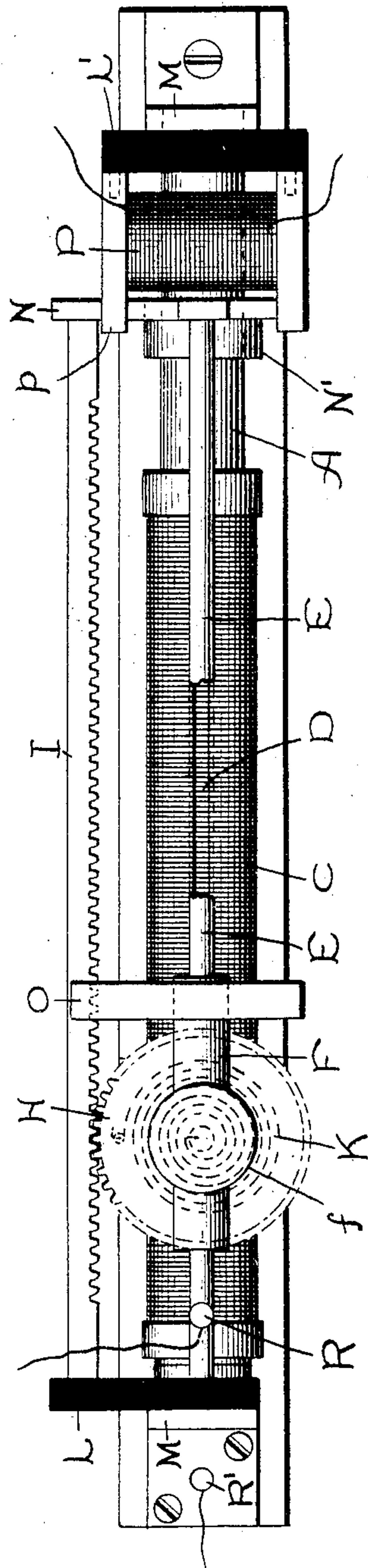


Fig. 2.

Witnesses:
Marcus L. Byng.
Alfred Macdonald

Inventor:
George H. Rupley,
by Allen F. Davis
Att'y

UNITED STATES PATENT OFFICE.

GEORGE H. RUPLEY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

AUTOMATIC RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 789,456, dated May 9, 1905.

Application filed September 20, 1901. Serial No. 75,737.

To all whom it may concern:

Be it known that I, GEORGE H. RUPLEY, a citizen of the United States, residing at Schenectady, county of Schenectady, and State of New York, have invented certain new and useful Improvements in Automatic Rheostats, of which the following is a specification.

This invention relates to rheostats for controlling the admission of electric current to a translating device. Its object is to provide a simple and compact apparatus of low cost and yet durable and efficient.

The invention consists in a straight helix of insulated wire, a brush-making sliding contact with the convolutions of said helix, an electromagnet for retaining the brush in the position it reaches when all the convolutions are cut out, and a spring which is put under tension by this movement of the brush and operates to retract the brush when the circuit is broken.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a rheostat embodying my improvements. Fig. 2 is a top plan view of the same, partly broken away.

A metal tube A is covered with insulating material B, such as mica or asbestos, and has wound upon it tightly and closely one or more layers of wire C, preferably of high-resistance material, such as German silver. The wire is insulated before it is wound with some material capable of standing a high heat—such, for instance, as a good baking japan. After winding the wire a narrow strip of the insulation is scraped from the outer surface thereof along one side of the coil, forming a path or track D of bright metal running parallel with the axis of the tube.

A guide-rod E is mounted in the frame of the apparatus parallel with the tube A. A block F is arranged to slide along the rod, being prevented from rotation by a spline *e*. The block has a handle *f*, by which it can be moved, and it carries a metal contact-brush or spring-finger G, arranged to travel along the path D in contact with the bare wire. The block F also carries a toothed wheel H, journaled to revolve in a horizontal plane.

Means for rotating the wheel are provided, such as a rack I, mounted in the frame of the apparatus parallel with the tube A and meshing with teeth on the wheel. To the wheel is attached one end of a spiral spring K, the other end of which is attached to the stationary shaft on which said wheel revolves, so that when the wheel turns the spring is thrown into tension.

The guide-rod E and the rack I are both preferably supported at one end by a plate L of insulating material attached to one of the end standards M, by which the tube A is carried. The other ends of the rod and rack are preferably supported by an arm N, projecting from a sleeve N', surrounding the tube A and insulated therefrom by a bushing *n*, of mica or the like.

The carrier-block F has attached to it a soft-iron armature O, which when the block has been slid to its limit in cutting out the resistance-coils comes against the poles *p* of an electromagnet P, supported by a bar L' of insulation secured to an end standard M.

The line-terminals are brought to binding-posts R R', one on the end standard M and the other on the guide-rod E. The former is connected by wire *r* with that end of the wire C nearest the magnet P. The circuit from the binding-post R to the post R' is through so much of the resistance-wire B as lies between the brush G and the end of the wire *r*. By including this part of the apparatus in series with the armature of an electric motor and the electromagnet P in series with the shunt field-coil of said motor the apparatus will serve to gradually start the motor and to automatically cut in the resistances in case the motor stops, the operation being as follows: The spring normally keeps the carrier-block at the end of the coil farthest from the magnet, so that the entire resistance is in circuit. As the block is moved to the right in the drawings the convolutions of the coil are successively cut out by the brush G, reducing the resistance until the armature abuts against and is held by the magnet-poles, at which point the resistance is entirely cut out. The movement of the block has caused the wheel

to rotate and wind up the spring, so that the instant the circuit is opened and the magnet is deenergized the spring rotates the wheel backward and slides the block back to the position shown in the drawings, thus cutting in the resistance, so that the motor cannot be injured by an excessive rush of current when the circuit is closed again.

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

1. The combination with a resistance-coil, of a contact-brush adapted to slide along said coil, a carrier on which said brush is mounted, a wheel journaled on said carrier, and rotatable by the movement of the carrier, and a spring put under tension by the rotation of said wheel.

2. The combination with a tubular resistance-coil having a bare lengthwise portion, of a guide-rod parallel with said coil, a carrier-block on said rod, a brush on the carrier mak-

ing contact with said bare portion of the coil, a wheel journaled on the carrier and rotatable by the movement thereof, and a spiral spring concentric with the wheel and having one end attached thereto.

3. The combination with a tubular resistance-coil having a bare lengthwise portion, of a guide-rod and a rack parallel with said coil, a carrier-block on the rod, a brush on said block making contact with said bare portion of the coil, a toothed wheel journaled on the carrier and meshing with the rack, and a spiral spring concentric with the wheel and attached thereto at one end.

In witness whereof I have hereunto set my hand this 14th day of September, 1901.

GEORGE H. RUPLEY.

Witnesses:

ALEX F. MACDONALD,
MARY HELENA SHIELDS.