(No Model.)

T. E. ADAMS.

ELECTRO MAGNETIC REGULATOR.

No. 351,351. Patented Oct. 26, 1886.

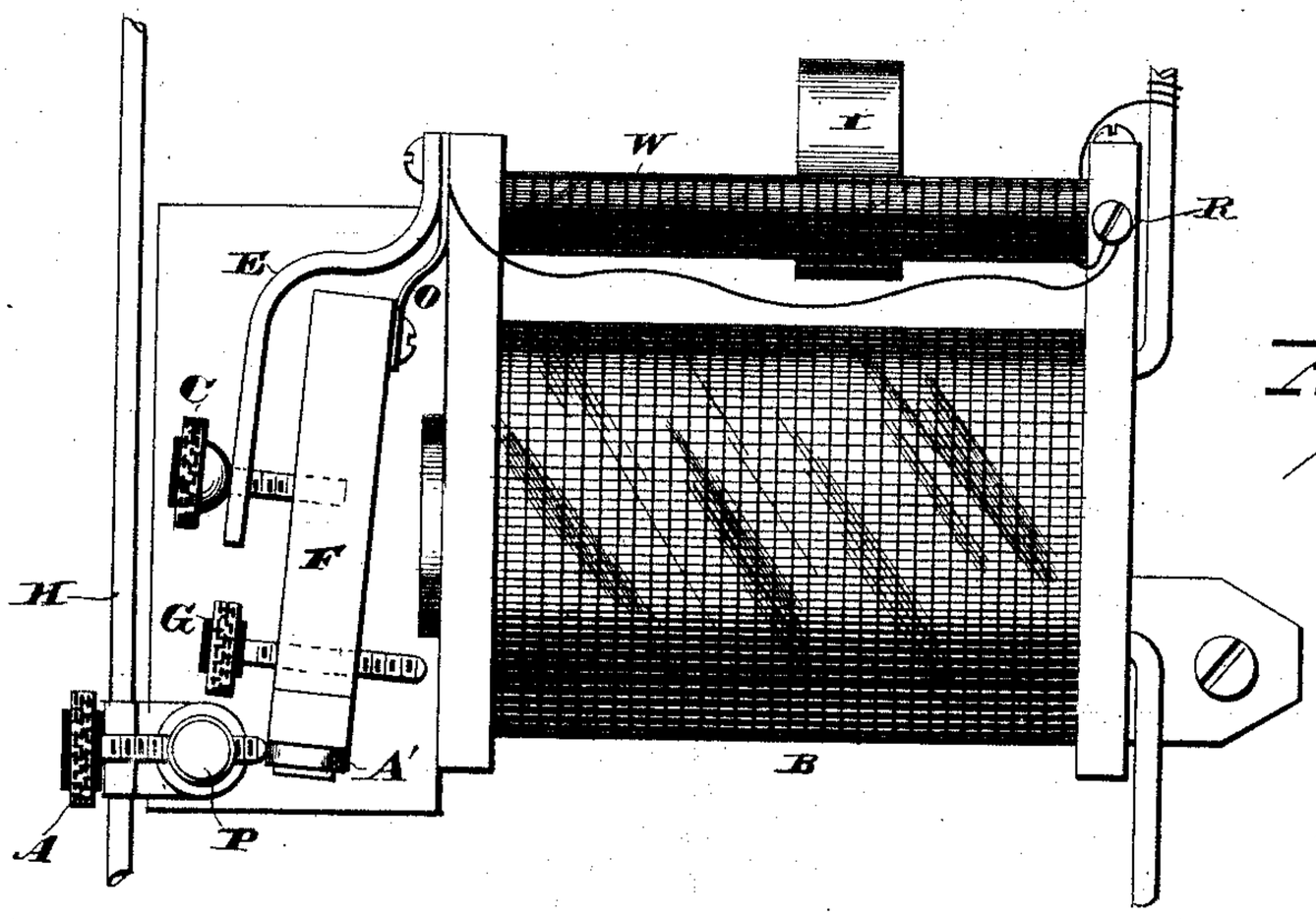

Fig. 1.

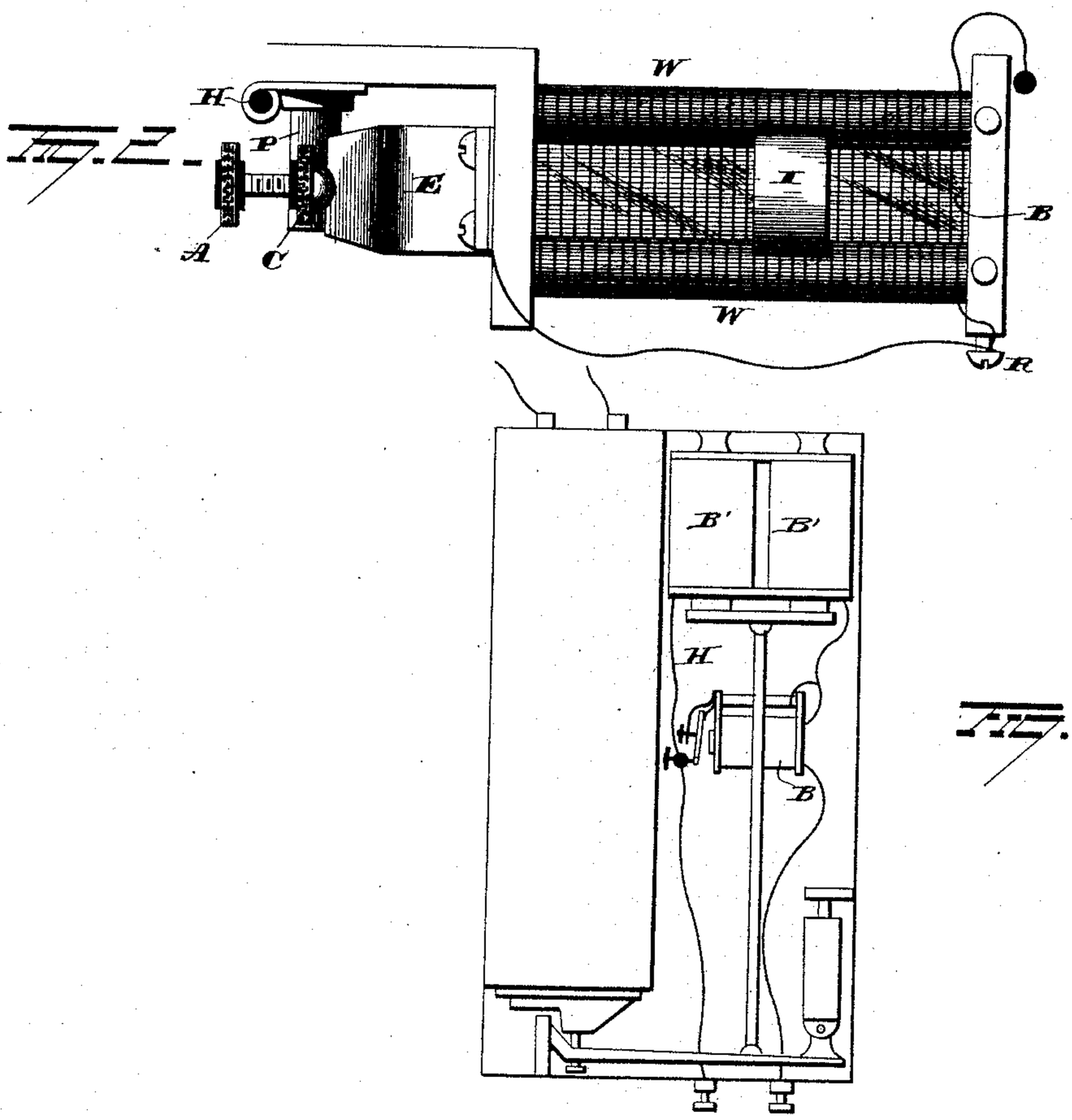

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

THOMAS E. ADAMS, OF CLEVELAND, OHIO.

ELECTRO-MAGNETIC REGULATOR.

SPECIFICATION forming part of Letters Patent No. 351,351, dated October 26, 1886.

Application filed December 5, 1885. Serial No. 184,825. (No model.)

To all whom it may concern:

Be it known that I, THOMAS EDGAR ADAMS, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Electro-Magnetic Regulators, of which the following is a specification.

My invention relates more particularly to the improvement of a current-regulator for dynamo-electric machines, patented by C. F. Brush, February 17, 1880, No. 224,511, rendering it more easily adjustable and increasing its sensitiveness to current changes. It is also applicable, by reason of its compact form, wide range, and easy adjustment, to many other uses, as controlling the strength of any electro-magnet, or short-circuiting any electric circuit when the current falls below a certain strength.

In the accompanying drawings, Figure 1 is an elevation of my controller-magnet. Fig. 2 shows the arrangement of adjustable resistances in the shunt-circuit of the controller. Fig. 3 is an elevation showing the controller attached to a Brush regulator.

B represents the electro-magnet of the controller, the wire of which is in the main circuit. It is wound with suitable size wire to carry the maximum current intended to be used, and of sufficient convolutions to operate its armature F against the pull of the spring E. The armature F is attached to B in a flexible manner, and carries the contact-piece A′. The tension on spring E is adjusted by means of screw C.

The armature F may be adjusted to or from the magnet B by the screw G and contact-screw A. The contact-screw A passes through the post P, which is electrically connected to one wire of the main circuit.

W is resistance-wire, wound upon parallel rods of stone, that are fastened upon B in any convenient position. (See Fig. 2.) The wire W is connected at one end to the screw or binding-post R, and is wound around one of the rods throughout its length, and is then carried to the adjacent end of the other rod, and wound thereon in a return direction, the other end of the wire being electrically connected with the main conductor at T. When the contact between A and A′ is closed, the current path through the shunt-circuit of the controller is as follows: From one wire of the main circuit H, through the sheet-copper connection to post P, screw A, contact-piece A′, armature F, flexible connection or armature-hinge O, to wire, and by a conductor to the screw or binding-post R, from thence through the wire W to the short-circuiting spring I, and through the latter to the wire W on the other parallel rod to the other part of the main circuit at T.

The spring-piece I can be moved lengthwise of the rods to vary the resistance to the desired amount. This shunt-circuit, thus controlled by magnet B and adjusted by spring I, is around the magnet to be controlled, (see Fig. 3,) and it will be seen that any increase in the main current will break the shunt-circuit and cause the main magnets B′ of the regulator to respond quickly and cut the current down to the constant amount desired. When the main current weakens, the reverse takes place.

To be able to vary the resistance in the shunt-circuit while current is in it and in the main circuit is a great advantage. It is desirable to have the resistance of the shunt-circuit as high as the duty required in the main circuit will allow, to avoid destruction of the contact parts A and A′.

The controller causes the main magnets B′ to act very much more promptly, and gives a very much greater range of control with a more constant current.

Having thus described my invention, what I claim as new is—

1. The combination, with an electric circuit, a main magnet, and a relay or controller magnet included therein, of a shunt-circuit around the main magnet, a resistance in the shunt-circuit, and devices actuated or controlled by the controller-magnet for breaking the shunt-circuit, substantially as set forth.

2. The combination, with an electric circuit, a main magnet, and a relay or controller magnet included therein, of a shunt-circuit around the main magnet, an adjustable resistance in the shunt-circuit, and devices actuated or controlled by the controller-magnet for opening and closing the shunt-circuit, substantially as set forth.

3. The combination, with an electric circuit, having included therein a main magnet and

devices connected therewith, whereby said magnet serves as a motor for controlling or regulating the current, and a relay or controller magnet included in the main circuit, of a shunt-circuit around the main magnet having an adjustable resistance included therein, and a circuit-breaker in the shunt-circuit operated and controlled by the controller-magnet, substantially as set forth.

4. The combination, with a main circuit and a magnet included therein, of an adjustable resistance composed of wire wound upon parallel rods, an elastic sliding connection for short-circuiting more or less of the work, and a circuit-breaker in the shunt-circuit controlled and actuated by the magnet, substantially as set forth.

5. An electro-magnet, its armature and stops, in combination with a resistance electrically connected with the armature, and arranged around the electro-magnet, substantially as set forth.

6. The combination, with an electro-magnet and circuit-breaker, of an adjustable resistance composed of parallel rods attached to the frame of the electro-magnet, wire wound upon said parallel rods, and an elastic sliding connection for short-circuiting more or less of the wire on the rods, substantially as set forth.

In testimony whereof I have hereunto set my hand.

THOMAS E. ADAMS.

Witnesses:
J. POTTER,
ALBERT E. LYNCH.