

(No Model.)

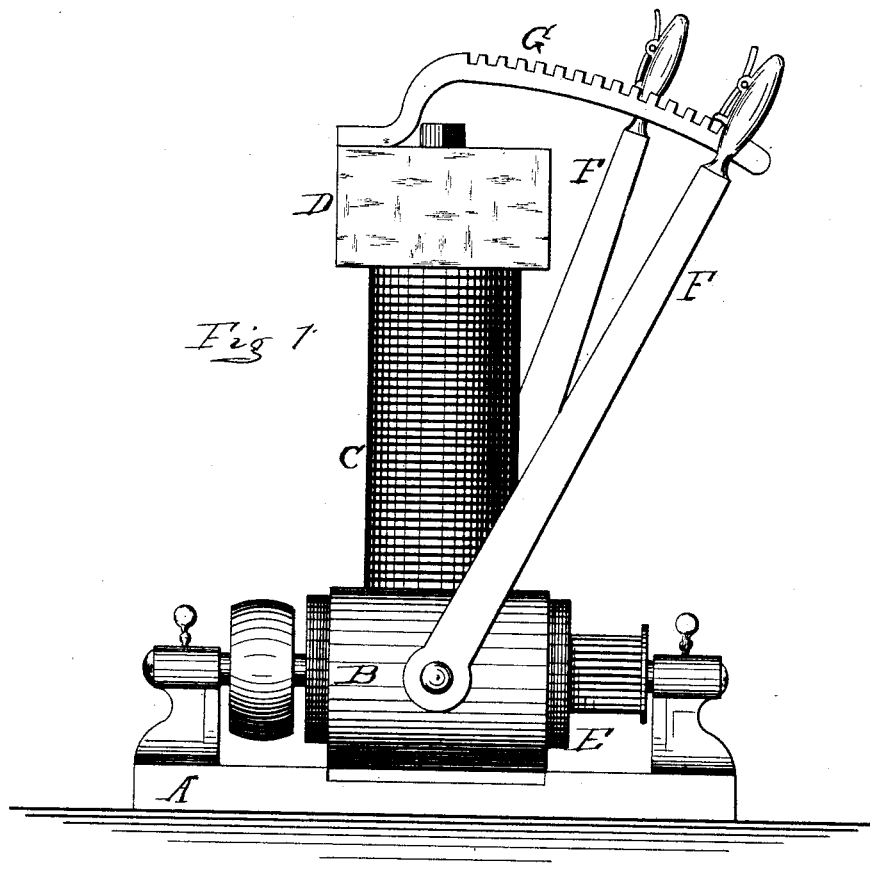
3 Sheets—Sheet 1.

T. A. EDISON.

REGULATOR FOR DYNAMO OR MAGNETO ELECTRIC MACHINES.

No. 263,136.

Patented Aug. 22, 1882.



WITNESSES:

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Frank H. Hall.

INVENTOR:

T. A. Edison
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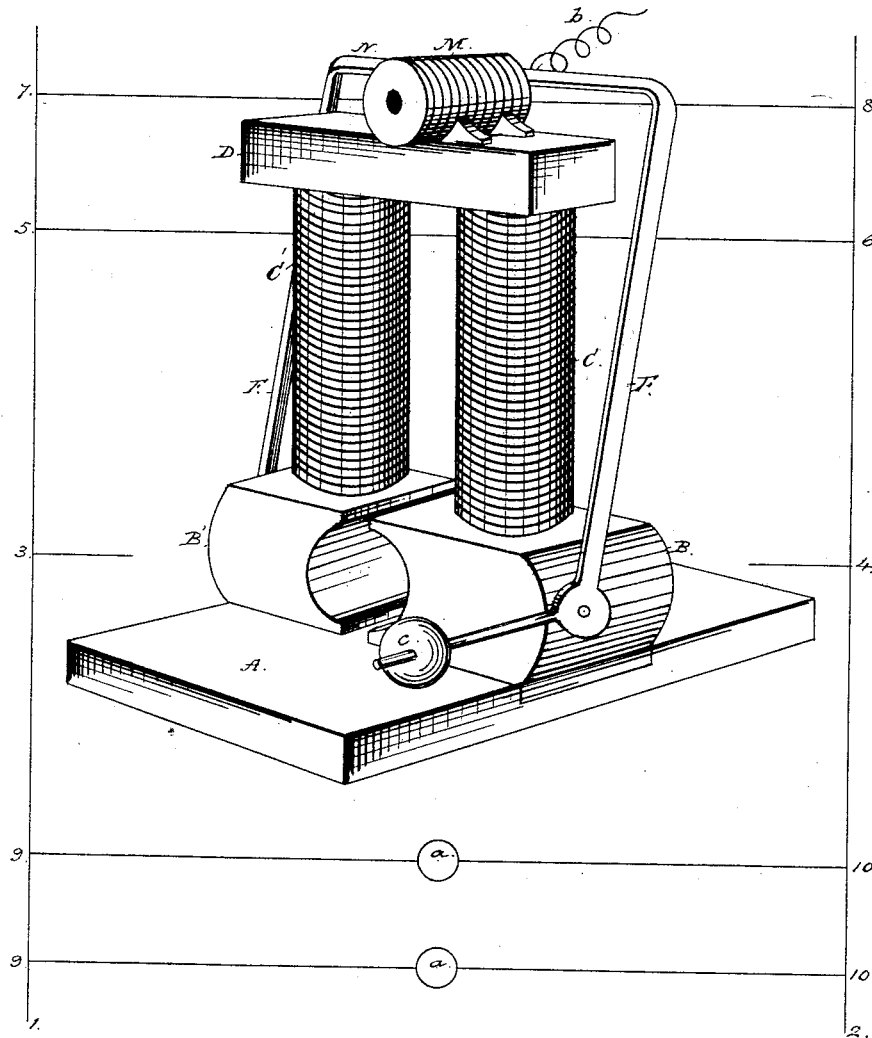
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Fig. 2.



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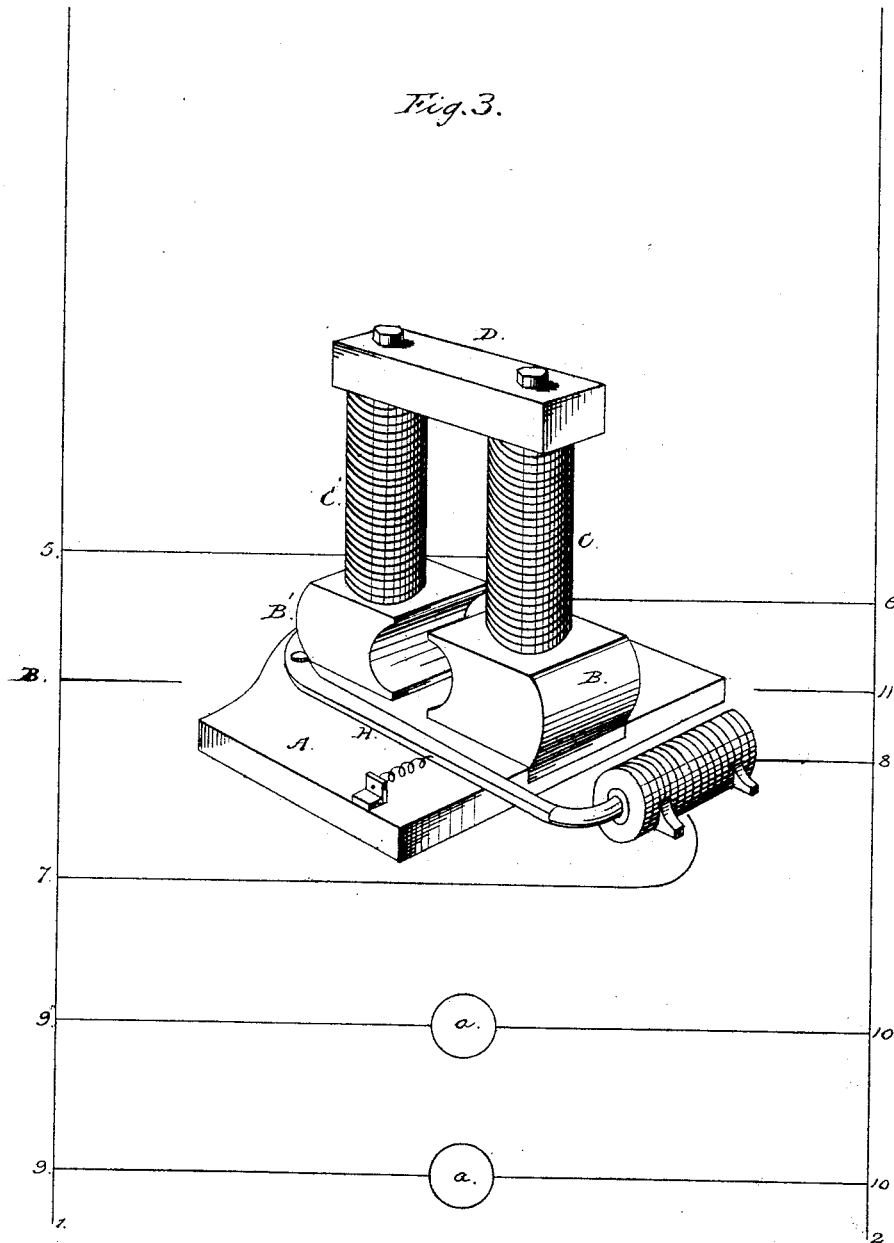
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Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY, ASSIGNOR TO THE
EDISON ELECTRIC LIGHT COMPANY, OF NEW YORK, N. Y.

REGULATOR FOR DYNAMO OR MAGNETO ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 263,136, dated August 22, 1882.

Application filed May 27, 1881. (No model.) Patented in England October 18, 1881, No. 4,552; in Canada November 20, 1881, No. 13,734, and in France December 7, 1881, No. 145,598.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Dynamo and Magneto Electric Machines, (Case No. 312;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of my invention is to produce simple and efficient means, operating either automatically or by hand, for regulating the generation of current by a dynamo or magneto electric machine by increasing or diminishing at will the strength of the lines of force in the magnetic field in which the induction-bobbin rotates. This I accomplish by the use of levers or bars of iron adapted to be adjusted close to or farther away from the pole ends and yoke of the magnet or the pole ends alone, which partially shunt the magnetic current or lines of force away from the field in which the armature revolves. These levers or bars I may arrange in either of two ways.

First. I may pivot to the outer sides of the pole ends of the magnet two vertical soft-iron levers rising above the ends of the yoke and making contact with such yoke when in line therewith. The yoke supports two brass segments, which are secured thereto and project some distance off from the same in the line of the play of the shunting-levers. To these segments are connected the said levers by means of suitable latches or clamps, so that such levers, at their upper ends, can be adjusted toward or away from the yoke or brought into contact with the ends of the same.

Second. I may, in place of or in addition to the first construction, pivot upon the base of the machine, close to one of the pole ends of the magnet, one or two horizontal soft-iron levers. The lever used extends across the pole ends of the magnet, being pivoted at one end and adjustable back and forth at the other.

In both constructions the effect of the levers depends upon their mass and their posi-

tion with relation to the magnet. In the first construction the vertical levers become magnetized, diminishing thereby the strength of the lines of force in the magnetic field, the free end of each lever having a polarity opposite to that of the end of the magnet to which it is attached. Consequent poles are thereby established in the yoke of the magnet opposite the ends of the levers, which poles are increased in power by the approach of the levers to the yoke, from which it will be seen that the lines of force are shunted away from the field in which the induction-bobbin rotates, more or less, according to the distance of the vertical levers from the yoke. In the second construction, supposing one lever only is used, the approach of this lever to the pole ends of the magnet will have the effect of partially bridging or connecting (more or less) the poles of the magnet and shunting the lines of force or magnetic current around or away from the magnetic field. With two levers, one on each side of the magnet, the effect would be increased. The proper size or mass of the levers having been determined to accomplish the effect desired, the adjustment of such levers will diminish or increase the strength of the lines of force in the magnetic field, and in consequence thereof the current generated in the bobbin. Either of these arrangements may be worked automatically by means of an electro-magnetic device actuated by the current generated for moving the levers in the proper direction. For this purpose I use preferably an axial magnet whose core is attached to some portion of the pivoted lever in such way as to move said lever forward or backward according to the degree of magnetization, the arm being provided with a spring or weight to assist its backward motion.

In the drawings, Figure 1 is an elevation of a generator provided with that form of my invention in which the pivoted bars connect the yoke and the polar extensions of the field-magnet; Fig. 2, a perspective view of the same, arranged to operate automatically; Fig. 3, a perspective view of the form in which a pivoted bar crosses the polar extensions of the

field-magnet, this also being so arranged as to operate automatically.

Like letters denote corresponding parts in all three figures.

5 A is the base of the machine, B B' the pole ends of the magnet, C C' the helices, D the yoke, and E the revolving armature, all of which are constructed in any suitable or usual way employed in dynamo or magneto electric machines.

10 In Fig. 1, F F' are two vertical soft-iron levers, which are pivoted to the outer sides of the pole ends B B' of the magnet and rise above the yoke D. Two brass segments, G, are secured to the yoke at opposite ends thereof, (only one being shown,) with which the levers are locked by any suitable means, the segments being shown as toothed and the levers being provided with latches for 20 this purpose.

In Fig. 2 the armature is omitted for convenience of drawing. Main conductors 1 2 are, however, shown.

The derived circuit 3 4 includes the armature, the circuit 5 6 the field-coils, and the circuit 7 8 the coils of the axial magnet M. The movable core of this magnet is attached to the bar N, connecting the levers F F'. In derived circuits 9 10 are placed electric lamps, or other 30 translating devices *a a*. When more of these are placed in circuit the current in the derived circuit 7 8 decreases and the magnet M weakens in power. The levers F are then drawn back by means of the spring *b*. Instead of adjusting the spring *b*, a weight, *c*, sliding on an arm projecting from the lever, may be used, so that the force acting against the spring may be readily varied. The levers being drawn back, the magnetic field is strengthened and the generation of current proportionately strengthened. A reverse operation of course occurs as transitory devices are thrown out of circuit.

45 In the modification shown in Fig. 3 the horizontal soft-iron lever H is pivoted to the base A close to B', and extends across such base to the other side. A similar lever may be situated upon the opposite sides of the poles, if desired. The shunting effect of these levers, 50 the diminishing thereby of the strength of the lines of force in the magnetic field, and the consequent effect upon the current generated in-

ductively in the bobbin will be understood from the foregoing description. The movement of the levers is automatically accomplished by means of the magnet M, located in the desired circuit 7 8, its movable core being attached to the lever H and the latter being retracted by a spring, *d*. The operation in this case is similar to that described with reference to Fig. 2. 60

What I claim is—

1. In a dynamo or magneto electric machine, the combination, with the field-magnet, of a bar or lever adapted to magnetically connect the polar and yoke ends of the magnet, being pivoted to or upon one end and adjustable to or from the other end, substantially as set forth. 65

2. In a dynamo or magneto electric machine, a shunting lever or bar for shunting the lines of force away from or around the magnetic field in which the induction-bobbin rotates, said bar or lever being automatically adjustable to and from the magnet, substantially as set forth. 70

3. In a dynamo or magneto electric machine, a magnetic shunting lever or bar operating as described, pivoted at one end close to or upon a portion of the magnet and automatically adjustable from the other end to and from another portion of the magnet, substantially as set forth. 80

4. In a dynamo or magneto electric machine, the combination, with the field-magnet, of a magnetic shunting lever or bar operating as described, and an electro-magnet energized by the current generated for automatically adjusting said lever to and from the magnet, substantially as set forth. 85

5. In a dynamo or magneto electric machine, a bar or lever adapted to magnetically connect the polar and yoke ends of the field-magnet, being pivoted to or upon one end and adjustable to or from the other end, in combination with an electro-magnet energized by the current generated for automatically accomplishing such adjustment, substantially as set forth. 95

This specification signed and witnessed this 17th day of May, 1881.

THOMAS A. EDISON.

Witnesses:

WM. H. MEADOWCROFT,
H. W. SEELY.