(No Model.)

J. F. OTT.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 265,859. Patented Oct. 10, 1882.

Fig. 2.

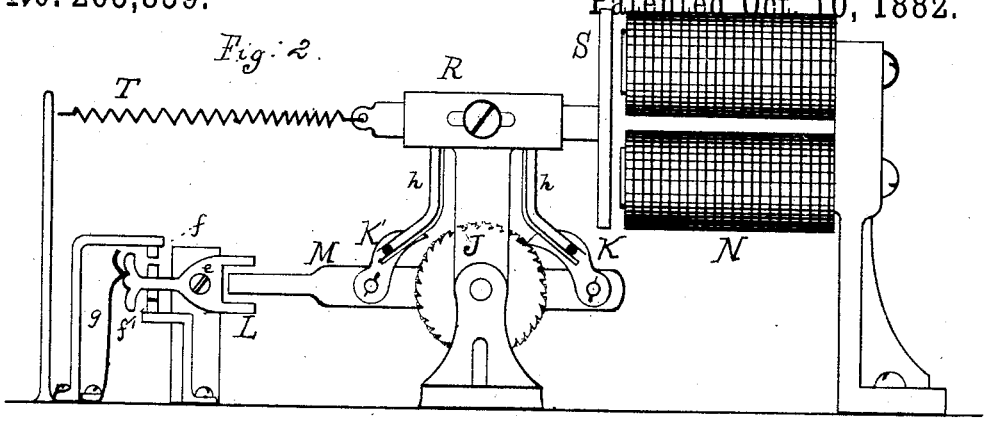
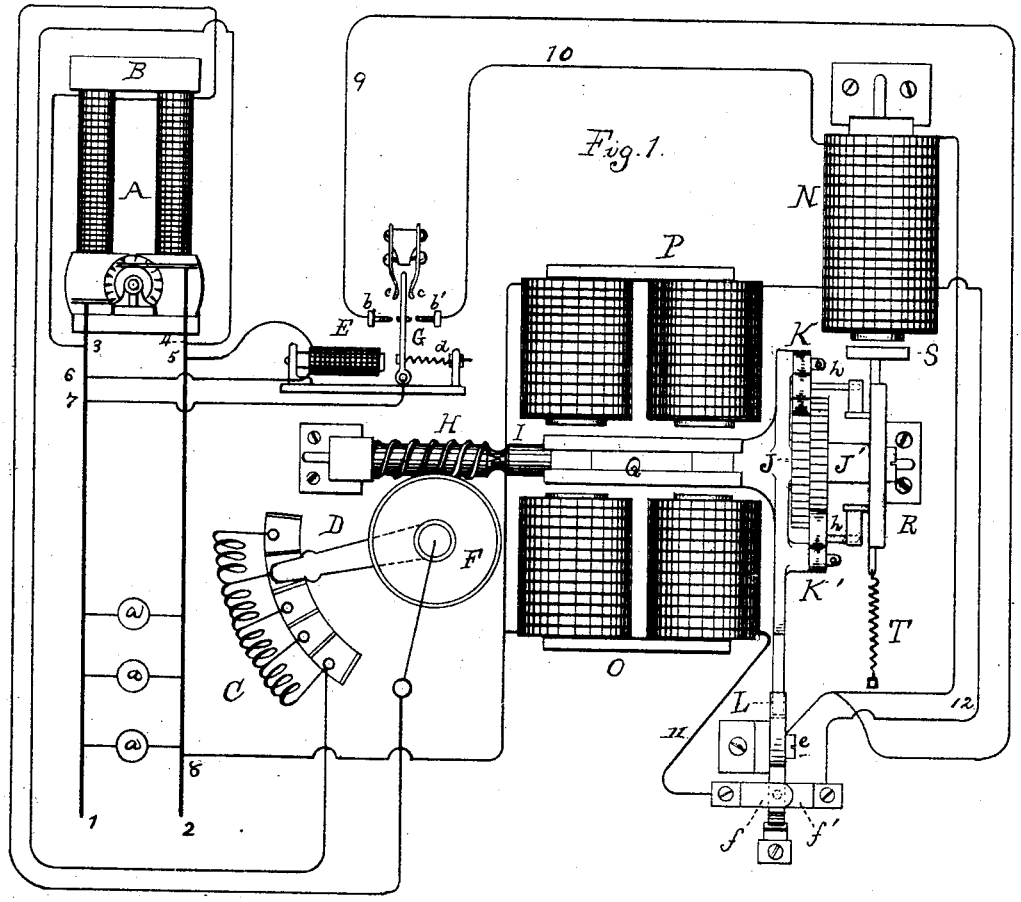


Fig. 1.



WITNESSES:

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REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 265,859, dated October 10, 1882.

Application filed August 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. OTT, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in the Regulation of Dynamo or Magneto Electric Machines; 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.

My invention relates to means for automatically varying the current energizing the field-magnet of a dynamo or magneto electric machine, for the purpose of regulating the generation of current by said machine; and said invention consists in novel and peculiar devices for this purpose, as hereinafter described, and pointed out in the claims.

In the annexed drawings, Figure 1 is a view, partly diagrammatic, illustrating my invention; and Fig. 2, a detail view of a portion of the same.

A, Fig. 1, is a dynamo-electric machine, having main conductors 1 2 leading from it, and lamps or other translating devices, *a a*, placed in multiple arc upon said conductors. The field-magnet B of the machine is energized by a multiple-arc circuit, 3 4, derived from the main line. In this field-circuit is placed an adjustable resistance, C, and a pivoted arm, D, for throwing portions of such resistance in or out of circuit. The arm D is revolved by means of a worm-wheel, F, and worm H, the latter being on the shaft I, on which are also two ratchet-wheels, J J′, which are revolved in opposite directions, respectively, by the pawls K K′.

In a derived circuit, 5 6, is placed an electro-magnet, E, provided with a pivoted spring-retracted armature, G, which is placed between contact-points *b b′*, and also between spring-arms *c c*, which hold the lever normally midway between *b* and *b′*, but allow it to make contact when drawn forward by the magnet E or sufficiently retracted by the spring *d*. The armature-lever G forms a part of the multiple-arc circuit 7 8.

From the contact-points *b b′* respectively run the wires 9 and 10. Both terminate at the pivot *e* of a vibrating circuit-breaker, which is more clearly shown in Fig. 2. Such circuit-breaker consists of the Y-shaped piece L, pivoted at *e*, which is thrown back and forth by the arm M, as will be hereinafter explained, so that contact is made with one or the other of the points *f f′*. The spring *g* is used to assist the motion of the piece L. The wire 9 runs directly from the point *b* to the point *e*; but the wire 10 includes the coils of the electro-magnet N. From the point *f* a wire, 11, runs to the electro-magnet O, while wire 12 from point *f′* includes electro-magnet P, both these wires then returning to the main conductor 2 at point 8. The arm M is carried by the armature Q, which is common to both electro-magnets O P. This armature surrounds the shaft I, but is large enough to have a transverse movement without moving said shaft. The arm M also carries the pawls K K′, which impart motion to the ratchet-wheels J J′, respectively. Arms *h h* project from the arm R and engage with pins on the pawls K K′. One end of the arm R forms the armature S of the magnet N, and to the other end is attached a spring, T.

The operation of my invention is as follows: When the number of translating devices *a a* in circuit is increased the current energizing the magnet E is diminished, and the spring *d* is allowed to act and draw back the armature G against the contact *b′*. The magnet N is therefore energized and draws forward the arm R, which, through the arms *h*, brings the pawl K′ into contact with the ratchet-wheel J′ and removes the pawl K from the ratchet-wheel J. The circuit-breaker L being in contact with *f′*, the magnet P is energized and draws armature Q toward it; but this causes the arm M to throw the circuit-breaker L against *f*, so that magnet O is energized, magnet P demagnetized, and armature Q attracted in the other direction. The vibration of the armature causes that of the pawls K K′, and K′ turns the ratchet-wheel J, and thence through shaft I and worm-gearing H F the arm D is turned so as to throw a portion of the resistance C out of circuit. A decrease in the number of translating devices causes the armature G to be attracted and make contact at *b*, which cuts the magnet N out of circuit, when the spring T

draws back the arm R and pawl K′ and brings the pawl K against the ratchet-wheel J, so that the arm D is turned in the opposite direction from before, and more of the resistance C is placed in circuit.

It will be seen that the magnets O P, with the armature Q, form an electromotor, whose motion is communicated to the pawl and ratchet-wheel, and thence to the arm controlling the field-circuit resistance.

It is evident that the field-circuit 3 4 could be a circuit supplied from any external source, instead of a multiple-arc circuit from the main conductors.

I am aware that a regulating mechanism has been before used consisting of two motors acting upon ratchet-wheels, which control resistance in the field-circuit, and a circuit-controlling electro-magnet in a multiple-arc circuit for closing the circuit to one or the other of said motors, according as it is desired to increase or diminish the resistance.

What I claim is—

1. In a regulating apparatus for dynamo or magneto electric machines, the combination of an electromotor actuated by the current generated, and having a vibrating armature, with a resistance in the field-circuit, two pawl-arms and two ratchet-wheels actuated by said vibrating armature, and means actuated by variations in the number of translating devices in circuit for throwing one or the other of said pawls into engagement with its ratchet-wheel to throw resistance into and out of the field-circuit, substantially as set forth.

2. The combination, with a dynamo or magneto electric machine, of a variable resistance in its field-circuit, an electromotor, an electromagnetic escapement or escapements for controlling the resistance by step-by-step movement, and an automatic circuit-breaker controlled by the motor itself for giving the intermission of current necessary to the step-by-step movement, substantially as set forth.

3. The combination, with a dynamo or magneto electric machine, of a variable resistance in its field-circuit, an electromotor, an electromagnetic escapement or escapements for controlling the resistance by step-by-step movement, and an automatic circuit-breaker controlled by the motor itself, for giving the intermission of current necessary to the step-by-step movement, and means for determining the direction of action of the escapement or escapements, substantially as set forth.

This specification signed and witnessed this 6th day of June, 1882.

JOHN F. OTT.

Witnesses:
WM. H. MEADOWCROFT,
H. W. SEELY.