

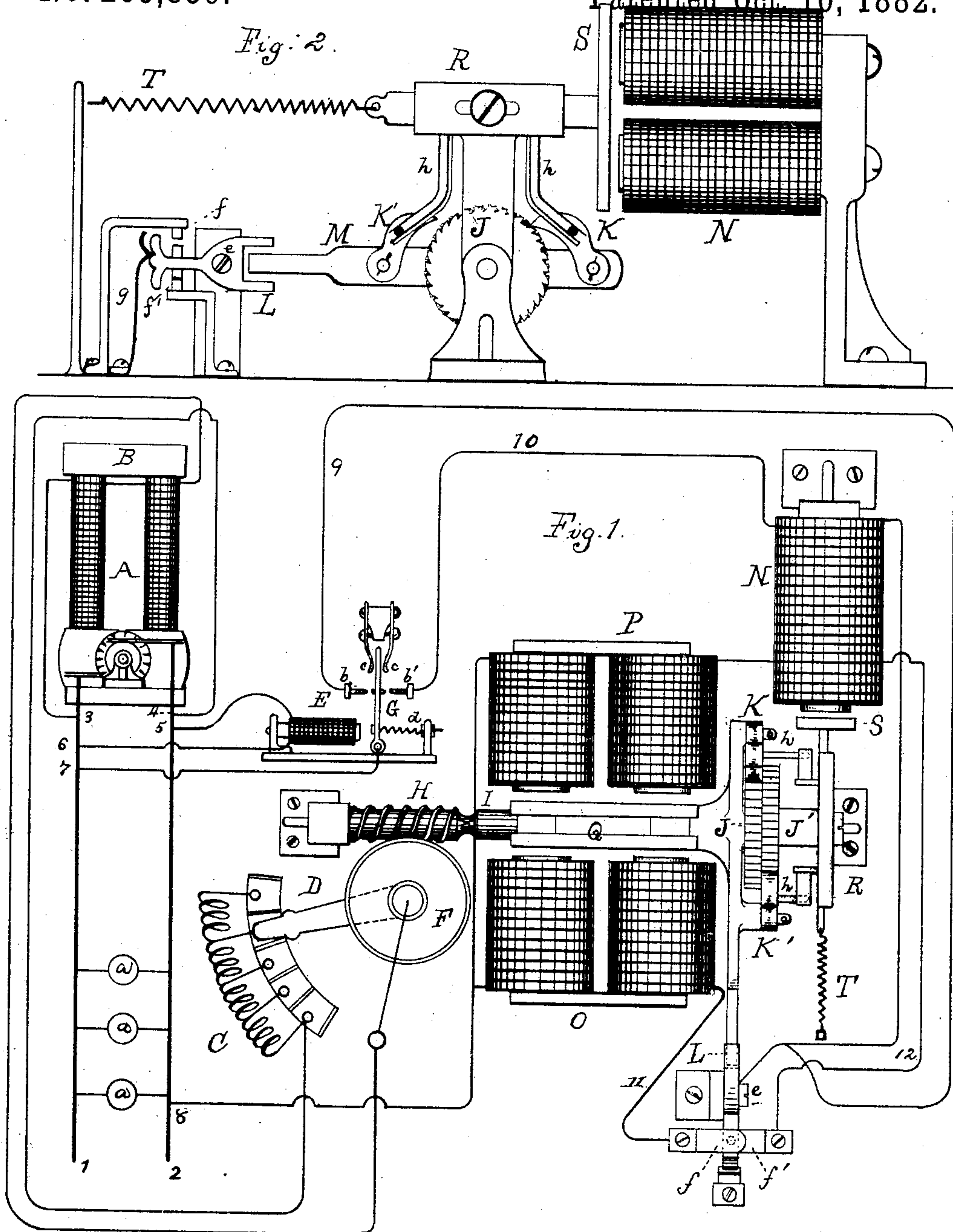
(No Model.)

J. F. OTT.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 265,859.

Patented Oct. 10, 1882.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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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 New-  
ark, in the county of Essex and State of New  
Jersey, have invented a new and useful Im-  
5 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 let-  
10 ters of reference marked thereon.

My invention relates to means for automati-  
cally varying the current energizing the field-  
magnet of a dynamo or magneto electric ma-  
chine, for the purpose of regulating the gen-  
15 eration of current by said machine; and said  
invention consists in novel and peculiar de-  
vices for this purpose, as hereinafter described,  
and pointed out in the claims.

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

A, Fig. 1, is a dynamo-electric machine, hav-  
ing main conductors 1 2 leading from it, and  
25 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  
30 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 lat-  
ter being on the shaft I, on which are also two  
35 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-re-  
40 tracted armature, G, which is placed between  
contact-points *b b'*, and also between spring-  
arms *c c*, which hold the lever normally mid-  
way between *b* and *b'*, but allow it to make  
contact when drawn forward by the magnet  
45 E or sufficiently retracted by the spring *d*.  
The armature-lever G forms a part of the mul-  
tiple-arc circuit 7 8.

From the contact-points *b b'* respectively  
run the wires 9 and 10. Both terminate at  
50 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, piv-  
oted 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 55  
of the points *f f'*. The spring *g* is used to as-  
sist 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 elec-  
tro-magnet N. From the point *f* a wire, 11, 60  
runs to the electro-magnet O, while wire 12  
from point *f'* includes electro-magnet P, both  
these wires then returning to the main con-  
ductor 2 at point 8. The arm M is carried by  
the armature Q, which is common to both elec- 65  
tro-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 70  
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 arma-  
ture S of the magnet N, and to the other end  
is attached a spring, T. 75

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 80  
against the contact *b'*. The magnet N is there-  
fore energized and draws forward the arm R,  
which, through the arms *h*, brings the pawl K'  
into contact with the ratchet-wheel J' and re-  
moves the pawl K from the ratchet-wheel J. 85  
The circuit-breaker L being in contact with *f'*,  
the magnet P is energized and draws arma-  
ture 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 demagnet- 90  
ized, and armature Q attracted in the other di-  
rection. The vibration of the armature causes  
that of the pawls K K', and K' turns the ratch-  
et-wheel J, and thence through shaft I and  
worm-gearing H F the arm D is turned so as 95  
to throw a portion of the resistance C out of  
circuit. A decrease in the number of trans-  
lating devices causes the armature G to be at-  
tracted and make contact at *b*, which cuts the  
magnet N out of circuit, when the spring T 100



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.