

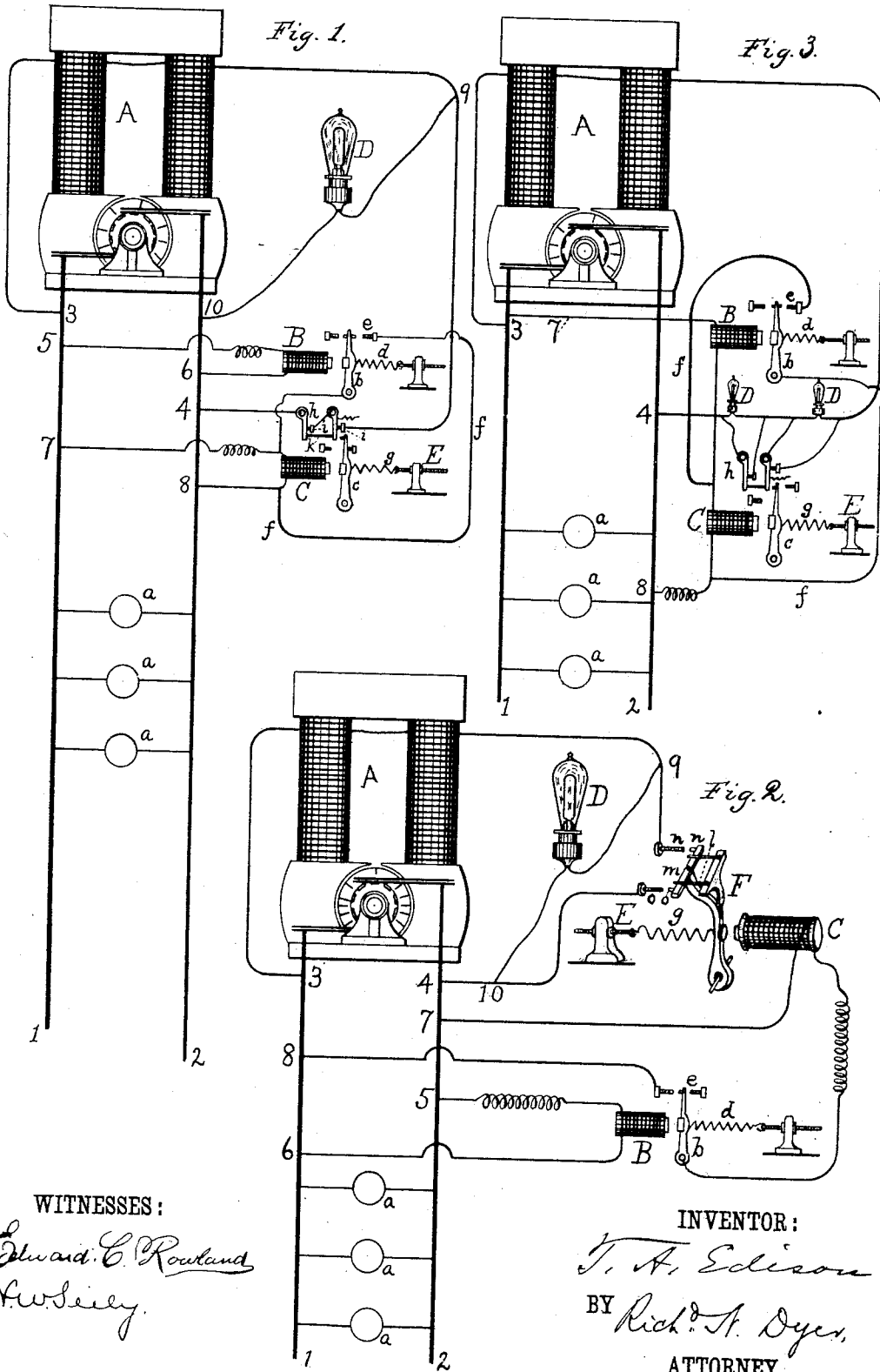
(No Model.)

T. A. EDISON.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 264,659.

Patented Sept. 19, 1882.



# UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

## REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 264,659, dated September 19, 1882.

Application filed August 7, 1882. (No model.)

*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 the Regulation of Dynamo or Magneto Electric Machines, (Case No. 406;) 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 this invention is to produce means for automatically regulating the generation of current by a dynamo or magneto electric machine supplying current to a multiple-arc system of electrical distribution, which shall not vary the resistance of or the current flowing in the field-circuit of the machine, and shall be exceedingly and unusually sensitive in their action, responding instantly to the slightest variation in the current on the main line. This I accomplish in the following manner: Two electro-magnets are placed each in a derived circuit from the main conductors of the generator, and each actuating a vibrating circuit-controller. The circuit-controller of one magnet opens and closes a circuit whose opening and closing controls or assists in controlling the energy of the other magnet, whose vibrating circuit-controller is placed in the field-circuit, so as to regulate the energy of the field-magnet of the machine, as explained in another application made by me of even date herewith; or where the main circuit includes the field-coils the circuit-controller would be placed in a shunt-circuit around such coils. One or more shunt-circuits may be formed around the last-mentioned circuit-controller, (which is preferably one which makes and breaks circuit at several points simultaneously,) such shunts having a high resistance, and being used to decrease the spark which might otherwise ensue.

In the drawings, Figures 1, 2, and 3 are diagrams of different forms of my invention.

Referring to Fig. 1, A is a dynamo-electric machine, from which lead main conductors 1 2, having lamps or other translating devices, *a a*, placed in multiple arc upon them.

3 4 is a multiple-arc circuit including the field-magnet of the machine.

In multiple-arc circuits 5 6 and 7 8 are placed respectively the electro-magnets B and C. The magnet B is provided with a pivoted armature-lever, *b*, retracted by a spring, *d*, its free end making and breaking contact at *e*, and thus opening and closing the shunt-circuit *f* around the magnet C, of which circuit the armature-lever *b* forms a part. The magnet C has pivoted armature *c*, retracted by spring *g*. The movement of this armature causes the vibration of the circuit-controller *h*, which, in order to reduce the spark, is made to break circuit simultaneously at points *i i*, *k k* being an insulating-pin. This circuit-controller regulates the machine as in the application above referred to. A shunt-circuit, 9 10, is formed around this circuit-controller, containing a high resistance, preferably an incandescent electric lamp, D, in order that the spark may be still further reduced; or the shunt-circuit may include a portion of the field-magnet coils with the same result. The opening and closing of the shunt *f*, controlling the energy of the magnet C, increases the sensitiveness of the action of the circuit-controller *h*. All the movements of the armatures *c* and *b* are simultaneous, and thus a double effect, both in increase and decrease of energy, is produced in C.

In Fig. 2 the magnet B is used to close and open directly the circuit 7 8 through the magnet C, instead of a shunt around it. The circuit-controller F here shown is one in which the flat springs *l l* bear on the cross-piece *m*, and so keep the contacts *n n* and *o o* always in line. With the exception of the points above noted, this form is similar to that of Fig. 1.

In the form shown in Fig. 3 two incandescent electric lamps, D D, are used as resistances for decreasing the spark, and placed directly in the field-circuit 3 4, a shunt being formed around each, and both shunts being opened or closed simultaneously by the movement of the vibrating circuit-controller *h*. The magnet B is used to open and close a shunt, *f*, around the magnet C, as in Fig. 1, and the movement of the armature-lever *c* throws the lamps or other suitable high resistances, D D, in or out of circuit. In this case the magnets B C are placed in series in the same multiple-arc circuit, 5 6.

It is evident that in all these forms the field-circuit 3 4 might be a circuit supplied from an external source, or a shunt instead of a derived circuit from the main line; or the vibrating circuit-controller could be placed in a shunt 5 around the field in those machines in which the main current energizes the field-magnet.

I do not claim broadly the use of a vibrating circuit-controller for regulating the generation of current, or a spark-arresting shunt 10 around such a circuit-controller, or providing such a circuit-controller with an adjustable retractor, since such invention forms the subject-matter of claims in my application No. 15 68,627, of even date herewith.

What I claim is—

1. The combination, with a dynamo or magneto electric machine, of a circuit-controller 20 operated by the current generated for regulating the generation of current by the machine, and a second circuit-controller, also operated by the current generated for controlling or assisting in controlling the current operating the first circuit-controller, as desired, substantially as set forth. 25

2. The combination, with a dynamo or magneto electric machine, of a vibrating circuit-controller adapted to make and break circuit at several points simultaneously, and another 30 vibrating circuit-controller for controlling or assisting in controlling the current operating the first circuit-controller, substantially as set forth.

3. The combination, with a dynamo or magneto electric machine, of two electro-magnets 35 placed in a multiple-arc circuit or circuits from the machine, and each provided with a vibrating circuit-controller, one for regulating the generation of current by the machine, the other for controlling or assisting to control the supply of current energizing the first, substantially as set forth. 40

4. The combination, with the two vibrating circuit-controllers, one for regulating the generation of current, the other for controlling the 45 supply of current to the first, of the spark-arresting shunt around the first circuit-controller, substantially as set forth.

5. The combination, with an electro-magnet placed in a multiple-arc circuit from a dynamo 50 or magneto electric machine, and a vibrating circuit-controller operated thereby and placed in the field-circuit of the machine, of an electro-magnet placed in the same or another multiple-arc circuit, and a vibrating circuit-controller 55 for controlling the current energizing the first-mentioned electro-magnet, placed in the circuit of said first-mentioned magnet or in a shunt around the same, substantially as set forth. 60

This specification signed and witnessed this 28th day of February, 1882.

THOS. A. EDISON.

Witnesses:

H. W. SEELY,  
THOMAS JOHNSTON.