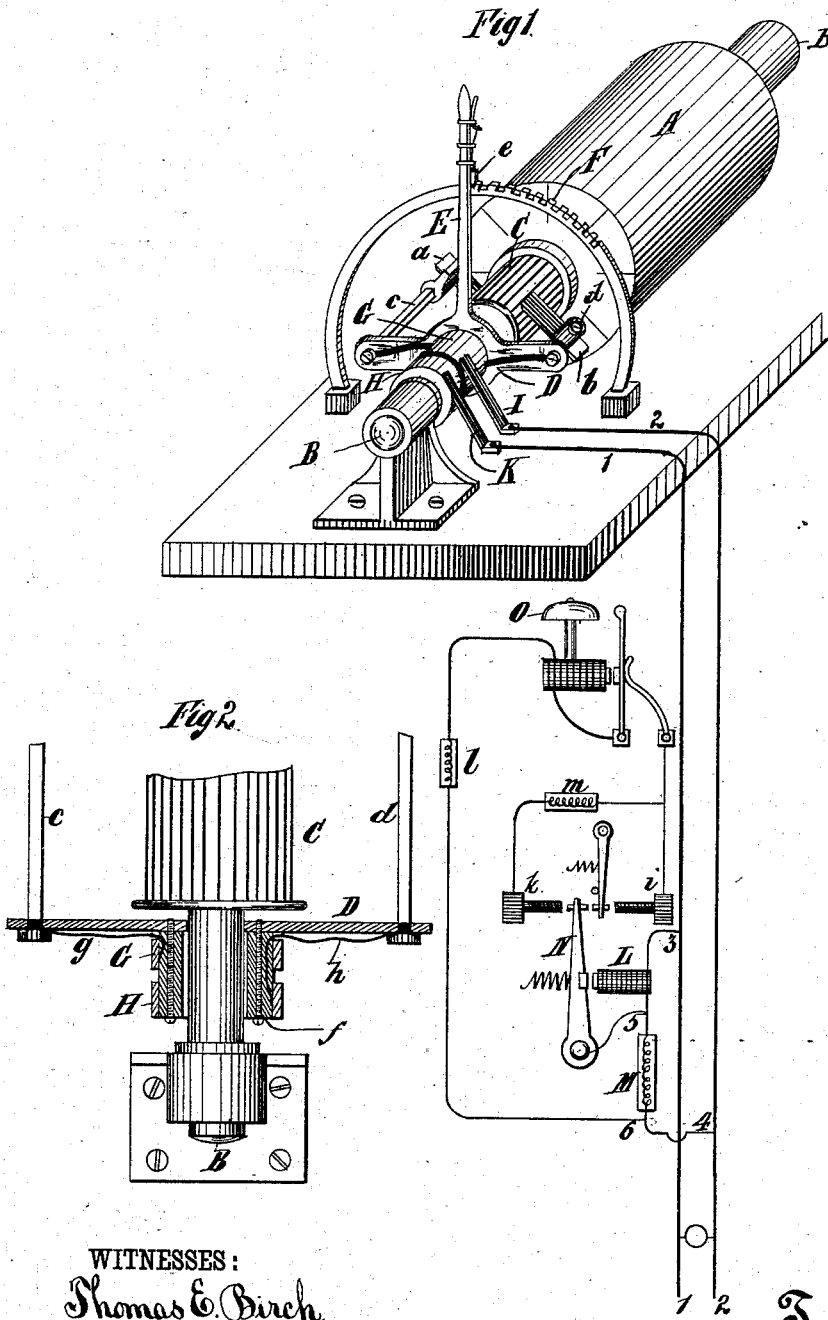


(No Model.)

T. A. EDISON.
DYNAMO ELECTRIC MACHINE.

No. 278,419.

Patented May 29, 1883.



WITNESSES:
Thomas E. Birch
O. W. Mott

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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.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 278,419, dated May 29, 1883.

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 Dynamo-Electric Machines, (Case No. 388;) 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 I have in view is to produce simple and efficient means for regulating the generative capacity of dynamo or magneto electric machines, which means will not require in their operation and adjustment the attention of a person skilled in the working of electrical apparatus. This I accomplish by constructing and arranging the commutator-brushes so that they can be readily shifted to and can be conveniently and securely held in any desired position between the point of greatest generation and that of no generation, and by providing at the machine an indicator or alarm which will show in a simple manner the condition of the current and will serve as a guide in the adjustment of the commutator-brushes.

In carrying out my invention the commutator-brushes are mounted upon arms projecting from a pivoted yoke which surrounds the armature-shaft and turns upon the axis of rotation, such arms being insulated from the yoke and being connected electrically with the main conductors leading from the machine. From the yoke projects a hand-lever having a spring locking device which engages with a toothed quadrant. This quadrant permits the adjustment of the brushes to any desired extent, and the locking device serves to hold the lever wherever it is placed.

In a multiple-arc or derived circuit from the main conductors is placed means for indicating electrically the strength of the current, which varies directly as does the candle-power of the lamps. The device I prefer to use is that shown in a prior application filed by me, (Serial No. 45,668,) by which an alarm is sounded when a certain strength of current corresponding with a definite candle-power is exceeded, and another alarm is given when the strength of the current in each multiple-arc circuit drops

below a fixed limit; but a dynamometer may be used, or other form of indicator, for showing the strength of the current, with or without an alarm for calling attention to an abnormal condition of the current. The operator will shift the brushes in the direction indicated by the nature of the alarm or by the indicator until the alarm stops sounding, which will be when the current in the main conductors is restored to its normal condition. If, after the brushes are shifted to the position of greatest generation in increasing the strength of current, the alarm continues to sound, this will show that the number of translating devices should be reduced in order to restore the current to its normal strength.

The commutator-brushes may be connected with the main conductors by coiled wires connected with the arms that carry them, since the movement of the yoke in practice is not very great; but I prefer, on account of the large size that it is desirable to give these conductors, to make a swiveled connection between them and the commutator-brushes, so that the yoke can be readily moved to any desired extent without disturbing said conductors. This swiveling device is composed of two metal rings, which surround the shaft outside of the yoke and are supported upon insulation carried by said yoke. These insulated rings turn with the yoke and are connected electrically each with one of the commutator-brush-carrying arms. Two springs of plates, strips, or wires bear on these rings and are connected with the main conductors, allowing the yoke to be shifted in either direction to any extent.

The field-magnet of the generator, provided with the means described, is preferably energized by a constant source of electrical energy, such as a galvanic battery or another generator. The field-circuit may, however, be adapted to have the current passing through it varied in strength, and such circuit may be supplied from an external source, or from the machine itself.

The foregoing will be better understood by reference to the drawings, in which Figure 1 is a perspective view of a portion of a dynamo or magneto electric machine embodying a part of my invention, and a diagram of the means for indicating predetermined limits above and

below the normal condition of current; and Fig. 2, a top view and part horizontal section of the commutator end of the machine.

A is the armature of the machine, and B its shaft. The field-magnet is not shown. C is the commutator-cylinder, and *ab* the brushes bearing thereon. D is the pivoted yoke, having arms *c d*, which carry the commutator-brushes. E is the lever projecting from yoke. F is the toothed quadrant with which the lever is locked by means of spring locking device *e*. G H are the metal rings of the swiveling device, supported on hollow wood cylinder *f*, secured to the yoke. The arms *c d* are connected with rings G H by insulated arms *g h*. I K are the springs bearing on rings G H and connected with main conductors 1 2. In a multiple-arc circuit, 3 4, from the main conductors 1 2 are placed an electro-magnet, L, and a resistance, M. A shunt-circuit, 5 6, around the resistance M passes through armature-lever N in one direction, and in the other direction through a vibrating bell, O, after which the circuit is divided, and its two parts are connected with the front and back contacts, *i k*, of the armature-lever. Resistances *l m* are placed in shunt-circuit 5 6 to change the nature of the alarm, according to whether the lever makes

the front or back contact, the sound of the bell being loud in one case and feeble in the other. 30

What I claim is—

1. A dynamo or magneto electric machine having movable commutator-brushes, and means operated by hand for adjusting and securing said commutator-brushes, in combination with means for indicating predetermined limits above and below the normal condition of the current, substantially as set forth. 35

2. The combination of the commutator-brushes carried by a pivoted yoke, a hand-lever and locking device for adjusting and holding said yoke, and means for indicating predetermined limits above and below the normal condition of the current, substantially as set forth. 40 45

3. In a dynamo or magneto electric machine, the movable commutator-brushes, in combination with swiveled connections between the same and the main conductors, substantially as set forth. 50

This specification signed and witnessed this 15th day of December, 1881.

THOMAS A. EDISON.

Witnesses:

RICHD. N. DYER,
H. W. SEELY.