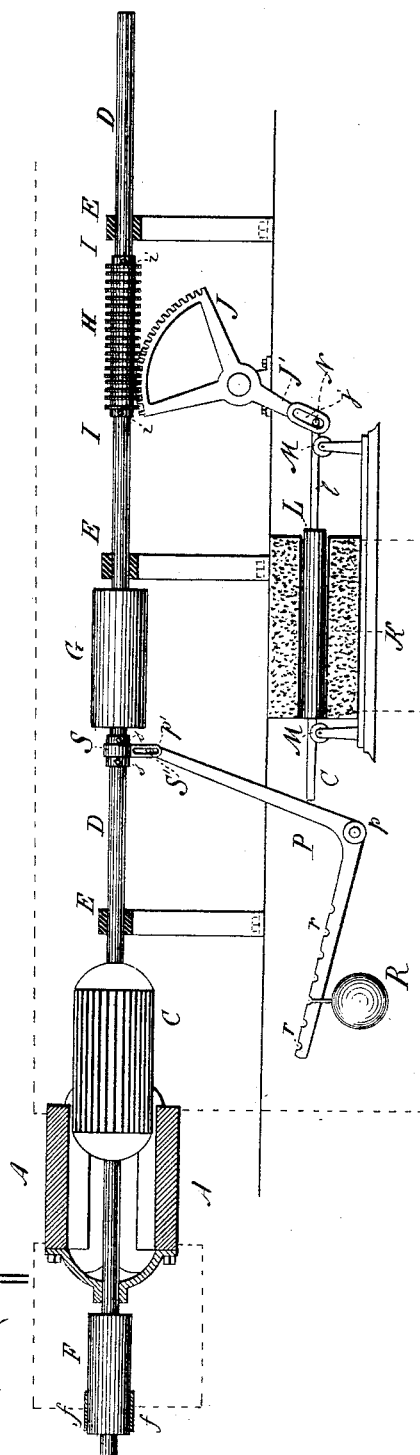


(No Model.)

J. H. IRWIN.  
DYNAMO ELECTRIC MACHINE.

No. 262,421.

Patented Aug. 8, 1882.



Witnesses=  
*Charles R. Searls*  
*Wm A. Lowe*

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# UNITED STATES PATENT OFFICE

JOHN H. IRWIN, OF MORTON, PENNSYLVANIA.

## DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,421, dated August 8, 1882.

Application filed April 24, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. IRWIN, of Morton, county of Delaware, and State of Pennsylvania, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention relates especially to dynamo-electric machines or generators, and has for its object the production of a device whereby the quantity of the current generated may be automatically increased or decreased in accordance with the energy required in the circuit; and it consists essentially in arranging the constituent parts of the device in such a manner that the relative surface of action between the armature and field-of-force magnets will be automatically changed or varied in accordance with the demands, said automatic action being obtained by passing the current from the generator through a solenoid connected directly in the main or in a shunt circuit, the core of said solenoid actuating a toothed segment engaging with the armature-shaft, moving the armature into and out of or partially into or out of the field-of-force magnets; and my invention involves certain novel and useful combinations or arrangements of parts and peculiarities of construction and operation, all of which will be hereinafter first fully described, and then pointed out in the claims.

My invention consists in the method for automatically increasing and decreasing and regulating the current of a magneto-electric machine, and in the means and mechanism for effecting the same, a preferable form and construction of such means or mechanism being indicated in the drawing and hereinafter more fully described.

The accompanying drawing shows a sectional view of my improved generator.

Like letters of reference indicate corresponding parts.

A are the field-of-force magnets, constructed in the usual manner. C is the armature, and D is the armature-shaft, supported by bearing E. F is the commutator, and *f f* are the brushes. G is a pulley, located upon shaft D, for driving the generator. The above-mentioned parts of my present invention are constructed in ac-

cordance with the principles fully set forth and described in an application for Letters Patent for an improvement in dynamo-electric machines, filed by me February 25, 1882.

H is a sleeve having rings or flanges thereon. Said sleeve fits loosely upon shaft D in such a manner as to permit free revolution of the shaft without turning the sleeve.

I are collars held in place upon shaft D by set-screws *i*.

J is a toothed segment, engaging with the flanges upon sleeve H. Upon segment J is an arm, J', wherein is formed a slot, *j*.

K is a solenoid located in the main or a shunt circuit from the generator.

L is a core fitting within the solenoid, said core being upheld therein by means of a shaft, *l*, mounted upon wheels M. A pin, N, at the extremity of shaft *l* plays in slot *j*.

P is a bent lever, fulcrumed at *p*, the lower arm of said lever being provided with notches *r*, wherein a weight, R, finds support. The upper arm of lever P is provided with a pin, *p'*.

S is a ring fitting loosely upon shaft D, and held from lateral displacement by means of collars *s*. Said ring is provided with a tongue, S', wherein is a slot, *s'*, within which pin *p'* travels.

When constructed and arranged in accordance with the above description the generator will respond to variations in the resistance of the outside circuit, as when the current through solenoid K becomes stronger core L will be drawn therein, actuating segment J, and by means of the flanged sleeve H drawing the armature more or less from the field-of-force magnets, reducing the strength of the current generated in accordance. When the current falls below the demands of the circuit weight R upon lever P will force the armature into the field-of-force magnets, drawing the core from the solenoid, and a correspondingly-increased current is generated. The relative position of the armature and field magnets may be readily changed by hand by shifting the sleeve to any desired position upon the armature-shaft and setting the collars so as to prevent displacement of this relative adjustment while the generator is in motion.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In combination with a dynamo-electric generator, a solenoid in the main or a shunt circuit, coupled with the shaft of the armature and intermediate mechanism, whereby the retractile force of the solenoid in drawing in its core causes the armature to be correspondingly drawn out of its field-of-force magnets, substantially as and for the purposes described.
2. In combination with a dynamo-electric generator, a solenoid in the main or a shunt circuit, coupled with the shaft of the armature and intermediate mechanism, whereby the retractile force of the solenoid in drawing in its core causes the armature to be correspondingly drawn out of its field-of-force magnets, and mechanism for pushing back the armature into its field-of-force magnets and correspondingly pushing out the core of the solenoid, substantially as and for the purposes described.
3. In combination with a dynamo-electric generator, a solenoid in the main or shunt circuit, coupled with the shaft of the armature, mechanism by which the position of the armature within its field-of-force magnets may be fixed as desired, mechanism by which the retractile force of the solenoid in drawing in its core causes the armature to be correspondingly drawn out of its field-of-force magnets, and mechanism for pushing back the armature into

its field-of-force magnets and correspondingly pushing out the core of the solenoid, substantially as and for the purposes described.

4. In a dynamo-electric generator, the combination, with the field-of-force magnets A, of armature C, having shaft D, sleeve H, bearing rings or flanges thereon, collars I, toothed segment J, solenoid K, and core L, said core being upheld by a shaft, l, mounted upon friction-wheels M and engaging with an arm, J', upon segment J, substantially as shown and described.

5. The combination, with the field-of-force magnets A, of armature C, shaft D, ring S, held in place upon said shaft by means of collars s, and having a slotted tongue, S', lever P, bearing-weight R, sleeve H, toothed segment J, solenoid K, and core L, the shaft of said core being mounted upon friction-wheels M and engaging with an arm, J', upon segment J, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

JOHN H. IRWIN.

Witnesses:

F. W. HANAFORD,  
A. M. PIERCE.