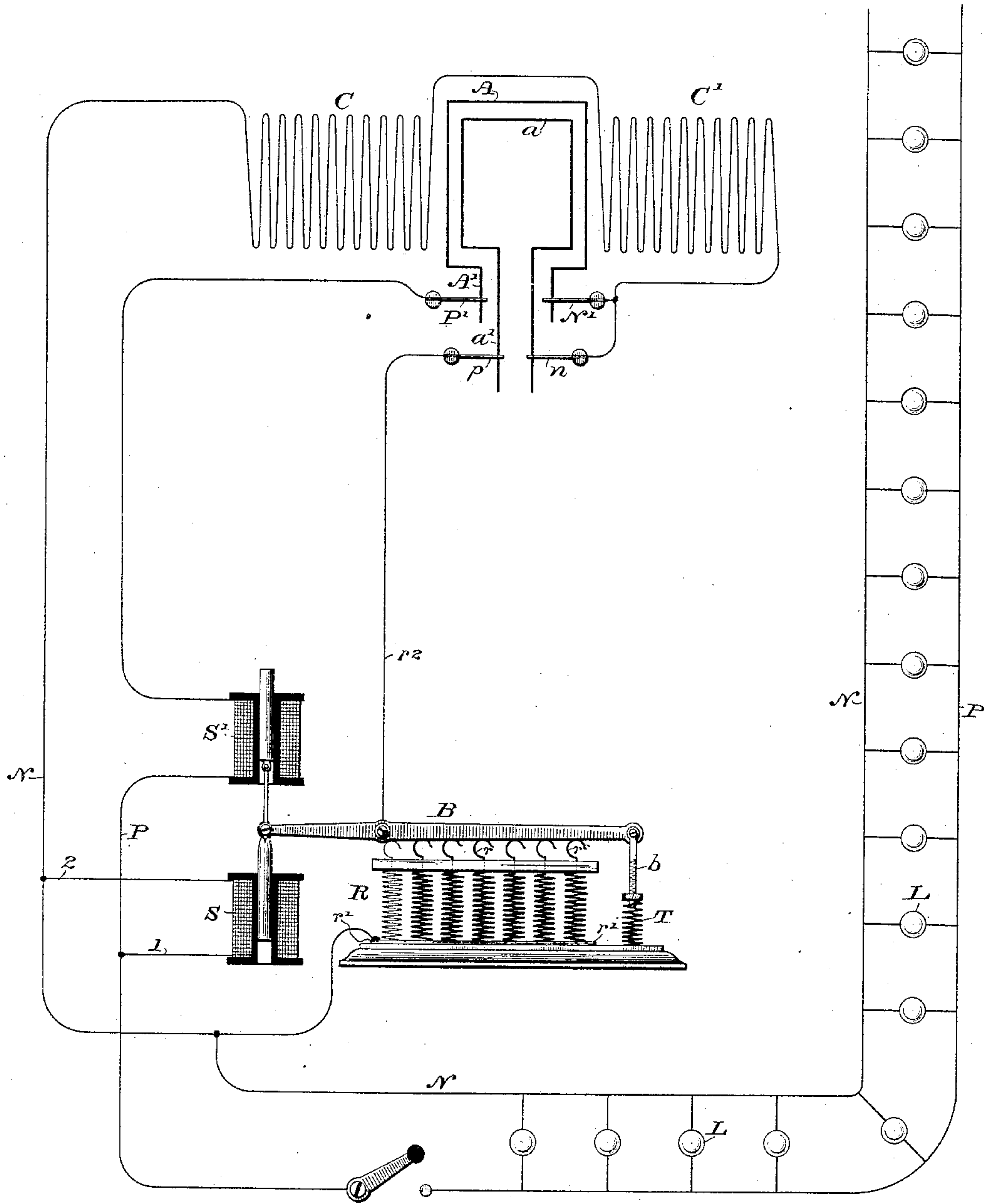


(No Model.)

C. J. VAN DEPOELE.  
DYNAMO ELECTRIC GENERATOR.

No. 338,320.

Patented Mar. 23, 1886.



Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

## DYNAMO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 338,320, dated March 23, 1886.

Application filed August 1, 1885. Serial No. 173,304. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dynamo-Electric Generators, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to improvements in dynamo-electric generators, designed for the production of current of constant electro-motive force; and it consists in the various details of construction and arrangement herein-  
after fully described.

The drawing is a diagrammatic representation of a dynamo-electric generator arranged according to my invention, and showing, also, the arrangement of the consumption and exciting circuits.

The armature is divided into two portions, each being provided with a separate commutator.

A represents the main portion of the armature—viz, that part of it which feeds directly into the consumption-circuit. *a* represents the remainder thereof, and may include any proportion of the coils best suited to produce the desired results.

A' is the commutator for the main portion of the armature, and *a'* the commutator for the auxiliary portion thereof, P' and N' representing the main, and *p* and *n* the auxiliary, commutator-brushes.

C C' are the helices of the field-magnets.

R is the rheostat, the coils of which are all united at their lower ends to the conductor *r'*, their upper ends being free terminals *r*. A contact-bar, B, is suitably pivoted in position to make and break contact successively with the terminals *r*, and is electrically connected to brush *p* by conductor *r''*. The bar B is prolonged beyond its pivotal point and provided with two iron plungers, which move in the solenoids S S', and by means of which the said bar is caused to make or break contact with the terminals *r* successively, according to the condition of the current. The opposite extremity of the bar B is provided with an adjusting-screw, *b*, and tension-spring T, which opposes the action of the solenoids with any desired degree of force.

The generator here shown is of the series type, the main or consumption circuit including also the auxiliary commutator-brush *n*, the positive commutator-brushes being connected to the external and regulating or exciting circuits, respectively.

A number of working-resistances, L, are shown connected in multiple arc between the main conductors P and N. The solenoid S is similarly connected, being placed between the main conductors and parallel with the working-resistances through the conductors 1 and 2, leading to the conductors P and N. The solenoid S' is in series with the main circuit, as shown.

The current in the auxiliary or exciting circuit runs as follows: From armature-coils *a* the current passes by brush *p* and conductor *r'* to the contact-bar B, through the contacts *r r r*, &c., the resistances R, conductor N, field-magnet coils C and C', and thence to negative brush *n*, completing the exciting-circuit.

That portion of the internal circuit of the generator which is in circuit with the working-resistances is as follows: main armature-coils A, brush P', from which the current passes, by suitable conductor, P, to the translating devices or working-resistances L L L L, &c., all arranged in multiple arc, back to machine by conductor N, to the coils C C' of the field-magnets, and from here by suitable conductor to brush N', closing the circuit upon the main armature-coils A. On starting the machine, we run same at a constant speed—say one thousand revolutions per minute—and the auxiliary circuit being closed by means of the rheostat R, a current is at once set up in the coils C and C', thus energizing the field of force. The proportions of the auxiliary circuit are such that the current induced in the armature-coils A will equal, say, one hundred volts—that is to say, by placing a voltmeter between the conductors N and P we will have an indication of one hundred volts. If the exciting-circuit would give more than is necessary, the solenoid S will draw in its core and break contact with some of the resistances in R, thus increasing the total resistance in the rheostat and diminishing the current in the auxiliary circuits around the generator. The power of the solenoids can be regulated to allow more or



less current to be produced in the exciting-circuit by means of their own action, counteracted by the adjusting-screw and tension-spring T. On closing the working-circuit, more current will at once flow through the field-magnet coils and increase the production of current in the main armature-coils A, according to the condition or the number of working-resistances in circuit. The proportions of the main armature-coils A and the field-magnet coils C and C' are such that when all the working-resistances are in circuit, then the machine, running at one thousand revolutions per minute, will give a fall of potential of one hundred volts between the two main conductors P and N. The fall of potential between the brush P of auxiliary armature-coils and the conductor N should also always be equal to that in the main or working circuit. When sufficient working-resistances or translating devices are placed between the main conductors, it is no longer necessary to keep up the exciting-current, and the rheostat R is to be entirely cut out. This is accomplished by means of the solenoid S', which is placed in circuit with one of the main conductors, and is so disposed as to work in conjunction with solenoid S, which is, as before stated, parallel with the working-resistances. Whenever the potential rises above the predetermined point—say one hundred volts—the solenoid S will draw down its core and raise the bar B without assistance from S'. If no current is flowing through the latter, however, as soon as sufficient current is flowing through the machine and outside circuits to keep up the current, the solenoid S' will draw in its core and cut out the resistances of R, thus weakening or entirely breaking the exciting-circuit. The reverse will take place on the weakening of the main current. It will thus be seen that as long as there are not working-resistances enough in the main circuit the auxiliary current will flow through the electro-magnet coils and parallel with the current of the main armature-coils, which also passes through the same field-magnet coils.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a dynamo-electric generator the field-magnet coils of which are included in the external circuit, of a variable resistance spanning the field-magnet conductor, a number of working-resistances in multiple arc, a solenoid in circuit in the main conductors and a solenoid in parallel circuit with the working-resistances, and means operated by said solenoids for cutting out the variable resistance as the working-resistances are brought into circuit, as set forth.

2. The combination, with a dynamo-electric generator having its field-magnet coils in the external circuit, of main and auxiliary armatures, a consumption-circuit including working-resistances arranged in multiple arc, and a solenoid in series with said main conductor, a group of artificial resistances connected in

multiple arc between one of said main conductors and the auxiliary armature, the other pole of said auxiliary armature being connected to the other end of said conductor, thereby including the coils of the field-magnets in the auxiliary circuit, and a contact device operated by the joint action of the solenoids to diminish or increase the extent of the group of artificial resistances as more or fewer of the working-resistances are brought into circuit, as set forth.

3. The combination, with a dynamo-electric generator the field-magnet coils of which are included in the external circuit of a divided armature, the main portion of which feeds the consumption-circuit, in which are placed a number of working-resistances in multiple arc, a group of artificial resistances, also in multiple arc and arranged to span the field-magnet conductors, a solenoid in series with the main circuit, and a solenoid in multiple arc and parallel with the working-resistances in circuit, and connections leading from the auxiliary portion of the armature to the artificial resistance and from said resistance to one of the main conductors, and from the opposite binding-post of the auxiliary armature to the other main conductor, as set forth.

4. In a dynamo-electric machine, an armature provided with two sets of independent coils—one as the main and the other as an auxiliary—both arranged so as to send their current through the field-magnet helices for the purpose of exciting the same, and proper means for varying the resistance in the auxiliary circuit, corresponding to the resistance in the working-circuit, substantially as described.

5. In a dynamo-electric machine, an armature provided with two independent sets of coils around its core, one set of coils—the main—so arranged as to send its current through the working-resistances and the field-coils, the second set—the auxiliary—so disposed as to send its current through the field-magnet coils and a variable resistance in circuit with said auxiliary armature, in order to vary the intensity of the current produced in the main armature-coils by adding more or less to the current flowing through the single field-conductors, substantially as described.

6. In a dynamo-electric machine, the field-magnet coils composed of a single conductor, through which the current of the consumption-circuit and main armature is flowing, and an auxiliary armature capable of adding its current to that of the main armature flowing through the field-magnet coils, for the purpose of varying the intensity of the current in the consumption-circuit.

In testimony whereof I hereto affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:

JOHN EASON,  
WARREN S. STEARNS.