(No Model.)

W. H. ELKINS.

SYSTEM OF ELECTRICAL DISTRIBUTION.

No. 474,166. Patented May 3, 1892.

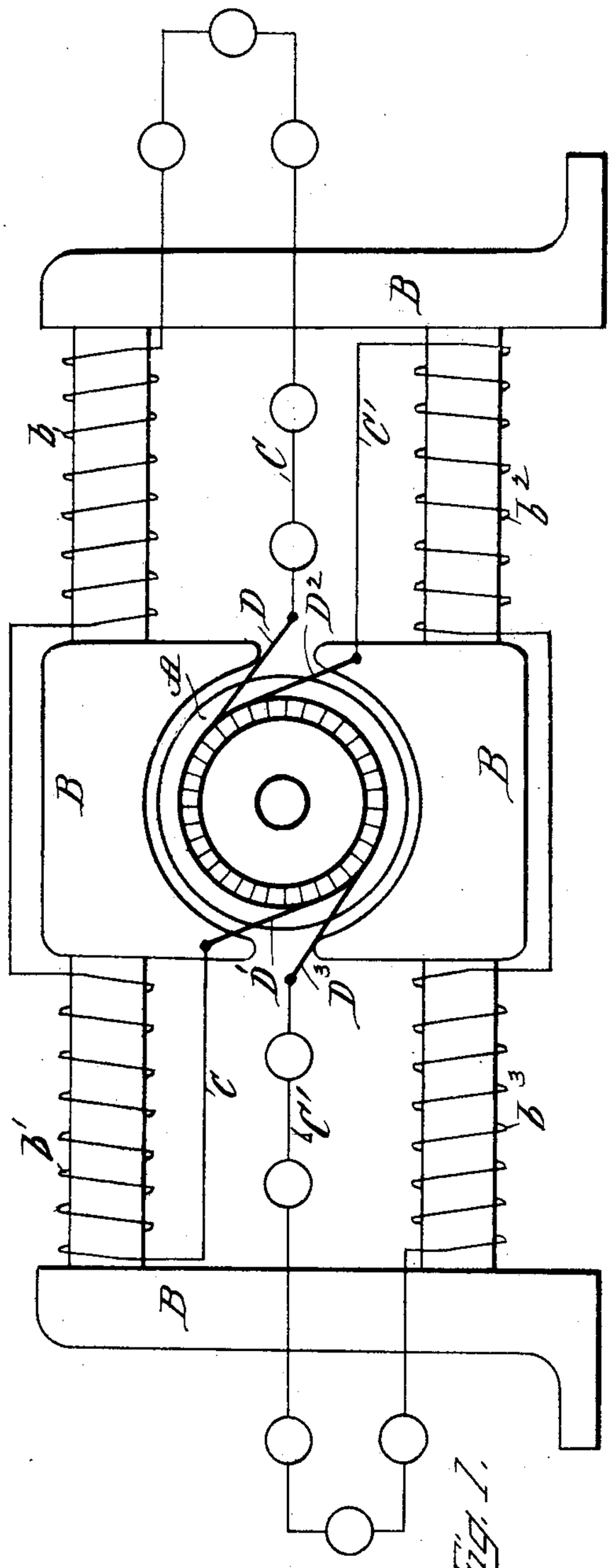

Fig. 1.

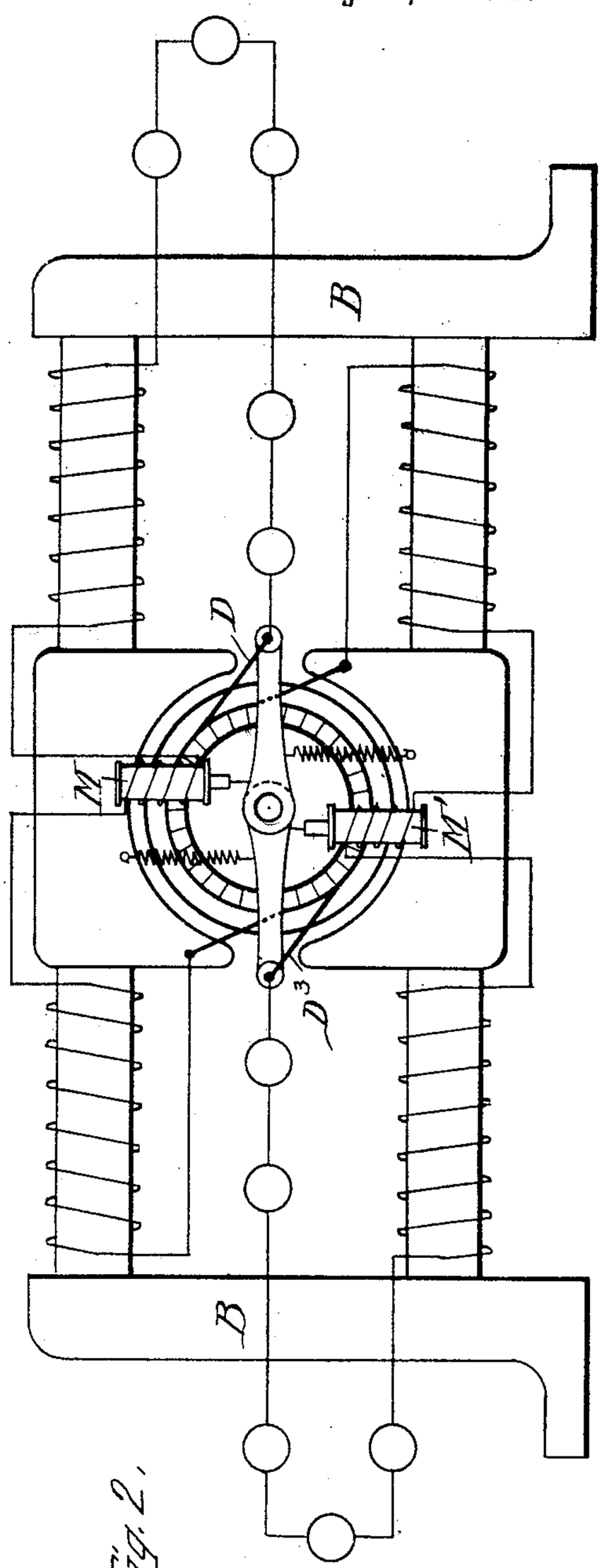

Fig. 2.

Witnesses:
H. A. Minnick
John R. Snow.

Inventor:
William Henry Elkins
by Maynadier & Beach
Attys

UNITED STATES PATENT OFFICE.

WILLIAM H. ELKINS, OF CAMBRIDGE, MASSACHUSETTS.

SYSTEM OF ELECTRICAL DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 474,166, dated May 3, 1892.

Application filed July 11, 1891. Serial No. 399,234. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY ELKINS, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful System of Electrical Distribution, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a diagram illustrating my system. Fig. 2 illustrates the preferred form of regulation.

My invention relates to dividing the current from a dynamo in such a way that two separate circuits will each be supplied with a constant current even if the resistance in either current be varied without regard to the resistance in the other circuit; and it consists in a dynamo within a dynamo with a plurality of circuits, each independent except that the armature-coils which at any moment make part of one circuit are carried by the revolution of the armature into such relation with the brushes of each circuit that each armature-coil makes a part of each circuit once during every revolution of the armature—that is to say, each circuit is externally independent, each has its own brushes, and the positive and negative brushes of each circuit are energized by those coils of the armature between them at any moment, but a coil which forms part of one circuit at one point in the revolution of the armature will form part of the other circuit at another point in the revolution of the armature.

In the drawings, A indicates the armature and B the field-magnet of a dynamo of usual construction. The brush D connects through work-circuit C and coils $b\ b'$ with brush D′, and brush D^2 connects through coils $b^2\ b^3$ and work-circuit C′ with brush D^3. When both circuits C C′ are at full load, assuming full load to be the same—say thirty arc lights for each—the difference of potential must of course be the same in each circuit, and the speed and field strength of the dynamo will be appropriate to generate that difference of potential. In practice the speed and field strength, due to the constant current, are kept constant; but if the load be changed in either circuit D C $b\ b'$ D′ or D^2 C′ $b^2\ b^3$ D^3 the current in that circuit will vary with the varying resistance, and that will vary the field strength and consequently vary the current in the other circuit in which there has been no change of resistance or load.

In the practical working of my new system an ammeter or its equivalent is used with each circuit, and when the current is too high in either circuit the brushes D and D^3 are adjusted to keep the current in each circuit constant, for while adjusting D directly controls only the current in its circuit, yet it indirectly affects the current in the circuit of D^3, and vice versa.

Instead of adjusting the brushes by hand according to the indications of ammeters, they may be controlled automatically, as will be clear from Fig. 2, in which M and M′ are solenoids controlling the brushes D and D^3, respectively, as will be well understood without further description.

One example of my new system is to use a dynamo, adapted for, say, sixty arc lights of fifty volts each in series, with a current of ten ampères and without change of wire in the armature-coils, but rewinding the field-magnet with twice the original number of turns, obtaining a current of five ampères in each circuit and sixty arc lights of fifty volts each—that is to say, one hundred and twenty arc lamps of fifty volts each instead of sixty as before; but each lamp of less candle-power than before, the total light from all the lamps being, however, far better diffused than before and therefore far more efficient. As another example the armature-coils will be changed in, say, a sixty-light machine and the field left as usual, when there will be ten ampères in each circuit, but practically only thirty lamps in each circuit, for the wire used in rewinding the armature being larger than before will change the dynamo from a three-thousand-volt dynamo to, say, a fifteen-hundred volt. The advantage in this case, as before, is, in fact, that I can use one hundred and twenty lights each of fifty volts with three thousand volts or sixty lights each of fifty volts with fifteen hundred volts.

I am aware that several circuits independent externally have been taken from a single dynamo when all the coils of the armature were in each circuit, as this is common with constant-potential dynamos; and I am also aware that several circuits independent both

externally and internally have been taken from a dynamo with two or more independent sets of armature-coils—as, for example, in Freeman's patent, No. 270,779, dated January 16, 1883; but I am the first to take two or more circuits from one set of armature-coils a portion of which at any one moment is practically independent of the rest and yet forms part of each circuit once during every revolution of the armature.

I am aware of Edgerton's patent, No. 279,362, dated June 12, 1883, in which a main circuit and a subsidiary circuit or two main circuits, each independent of the other internally as well as externally, and a subsidiary circuit are furnished from an open-coil armature, and I disclaim all that is described in that patent, my invention relating solely to closed-coil armatures, in which all the coils form one continuous conductor, and in which each coil is connected to adjacent segments of the commutator as well as to the adjacent coils.

What I claim as my invention is—

1. In a closed-coil dynamo, a plurality of circuits independent both externally and internally, each with brushes of its own and each comprising armature-coils which are connected with the adjacent coils and adjacent segments of the commutator, and which are common to all the circuits as the armature revolves, but wholly in one circuit while operative, all substantially as described.

2. In combination in a closed-coil dynamo, a circuit comprising a positive brush, one portion of the field-coil, a negative brush, and a portion of the armature-coils, armature-coils each connected with adjacent coils and adjacent segments of the commutator, and a second circuit comprising a second positive brush, a second portion of the field-coil, a second negative brush, and a portion of the armature-coils, the two circuits being independent except in so far as the armature-coils are common to both as the armature revolves, all substantially as described.

3. In a closed-coil dynamo, a plurality of circuits independent both externally and internally, each with brushes of its own and each comprising armature-coils which are connected with adjacent coils and to adjacent segments of the commutator, and which are common to all the circuits as the armature revolves, but yet wholly in one circuit while operative, in combination with means for moving the brushes to regulate the current in the circuits, substantially as described.

W. H. ELKINS.

Witnesses:
J. E. MAYNADIER,
JOHN R. SNOW.