(No Model.)

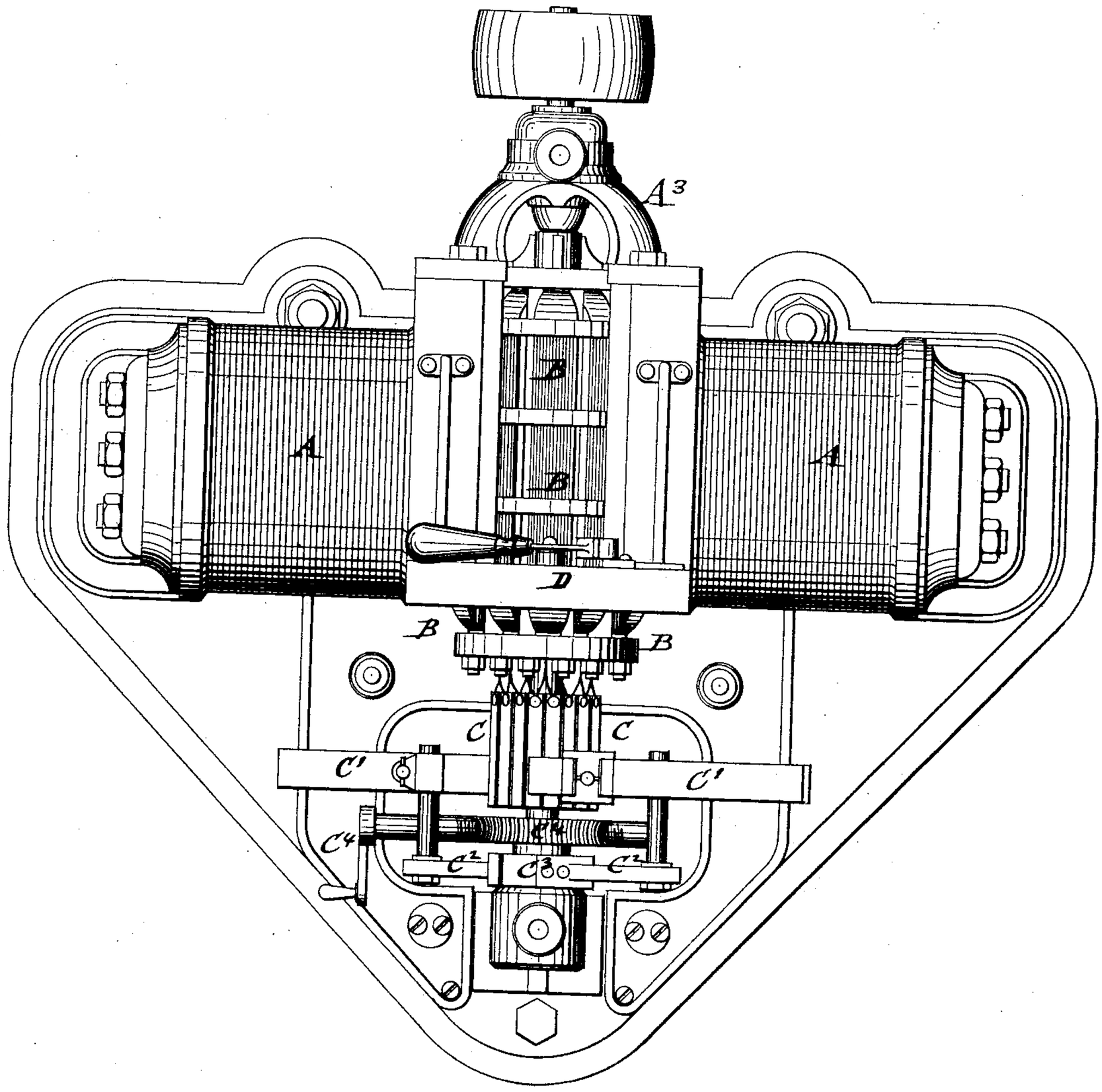
3 Sheets—Sheet 1.

E. GRAUERT.

DYNAMO ELECTRIC MACHINE.

No. 327,790. Patented Oct. 6, 1885.

Fig. 1.



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(No Model.)

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Fig. 2.

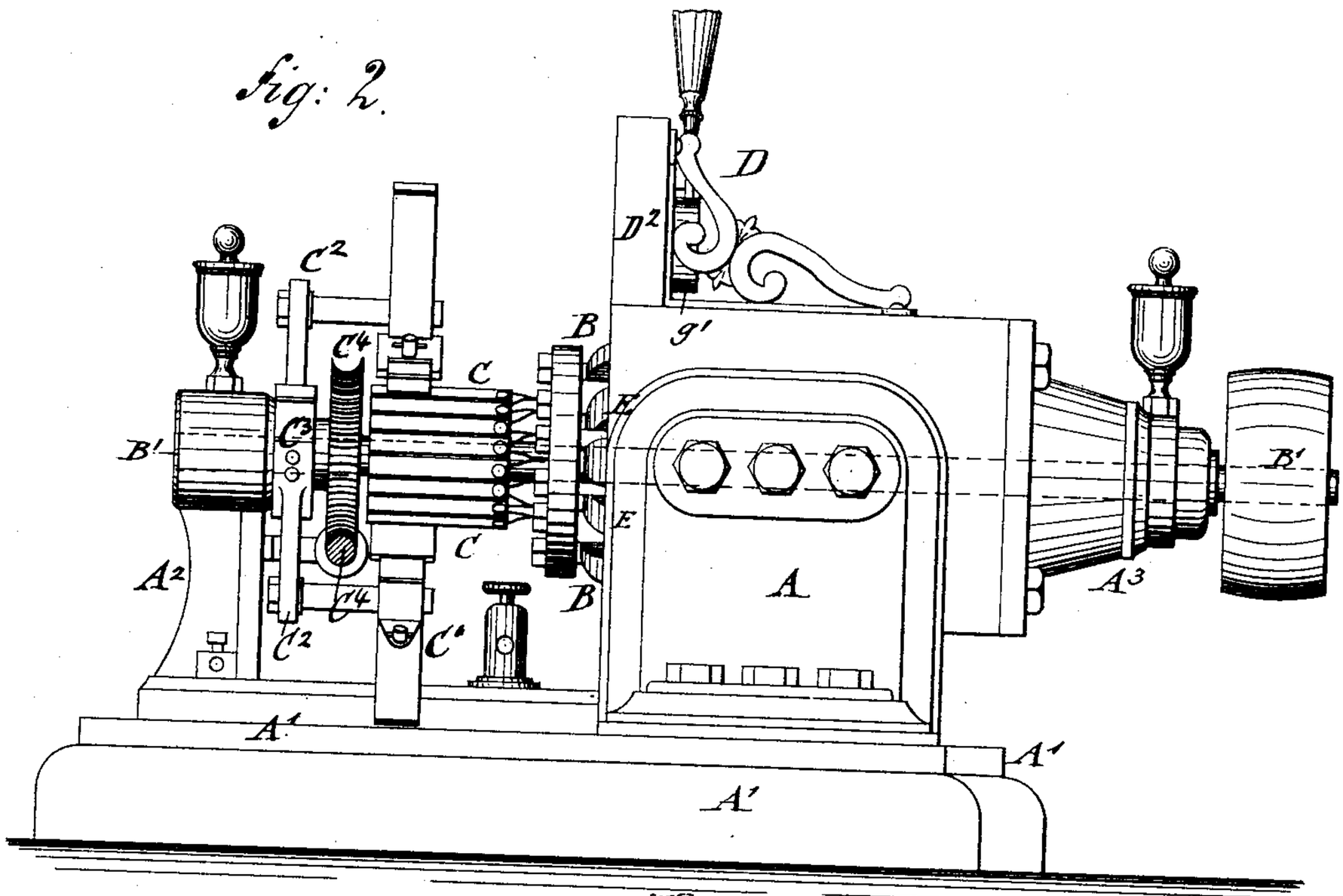
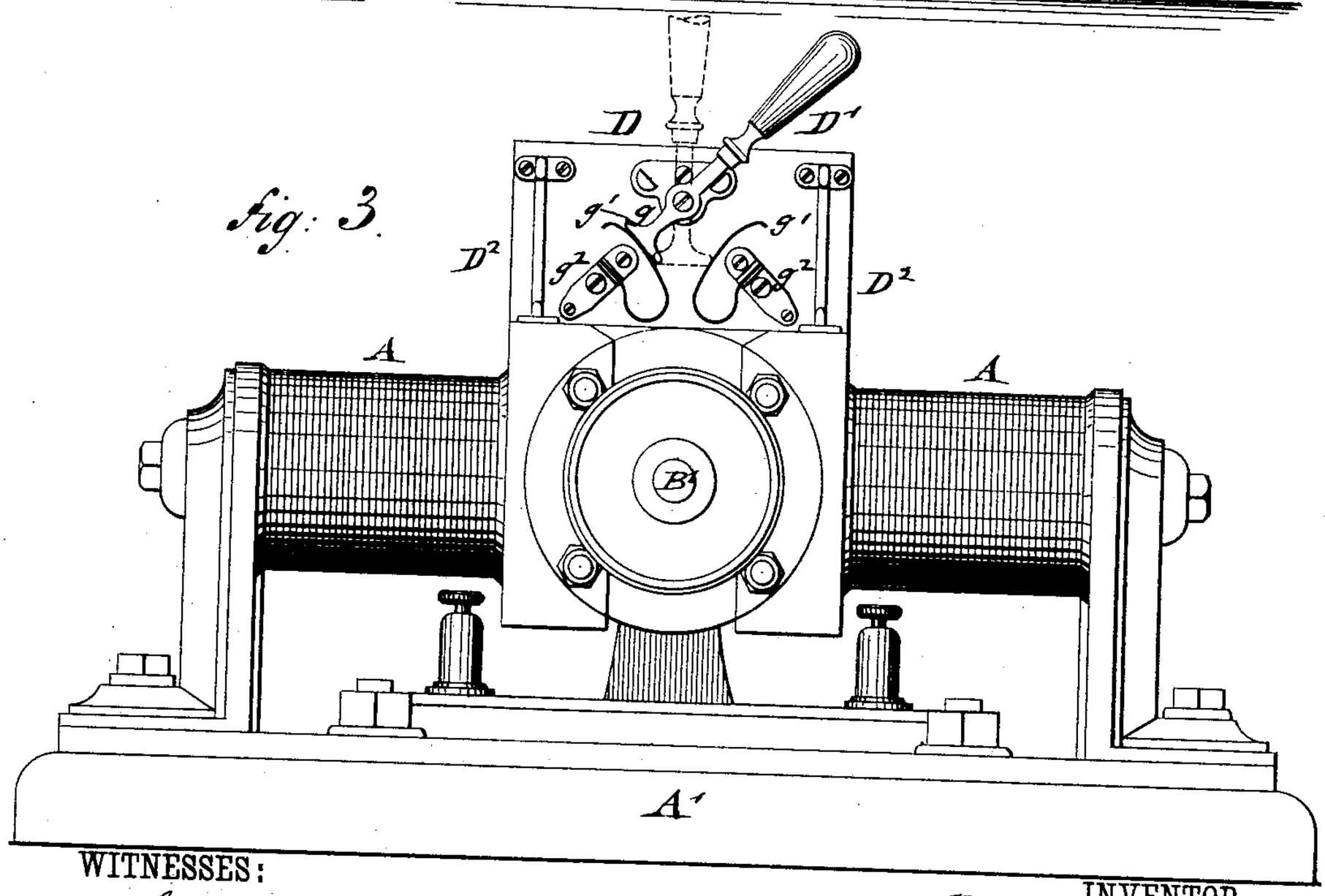


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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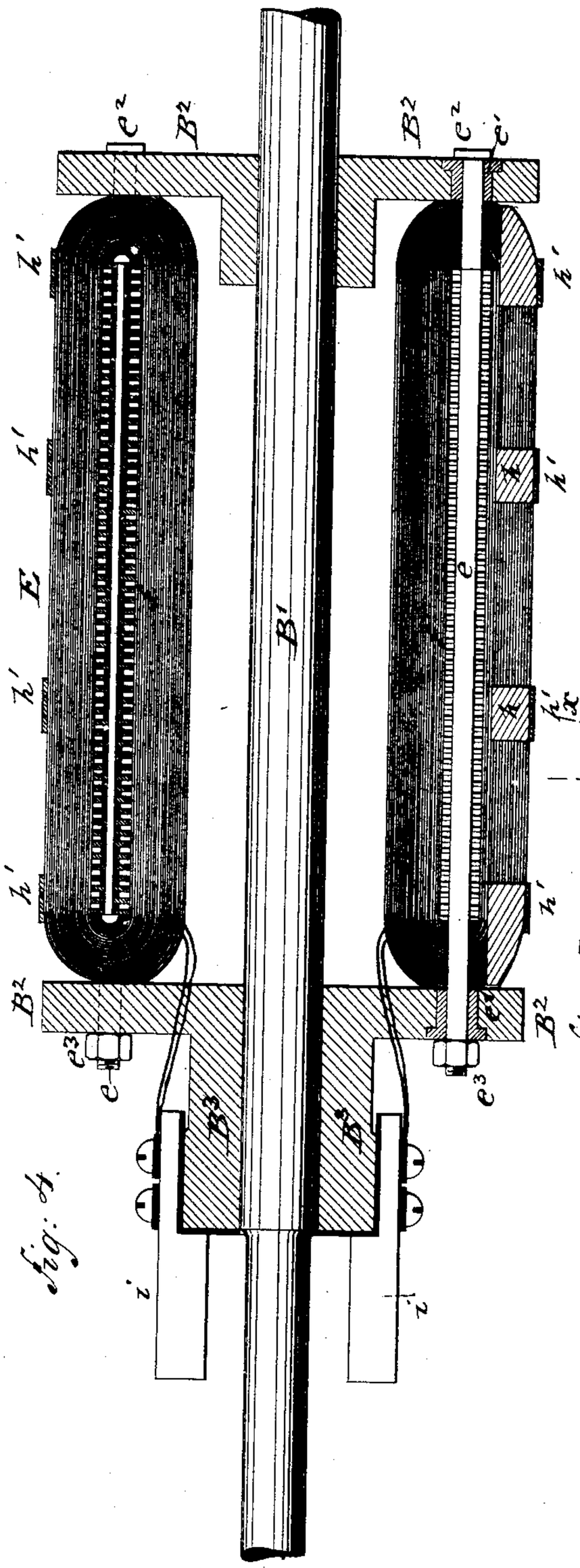

Fig. 4.

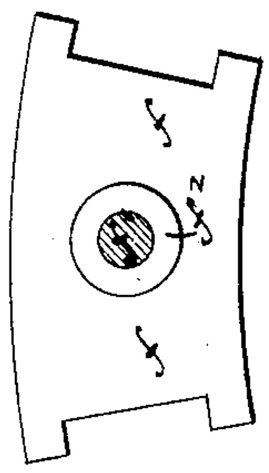

Fig. 7.

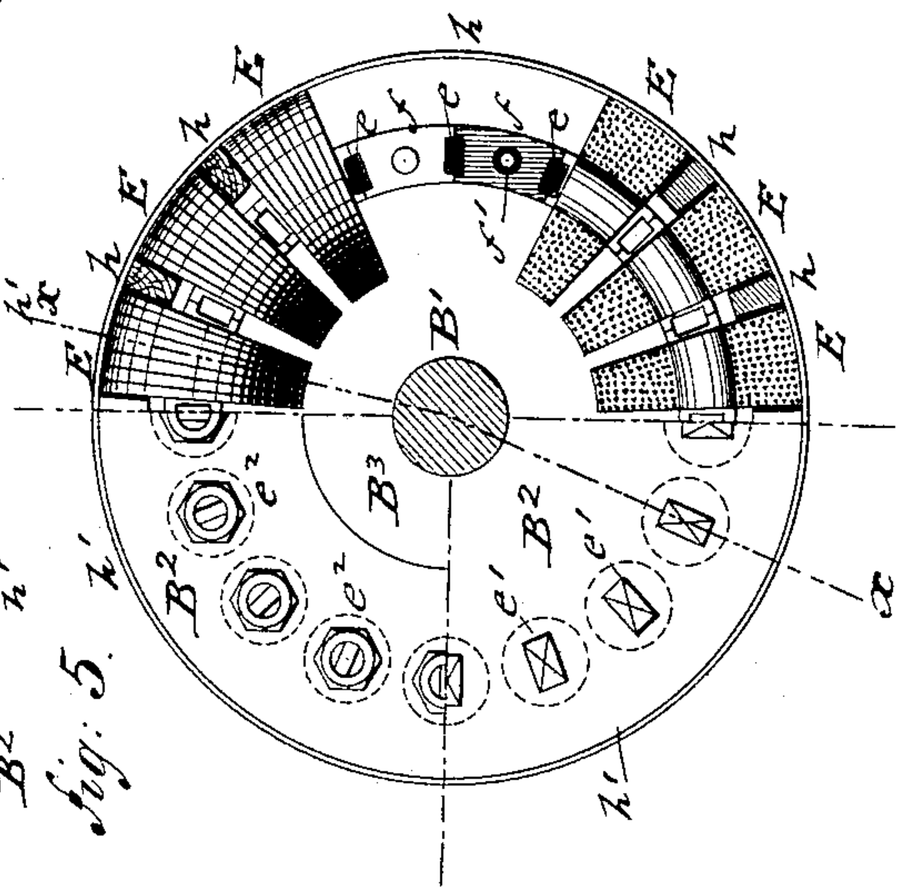

Fig. 5.

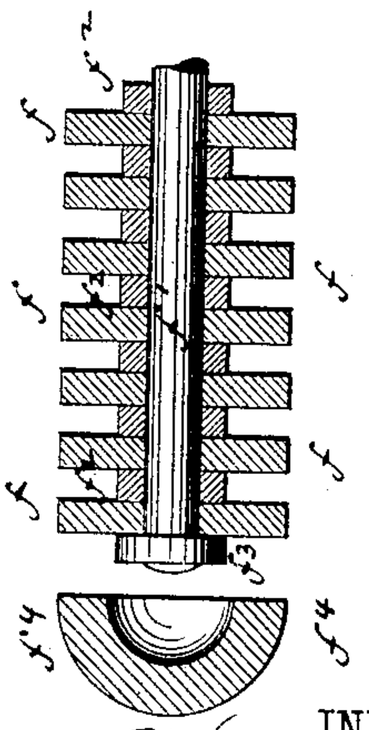

Fig. 6.

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UNITED STATES PATENT OFFICE.

EDGAR GRAUERT, OF NEW YORK, N. Y.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 327,790, dated October 6, 1885.

Application filed January 2, 1885. Serial No. 151,757. (No model.)

To all whom it may concern:

Be it known that I, EDGAR GRAUERT, of the city, county, and State of New York, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification.

This invention has reference to certain improvements in dynamo-electric machines of that class in which an armature of the Pacinotti type is used; and the invention consists in a dynamo-electric machine of an improved supporting-frame for a sectional armature and an improved construction of armature, as will more fully appear hereinafter, and finally be pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan of my improved dynamo-electric machine. Figs. 2 and 3 are respectively a side and end elevation of the machine. Fig. 4 is a vertical longitudinal section of the armature on line *x x*, Fig. 5, drawn on a larger scale. Fig. 5 shows at one side opposite end elevations of the armature-disks, while the other half shows an end view of the coils of the armature and a vertical transverse section of the same; and Figs. 6 and 7 are details of the soft-iron core of the coils of the armature.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the field-magnets; B, the armature which rotates between the enlarged pole-pieces of the same; C, the commutator, and D the switch, by which the armature is thrown in or out of circuit. The field-magnets A A are supported on a base-plate, A′, to one end of which is secured an upright standard, A^2, that supports in suitable bearings one end of the armature-shaft B′, while the opposite end of the same turns in bearings of a bell-shaped support, A^3, attached to the ends of the enlarged pole-pieces of the field-magnets A, as shown clearly in Figs. 1 and 2. The armature B is formed of a series of independent induction-coils E, the cores of which are recessed at the sides, so as to be engaged by longitudinal bars *e e*, of oblong cross-section, which are arranged intermediately between the coils E, and attached to the supporting end disks, B^2, keyed to the armature-shaft B′. The ends of the longitudinal bars *e e* are passed through oblong openings of the disks B^2, insulated therefrom by means of thimbles *e′*, and secured to one disk, B^2, by enlarged heads e^2, and to the other disk B^2 by screw-nuts e^3, as shown in Fig. 4. The induction-coils E E are supported rigidly in position by the said disks B^2 and bars *e e*, which latter interlock with the recessed cores of the coils. The cores of the induction-coils are formed of a series of soft-iron plates, *f*, which are strung upon a central brass rod, *f′*, and separated by intermediate brass washers, f^2, as shown clearly in Figs. 6 and 7. The core-plates *f f* form segments of a circle, are recessed at the sides for the bars *e e*, and have central openings for the connecting-rods *f′*. The rods *f′* are provided at the ends with screw-nuts f^3, so as to keep the core-plates firmly in position on the center rods, *f′*. The nuts f^3 are covered by semicircular wooden end pieces, f^4, (shown in Fig. 6.)

In making the coils E the wire is wound on a form of the required size, after which the core is inserted into the coil. The coils are next secured to the disks B^2 by passing the longitudinal bars *e e* through the disks and side recesses of the cores and fastening the ends of the bars to the disks. The cores of the induction-coils form thereby a cylindrical body, which is rigidly held in position by the longitudinal bars *e e*. The induction-coils are held apart by short wooden blocks *h h*, and are finally bound together by exterior bands, *h′*, that extend transversely around the coils and blocks.

The described construction and support of the induction-coils admit the removing and replacing of any one coil, in case the same should be injured by use, without disturbing the remaining coils. For this purpose it is simply necessary to withdraw the two longitudinal bars *e e*, that support the core of the coil, remove the same and replace it by a new coil that is secured in position by replacing the supporting-bars *e e* in position on the disks B^2.

The ends of the induction-coils E E are connected in the usual manner to the sections of the commutator C. The commutator C is composed of a number of parallel metal strips,

i, which are recessed at one end and attached to the cylindrical hub B^3 of one of the disks B^2 of the armature, as shown in Fig. 4. The strips *i* are insulated from the hub B^3, and are made by sawing a metallic cylinder of the proper shape into the required number of strips *i*. The outer ends of the sections *i* of the commutator are not separated by insulating material, but simply by air-spaces. In this manner a very cheap and simple form of commutator is obtained, in which any section that may be oxidized or worn out by use can be quickly exchanged. The commutator-brushes C′ are made of any suitable construction and held in contact with the sections of the commutator C. They are supported on radial arms C^2, which are attached to a ring, C^3, that is axially adjustable on an extension-hub of the standard A^2, so as to set the brushes into proper relative position to the commutator-sections by means of a worm-gear, C^4, that may be operated by hand or by a suitable automatic regulating mechanism, as preferred.

The advantages of my improved dynamo-electric machine are, first, simplicity of construction, as all the induction-coils can be wound up independenly of each other and finally united into a cylindrical body around the armature-shaft; second, the armature is kept cool, as the induction-coils are open at both sides so that the air can freely circulate through the cores of the same and prevent undue heating of the coils; third, the commutator is made of very simple construction and can be readily repaired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A supporting-frame for a sectional armature, consisting of supporting disks or heads, longitudinal connecting-bars, and a series of recessed and separated core-plates fitted to said bars, substantially as set forth.

2. In a dynamo-electric machine, an armature composed of supporting-disks, induction-coils open at the sides and provided with cores formed of a series of recessed and separated core-plates, and longitudinal supporting-bars that engage the recesses of the core-plates, and are attached to the end disks of the armature, substantially as set forth.

3. In dynamo-electric machines, an armature composed of a series of induction-coils open at the sides and provided with cores which are formed of a series of core-plates, intermediate washers, and central connecting screw-rods, substantially as set forth.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EDGAR GRAUERT.

Witnesses:
PAUL GOEPEL,
CARL KARP.