No. 808,552. PATENTED DEC. 26, 1905.

L. J. LE PONTOIS.

MAGNETO ALTERNATOR.

APPLICATION FILED SEPT. 24, 1904.

3 SHEETS—SHEET 1.

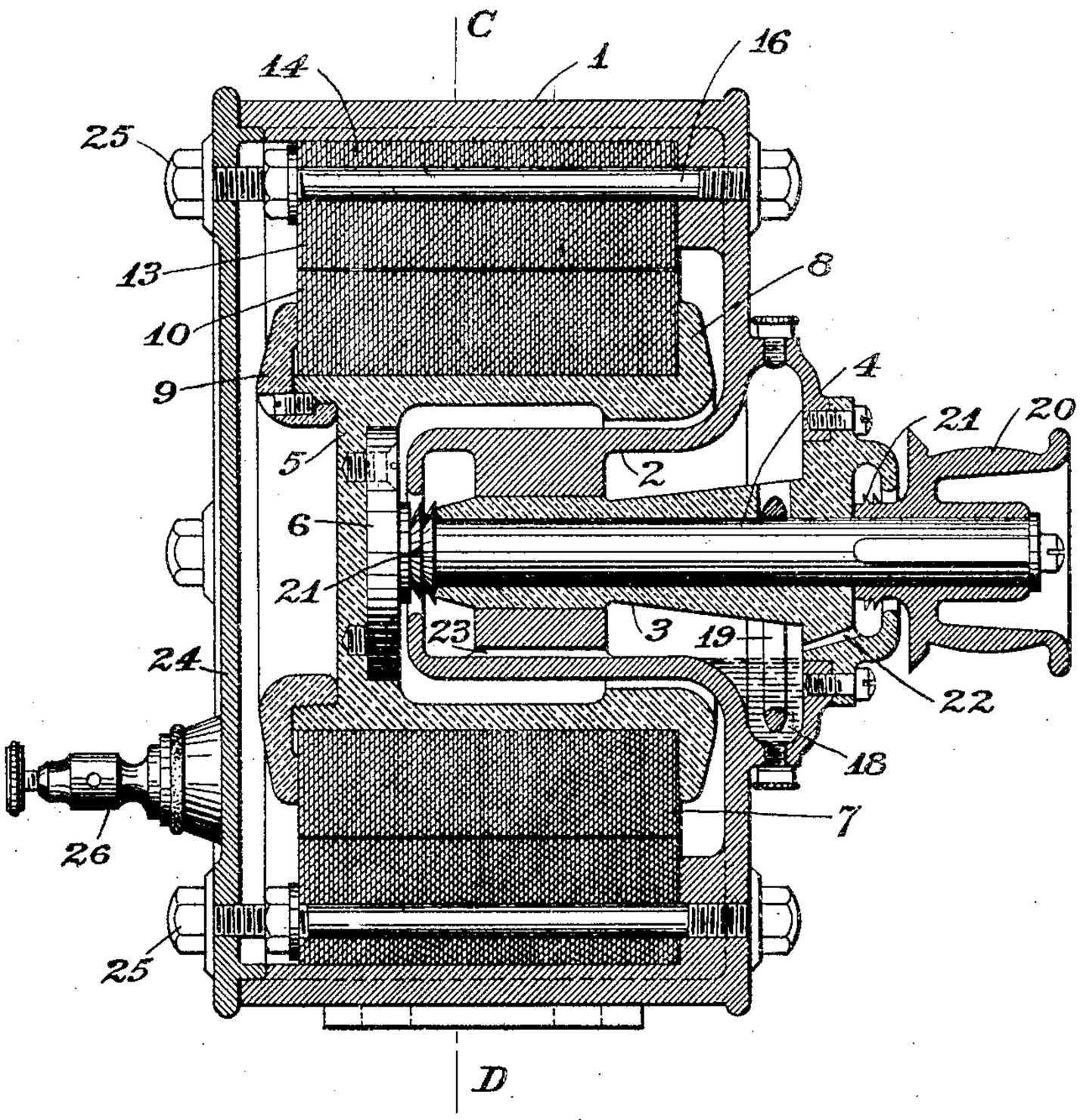

Fig. 1.

Witnesses
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Inventor
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By his Attorney
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3 SHEETS—SHEET 2.

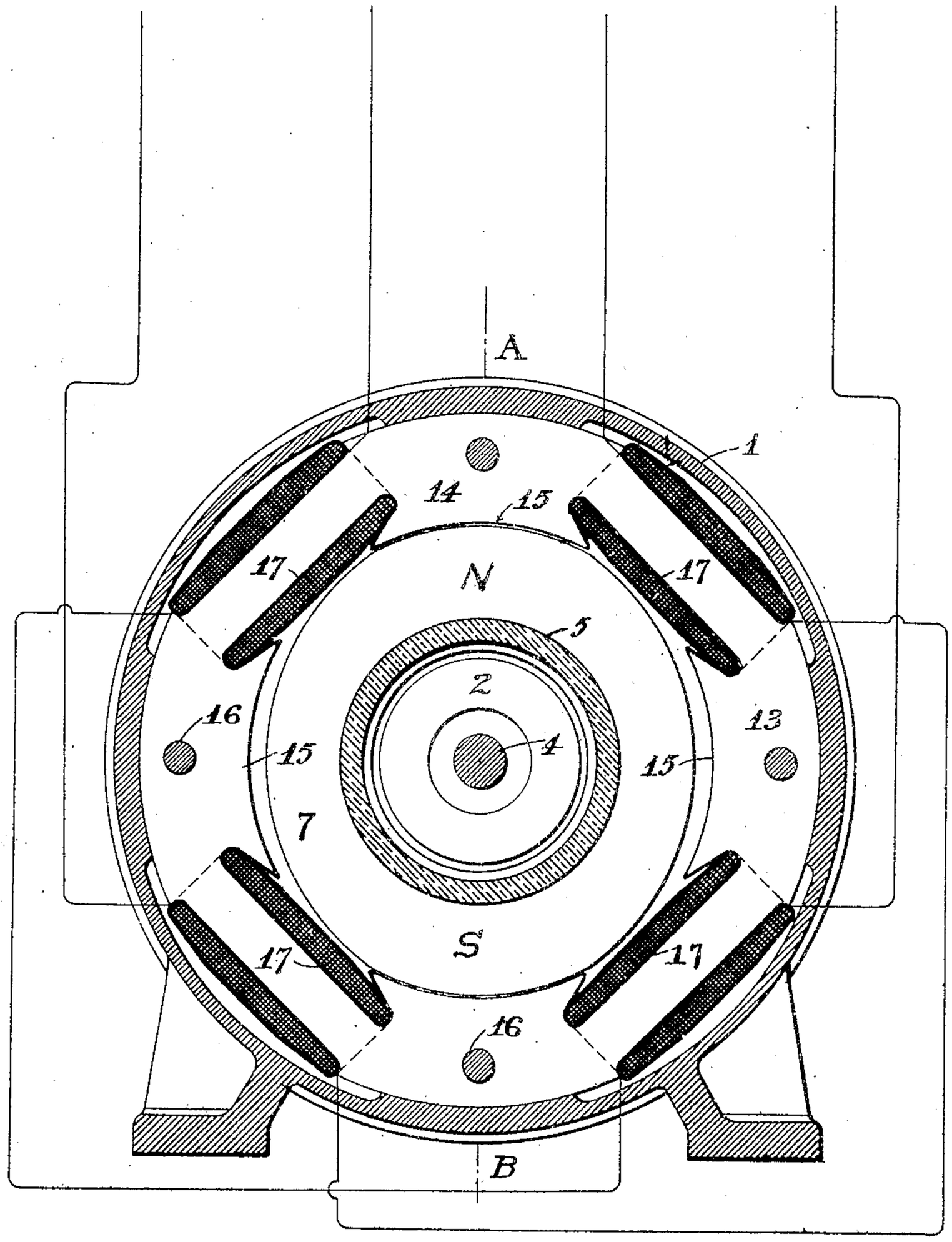

Fig. 2.

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3 SHEETS—SHEET 3.

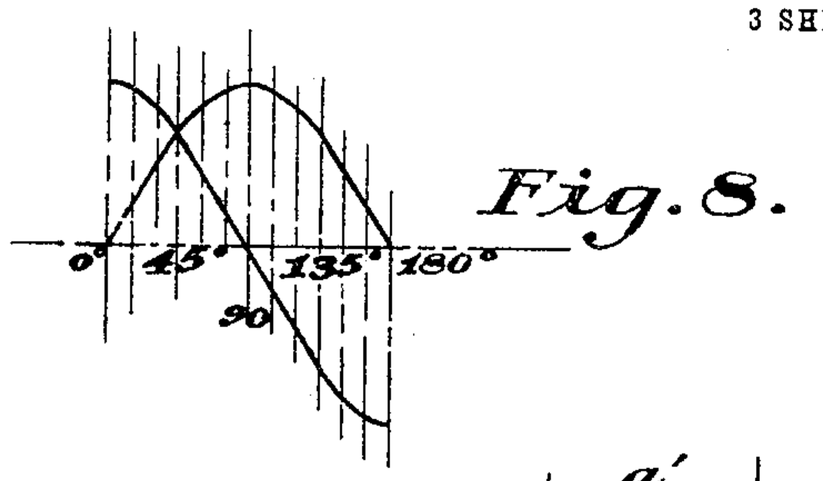

Fig. 8.

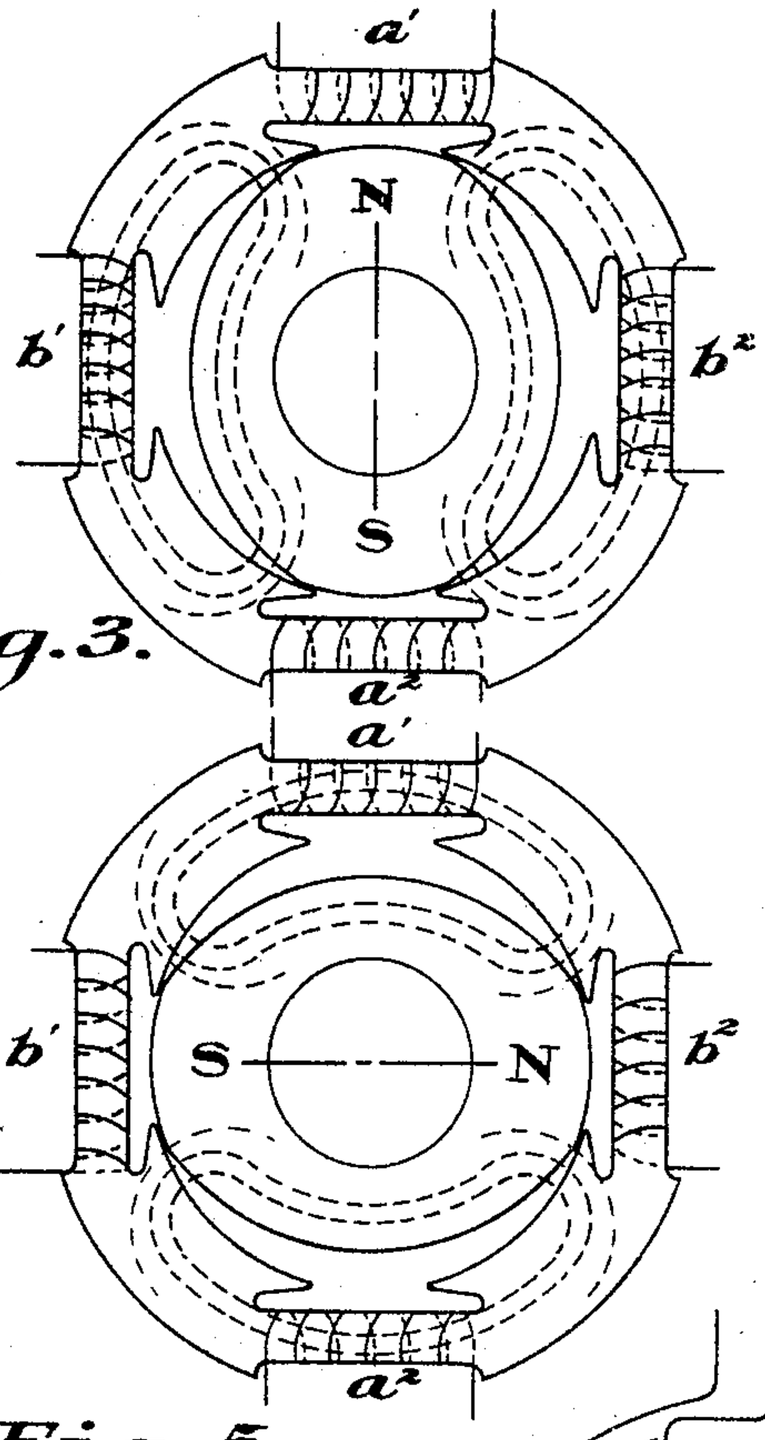

Fig. 3.

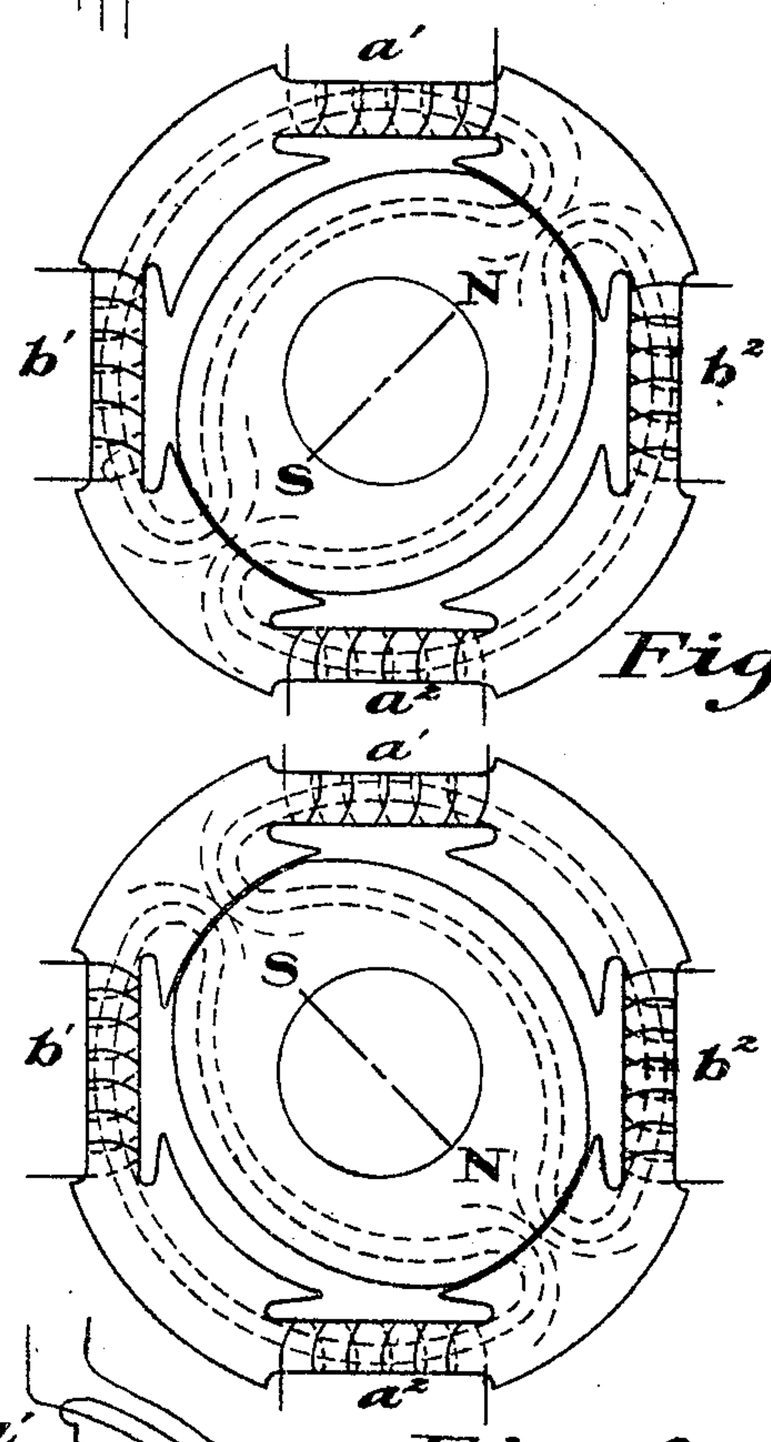

Fig. 4.

Fig. 5.

Fig. 6.

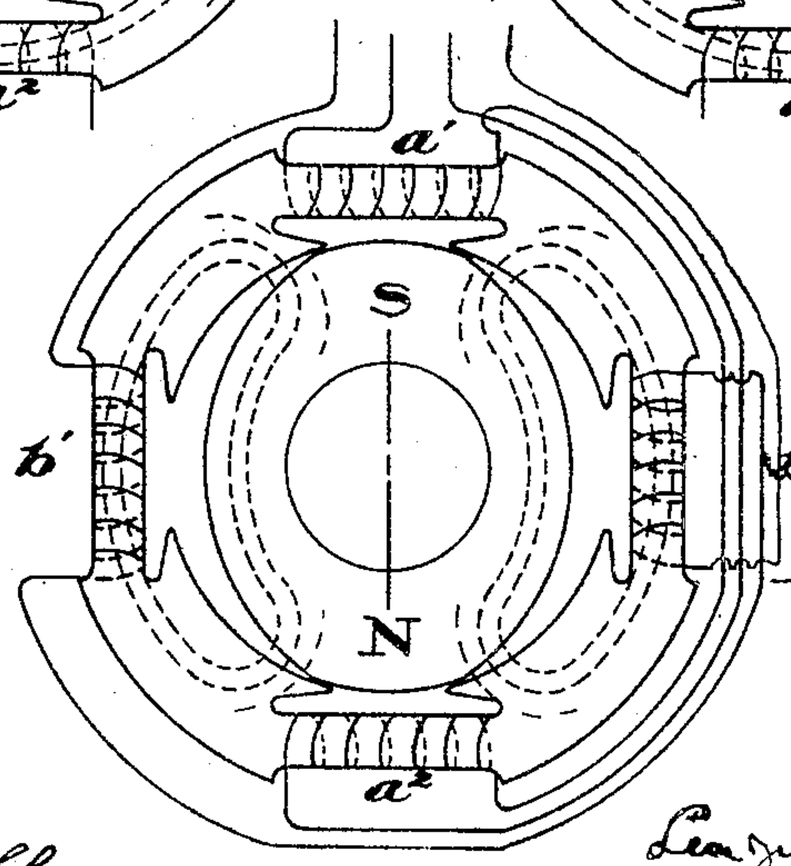

Fig. 7.

Witnesses
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Inventor
Leon Jules Le Pontois
By his Attorney
Sealey & Mastick

UNITED STATES PATENT OFFICE.

LEON JULES LE PONTOIS, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO POLY-PHASE IGNITION SYSTEM COMPANY, A CORPORATION OF NEW YORK.

MAGNETO-ALTERNATOR.

No. 808,552. Specification of Letters Patent. Patented Dec. 26, 1905.

Application filed September 24, 1904. Serial No. 225,853.

To all whom it may concern:

Be it known that I, LEON JULES LE PONTOIS, a citizen of the Republic of France, and a resident of New Rochelle, Westchester county, New York, have invented a certain new and useful Improvement in Magneto-Alternators, of which the following is a specification.

My invention relates to a polyphase magneto-alternator designed to deliver to suitable sparking devices two alternating currents having jointly or singly sufficient energy to cause the ignition of explosive mixtures according to my Patent No. 752,690, dated February 23, 1904.

Owing to the fact that it is difficult to construct simple alternating-current generators having collectors and moving coils, I have constructed an apparatus, one form of which is illustrated herein, with stationary coils and a rotating field, using a special form of permanent magnet for the field in order to avoid the necessity of exciting the same by direct current.

In the following I have shown with reference to the accompanying drawings a structure illustrating one form of my invention, the features thereof being more fully pointed out hereinafter in the claims.

In the drawings, Figure 1 is a sectional view of my improved polyphase magneto-alternator on the plane of the line A B of Fig. 2. Fig. 2 is a sectional view of the same on the plane of the line C D of Fig. 1. Figs. 3, 4, 5, 6, and 7 are diagrammatic views showing the distribution of the magnetic field through the stator while the rotor moves through an angle of one hundred and eighty degrees; and Fig. 8 is a diagrammatic view showing the respective values of the two alternating currents generated.

Similar reference characters indicate similar parts in the several views.

Referring to the drawings, the numeral 1 designates the outer casing of non-magnetic material, which casing is provided with an inturned projection 2, adapted to receive the elongated bearing 3 of the shaft 4. A drum 5, made of non-magnetic material, is rigidly mounted on the end of shaft 4 by means of the hub 6, which hub is preferably drop-forged with the shaft. The drum 5 supports a ring 7, formed of a number of steel laminæ 10, permanently magnetized. These laminæ are made fast on the drum by being clamped between the rim 8 and the screw-ring 9. By suitable magnetization two consequent poles N and S are developed at opposite ends of the same diameter. The laminæ 10 are made slightly elliptical in shape in order to better concentrate the magnetic flux at the ends of the same diameter and to decrease as much as possible the magnetic leakage which would otherwise take place between the magnetized ring and the iron ring constituting the stator. By this means I obtain a very homogeneous permanent magnet thoroughly and evenly magnetized throughout its entire mass. The laminæ are insulated from each other by a suitable coating of varnish, so as to diminish as much as possible magnetic short-circuits which might be formed between two contiguous laminæ owing to differences in their magnetic potential, also to diminish the eddy-currents which would otherwise take place through their mass owing to the stator armature reactions.

A ring 13, of soft-iron laminæ 14, having four oppositely-disposed polar projections 15, is clamped to the casing 1 by means of insulated bolts 16. Coils 17 are wound around ring 13 between the polar projections 15, the oppositely-disposed coils being connected together either in series or in parallel, thus forming two distinct circuits in which currents differing in phase from each other by ninety degrees are generated, as shown hereinafter.

An oil-well 18 is provided in the casing 1, a loose ring 19 resting on the shaft and depending into the oil-well acting as a medium for carrying the oil to the shaft. The shaft is adapted to be rotated by any convenient means through pulley 20, keyed to the shaft. The sleeve of the pulley and the shaft itself are each provided with oil-grooves 21 for preventing the surplus oil from working out into the casing and causing the same to drip off and return to the oil-well through oil-ducts 22 and 23, respectively. A cover 24 is adapted to be fastened to the front of the casing by means of suitable screws 25 and serves as a support for the binding-posts 26, adapted to receive the terminals of the coils.

To facilitate an understanding of the mode of generating currents by the apparatus above

described, reference may be had to the diagrammatic views Figs. 3 to 7, inclusive, which show the changes in the distribution of the magnetic field threading through the four stationary coils while the field-magnet rotates through an angle of one hundred and eighty degrees. An inspection of these figures shows that the intensity of the magnetic flux threading through opposite coils a' a^2 passes from minimum in Fig. 3 to maximum in Fig. 5, reverting to a minimum in Fig. 7, after having passed through intermediate values in Figs. 4 and 6. In the same manner the magnetic flux threading through the opposite coils b' b^2 undergoes similar variations; but it will be noticed that this variation occurs ninety degrees before or after similar variations occur in the intensity of the magnetic field threading through the coils a' a^2.

According to the well-known law of induction the two alternating currents, respectively, generated in the circuits of the coils a' a^2 b' b^2 must differ in phase from each other by ninety degrees, and are therefore suitable for the production of sparks for the ignition of explosive mixtures according to my Patent No. 752,690. Fig. 8 represents diagrammatically the simultaneous values of the two alternating currents delivered by each circuit during a revolution of the rotor through an angle of one hundred and eighty degrees.

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

1. A polyphase alternator comprising a rotor consisting of a permanent magnet having a plurality of separately-magnetized steel laminæ substantially annular in shape and so magnetized that two consequent poles are formed at opposite ends of the same diameter.

2. A polyphase alternator comprising a rotor consisting of a permanent magnet having a plurality of separately-magnetized steel laminæ substantially annular in shape, said magnet having polar projections at opposite ends of the same diameter.

3. A polyphase alternator comprising a stationary soft-iron laminated ring having a plurality of polar prejections, stationary coils wound on said ring between said polar projections, and a rotor consisting of a permanent magnet having a plurality of separately-magnetized steel laminæ substantially annular in shape and so magnetized that two consequent poles are formed at opposite ends of the same diameter.

4. A polyphase alternator comprising a stationary soft-iron laminated ring having four polar projections, stationary coils wound on said ring between said polar projections the opposite coils being connected in series or in parallel to form two independent circuits, and an annular permanent magnet adapted to be rotated within the ring, said permanent magnet consisting of a plurality of separately-magnetized steel laminæ substantially annular in shape and so magnetized that two consequent poles are formed at opposite ends of the same diameter.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LEON JULES LE PONTOIS.

Witnesses:

E. F. PORTER,

CHARLES S. JONES.