(No Model.)

4 Sheets—Sheet 1.

W. K. FREEMAN.

DYNAMO ELECTRIC MACHINE.

No. 441,793. Patented Dec. 2, 1890.

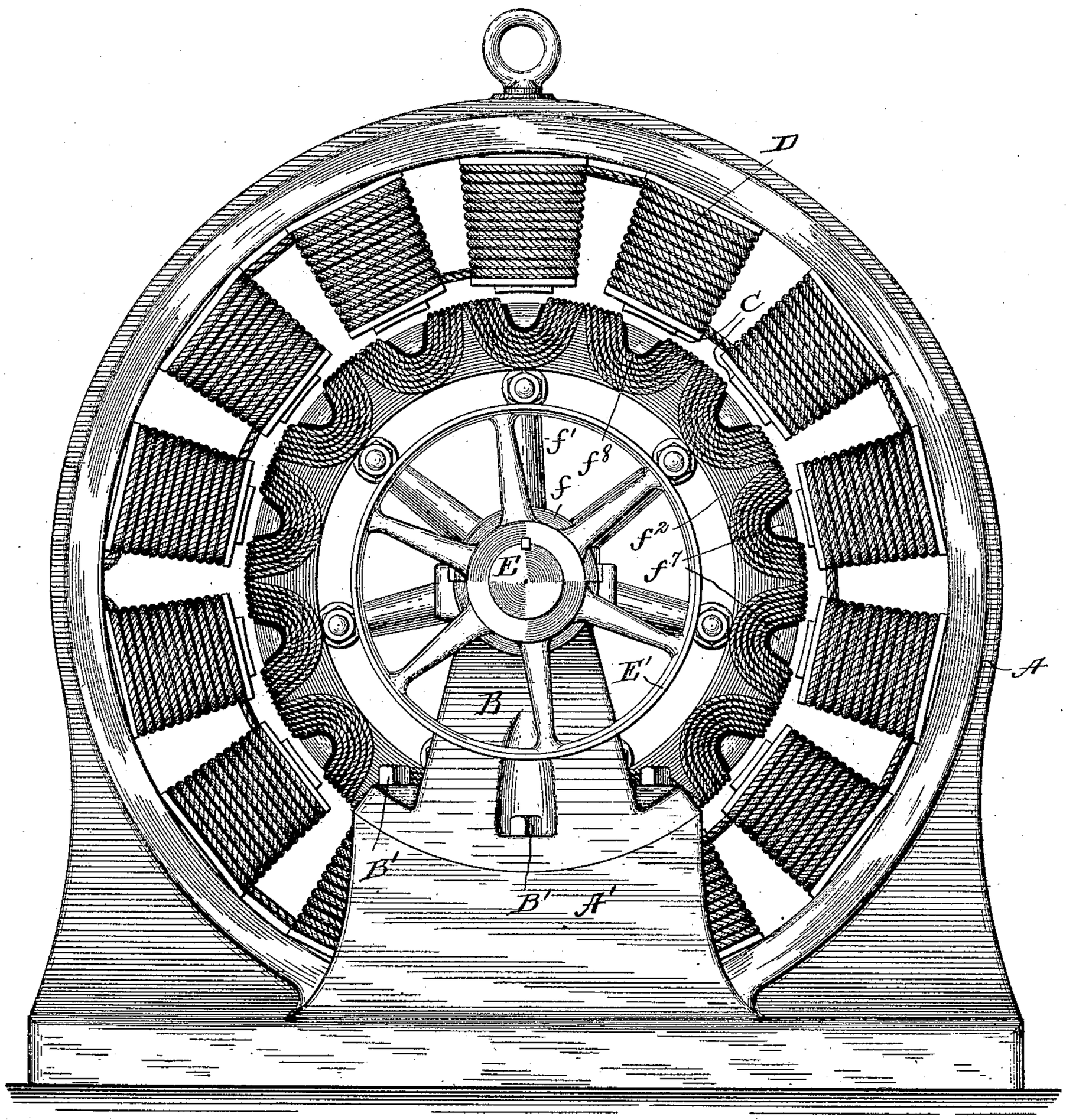

Fig. 1.

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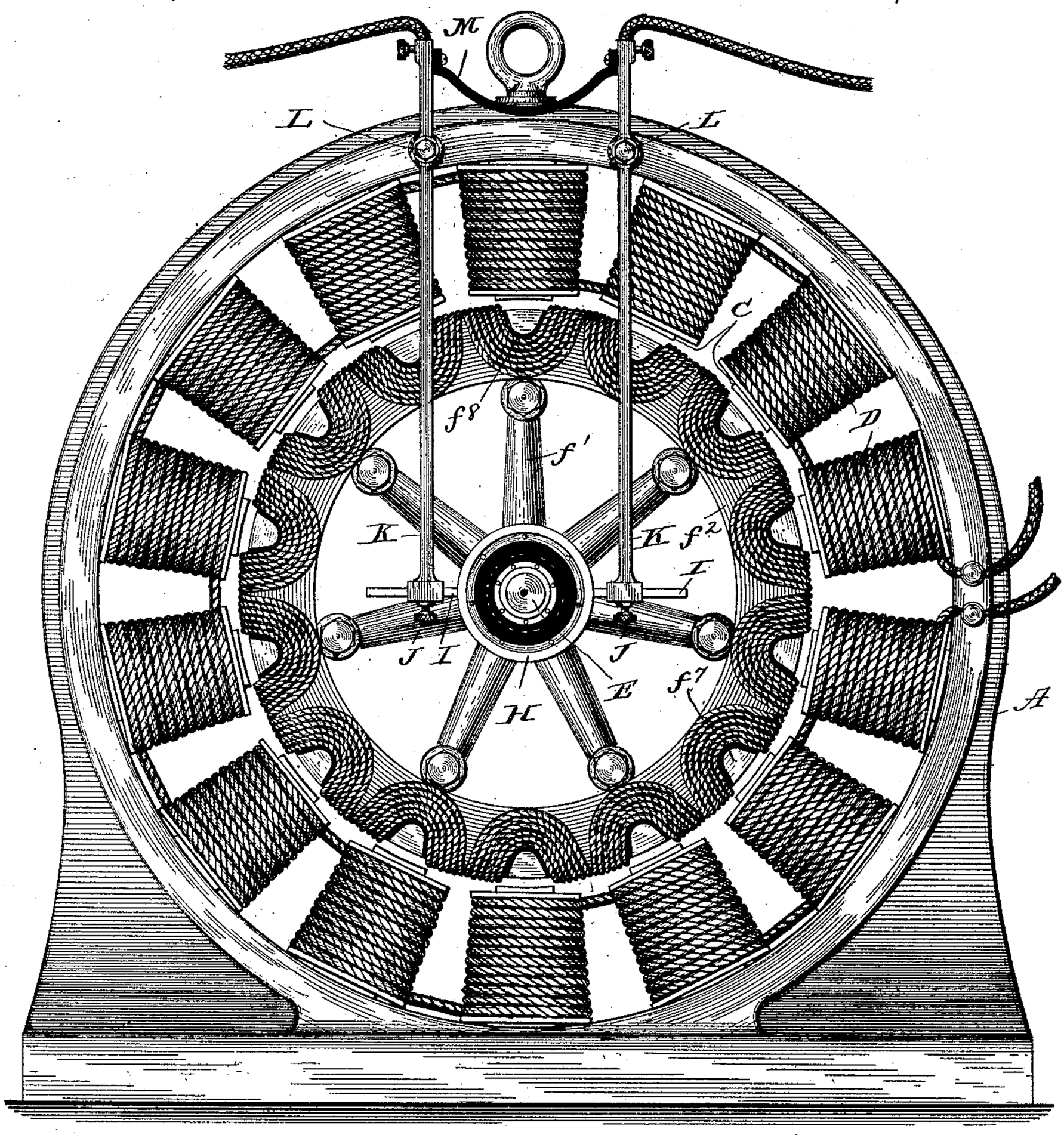

Fig. 2.

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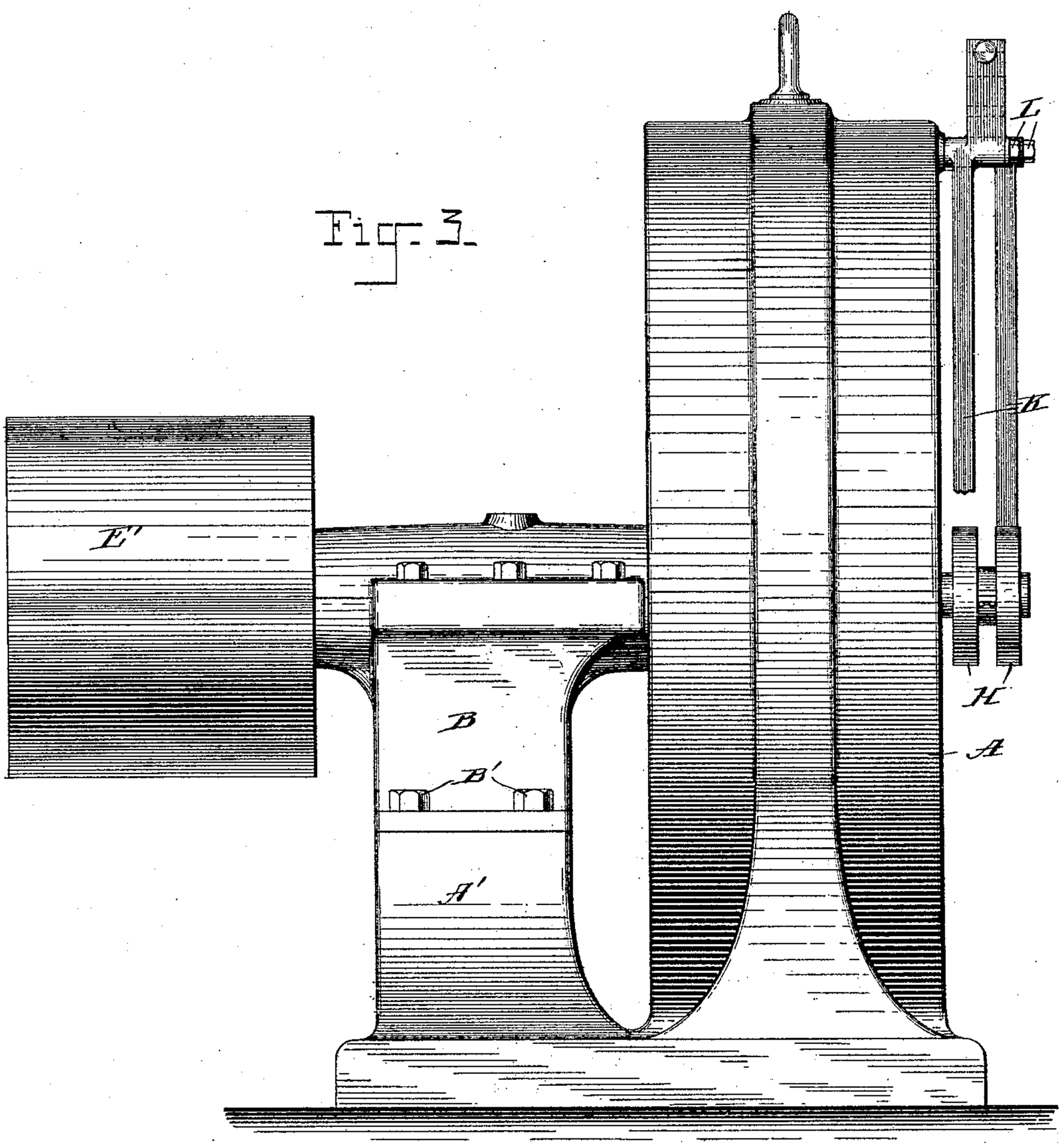
Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

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DYNAMO ELECTRIC MACHINE.

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Fig. 5.

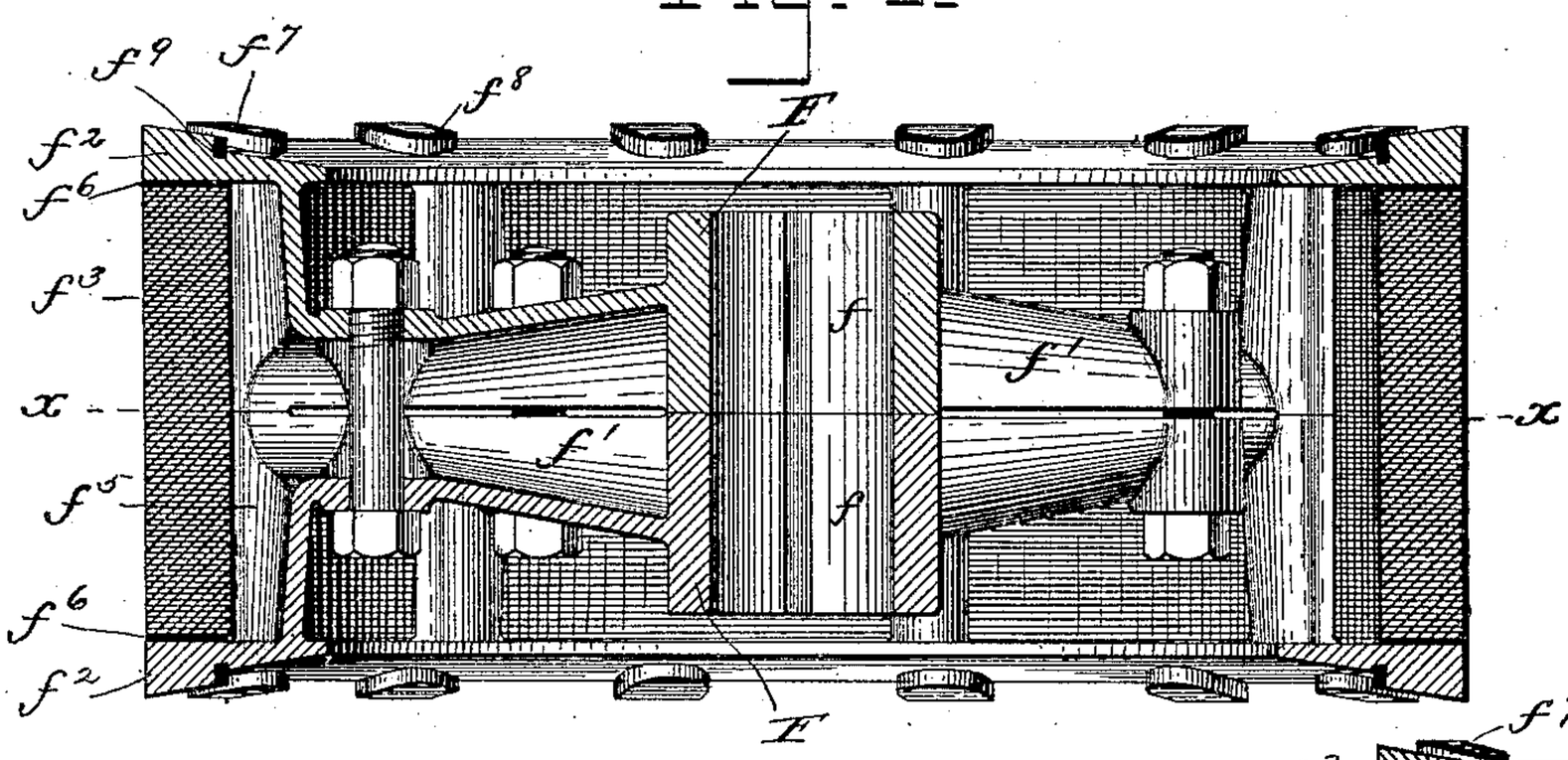


Fig. 6.

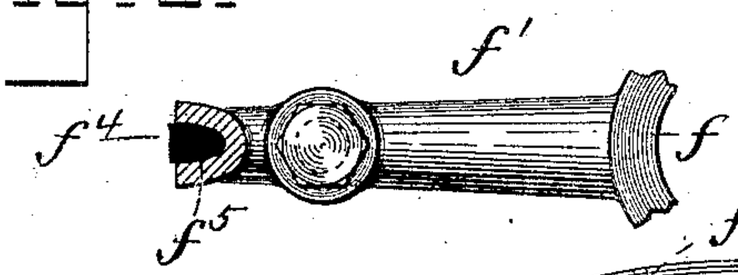


Fig. 7.

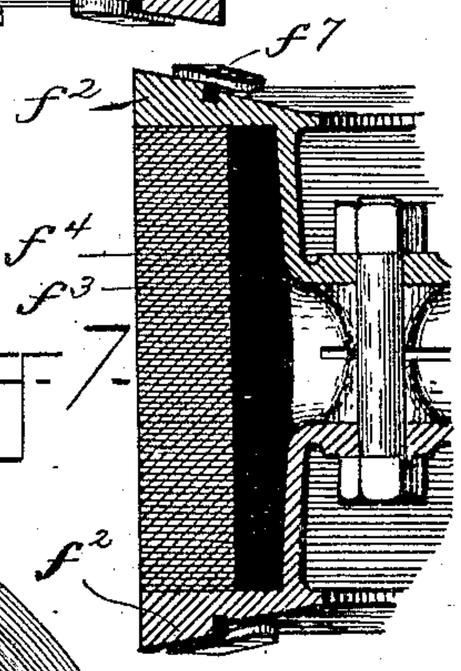
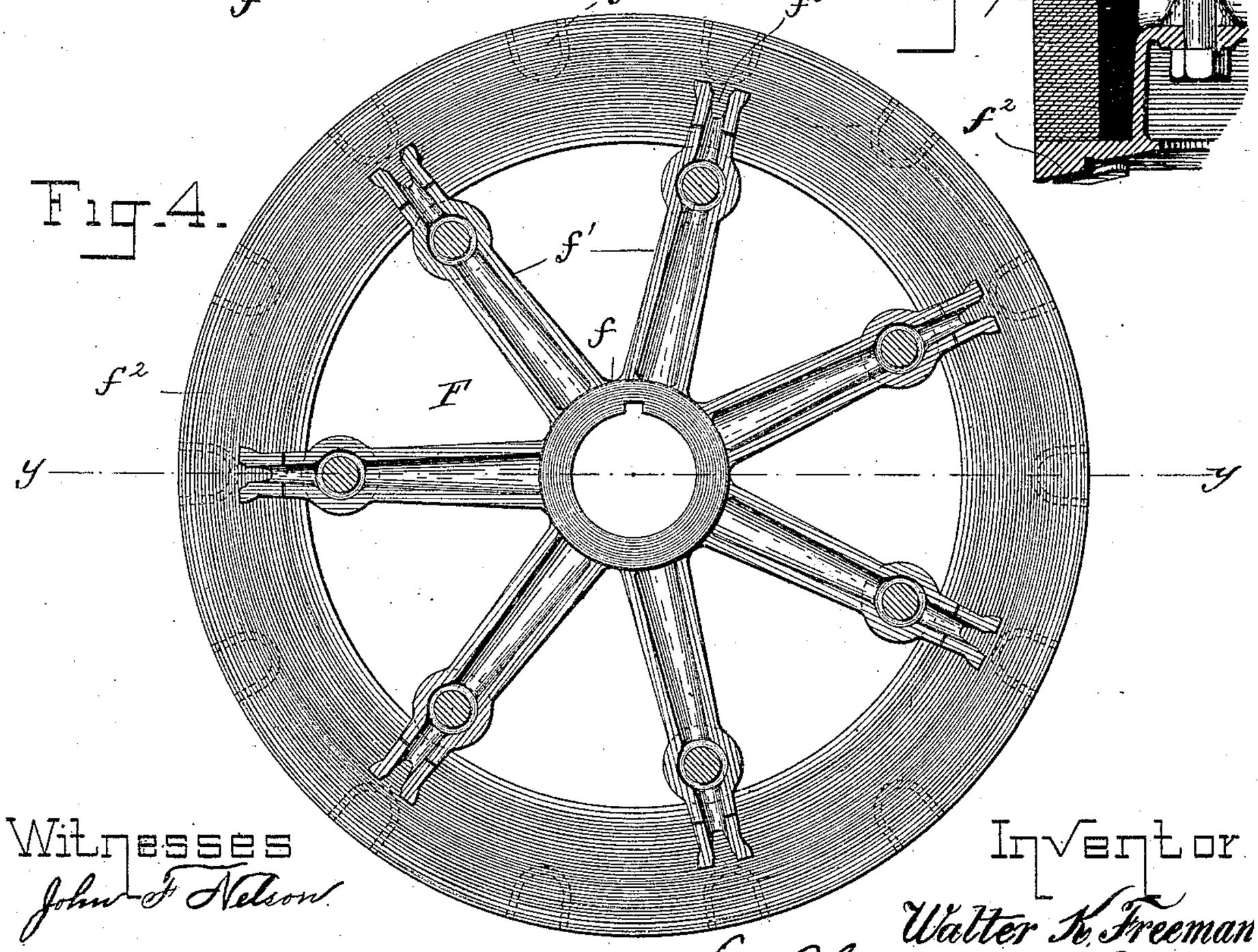


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 441,793, dated December 2, 1890.

Application filed September 20, 1890. Serial No. 365,674. (No model.)

To all whom it may concern:

Be it known that I, WALTER K. FREEMAN, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Dynamo-Electric Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

My invention has for its object to simplify and improve the construction of machines of this class; and to this end it consists in certain novel details of construction and combinations of parts, which I will first describe and then point out particularly in the clauses of claim at the close of this specification.

In the drawings, Figures 1 and 2 are elevations of opposite ends of the machine. Fig. 3 is a side elevation of the same. Fig. 4 is a vertical sectional view of the armature-frame, taken on the line $x\ x$, Fig. 5. Fig. 5 is a horizontal section of the same, taken on the line $y\ y$, Fig. 4. Fig. 6 is a detail view of one of the arms of the armature-frame. Fig. 7 is a detail sectional view, showing particularly the manner of supporting the annular plates of which the armature is in part composed.

Similar letters of reference in the several figures indicate the same parts.

The main frame of the machine consists, essentially, of two parts A and B, the part A having formed upon or secured to it, but preferably formed upon it, the cores C of the field-of-force magnets D, and being further formed with a pedestal A′, upon which the part B, which is in effect a pillow-block, rests, and to which the same is secured by bolts B′ or otherwise. The pillow-block B constitutes the bearing and support for the shaft E, upon one end of which the driving-pulley E′ is secured, and upon the other end of which is mounted and secured the armature. The part A, with its pedestal A′, is preferably cast or formed in one piece, and the line of junction between the pillow-block B and pedestal A′ is concentric with the axis of the shaft E, from which it results that it is impossible to secure the pillow-block B in any position that will bring the armature out of center. This construction reduces the difficulty of fitting to a minimum, and when, as shown, the line of junction is at or beyond a circle formed by the projection of the circumference of the armature horizontally the removal of the armature may be easily effected without removing the pulley or coils by first removing the pillow-block, as will be readily understood, thereby overcoming a serious difficulty incident to casting the base and complete keeper-ring in one piece.

In small machines it will be practicable to form the pillow-block B integral with the pedestal A′, or, in other words, form the keeper-ring and base constituting the part A, the pedestal A′, and pillow-block B all in a single casting; but for larger machines I prefer the construction shown.

The frame of the armature is best shown in Figs. 4 and 5. It consists, essentially, of two frame-sections F F, each composed of a central hub portion f, radial arms f', and a peripheral flange f^2, as shown particularly in Fig. 5. Between the flanges f^2 of the two sections are clamped the annular metal plates f^3, of magnetizable material, said annular metal plates being supported upon bars f^4, of insulating material, held in recesses f^5, as shown in Fig. 6.

In assembling the parts of the armature-frame one of the frame-sections is preferably rested in horizontal position, and a ring of insulating material f^6 is slipped over it and rested upon the flange f^2, after which a sufficient number of annular metal plates are superposed upon the insulating-ring to fill the frame-section. This done, the bars or keys f^4 of insulating material are inserted in the recesses f^5, and the remainder of the annular metal plates and another outside ring of insulating material are added. The other frame-section is then placed in position, and the bolts are applied to draw the two sections together, so as to hold and clamp the annular plates as tightly as possible. Projections f^7 are formed upon the frame-sections to support the coils of insulated wire of the armature wound about them, and to provide a high degree of insulation between the coils and projections I apply to each projection a strip or covering of insulating material f^8,

said strip being embedded in a groove f^9, as shown in Fig. 5. It will of course be understood that the entire surface of the flange f^2 of the frame-sections of the armature, as well as the periphery of the annular metal plates f^3, is to be highly insulated by the application of insulating material. The coils of the field-magnets and the coils upon the armature are preferably applied as shown in Figs. 1 and 2.

The current-collectors of this machine are shown in Figs. 2 and 3. Each of these consists of a collector-ring H, mounted upon the armature-shaft, though insulated therefrom, and a brush or contact I, secured by a set-screw J to the lower end of a springy metal bar K, mounted upon though insulated from a bolt or stud L, projecting from the keeper-ring A. Between the upper ends of the bars K is interposed a spring M, insulated from the bars or formed of insulating material. By adjusting the brushes or contacts I and securing them at the proper point by the screws J or other fastening means they may be caused to bear with more or less pressure upon their co-operating collector-rings.

I have stated that the upper ends of the bars K are pressed apart by a spring; but it is evident that where the bodies of the bars are of sufficient resiliency a non-elastic member may be interposed in place of the spring.

Having thus described my invention, what I claim as new is—

1. The combination, with the armature divided longitudinally into two parts, each having a complete peripheral flange and recesses or key-seats, of the bars or keys of insulating material in said seats, the annular plates of magnetizable material resting on said bars or keys between the flanges, and the bolts or clamping devices, substantially as described.

2. The combination, with the armature divided longitudinally into two parts, each having radial arms with recesses or key-seats in their ends and flanges uniting the outer ends of said arms and extending above the seats, of the bars or keys of insulating material in said seats or recesses, the annular plates of magnetizable material resting on said bars or keys between the flanges, and the bolts or clamping devices uniting the halves of the frame and clamping the plates between the flanges, substantially as described.

3. The combination, with the armature having the peripheral flanges with the projections on their outer surfaces, of the magnetizable rings clamped between said flanges, and the coils looped over said projections and passing alternately back and forth across the circumference of the rings, substantially as described.

4. The combination, with the armature divided longitudinally into two parts, each having the radial arms, peripheral flanges connecting the outer ends of said arms, and the projections on the outer faces of said flanges, of the rings of magnetizable material clamped between the flanges, and the coils looped over said projections and passing alternately back and forth across the circumference of the rings, substantially as described.

5. The armature-frame provided with the projections for receiving the armature-coils, and the insulation applied around said projections and recessed into the armature-frame, as shown and described.

6. The combination, with the collector-rings, of the resilient metal bars pivoted at a point intermediate their ends to the face of the keeper-ring, the brushes or contacts mounted on the lower ends of the bars below the pivots, and the spring interposed between the ends of the bars above the pivots, substantially as described.

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Witnesses:
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