

(No Model.)

E. THOMSON & A. L. ROHRER.
FIELD MAGNET FOR DYNAMOS.

No. 422,999.

Patented Mar. 11, 1890.

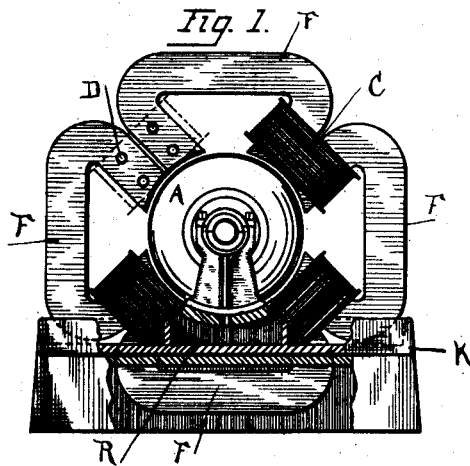


Fig. 6.

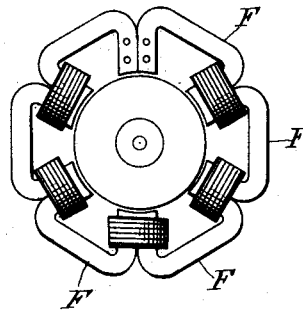


Fig. 2.

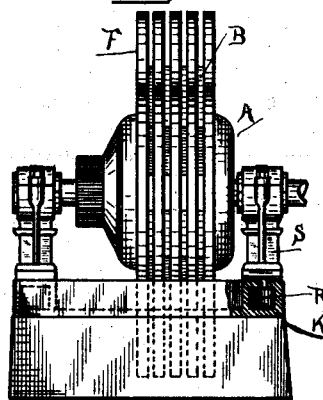


Fig. 3.

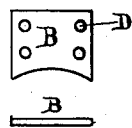


Fig. 5.

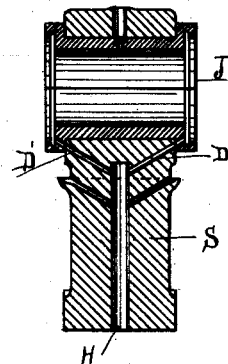
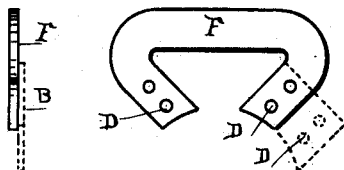


Fig. 4.



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FIELD-MAGNET FOR DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 422,999, dated March 11, 1890.

Application filed November 25, 1889. Serial No. 331,547. (No model.)

To all whom it may concern:

Be it known that we, ELIHU THOMSON and ALBERT L. ROHRER, citizens of the United States, and residents of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Field-Magnets for Dynamo-Electric Machines and Motors, of which the following is a specification.

Our invention relates to the construction of a field-magnet for dynamo-electric machines or motors.

The object of the invention is to secure a cheap, efficient, and easily-assembled construction, as well as to attain compactness for multipolar dynamos or motors intended for use in confined situations, as on shipboard.

A further object of the invention is to secure all the ventilation possible in the field-magnet structure of dynamos or motors intended for use in positions where very little ventilation ordinarily exists, as on shipboard.

Our invention consists in making the field-magnet from two or more sets of iron plates or pieces arranged circumferentially around the armature, the plates or pieces of each set being separated from one another at free air-spaces, while the adjacent ends of the plates of different sets are united by tie blocks or plates, at which point of connection the coils are applied.

Our invention consists, further, in the novel construction shown and described, wherein the adjoining ends of the separated plates of different sets turn radially inward and are there united by tie blocks or plates to form a solid magnet-core, over which electric coils are wound. The separate plates making up the compound-magnet structure are preferably of forged iron.

In the accompanying drawings, Figure 1 is a side view of a four-pole dynamo machine or motor having a field-magnet structure organized in accordance with our invention. The base of the machine is shown in partial section. Fig. 2 is an end view of the machine, showing the separation of the iron plates. Fig. 3 shows in side and edge view one of the tie or binding blocks or plates. Fig. 4 shows in side and edge view one of the forged iron plates, with one of the tie blocks or plates ap-

plied and indicated in dotted lines. Fig. 5 is a vertical section through the journal-bearing of the machine, and shows a preferred form of oil-receptacle to be used with the machine. Fig. 6 illustrates the extension of the invention to a machine having six poles.

In Fig. 1, four sets of forged iron pieces or plates are indicated by the letter F, arranged in position about the armature A of the machine. The adjoining ends of the plates of the several sets are preferably turned or bent inward, so as to form together a magnet-pole, to which coils C may be applied. By the arrangement shown a four-pole dynamo is made, having four polar faces directed toward the armature.

K is the base-plate of the machine, to which the plates F may be secured by bolts or other devices. Each set may consist of any desired number of plates F, arranged side by side, as shown in Fig. 2, with air-spaces between them. The plates are preferably kept separated by the devices which are employed for tying them together at their adjoining pole ends.

B B indicate binding plates or blocks by which the adjoining ends of the plates F of different sets are connected together. These connecting pieces or blocks may be made of either cast or wrought iron, as desired. The plates F, as well as the blocks or connecting-plates B, are preferably secured together by means of bolts, which are inserted in openings drilled at D, and which hold the structure firmly together, forming a compound field-magnet made up of the pieces F and B. After the pieces F and B are bolted together the structure is bored out for the reception of the armature A, as it is not practical to forge the pieces F so accurately that when bolted in position they will present a true and uniform surface to the armature.

As will be seen in Fig. 2, the plates F are separated by an air-gap, thus securing ventilation of the fields, which is necessary in very large machines. The pieces F being made of wrought-iron, which has a high capacity for the conveyance of magnetism, are amply sufficient for the securing of a good magnetic circuit. Where the field-poles are

directly next the armature A the intermediate connecting-blocks of cast or wrought iron B B make the field-pole a solid structure, increasing the extent of iron surface presented to the armature and assisting the passage of the magnetic lines across the air-field between the field-poles and armature, in which air-field by far the greater part of the total magnetic resistance is found.

By constructing the field-magnet of a dynamo-electric machine after the manner of the invention, it is very easy to make any size machine desired, so far as the field structure is concerned, it being only necessary to employ a greater or less number of the pieces F F, secured together beside one another, as shown. The armature must of course be increased or diminished in length to correspond.

It is obvious that the invention is not limited to any particular number of poles in the field-magnet structure, as a greater or even a less number might be used by varying the number of sets of plates F and properly changing the conformation of the plates of each set. Thus, as indicated in Fig. 6, a six-pole dynamo or motor might be constructed in the same manner, the only difference being that the ends of the plates F where they turn in for presentation to the armature would make a little greater angle with the connecting parts where the plates are separated from adjoining plates by the air-spaces.

In the drawings the commutator-brushes and the commutator are omitted, as they form no part of our invention.

In Fig. 5 there is shown a preferred arrangement for the removal and disposition of the oil after it has passed through the journal-box. S is the standard or pillar on which the shaft of the armature is borne, and J is the journal-box on the top of said standard. The standard or pillar S has a hole or oil-passage drilled through it lengthwise from the bottom upward, but not extending to the journal-box. Lateral ducts D' D' connect this passage, as

shown, to outer channels provided in the journal-box, and in the bed-plate K of the machine are formed oil-receptacles RR, Figs. 1 and 2, directly below the standard S, which prevent the escape of the oil after its use. The oil enters the journal-box at the top, as usual, spreads sidewise to the exterior of the box, where it is caught in the channels (shown) and led off to the ducts D' D' and to the oil-receptacle R.

What we claim as our invention is—

1. In a dynamo-electric machine or motor, a field-magnet made up of two or more sets of separated iron plates having the adjoining ends of the plates of different sets united by tie plates or blocks, and electric coils applied over the tie blocks and plates, as and for the purpose described.

2. In a dynamo-electric machine or motor, a multipolar field-magnet consisting of sets of forged iron plates separated from one another by air-spaces and having the adjoining ends turned inwardly for presentation as pole-pieces to the armature, in combination with tie plates or blocks connecting the adjoining ends, and electric coils applied over the said adjoining ends and connecting-blocks.

3. In a dynamo-electric machine or motor, a multipolar field-magnet structure consisting of sets of forged iron plates F, having their ends turned inwardly for presentation to the armature of the machine, in combination with connecting tie blocks or plates interposed between adjoining ends of the plates F, and coils C applied over such connected ends, as and for the purpose described.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 20th day of November, A. D. 1889.

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