April 15, 1924. 1,490,205

B. H. CHATTO

DYNAMO ELECTRIC MACHINE

Filed Jan. 14, 1918

Fig. 1.

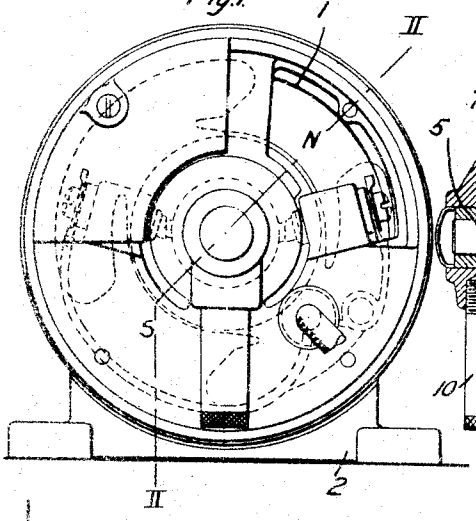
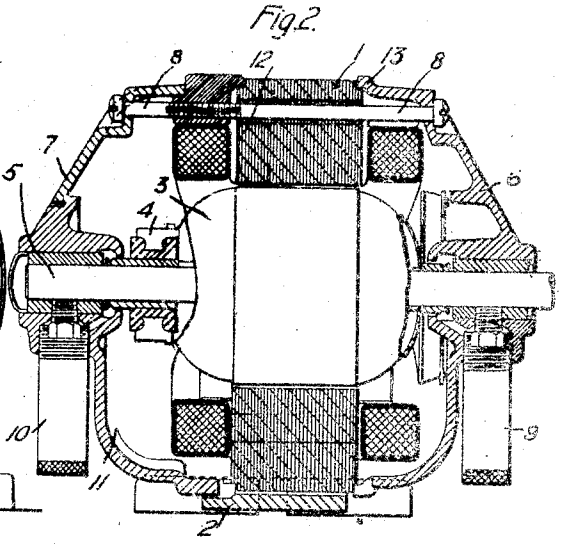


Fig. 2.



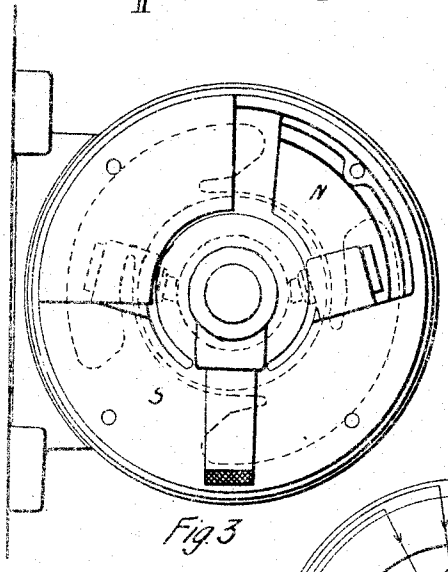


Fig. 3

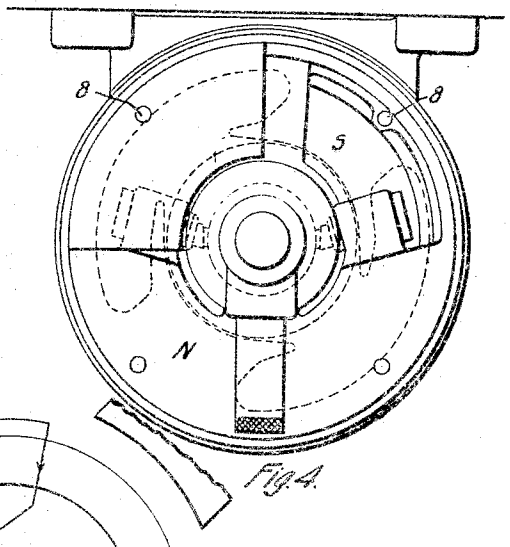


Fig. 4

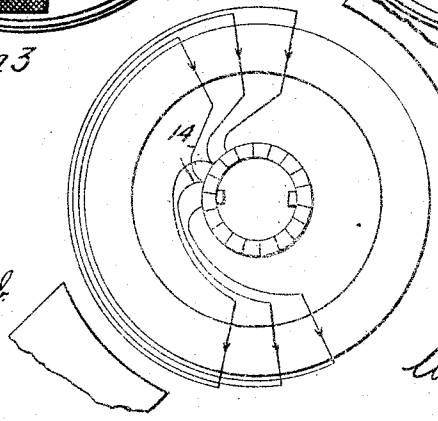


Fig. 5.

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UNITED STATES PATENT OFFICE.

BYRON H. CHATTO, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

DYNAMO-ELECTRIC MACHINE.

Application filed January 14, 1918. Serial No. 211,731.

To all whom it may concern:

Be it known that I, BYRON H. CHATTO, a citizen of the United States, and a resident of Swissvale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dynamo-Electric Machines, of which the following is a specification.

My invention relates to dynamo-electric machines and particularly to such machines as are adapted for either wall, ceiling or floor mounting.

The object of my invention is to provide a machine of the character designated that shall be adapted for any type of mounting and that may be changed from one type of mounting to any other type by merely changing the method of assembly.

In dynamo-electric machine construction, it has been customary to design four-pole machines so that they may be changed from one type of mounting to another by merely changing the angular relation of the end bell on which the commutator brushes are mounted, with respect to the magnetic field frame. Also, machines of this character, having but two poles, have been constructed in which the brushes were mounted in such manner as to be adjustable about the commutator cylinder, and the end bells were movable with respect to the magnetic field frame. An objection to this type of brush mounting is that the machine housing must be longer than is necessary for other purposes to allow space for the brushes to move freely between the end bell and the field-magnet frame. Also, a somewhat complicated current-collecting device results therefrom. Heretofore, no two-pole machine adapted for several different types of mounting has been built in which the commutator brushes were permanently mounted on the end bell.

By my invention, I provide a two-pole dynamo-electric machine that may be used for any type of mounting and that may readily be changed to any other type of mounting without changing the relative positions of the field-magnet poles and the commutator brushes and without moving the oil cup from a vertical position on the under side of the bearing housing which forms a part of the end bell.

Referring to the accompanying drawings, Fig. 1 is an end elevational view of a dynamo-electric machine constructed in accordance with my invention and adapted for floor mounting. Fig. 2 is a cross sectional view, taken along the line II—II of Fig. 1. Fig. 3 is an end elevational view of the machine shown in Fig. 1, adapted for wall mounting; and Fig. 4 is a similar view of the machine adapted for ceiling mounting. Fig. 5 is a diagrammatic view of the armature connections employed in my machine.

Referring more particularly to the drawings, I have shown a bi-polar field-magnet frame 1 provided with a supporting base 2 permanently connected thereto and an armature 3 which rotates within the magnetic field thereof. A commutator 4 and the armature 3, to which it is connected, are mounted upon a shaft 5 that is supported by bearings mounted in end bells 6 and 7 which are held in proper relation to the magnetic field frame 1 by means of bolts 8. The bearings are provided with lubricant from oil cups 10 that are mounted in the bearing housings. Commutator brushes 11 are rigidly mounted in diametrically opposite positions on the end bell 7.

It is apparent, from the drawings, that, in the machine adapted for floor mounting, the transverse axis of the magnetic field poles is disposed at an angle of 45° to the horizontal. It is also apparent that the commutator brushes, which are supported from the end bell 7, engage the commutator cylinder at horizontally opposite points and that the oil cup is maintained in a vertical position under the bearing housing.

When it is desired to change this machine from floor to ceiling mounting, as illustrated in Fig. 4, the only changes necessary in the assembly are to turn the magnetic field frame through an angle of 180° about its own longitudinal axis and to reverse the armature connections in order to produce a rotation in the same direction as that secured from the floor mounting. The end bell, the permanently mounted commutator brushes and the oil cup are not relatively moved. The angular adjustment of the magnetic field frame, with respect to the end bell, is accomplished by means of the bolts 8 which are positioned around the end bell in regular angular displacements of substantially 90° each.

When it is desired to mount a machine

adapted for floor mounting upon a vertical wall, as shown in Fig. 3, it is only necessary to reverse the magnetic field frame, with respect to the end bells, and to turn it through an angle of 90° about its own longitudinal axis before attaching the end bells. In wall mounting, as in floor and ceiling mounting, the end bell is not moved. The two end surfaces 12 and 13 of the field frame 1 are similarly machined in order that it may be reversed with respect to the end bells and that a perfect fit between the end bell and the field-magnet frame may be insured in either position.

In Fig. 5, is shown an armature in which a connection 14 of V shape is provided having armature throws of substantially 45° and 135°, respectively, and in which the field-magnet poles and the commutator brushes are shown in their proper positions.

The described relative positions of the field-magnet poles and the commutator brushes and the type of winding used in the armature enable me to secure all of the advantages, in a two-pole motor, with respect to positions of mounting, that are secured by the use of a four-pole motor.

While I have shown one form of my invention and described, in detail, one application of the same, it will be obvious to those skilled in the art that it is not so limited but is susceptible of various minor changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:

1. A bipolar dynamo-electric machine comprising a frame, pole pieces carried thereby and having the axes thereof extending in a direction of substantially 45° with respect to the horizontal, said frame and pole pieces being constructed and arranged symmetrically with respect to a plane intersecting the axis of said machine, end bells carried by said frame for relative adjustment of 90°, an armature mounted in said end bells for co-operating with said pole pieces, and a plurality of brush members carried by one of said end bells and disposed on an axis of commutation extending in a direction of substantially 45° with respect to the axes of said pole pieces, the coils of said armature having throws of substantially 45° and 135° to correspond to the adjusted positions of said frame and pole pieces relative to said end bells and brush members.

2. A commutator machine comprising a two-pole field magnet frame having a supporting base, the poles of said frame being on an angle of substantially 45° with respect to the plane of said base, end bells, means for securing said end bells to said frame with provision for adjustments of 90°, a rotor comprising an armature winding and a commutator member supported within said frame and end bells, connections interposed between said armature winding and said commutator member and having throws of substantially 45° and 135° whereby the axis of commutation is displaced substantially 45°, and a pair of brushes bearing on said commutator member and carried by one of said end bells at an angle of substantially 45° with respect to said poles, the field magnet frame being reversible whereby either end bell may be secured on either end of said frame.

3. A commutator machine comprising a field magnet frame having a supporting base, a pair of end bells, means for securing, at will, either one of said end bells on either end of said frame, a rotor comprising an armature winding and a commutator member supported within said frame and end bells, connections interposed between said armature winding and said commutator member and having throws of substantially 45° and 135° whereby the axis of commutation is displaced substantially 45°, and a pair of diametrically opposite brushes bearing on said commutator member and carried by one of said end bells at an angle of substantially n times 90° with respect to the plane of said base, where n may be any integer including zero, the number and positions of the poles of said field magnet frame being such that interpolar neutral zones are provided in only one diametric line inclined at an angle of substantially 45° with respect to the plane of said base.

In testimony whereof, I have hereunto subscribed my name this 31st day of Dec., 1917.

BYRON H. CHATTO.