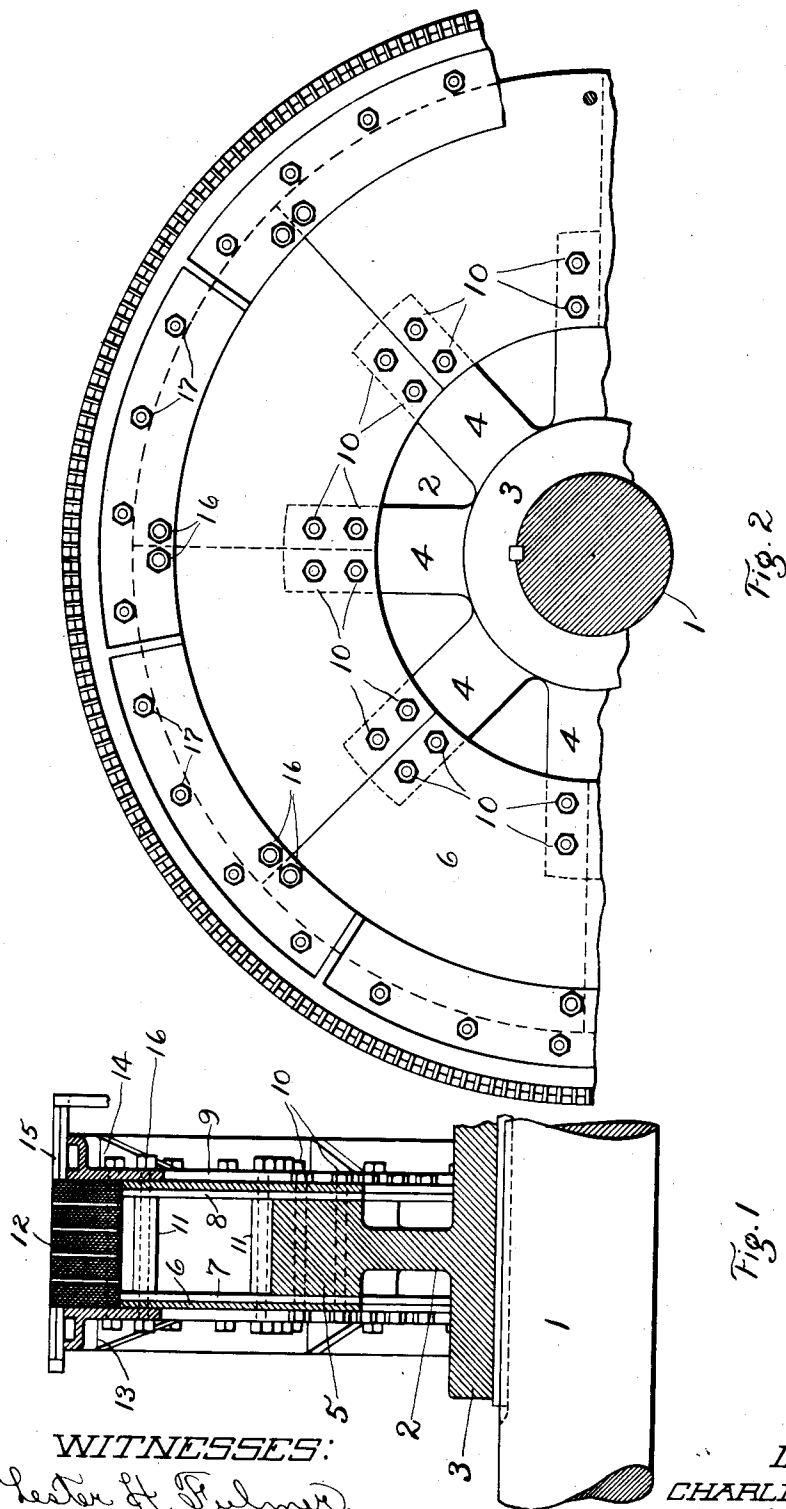


No. 868,190.

PATENTED OCT. 15, 1907.

C. D. KNIGHT.
DYNAMO ELECTRIC MACHINE.
APPLICATION FILED FEB. 11, 1907.



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UNITED STATES PATENT OFFICE.

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DYNAMO-ELECTRIC MACHINE.

No. 868,190.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed February 11, 1907. Serial No. 356,690.

To all whom it may concern:

Be it known that I, CHARLES D. KNIGHT, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification.

In dynamo-electric machines adapted to run at high speeds and having rotors provided with heavy laminated cores arranged at some distance from the axis, great care must be taken to make the rotors strong enough to withstand the centrifugal stresses. It is chiefly to this class of machines that the present invention is directed, and it has for its object to improve the same.

To the above end, I build up the supporting member for the core proper in such a manner that an extremely strong and stiff construction is produced. This member may conveniently consist of a central spider to which are secured two annular parallel plates or series of plates which project radially beyond the spider and are braced in any suitable manner. The core proper rests upon the outer edges of these annular plates and is rigidly secured thereto. The spider may be made of forging or of cast steel having great tensile strength, while the annular plates may be of extremely tough material such as boiler plate, whereby a much stiffer and stronger structure is obtained than if the spider were enlarged so as to carry the core member on its periphery.

In the accompanying drawing I have shown a preferred form of my invention, Figure 1 being a longitudinal section showing one-half of a dynamo-electric machine; and Fig. 2 an end elevation of the parts shown in Fig. 1.

Referring to the drawing, 1 indicates a rotor shaft and 2 a spider mounted upon this shaft. This spider may conveniently be formed of an elongated hub 3, whereby a wide bearing surface is obtained on the shaft, and a series of short radial arms or spokes 4 arranged midway between the ends of the hub. The outer ends of the arms are preferably enlarged or provided with bosses on opposite sides, as at 5. On each side of the arms I arrange one or more annular metal members made of boiler plate or the like, which members are securely fastened to the spider arms at the enlarged portions thereof. The internal diameter of the annular members need only be small enough to permit the fastenings to be applied between the plates and the spider arms; the external diameter is such, however, that the laminated core structures 12 may rest upon the outer edges of the plates. Where the diameter is considerable, I prefer to form each of the plates of segments and to so arrange the segments of the plates on the same side of the spider that they break joints. In the particular form

shown, there are two of these annular plates lying one against the other on each side of the spider arms; 6 and 7 being the plates on one side, and 8 and 9 those on the other. The plates are secured to the arms at their enlarged portions by means of bolts 10, each of which may conveniently pass entirely through the four plates and one of the spider arms. The portions of the plates which project beyond the spider are braced and held apart by means of spacing blocks 11 arranged at suitable intervals; these blocks having lengths equal to the thickness of the spider arms so that the two sets of plates are rigidly held in parallelism. The laminated core body 12 is in the form of an annular ring built up in any suitable way and this ring may be most conveniently supported directly upon the outer edges of the annular plates. The laminated structure is securely fastened in position by means of annular rings 13 and 14 secured to the plates and also to the laminated structure. These latter rings may conveniently take the form of castings which serve also as the end-plates between which the laminæ of the core structure are clamped, and the rotor conductors, one set 15 of which is shown, may be supported at their ends on the peripheries of the rings. Bolts 16, which pass through both of these rings and also through the annular plates, firmly unite these parts. These bolts may also pass through the spacing blocks 11, thereby making it unnecessary to use separate bolts for positioning and securing the spacing blocks. A second set of bolts 17 pass through the rings 14 and 15 and through the laminæ of the core structure. The latter bolts therefore hold the laminated structure against radial displacement on the supporting frame, and also act as the clamping bolts for pressing the laminæ firmly together into a solid mass.

It will thus be seen that the present invention provides a simple and at the same time strong and stiff frame structure for rotors, thereby making it possible to run such rotors at high peripheral speeds without danger of distortion or other injury arising through mechanical weakness.

What I claim as new and desire to secure by Letters Patent of the United States, is,

1. A rotor core structure consisting of a laminated core ring, a spider concentric with said core ring and having a diameter less than the interior diameter of the core ring, and a pair of parallel annular plates secured at opposite sides to the spider and carrying the core ring at their outer edges.

2. A rotor core structure consisting of a spider, a pair of parallel annular plates secured one on each side of the spider and extending radially beyond the spider, a laminated core ring surrounding said plates, and means for securing said ring to said plates.

3. A rotor core structure consisting of a spider, a pair of parallel annular plates secured one on each side of the spider and extending radially beyond the spider, space

blocks between the outer portions of said plates for maintaining said plates parallel with each other, a laminated core ring surrounding said plates, and means for securing said ring to said plates.

- 5 4. A rotor core structure consisting of a spider, having a thickened portion near its periphery, a pair of parallel annular plates secured one on each side of said thickened portion and extending radially beyond the spider, a laminated core ring resting upon the outer edges of the plates, and members lying beside said core ring and said plates and each secured to said ring and one of the plates.
- 10 5. A rotor core structure consisting of a spider, a pair of parallel annular plates secured one on each side of the spider and extending radially beyond the spider, a core ring surrounding said plates, a pair of clamping rings arranged one on each side of the core ring and overlapping the plates, and means for securing said clamping rings both to the core ring and to the annular plates.
- 15 6. A rotor core structure consisting of a spider, a pair of parallel annular plates secured one on each side of the spider and extending radially beyond the spider, a laminated core ring resting upon the outer edges of said plates,

flanges projecting outwardly from said plates so as to overlap the core ring, and bolts passing through said flanges and through said core ring so as to clamp the 25 laminæ of the core ring together and fasten the core ring to the plates.

7. A rotor core structure consisting of a spider, a pair of parallel annular plates secured one on each side of the spider and extending radially beyond the spider, space 30 blocks between the outer portions of said plates to maintain them in parallelism with each other, a laminated core ring resting upon the outer edges of the plates, flanges projecting outwardly from said plates so as to overlap the core ring, and bolts passing through said flanges and 35 through said core ring so as to clamp the laminæ of the core ring together and fasten the core ring to the plates.

In witness whereof, I have hereunto set my hand this 8th day of February, 1907.

CHARLES D. KNIGHT.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.