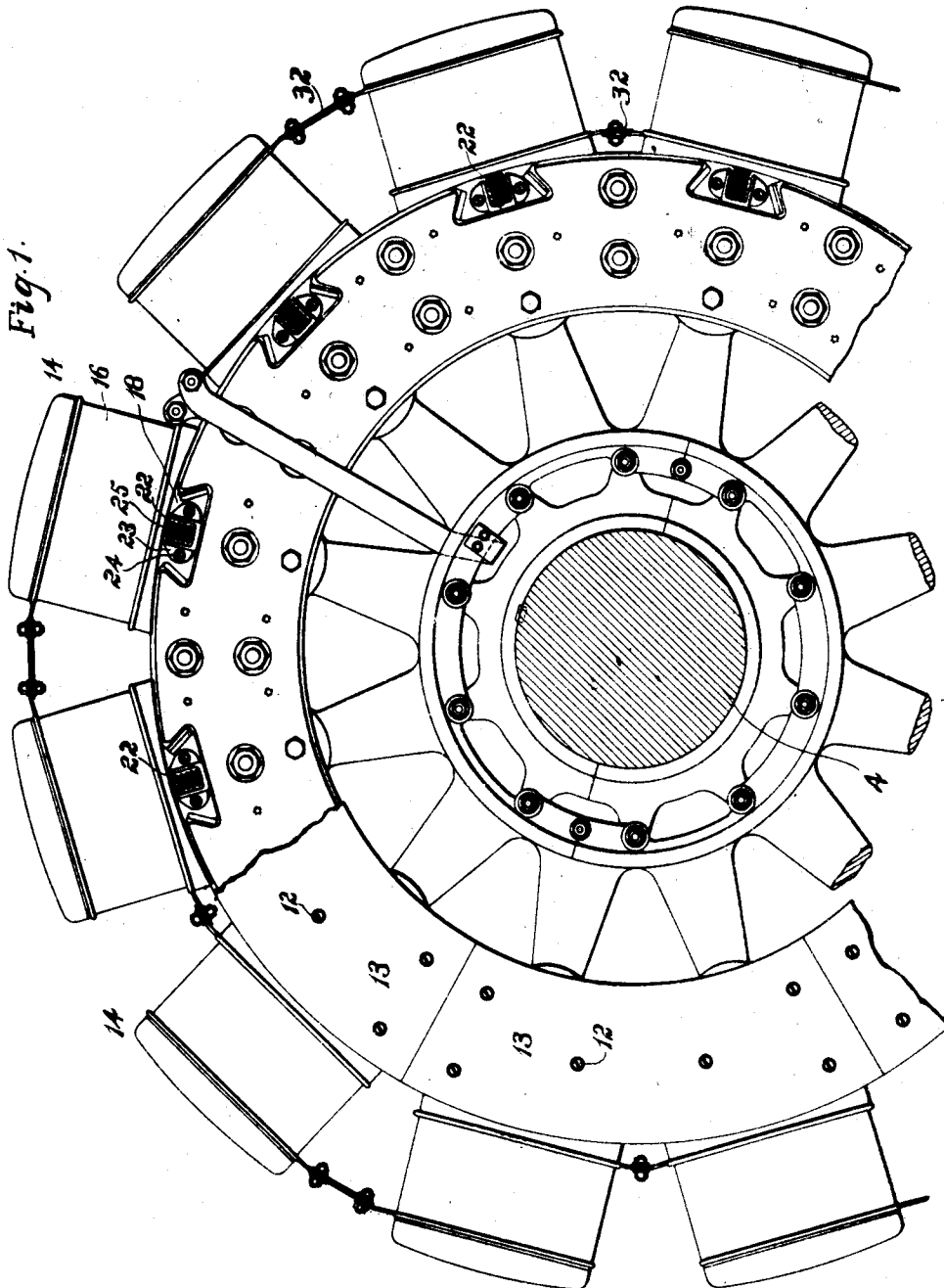


No. 873,160.

PATENTED DEC. 10, 1907.

E. T. MUG.
FIELD COIL SUPPORT.
APPLICATION FILED SEPT. 30, 1904.

2 SHEETS—SHEET 1.



Witnesses:

Louis C. Harbun
Fred J. Kinsey

Inventor:

Edward T. Mug.

By

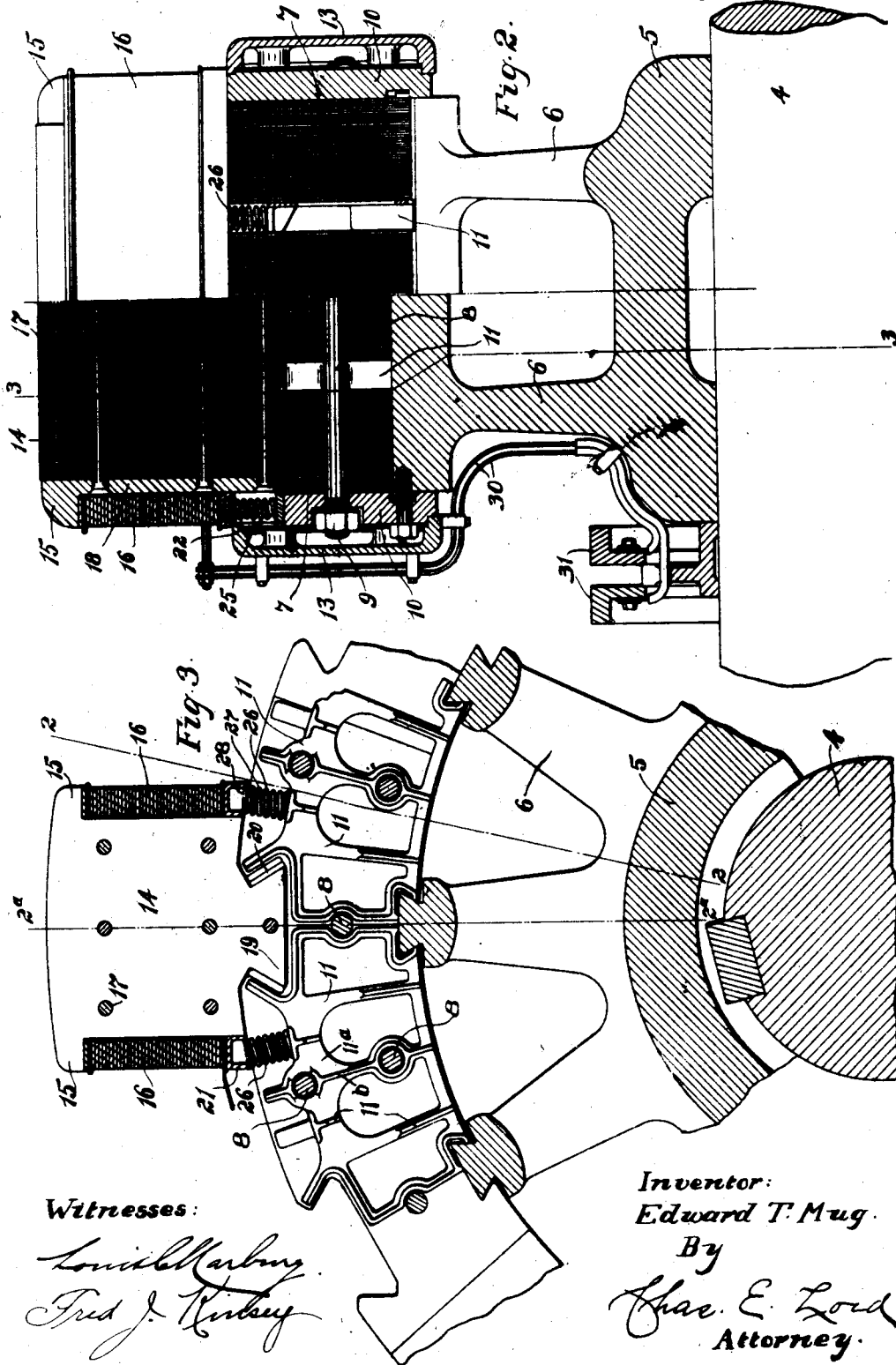
Chas. E. Lord
Attorney.

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2 SHEETS—SHEET 2.



Witnesses:

Louis H. Harby
Fred J. Kirby

Inventor:

Edward T. Mug.

By

Chas. E. Lord
Attorney.

UNITED STATES PATENT OFFICE.

EDWARD T. MUG, OF NORWOOD, OHIO, ASSIGNOR TO THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO.

FIELD-COIL SUPPORT.

No. 873,160.

Specification of Letters Patent.

Patented Dec. 10, 1907.

Application filed September 30, 1904. Serial No. 226,674.

To all whom it may concern:

Be it known that I, EDWARD T. MUG, citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Field-Coil Supports, of which the following is a full, clear, and exact specification.

My present invention relates to dynamo-electric machines and particularly to the means for supporting the field coils in such machines.

In dynamo-electric machines, particularly machines of the revolving field type it is essential that the parts be rigidly and firmly held in place when first assembled and also after the machine has been in operation for some time. It is also desirable that each pole piece and field coil surrounding same may be handled as a single unit when the field magnet is being assembled or taken apart.

The object of my invention is to so arrange each field coil and pole piece of the field magnet that the coil will be held in place on the pole piece regardless of whether the pole piece is in position on the field magnet structure or removed therefrom, and a further object is to mount the pole piece and its coil on the frame of the machine or field magnet structure so that the coil will be held firmly in place thereon and will be prevented from working loose when the machine is in operation.

My invention in one of its aspects consists of the combination of a frame, such as the core of the rotatable member of a dynamo-electric machine, a ventilating plate mounted in said frame, a pole piece secured to said frame, a coil on the pole piece and a resilient support for said coil mounted on said ventilating plate.

In another of its aspects, my invention consists of a separable pole piece for a dynamo-electric machine, a coil on said pole piece and means for yieldingly retaining said coil in position on said pole piece whether the latter is in the machine or removed therefrom.

My invention also comprises improvements in details and combination of parts which will be hereinafter described and more specifically pointed out in the appended claims.

In the accompanying drawings which illustrate the preferred embodiment of my invention, Figure 1 represents a side view of a revolving field magnet with parts broken away and in section: Fig. 2 is a composite longitudinal sectional view of the magnet shown in Fig. 1, the right hand half of said figure being on the line 2—2, Fig. 3, and the left hand half being a section through the center of the pole piece on the line 2^a—2^a, Fig. 3; Fig. 3 is a sectional view on the line 3—3 of Fig. 2.

The shaft upon which the revolving field magnet is mounted is indicated at 4. On the shaft is keyed a spider having a hub 5 and projecting arms 6. Dove-tailed or otherwise fastened to the outer ends of the arms of said spider is a rim or core built up of the laminæ 7 clamped by means of the bolts 8 and nuts 9 between the annular end plates 10. The laminæ are divided into sections separated by the ventilating plates 11 of the construction and contour clearly shown in Figs. 2 and 3. Each ventilating plate is provided with a web 11^a and with spacing ribs, lugs or projections 11^b. Fastened to the end plates 10 by means of the screws 12 are the segmental cover plates 13.

Attached to the annular core in any desired manner are the pole pieces 14, each provided with projecting portions 15 at their outer ends and having mounted thereon coils 16. The pole pieces are preferably made up of assembled laminæ clamped between the end plates 18 of said pole pieces by means of the bolts 17. These laminæ and end plates 18 as illustrated in the accompanying drawings are provided with dove-tailed projections 19 which enter dove-tailed grooves 20 in the annular core. Surrounding the pole piece 14 at the bottom of the coil 16 is a rigid continuous ring 21, which assists in retaining the coil 16 in its proper shape. The coils are here shown as made from flat copper strips edgewise wound, but they may be formed of wire, or in any other desired manner.

Bearing against the bottom of the end turns of the coil surrounding each pole piece and preferably, as shown, bearing against the continuous ring 21, are resilient supports such as springs 22 held in position on the pole piece in such a manner that said pole piece and coil may be removed from the machine and handled as a single unit. For the pur-

pose of holding said springs 22 in position on the pole piece, I prefer to employ a removable frame 23, screwed or otherwise fastened to the end plates 18 at 24. This spring supporting frame 23 is preferably fastened to the dove-tailed projection of the pole piece and is provided with means such as a pin 25 for the purpose of guiding said spring 22. For the purpose of resiliently supporting the sides of the coils 16 without interfering with the laminæ of the core, I mount upon the ventilating plates or segments 11, supporting springs 26 which are held in position and guided by means of the pins lugs or projections 27. The pins are formed on a depressed portion of the ventilating segment and are of less width than the spacing ribs, lugs or projections 11^b, so that the springs may be depressed below the periphery of the core and will thus be protected from external injury and will not interfere materially with the proper ventilation of the core. The springs for supporting the ends of the coils are similarly protected against injury by the segmental cover plates 13. The continuous ring 21 is preferably provided with slight recesses 28, which receive the outer ends of the supporting springs 22 and 26, said springs thus forming a resilient seat for the coil.

The current is led to the coils of the rotating member through the conductors 30, which are electrically connected with the collector rings 31 mounted on the shaft 4, the connections between adjacent coils being made at 32, Fig. 1.

Although I have illustrated my invention as applied to a rotating field magnet structure it will be readily understood that it may be employed in connection with a fixed field magnet structure and subjected to many modifications and changes without departing from its spirit and scope. I aim in the appended claims to cover all such changes and modifications.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a dynamo-electric machine, the combination of a frame, a ventilating plate in said frame, a pole piece secured to said frame, a coil on said pole piece, and a resilient support for said coil mounted on said ventilating plate.

2. In a dynamo-electric machine, the combination of a frame, a ventilating plate in said frame, a pole piece secured to said frame, said pole piece having projecting portions, a coil on said pole piece, and a spring or springs mounted on said ventilating plate for forcing said coil against the projecting portions of said pole piece to hold the coil in position on the pole piece.

3. In a dynamo-electric machine, the combination of a frame, comprising laminæ clamped between end plates, ventilating

plates in said frame, a pole piece fastened to said frame, a coil on said pole piece, springs on said ventilating plate supporting the sides of said coil, and springs on the pole piece for supporting the ends of the coil.

4. In a dynamo-electric machine, the combination of a frame, comprising laminæ clamped between end plates, ventilating plates in said frame, a pole piece fastened to said frame, a coil on said pole piece, springs on said ventilating plate supporting the sides of said coil, springs on the pole piece for supporting the ends of the coil, and guides on the ventilating plates and pole piece for holding said springs in position.

5. In a dynamo-electric machine, the combination of a frame, ventilating plates in said frame, a pole piece secured to said frame, a coil on said pole piece, and a resilient seat for said coil, comprising compression springs carried by said pole piece and said ventilating plates.

6. In a dynamo-electric machine, the combination of a frame, ventilating plates in said frame, a pole piece secured to said frame, a coil on said pole piece, and a resilient seat for said coil, comprising compression springs carried by said pole piece and said ventilating plates, and means on said pole piece and said ventilating plates acting as guides and supports for said springs.

7. In a dynamo-electric machine, a rotatable field magnet, comprising a laminated core, ventilating plates in said core, pole pieces fastened to said core, coils on said pole pieces, and compression springs mounted on said ventilating plates for supporting said coils.

8. In a dynamo-electric machine, a rotatable field magnet, comprising a laminated core, ventilating plates in said core, pole pieces fastened to said core, coils on said pole pieces, compression springs mounted on said ventilating plates for supporting the sides of said coils, and springs mounted on said pole pieces for supporting the ends of said coils.

9. As an article of manufacture, a separable pole piece for a dynamo-electric machine, said pole piece having projecting portions, a coil on said pole piece, and resilient means carried by and supported on said pole piece for forcing said coil at all times against the projecting portions of said pole piece.

10. As an article of manufacture, a separable pole piece for a dynamo-electric machine, a coil on said pole piece, resilient means for retaining said coil in position on said pole piece whether the latter is in the machine, or removed therefrom.

11. As an article of manufacture, a separable pole piece for a dynamo-electric machine, a coil on said pole piece, springs at the ends of the pole piece to retain and support the end turns of the coil, and supports for said springs carried by said pole, whereby

the coil is held in proper position when the pole piece is on the machine or removed therefrom.

12. As an article of manufacture, a separable pole piece for a dynamo-electric machine, a coil on said pole piece, springs on the ends of the pole piece to retain and support the end turns of the coil, and supporting frames for said springs fastened to said pole piece.

13. As an article of manufacture, a separable pole piece for a dynamo-electric machine, a coil on said pole piece, springs on the ends of the pole piece to retain and support the end turns of the coil, supporting frames for said springs fastened to said pole piece, and guiding pins in said supporting frames for holding said springs in position.

14. As an article of manufacture, a separable pole piece for a dynamo-electric machine, a coil thereon, a dove-tailed projection on the pole piece, and resilient means on said dove-tailed projection for retaining said coil in position on the pole piece whether the latter is in the machine or removed therefrom.

15. As an article of manufacture a ventilating plate having spacing ribs or projections, and one or more pins or projections of less width than the spacing ribs or projections, said last named pins or projections extending from one edge of the plate in substantially the plane of the plate.

In testimony whereof I affix my signature, in the presence of two witnesses.

EDWARD T. MUG.

Witnesses:

FRED J. KINSEY,
SANFORD KLEIN.