

A. J. BROWN & R. B. WILLIAMSON.

ROTOR COIL RETAINER.

APPLICATION FILED APR. 8, 1910.

981,057.

Patented Jan. 10, 1911.

Fig. 1

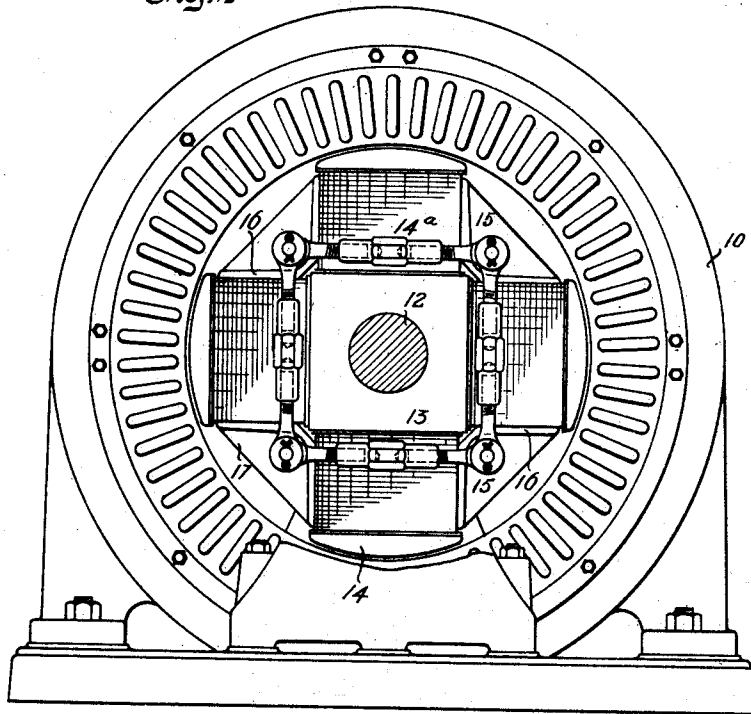
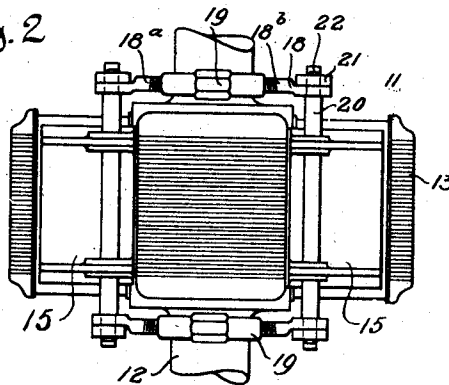


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

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ROTOR-COIL RETAINER.

981,057.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed April 8, 1910. Serial No. 554,225.

To all whom it may concern:

Be it known that we, ARTHUR J. BROWN and ROBERT B. WILLIAMSON, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Rotor-Coil Retainers, of which the following is a full, clear, and exact specification.

10 This invention relates to dynamo-electric machines, and particularly to revolving field members of high speed alternators, such as turbo-generators.

15 In certain types of dynamo-electric machines, and particularly in rotating field members of high speed machines portions of the coils are under high stresses tending to distort and displace the coils. These stresses are especially great in high speed rotating 20 field members having a small number of pairs of poles, for in such machines that component of the centrifugal force at right angles to the face of the pole and tending to shift the coil laterally or away from the pole, is very large.

25 To support the coils and to prevent their displacement at high speeds, coil bracing members have been employed, and these bracing members, each of which supports and braces sides of the coils on two adjacent poles, are usually retained in position by fastening devices extending into the core of the rotating member. Such bracing members have not been satisfactory in all respects 35 for the reason that very frequently it is a difficult matter to apply them to the machines and to tighten or adjust them, and it is often the case that the means for fastening them in position materially weakens 40 the core.

45 The object of the present invention is to provide bracing means for the coils of projecting pole pieces, particularly coils of high speed rotary field members, and to secure these bracing members in position in a novel and effective manner, which permits a more direct clamping action on the coils than is possible with the usual constructions, and also permits the bracing members to be securely fastened in position, and to be easily 50 and quickly adjusted when desired.

A further object is the provision of a coil supporting and bracing means which is sim-

ple in construction, inexpensive to manufacture, easy to assemble or apply to the 55 coils, and braces or supports the coils in a very satisfactory manner.

In carrying out our invention, we provide between adjacent poles coil bracing members, and instead of attaching these bracing 60 members to the core or other part of the machine, we secure them in position by connecting or fastening the members together. Preferably each bracing member is rigidly fastened at each side of the machine to two 65 adjacent bracing members, and in the preferred form of our invention, the members are fastened together by means of tie rods or links, which may be rendered adjustable by the use of turn-buckles or similar ad- 70 justing means.

The invention may be further briefly summarized as consisting of certain novel details of construction and combination and arrangement of parts which will be described in the specification and set forth in the appended claims. 75

Reference is had to the accompanying sheet of drawings wherein—

Figure 1 is a side elevation of a dynamo- 80 electric machine having a rotary field member equipped with our invention, and Fig. 2 is a plan view of the rotary field member.

Referring now to the figures of the drawing, 10 represents a stationary element of 85 a dynamo-electric machine, which element in this case is the armature, and 11 represents a rotary field member which is mounted upon a shaft 12 and comprises a core 13 and two pairs of field magnets 14 having 90 coils 14^a.

To avoid distortion of the coils, and to relieve the side portions of the coils of the stresses tending to cause their displacement, we employ between adjacent poles bracing 95 members 15, each including a pair of plates 16, which are in this case arranged at right angles to each other and bear against the sides of the coils, the plates 16 being connected together by ribs or webs 17. Ordinarily these coil bracing members 15 are secured in position and are prevented from displacement due to centrifugal force by radially arranged securing means, such as 100 bolts, screws or links, which fasten the members to the core of the machine. When such 105

fastening means are employed, suitable sockets or recesses must be provided in the core to receive the retaining means, and very frequently with such constructions the core is materially weakened and the coil bracing members are difficult to apply to the coils and to fasten in position. Furthermore, it is frequently a difficult matter to adjust the coil bracing members after they have once been applied to the machine. This is a serious objection, inasmuch as the coils frequently shrink, or after the machine has been used for some time, are shifted slightly from their original positions. To avoid these objections and to secure the coil bracing members in position in a very satisfactory and effective manner, we fasten the bracing members together by rigid adjustable means which serve to simultaneously hold all of the bracing members in position. In this case the adjacent coil bracing members are fastened together, at each side of the machine, by short tie rods or links 18, each of which consists of two sections 18^a and 18^b, and turn-buckle 19, which connects the two sections together, the two sections having respectively right and left handed threaded portions which are engaged by the turn-buckle. These tie rods may be secured to the bracing members in different ways, but in this case, the ends of the tie rods are connected to the ends of pins or rods 20, each carried by and mounted in the ribs or webs 17 of one of the coil bracing members. The pins 20 extend outwardly beyond the sides of the field magnets, and pass through openings in the heads or flattened ends 21 of the tie rods, which may be prevented from slipping off of the pins by cotter pins or equivalent means 22.

It will be seen that the coil bracing members can be easily applied to a machine, and secured in position, and that they can be adjusted at any time by merely turning the turn-buckle 19. It will be seen also that these tie rods and turn-buckles render the coil retaining members very effective for the reason that when the turn-buckles are tightened, they cause a direct clamping action on the coils, inasmuch as the tie rods connecting any two coil bracing members extend at right angles to the sides of the coils which are engaged by said coil bracing members. Another advantage is that these coil bracing members can be applied to an old machine which was not designed to have bracing members.

We do not desire to be confined to the exact details shown.

Having thus described our invention what we claim is:

1. In a dynamo-electric machine, an element having projecting poles provided with coils, coil bracing members between adjacent poles and each bearing against adjacent

sides of adjacent coils, said members being fastened together and thereby retained in position.

2. In a dynamo-electric machine, a member having projecting poles and coils thereon, bracing members for the sides of the coils, and means connecting each bracing member to two other bracing members.

3. In a dynamo-electric machine, a rotary field member having projecting poles and field coils, bracing members for the sides of the coils, and means for retaining the bracing members in position comprising devices fastening all of said members together.

4. In a dynamo-electric machine, a member having projecting poles and coils thereon, bracing members each supporting adjacent sides of the coils, and means for retaining the bracing members in position comprising adjustable devices fastening the members together.

5. In a dynamo-electric machine, a member having projecting poles and coils thereon, bracing members each supporting adjacent sides of the coils, and means for retaining the bracing members in position comprising adjustable tie rods fastening said members together.

6. In a dynamo-electric machine, a member having projecting poles and coils thereon, bracing members for the sides of the coils, and means for retaining the bracing members in position comprising adjustable tie rods fastening each coil bracing member to the two adjacent coil bracing members.

7. In a dynamo-electric machine, a member having projecting poles and coils thereon, bracing members for the sides of the coils, and means for retaining the bracing members in position comprising devices connecting said coil bracing members together, each fastening device having an adjustable turn-buckle.

8. In a dynamo-electric machine, a member having a magnetic structure comprising projecting poles and coils thereon, coil bracing members located between different coils, and means exterior to the magnetic structure for connecting all of said coil bracing members.

9. In a dynamo-electric machine, a member having a magnetic structure comprising projecting poles and coils thereon, and a connected system of coil bracing members located exterior to the magnetic structure.

10. In a dynamo-electric machine, a member having a magnetic structure comprising projecting poles and coils thereon, and an adjustably connected system of coil bracing members located exterior to the magnetic structure.

11. In a dynamo-electric machine, a member having a magnetic structure comprising projecting poles and coils thereon, bracing members for said coils, and means located

on opposite sides of said magnetic structure and exterior thereto retaining the coil bracing members in a fixed position.

12. In a dynamo-electric machine, a member having poles and coils thereon, and a connected system of tie-rods and supports for retaining said coils in position, said system including all of the rods and all of the supports.

10 13. In a dynamo electric machine, a member having projecting poles and coils there-

on, supports for said coils, and a plurality of tie rods retaining said supports in a fixed position and forming a closed polygon.

Milwaukee, Wis., March 22, 1910.

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In testimony whereof we affix our signatures, in the presence of two witnesses.

ARTHUR J. BROWN.

ROBERT B. WILLIAMSON.

Witnesses:

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ROB. E. HALL.