J. M. BARR.

MAGNETIZABLE WEDGE FOR DYNAMO ELECTRIC MACHINES.

APPLICATION FILED AUG. 2, 1909.

984,182. Patented Feb. 14, 1911.

Fig. 1.

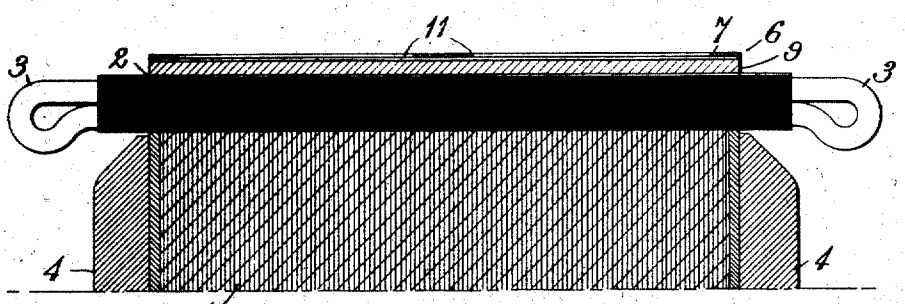


Fig. 2.

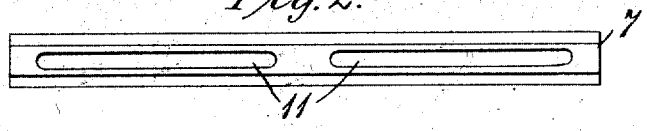


Fig. 4.

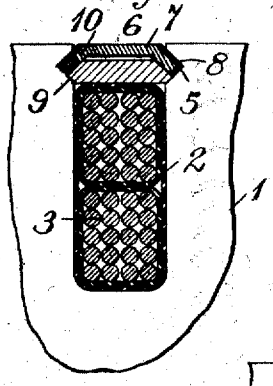


Fig. 3.

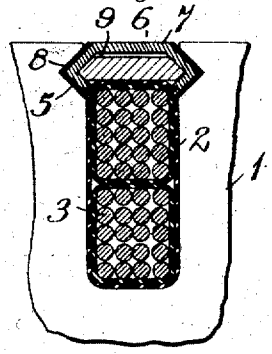
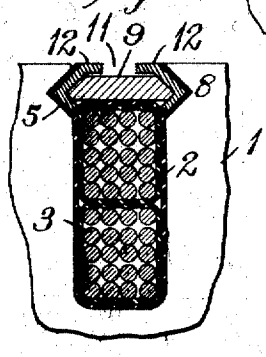


Fig. 5.



WITNESSES:

Fred H. Miller

R. J. Dearborn

INVENTOR

John M. Barr

BY

Wesley G. Carr

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN M. BARR, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

MAGNETIZABLE WEDGE FOR DYNAMO-ELECTRIC MACHINES.

984,182. Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed August 2, 1909. Serial No. 510,857.

To all whom it may concern:

Be it known that I, JOHN M. BARR, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Magnetizable Wedges for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to electrical apparatus, and it has special reference to magnetizable core members which are provided with coil-containing slots.

The object of my invention is to provide a simple and durable means for effectually holding the coils of open-slot machines in position against the action of centrifugal, magnetic and other forces which tend to displace them, and at the same time to provide the operating advantages which pertain to machines having partially closed slots.

Considerable difficulty has been experienced in attempting to use magnetizable wedges for holding the coils of open-slot machines in position by reason of the fact that it is necessary to electrically insulate the wedges from the core teeth in order to prevent excessive losses in the machine. For mechanical and magnetic reasons, the insulation must be very thin in order to permit the metal wedge to be securely held in position by the small grooves which are usually provided in the teeth of open-slot machines and in order to minimize the magnetic reluctance. Under these conditions, thin insulating strips are almost sure to be destroyed or mutilated when the wedges are driven into position if the fit is sufficiently close to prevent displacement in operation.

According to my present invention, I provide a sheet metal wedge which is preferably bent into the form of a flattened tube having one side cut away, and its size is such that it can readily be slipped into the grooves of a core slot after thin insulating strips have been introduced, a strip or rod of brass or other non-magnetizable material being finally forced into the tubular member to spread it and press it into very close engagement with the grooves without necessarily producing any downward pressure on the coils within the slot.

Figure 1 of the accompanying drawings is a partially sectional elevation of a dynamo-electric machine embodying my invention. Fig. 2 is a plan view and Fig. 3 is a sectional view, on a larger scale, of the wedge of Fig. 1. Figs. 4 and 5 are views corresponding to Fig. 3 of modified wedge structures embodying my invention.

Referring to the drawings, the structure here shown comprises a magnetizable core member 1 having a plurality of slots 2, in which coils 3 are located, and end plates 4 between which the core laminæ are assembled. Each of the slots 2 has substantially parallel side walls which are provided with grooves 5 that extend longitudinally of the slot near its open side. After the coils 3 are placed in the slots, they are held rigidly in position by means of wedges 6 which are so constructed as to improve the characteristics of the machine with which they are employed as well as to prevent the displacement of the coils.

I have shown three forms of wedges which are illustrated by transverse sectional views in Figs. 3, 4 and 5. Referring particularly to the wedge shown in Fig. 3, a magnetizable strip 7, preferably formed of sheet iron, is provided with lateral projections which are of hook shape in cross section and form a hollow bar open at one side. The form of the projections and the size of the strip are such that the hollow bar fits loosely into the grooves 5 provided in the walls of the slot and closes the sides of the slot after the coils are in position. Since the bar 7 is formed of sheet iron, it is, to a greater or less degree, resilient, and it is preferably arranged to fit loosely into the groove 5 in order that thin strips 8 of insulating material may be used for electrically separating the bar from the laminated iron of the core. After the insulating strips and the hollow bar are in position, a wedge 9 of non-magnetizable material is driven into the bar, in order to expand it into the grooves 5, making a particularly rigid wedge structure that is capable of holding the coils firmly in position without being dependent upon the outward pressure of the coils for preventing its displacement.

Reference may now be had to the modified structure shown in Fig. 4 of the drawings, in which like parts are designated by the same reference characters. The bar 7 here shown is provided with lateral projections 10 which are bent down and are adapted to enter the groove 5, the non-mag-

netizable wedge 9 being, in this case, also adapted to fit into the groove 5 and to force the projections 10 outwardly and upwardly against the upper half of the side of the groove. The projections 10 should be insulated from the core member by means of insulating strips 8, as in the form shown in Fig. 2. In each instance, the magnetizable bars are preferably provided with longitudinal slots 11 in order to prevent excessive iron losses and in order to approximate more nearly the form and operating characteristics of partially closed slots.

In Fig. 5, the slots 11 are extended throughout the entire length of the hollow magnetizable bar so that two channel-shaped members 12 are provided in lieu of the parts 7 of the other figures. The members 12 are to be regarded as parts of a single bar, since they coöperate with the wedge and the core slot grooves to perform the same functions as are performed by the parts shown in Figs. 3 and 4. The form of device shown in Fig. 5 is particularly well adapted for machines having relatively large core slots.

Variations in size and arrangement of parts may be effected within the spirit and scope of my invention, and I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. A coil-retaining wedge for open-slot dynamo-electric machines comprising a yielding magnetizable bar having lateral projections of hook shape in transverse section and a non-magnetizable wedge which is adapted to be forced into the magnetizable bar to expand it after it is placed in position.

2. A coil-retaining wedge for open-slot dynamo-electric machines comprising a yielding magnetizable bar having lateral projections that are bent to form a channel and a non-magnetizable strip or wedge which is adapted to be forced into the channel to expand it.

3. A coil-retaining wedge for open-slot dynamo-electric machines comprising a yielding magnetizable bar of channel shape and a non-magnetizable wedge which is adapted to be forced into the magnetizable bar to expand it after it is placed in position.

4. The combination with a cylindrical core member of a dynamo-electric machine having a plurality of core slots in its periphery and grooves in the side walls of the slots near their open ends, coil-retaining wedges comprising yielding sheet iron bars placed in the mouths of the slots and loosely engaging the grooves and non-magnetizable wedges for expanding the magnetizable bars into firm engagement with the grooves.

5. The combination with a cylindrical core member of a dynamo-electric machine having a plurality of core slots in its periphery and grooves in the side walls of the slots near their open sides, of coil-retaining members comprising yielding sheet iron bars of channel shape located in the mouths of the slots and engaging the grooves, and non-magnetizable wedges adapted to be forcibly inserted in the magnetizable bars to expand the same into rigid engagement with the grooves.

In testimony whereof, I have hereunto subscribed my name this 29th day of July, 1909.

JOHN M. BARR.

Witnesses:
R. J. Dearborn,
Charles W. McGhee.