(No Model.)

S. S. WHEELER.

ARMATURE FOR DYNAMO ELECTRIC MACHINES AND MOTORS.

No. 503,106. Patented Aug. 8, 1893.

Fig. 1.

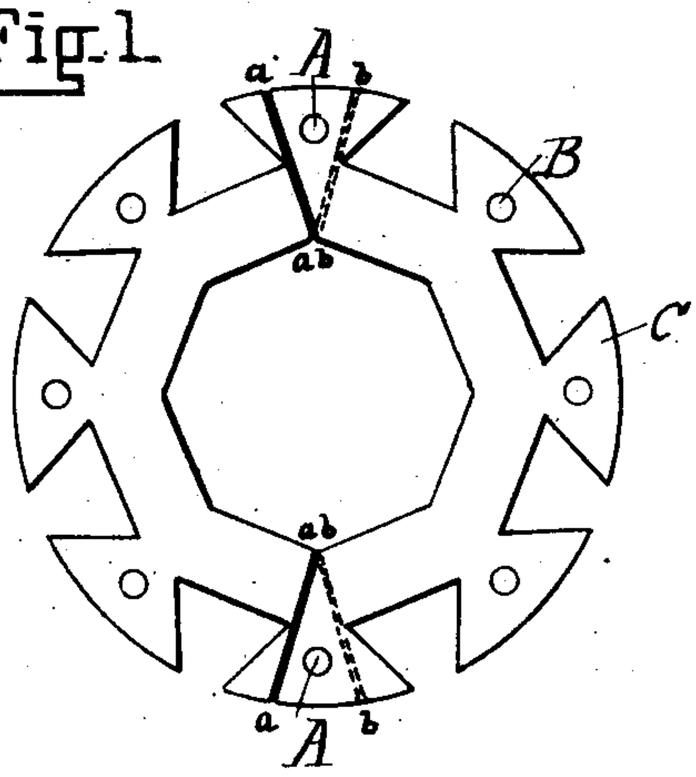


Fig. 3.

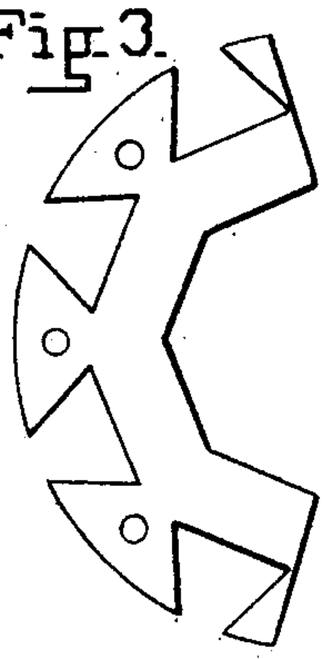


Fig. 4.

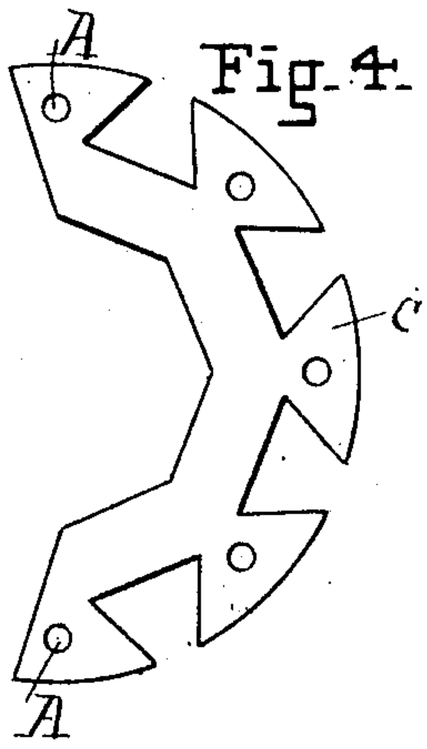


Fig. 2.

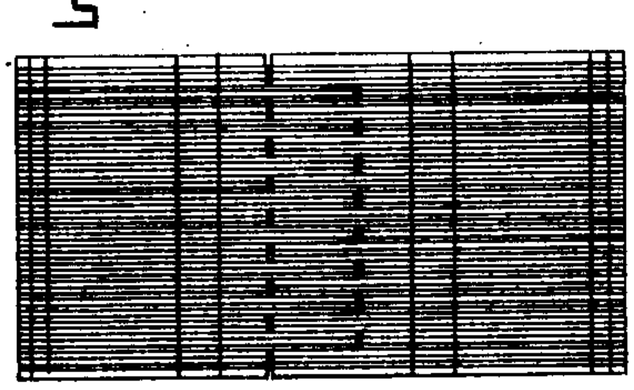


Fig. 5.

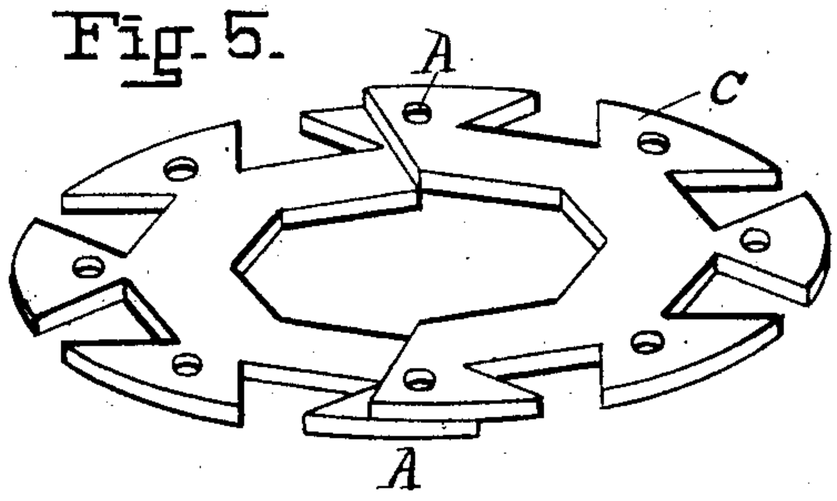


Fig. 6.

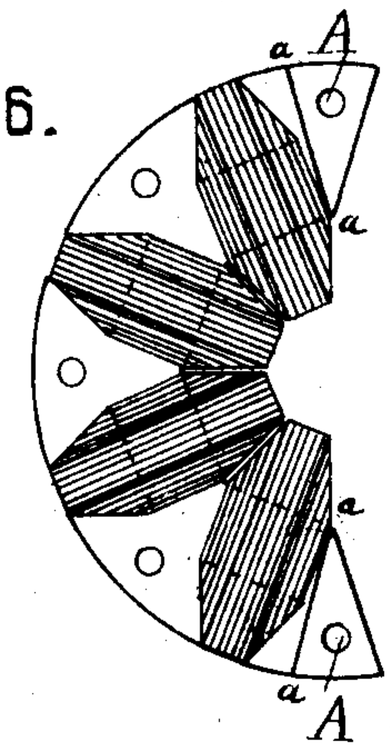
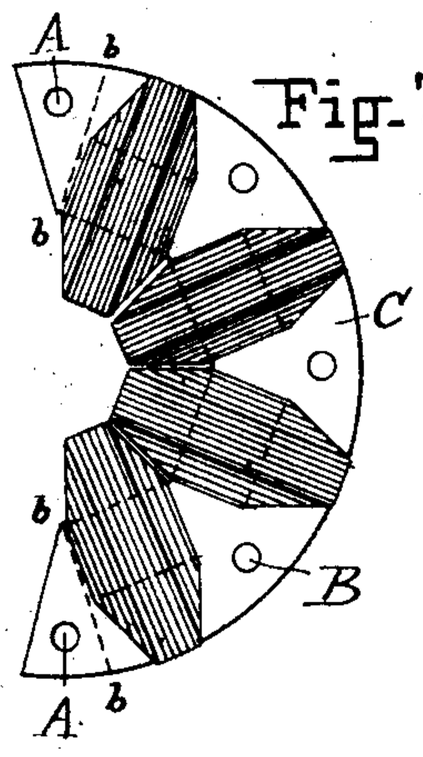


Fig. 7.



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UNITED STATES PATENT OFFICE.

SCHUYLER S. WHEELER, OF NEW YORK, N. Y., ASSIGNOR TO THE CROCKER WHEELER ELECTRIC COMPANY, OF NEW JERSEY.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES AND MOTORS.

SPECIFICATION forming part of Letters Patent No. 503,106, dated August 8, 1893.

Application filed April 24, 1893. Serial No. 471,576. (No model.)

To all whom it may concern:

Be it known that I, SCHUYLER S. WHEELER, a citizen of the United States of America, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Armatures for Electric Dynamos and Motors, of which the following is a specification.

My invention consists of a ring armature for electric dynamos and motors, the core of which is made up of two parts preferably alike and each composed of laminations of unequal lengths of arc, the longer laminations overlapping the shorter ones at both ends, and the long and short laminations of one part being complementary in lengths of arc to the short and long laminations respectively of the other part, and reversed in position relatively thereto, so that the two parts fit together with a mortise joint and the laminations form complete rings when the parts are fitted together.

In the accompanying drawings which form a part of this specification, Figure 1 is a top view of the core. Fig. 2 is a side view of the core. Fig. 3 is a top view of one of the short blanks. Fig. 4 is a top view of one of the long blanks; Fig. 5, a top view of two of the long blanks laid together as they overlap each other in the completed core; Fig. 6, a top view of one half of the complete armature; Fig. 7, a top view of the other half of the complete armature.

The laminations or blanks are of soft iron and are stamped out of sheet metal with dies. The blanks are, as shown, of two sizes, (Figs. 3 and 4) which are exact complements of each other, *i. e.* if the blanks of Figs. 3 and 4 be placed with their ends abutting they form a complete ring. The longer blank (Fig. 4) exceeds the shorter one by just enough length of arc to leave sufficient room for a bolt hole in each end of the longer one in the overlap. This may be seen in Figs. 6 and 7 in which the bolt holes A are seen in the ends of the longer blanks which project beyond the shorter blanks. The holes B, which are herein called rivet holes, are inserted, to admit of rivets to hold the laminations of the parts together.

To build up the complete core, blanks or groups of blanks of the two sizes are laid on top of each other, alternating first one size and then the other, to form one part of the core. The other part of the core is built up in the same manner except that, if the parts are composed of an odd number of blanks or groups of blanks, wherever a long blank is used in one part of the core a short blank must be used in the corresponding position in the other part of the core and vice versa. A convenient method of building up these parts of cores, is to pass rivets through holes B. When a sufficient number of blanks has been assembled they may be tightened up with nuts turned onto the rivets and the parts of the core are ready for winding. If these two parts are exactly alike in the number and arrangement of the long and short blanks used in each, as for instance if there is the same number of long and short blanks or groups of blanks in a part and they are alternated, in which case any two such parts will fit together on reversing one end for end with respect to the other, the two parts of any completed armature must be wound with the terminals of the coils on the opposite sides of the parts so that all the terminals shall lie on the same side of the completed armature. If however the parts are composed of an unequal number of alternating long and short blanks or groups of blanks, then one part will have say long outside blanks on both sides and the other must have short outside blanks on both sides. Two such parts will fit together irrespective of the ends of the parts that are in contact, and hence it is immaterial to which side of either part the terminals of the coils are brought. This latter construction appears particularly in Fig. 2, and the general construction is shown in Figs. 6 and 7 by the solid lines *a*—*a* and the dotted lines *b*..*b*. The solid lines *a*—*a* (Fig. 6) indicate that the top lamination in Fig. 6 is a short blank such as is shown in Fig. 3, and the longer blank (such as is shown in Fig. 4), which lies under this shorter one, projects beyond at both ends. The dotted lines *b*..*b* (Fig. 7) indicate that the longer blank is on top and projects at both ends beyond the shorter one, the ends of which are indicated by these dotted lines. The solid lines *a*—*a* in Fig. 1 show the location of the

joints in the top layer of laminations, and the dotted lines *b*..*b* show the location of the joints in the next succeeding layer of laminations.

If the core is a plain as distinguished from a toothed ring armature core the coils may be wound on bobbins and slipped onto the core, but if the core has teeth it must be wound directly, preferably on a lathe. I have shown the invention as applied to the toothed ring armature, each lamination having teeth, C, as this, from the intricacy and requirements of the subject, is the more difficult form to design and manufacture. When the two parts of the core have been completed, as shown in Figs. 6 and 7, they are fitted together, as shown in Figs. 1 and 2, and bolts are then passed through the holes A, whereby the two parts of the core are held together, thus forming the completed armature. The long blank of one layer or lamination then overlaps the long blank of the next lamination as shown in Fig. 5. The shape of the teeth and other features of the armature are of the general style shown in my Patent No. 451,884 dated May 5, 1891, for an improvement in electric motors or dynamo electric machines. But in the character of core therein shown, in which the core is composed of blanks that are all alike, and each is exactly a half ring, and in which therefore the bolts which join the two holes of the armature pass through but one end of each blank, the ends of the blanks not held by these bolts are apt, under the powerful centrifugal force and attraction of the field magnets, to spread out, throwing the armature out of the true cylindrical shape which it is absolutely necessary that it should retain, for the rivets holding the blanks of each half together have to be surrounded with insulating material which is necessarily somewhat soft.

If the core is of the form illustrated in the accompanying drawings, all the advantages of the armature shown in my above named patent are attained, together with the added advantage of a much higher degree of rigidity in the armature core.

Many advantages are attained by making each part of the armature a half armature, in the sense that bolt holes A A shall lie on the same diameter. One obvious advantage is that only two sets of blanks are used, and hence only two dies are required to stamp out all the blanks. I have therefore selected this form for illustration of my invention.

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

1. An armature for electric motors and dynamos, the core of which is made up of two parts, each composed of laminations of unequal lengths of arc, the longer laminations overlapping the shorter ones at both ends, and the long and short laminations of one part being complementary in lengths of arc to the short and long laminations respectively of the other part, and reversed in position relatively thereto, so that the two parts fit together with a mortise joint and the laminations form complete rings when the parts are fitted together, substantially as described.

2. An armature for electric motors and dynamos, the core of which is made up of two parts, each composed of laminations having teeth, and of unequal lengths of arc, the longer laminations overlapping the shorter ones at both ends, and the long and short laminations of one part being complementary in lengths of arc to the short and long laminations respectively of the other parts, and reversed in position relatively thereto, so that the two parts fit together with a mortise joint, and the laminations form complete rings when the parts are fitted together, substantially as described.

Signed by me in New York city, this 22d day of April, 1893.

SCHUYLER S. WHEELER.

In presence of—

B. J. HAMILTON,

A. L. DOREMUS.