(No Model.)

S. H. SHORT.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 595,081. Patented Dec. 7, 1897.

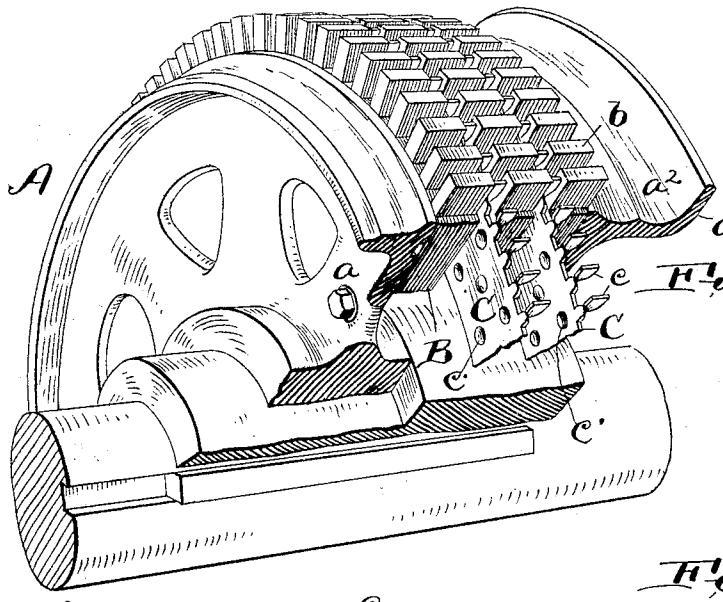


Fig. 1.

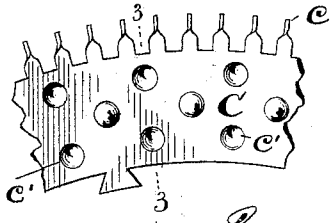


Fig. 2.

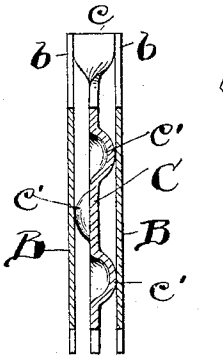


Fig. 3.

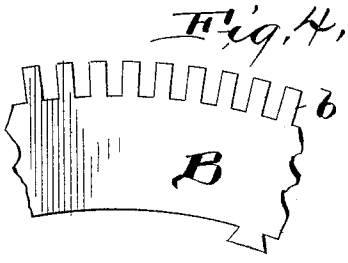


Fig. 4.

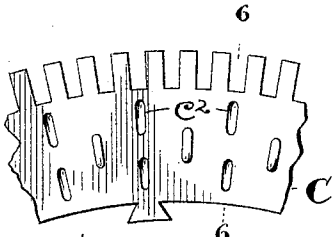


Fig. 5.

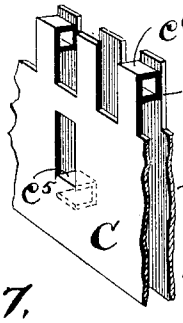


Fig. 8.

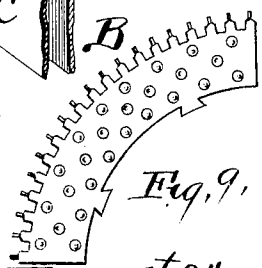


Fig. 9.

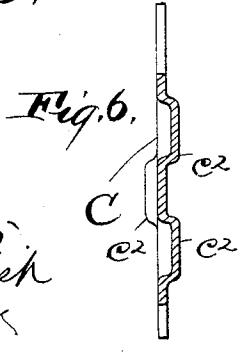


Fig. 6.

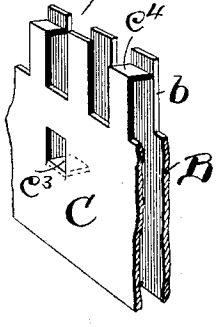


Fig. 7.

Witnesses:
E. B. Gilchrist
A. M. Rankin

Inventor:
Sidney H. Short,
By his Attorneys,
Thurston & Bates.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SIDNEY H. SHORT, OF CLEVELAND, OHIO.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 595,081, dated December 7, 1897.

Application filed March 12, 1897. Serial No. 627,170. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. SHORT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Armatures for Dynamo-Electric Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to armatures for dynamo-electric machines. Its object is to supply convenient, economical, and efficient means for ventilating the armature. In modern practice armatures are built up of a large number of laminations placed side by side in order to reduce to a minimum the Foucault currents; but notwithstanding the laminated construction a large amount of heat is developed in the core. In order to prevent this deleterious heating, I provide separating-laminæ to be introduced occasionally in building up the core for the purpose of forming ventilating air-spaces. These laminæ are constructed in the manner substantially as hereinafter described; and the invention consists in the construction of said separating-laminæ and in the combination of the same with the ordinary laminæ, substantially as described, and pointed out definitely in the claims.

The drawings clearly illustrate the invention.

Figure 1 is a perspective view of a portion of an armature embodying the invention. Fig. 2 is an elevation of a portion of the separating-lamina alone. Fig. 3 is a section on the line 3 3 of Fig. 2, showing also the laminæ on each side of the separating-lamina. Fig. 4 is an elevation of a portion of an ordinary lamina. It also represents the blank from which the separating-lamina is made. Fig. 5 is an elevation of a slightly-different embodiment of the form of separating-lamina shown in Fig. 3, and Fig. 6 is an enlarged section thereof on the line 6 6 of Fig. 5. Figs. 7 and 8 are perspective views of modified forms of separating-laminæ, and Fig. 9 shows a segment of a separating-lamina.

Similar letters of reference designate similar parts in each figure.

In the drawings, A is an armature having the usual end plates a a'. In the armature shown the end plate a' has a pocket a^2 for the reception of the bends in the armature-inductors. Between these plates there are held in suitable manner a number of laminæ B. These laminæ consist of the ordinary thin sheets of iron having the usual teeth b. At intervals between the laminæ B are placed separating-laminæ C for the purpose of properly ventilating the armature. These laminæ I form, preferably, by poking or turning out portions of an ordinary lamina or of a blank similar to an ordinary lamina, but somewhat thicker.

In the construction illustrated in Figs. 1, 2, and 3 this separating-lamina is formed by making dents c' in an ordinary lamina or blank in each direction. These dents are formed by a round headed punch and are of such depth that the distance between plain surfaces in contact with these dents on each side of the lamina is substantially the same as the width of one of the teeth b. The teeth c of this separating-lamina are twisted to a position at right angles to the lamina. In this turned position the edges of the teeth would therefore contact with the sides of the teeth of the ordinary laminæ on opposite sides of this separating-lamina. This is shown in Fig. 3. This turning of the teeth is preferably accomplished by annealing the edge of the lamina and twisting the teeth with a pair of pincers. If now an armature is built up, with these separating-laminæ occasionally introduced and the slots between the teeth filled with armature-inductors, the armature is nevertheless well ventilated by means of the air-passages between the separating-laminæ and their neighbors and between the armature-inductors and the sides of the teeth c, these teeth c preventing the teeth of the ordinary neighboring laminæ from being accidentally forced together and thereby closing the passage.

The separating-laminæ are secured in the armature in the same manner as the other laminæ. Figs. 2, 4, or 5 indicate one manner of securing them, which consists of dovetailed tongues taking into dovetailed slots, but the manner in which they are secured is immaterial.

Should it be desired to form a larger space at the point of separation of the bundles of laminæ than can be done by one of the sepa-

rating-laminæ, two might be used with the face of their dents in contact with each other.

Figs. 5 and 6 show a separating-lamina similar to that just described, except the dents are elongated and flat, as shown at c^2. The elongations are made, preferably, radially, and therefore do not interfere with the passage of the air. This form has the advantage of furnishing more separating-contact with the same number of punching operations. The teeth may be turned as hereinbefore described or as about to be described with reference to the other modifications.

Fig. 7 shows a modified form of making the separating-lamina. Here, instead of forming a dent, a tongue c^3 is cut, as shown, in a lamina and turned at right angles to the body of the lamina. The ends of alternate teeth are turned over at right angles, as shown at c^4, and this keeps the teeth of the ordinary laminæ apart. As this turning over of the teeth closes the passage, I turn only each alternate tooth, thus leaving a vent for half the teeth.

Fig. 8 shows a further development of the separating means illustrated in the preceding figure. Here the tongue c^5 is cut about three times as long as the tongue c^3 and is bent as shown, thus presenting a more rigid separating projection. The alternate teeth c^6 of the separating-laminæ are bent in similar form. This construction affords a very satisfactory method of separation, but it requires the separating-laminæ to be made from a blank having longer teeth than the ordinary laminæ.

It will be understood that modifications or different combinations of the features herein shown of the body and teeth of the separating-lamina may be used without departing from my invention. For instance, the dents c' or c^2 might be made to project from but one side of the sheet, or, on the other hand, the tongues c^3 or c^5 might extend to both sides, the alternate teeth, now straight in Figs. 7 and 8, being turned in the direction opposite to the teeth c^4 and c^6, or the body of the separating-laminæ might be dented and the teeth properly bent over instead of being twisted, and of course some of the advantages of my invention might be obtained without treating the teeth in any manner. These separating-laminæ may be cast out of any metal in the shape shown instead of being bent out of sheet metal, although the sheet-metal laminæ are the best. They may be complete disks, or they may be made of segments, as shown in Fig. 9. In large machines the armature-laminæ are made up of segmental sections, as shown, and these segmental sections are independently secured to the armature-hub by means of the tongues or otherwise. It will be noticed that the separating-laminæ are attached to the armature-hub just like the other laminations and that they are not fastened to said other laminations.

Having described my invention, I claim—

1. A separating-lamina for a dynamo-electric armature, having peripheral teeth the ends of which are bent at right angles, substantially as specified.

2. A separating-lamina for a dynamo-electric armature formed of sheet metal having integral teeth which are bent transversely to the body of the sheet, substantially as specified.

3. An armature-lamination of sheet metal having dents poked into it from opposite directions, whereby integral projections are formed on each side of it without cutting, said lamination being adapted to be introduced into an armature-core between ordinary laminæ and form an air-space on each side of itself, substantially as described.

4. In an armature-core, a lamination occupying the center of an air-duct in the armature-core, and having integral spacing projections on both sides, substantially as specified.

5. In an armature-core, a spacing-lamination occupying the center of an air-duct of an armature-core, and secured to the armature-hub at one or more places, substantially as specified.

6. In an armature-core, a spacing-lamination occupying the center of an air-duct of said core and having peripheral teeth which are twisted and thereby project to each side of said spacing-lamination, substantially as specified.

7. An armature for a dynamo-electric machine having its core made up of a plurality of ordinary laminæ and one or more separating-laminæ occasionally introduced between the ordinary laminæ, said separating-lamina consisting of a sheet of metal having integral lateral projections on both sides, and peripheral teeth which are twisted at substantially right angles to the sheet, substantially as specified.

8. An armature for a dynamo-electric machine, having its core made up of a plurality of segmental laminæ dovetailed to the armature-hub and occasionally separated by a segmental lamina provided with integral projections extending from it to the adjacent laminæ, the separating-laminæ being attached to the armature-hub, in the same manner as the other laminæ, substantially as specified.

9. In an armature for a dynamo-electric machine, the combination of a plurality of laminæ and of a segmental lamina, with integral projections on both sides, not attached to the adjacent lamina, but held in place by being attached to the armature-hub, substantially as specified.

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

SIDNEY H. SHORT.

Witnesses:

E. L. THURSTON,

ALBERT H. BATES.