

(No Model.)

J. J. WOOD.
ARMATURE CORE.

No. 529,437.

Patented Nov. 20, 1894.

FIG. 1.

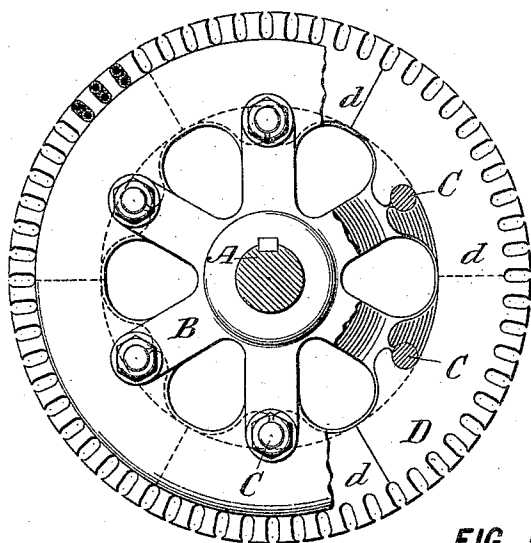


FIG. 3.

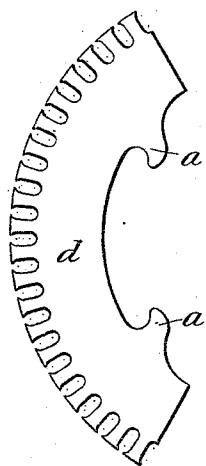


FIG. 4.

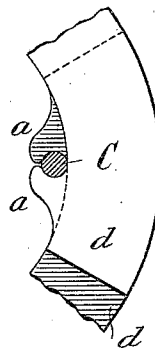


FIG. 5.

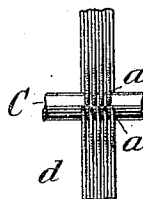
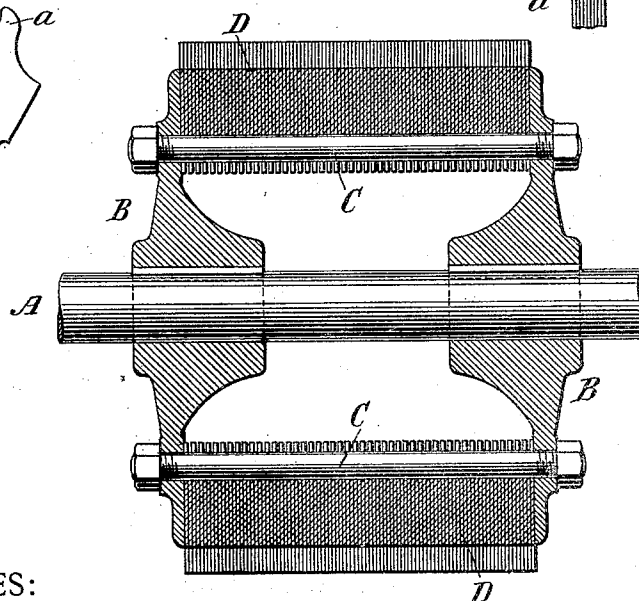


FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES J. WOOD, OF FORT WAYNE, INDIANA.

ARMATURE-CORE.

SPECIFICATION forming part of Letters Patent No. 529,437, dated November 20, 1894.

Application filed August 21, 1894. Serial No. 520,881. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. WOOD, a citizen of the United States, residing at Fort Wayne, Allen county, State of Indiana, have invented certain new and useful Improvements in Armature-Cores, of which the following is a specification.

This invention relates to an improved construction of laminated armature cores for dynamo electric machines or electric motors. Heretofore such laminated armature cores have been built up of blanks of sheet iron either cut out in the form of a complete ring and punched with holes through which to pass the fastening bolts of the spider, or they have been built up of laminated segmental blanks or punchings united to the spider either by being formed with dove tails on their inner sides interlocking with dove tails in a cast metal wheel, or punched with holes through which to pass the fastening bolts of the spider. The use of circular or ring shaped blanks is advantageous in avoiding joints and saving the necessity of passing fastening bolts through holes in the laminated cores, as each ring or lamina resists in itself the centrifugal force, but this construction is expensive because of the necessity of making an excessively large die for punching the ring and because of the waste of material from the corners and centers of the rectangular sheets of iron from which the rings are punched. Cores for all very large armatures, however, must of necessity be made of segmental blanks, since it is impossible to get iron in large enough sheets from which to cut the complete rings, and it is practically of great importance to secure the best construction for such segmental cores. The segmental constructions heretofore used have been defective in not providing for effective heat radiation from the core and in the liability to the generation of Foucault currents. Where the blanks or punchings are dove tailed to an inner cast metal ring or wheel considerable expense is involved in the fitting, the radiation of heat from the core is interfered with, and Foucault currents are liable to be generated in the metal wheel. Where bolts are passed through the laminated iron core they are required to be insulated in order to pre-

vent the generation of currents in them, and the insulation in course of time disintegrates and allows the armature core to become loose.

According to the improved construction provided by my invention I build up the core of segmental blanks or punchings and connect them to the spider by fastening bolts arranged entirely within the body of the core, the sole engagement of the laminated core with the bolts being by means of curved ears or hooks formed on the inner sides of the sheet iron blanks and projecting inwardly and overhanging the bolts to the extent of about half the diameter of the latter. The centrifugal force is thus resisted by the engagement of these ears or hooks with the bolts. Each blank has two such ears or hooks which overhang two adjoining bolts engaging the latter on opposite sides so that the two bolts stand between two ears, whereby the springing outward of the bolts under centrifugal force is prevented since the respective blanks serve thus as ties for linking the respective pairs of bolts together, and as the alternated layers engage different pairs of bolts the entire structure is effectively united. By this means also ventilating spaces are formed between the respective projecting ears or hooks, which contribute to the radiation of heat from the core.

Figure 1 of the accompanying drawings is an end elevation of an armature core constructed according to my invention partly broken away or dissected to show the details of construction. Fig. 2 is a transverse diametrical section of the armature core and spider. Fig. 3 is a plan of one of the sheet metal blanks or punchings. Fig. 4 is a fragmentary section showing the engagement of the superposed blanks or punchings with one of the fastening bolts. Fig. 5 is a fragmentary edge view of the same.

Referring to the drawings, A designates the armature shaft; B B, the opposite supporting heads or rings constituting the spider; C C, the fastening bolts, and D the laminated iron core.

The core D is built up of blanks or punchings *d* of sheet iron such as that shown in Fig. 3. Each blank constitutes a segment of the complete ring forming the core, being a

third, quarter, or other convenient division thereof. The exterior of the blank may or may not be formed with notches or grooves to form teeth for armature cores as may be required according to the type of armature to be made. In Fig. 3 the blank is shown as thus toothed, while in Fig. 4 it is shown plain or untoothed. Each blank is formed with two hook-shaped ears or hooks *a a* projecting from its inner side and spaced sufficiently apart to overhang or partly embrace two successive bolts C C. In building up the core from these punchings or blanks they are alternated so as to break joints, the joints between the blanks constituting one layer coming opposite the middles of the blanks constituting the adjoining layers. By means of this alternation the hooks *a a* engage alternately opposite sides of each of the bolts C in the manner clearly shown in Figs. 4 and 5, where it is seen that one-half of the bolt is embraced by the hooks on what I may call even numbered punchings, while the opposite half of the bolt is engaged by the hooks of intervening or odd numbered punchings. Thus each of the hooks or projecting ears is separated from its lateral neighbors by an air space equal to the thickness of the sheet from which the punchings are made and these air spaces contribute greatly to the cooling of the core by radiation. Each of the hooks forms thus essentially a half eye for engaging the bolt, which has the advantage over a full or complete eye, that it does not afford a path for magnetic lines of force to encircle the bolt, which would tend to give rise to electrical currents through the bolts. The hooks might be otherwise arranged to engage the bolts in different ways from that shown, but the construction shown is preferable to any other arrangement for the reason that with hooks otherwise engaging the bolts the centrifugal force would be resisted solely by the stiffness or strength of the bolts, which would be liable to spring and permit the core to become distorted by an outward displacement or bulging of the laminæ; but by forming the punchings as shown in Fig. 3 with the hooks arranged to engage the outer or remote sides of the two bolts and curving toward each other the punching or blank becomes a tie to bind the two bolts together so as to prevent their spreading apart, and when the entire core is built up by the alternation of such punchings all the bolts are firmly and closely linked to one another so that the centrifugal force is resisted mainly by the material of the blanks or punchings and little

or no strain is thrown upon the bolts or spiders, the sole function of which is thus reduced to carrying the core and resisting the torque.

My invention consequently has the following advantages:

First. There is little or no tendency to generate current in the bolts.

Second. There is greatly increased ventilating surface due to the hooks which engage the bolts.

Third. The construction is very economical since the waste of iron in making the punchings is reduced to the minimum.

Fourth. The punchings when assembled tend to hold each other and tie the entire structure together so that no greater strain is thrown upon the spider than if the punchings constituted complete rings.

Fifth. The mechanical construction is the simplest possible, requiring no heavy spiders and no expensive planing or fitting, but a mere easy slipping together of the punchings over the fastening bolts.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. A laminated armature core built up of alternated segmental blanks having hooks for overhanging the fastening bolts of the spider, the hooks of alternate laminæ embracing said bolts from opposite sides.

2. In an armature the combination with a spider and a series of parallel fastening bolts, of the laminated core built up of alternated segmental blanks having each two hooks curved toward each other and overhanging two bolts by embracing their relatively remote sides, the blanks of alternated layers embracing different pairs of bolts, whereby the bolts are tied together by the blanks.

3. A sheet-iron blank for an armature core, consisting of a segment of the core having on its inner side overhanging hooks for embracing the fastening bolts.

4. A sheet-iron blank for an armature core, consisting of a segment of the core having on its inner side two opposed hooks curved toward each other, adapted to overhang two fastening bolts by embracing their relatively remote sides.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES J. WOOD.

Witnesses:

K. STEINBRUNNER,
CHAS. JONES.