

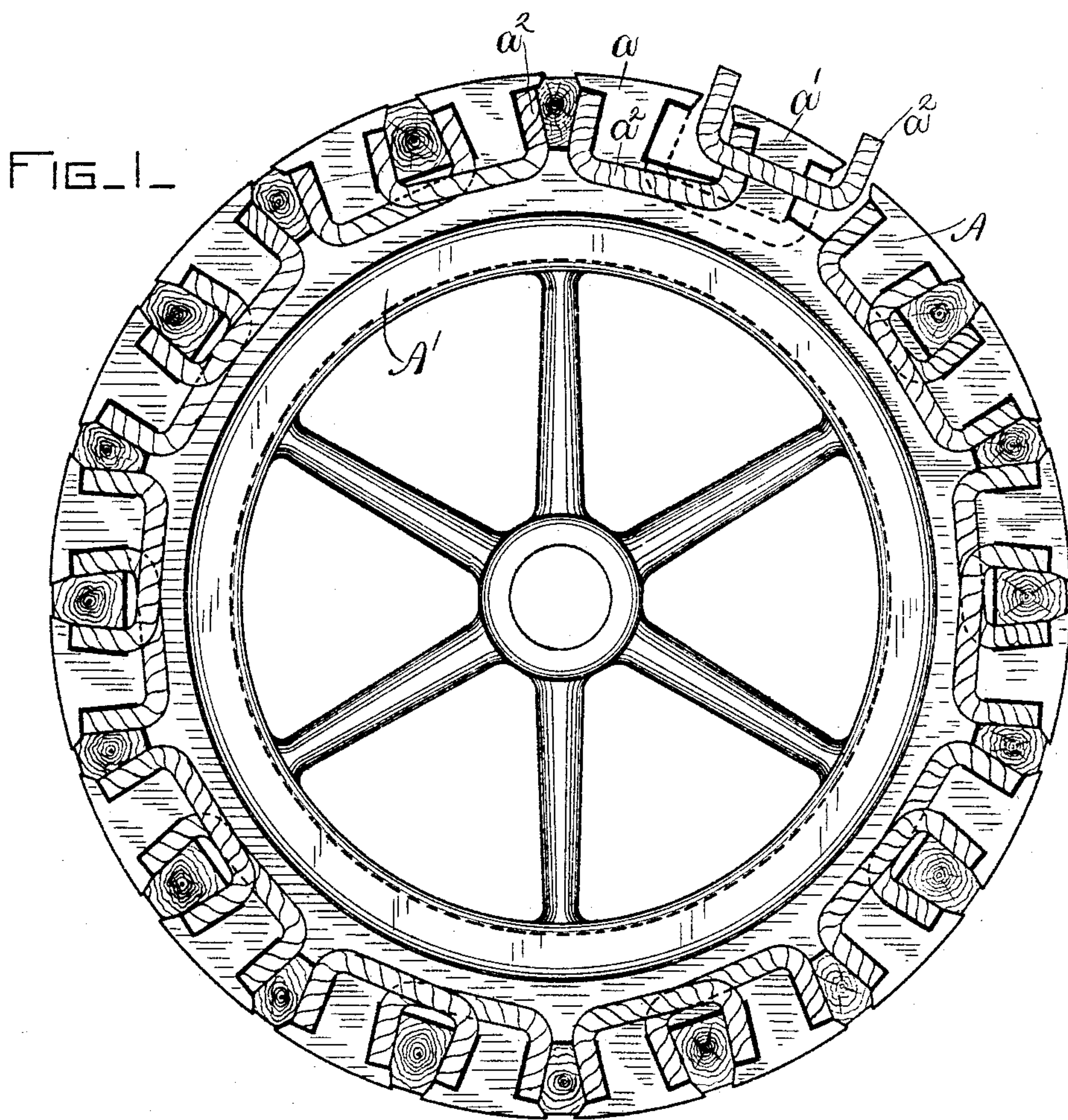
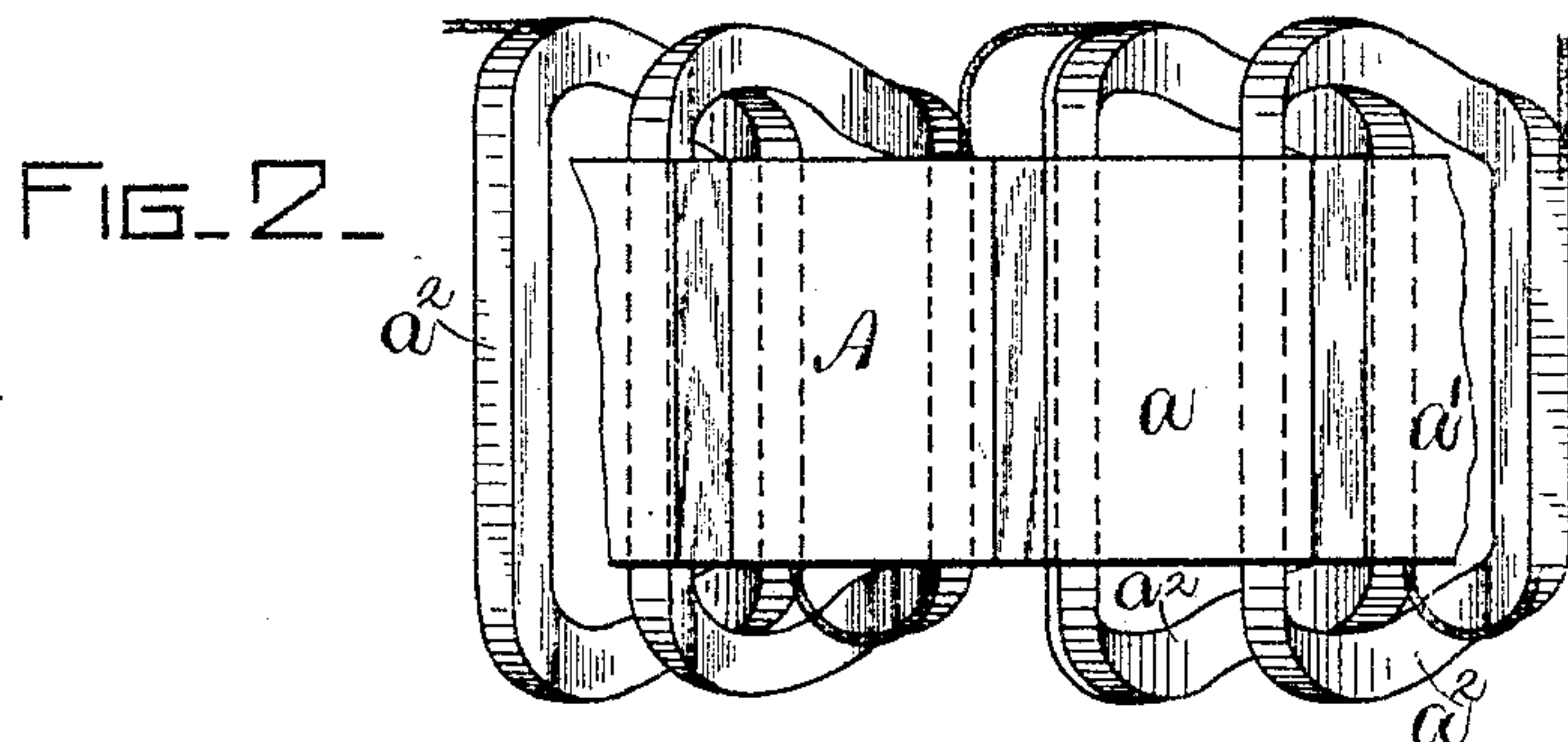
(No Model.)

E. W. RICE, Jr.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 516,837.

Patented Mar. 20, 1894.



WITNESSES.

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UNITED STATES PATENT OFFICE.

EDWIN WILBUR RICE, JR., OF LYNN, ASSIGNOR TO THE GENERAL ELECTRIC COMPANY, OF BOSTON, MASSACHUSETTS.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 516,837, dated March 20, 1894.

Application filed November 16, 1893. Serial No. 491,089. (No model.)

To all whom it may concern:

Be it known that I, EDWIN WILBUR RICE, Jr., a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Armatures for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to dynamo-electric machinery and consists in an improvement in separately wound armature coils and the method of applying the same to the core of an armature. Such coils have been hitherto constructed and applied to the armature by laying them in grooves upon the face of the core, said grooves being of such size as to receive one or more coils, but it has been a matter of some difficulty to so fasten the coils in the grooves as to prevent the possibility of their being accidentally displaced and at the same time render them readily removable in case it is necessary to replace them. By my invention however the separately wound coils are rendered applicable to armature cores having undercut grooves between the teeth, such cores, for example, as have been hitherto employed with coils wound directly thereon by means of a bobbin passed through the groove and carrying the wire which forms the coil.

In carrying out my invention I construct a coil of such cross-section as will admit of its being passed through the narrow opening in the groove, and I so shape the main portion of said groove that the coil after insertion can be moved laterally therein until it fits under and is retained by the shoulder or undercut portion, as will be more fully explained hereinafter.

In the accompanying drawings, Figure 1 is an end view of an armature, showing the method of inserting the coils, and Fig. 2 is a top plan view of a portion thereof.

Referring to Fig. 1, the armature core is built up in the usual way of laminæ A, insulated from each other and assembled upon a spider A'; the said core is of the toothed or notched type, and the teeth are arranged in symmetrical pairs, each pair being adapted to retain two coils. Thus the recesses under the overhanging portion of the teeth a and

a' contain two overlapping coils a^2 , the ends of the right hand coil fitting respectively the right hand sides of said adjacent teeth, and the left hand coil in like manner the left hand sides thereof. The coils, as shown, are wound upon a form, or otherwise, trapezoidal in shape, and covered with insulating material such as insulating tape. The object in making the coils trapezoidal is to allow the larger end of one coil to overlap the smaller end of another, as best shown in Fig. 2. After the coils are thus wound, the ends thereof are bent upward, as shown in Fig. 1, at such an angle as to conform to the sides of the teeth against which they are to rest, and the ends when thus bent are at such a distance from each other as to come opposite to two adjacent notches respectively when applied to the core. The coils of course may be made to span any number of teeth, and are made of the size necessary to fit the proper notches. Thus referring to the teeth a and a' near the top of Fig. 1, the right hand coil a^2 is passed through the notches on each side of the tooth a' , and then slipped to the left into the position shown in the dotted lines, the larger end of said coil surrounding the smaller end of the left hand coil, which has already been similarly inserted. Thus the coils are firmly held in position by the formation of the core itself, it being necessary only to insert a key or wedge such as a wooden plug B into the groove after the coils are in place to keep said coils in engagement with the teeth. Such a wedge is readily removable, and the coils can therefore be easily replaced if burned out or otherwise damaged.

In the accompanying drawings I have shown the ends of the coils bent upward at substantially a right angle, and to accommodate this shape have shown the teeth cut with corresponding sides parallel, that is to say the right hand side of tooth a is parallel to the right hand side of tooth a' , and likewise their respective left hand sides are parallel to each other. Such a formation however is not necessary to the invention, which consists in forming a coil small enough in cross-section to be passed between the overhanging surfaces of adjacent teeth on an armature core, slipped into recesses under such overhanging

surfaces, and thereby retained in place. The shape and general arrangement of the coils is immaterial, so far as this invention is concerned, and will depend upon the nature of the machine to which the armature is to be applied.

What I claim as new, and desire to secure by Letters Patent, is—

1. An armature comprising a core having transverse undercut notches in the surface thereof, separately wound coils of such size as to be inserted through the narrow openings of such notches into the undercut recesses therein, and keys or plugs holding said coils in said recesses, as set forth.

2. An armature comprising a core having undercut notches in the surface thereof thus forming teeth or projections with overhanging or spreading surfaces, separately wound coils surrounding one or more of said teeth, said coils being of such size as to pass through the narrow openings of said notches, into engagement with corresponding sides of two of said teeth under the overhanging portions thereof, and removable keys or plugs of insulating material in said notches to keep said coils in place under said overhanging portions, as set forth.

3. A separately wound coil adapted to surround one or more teeth of an armature core, and of such size in cross-section as will admit of its insertion through a narrow opening between said teeth and into a larger space

formed by the overhanging or spreading surfaces thereof, and means for retaining said coil in engagement with the sides of said teeth under the overhanging surfaces thereof, whereby said coil is retained in place.

4. In an armature, the combination with a toothed core, of separately wound coils surrounding each tooth and extending to the adjacent side of the next tooth, said coils being of such size in cross-section as will admit of their passage between the spreading surfaces of adjacent teeth, and of such shape that adjacent coils overlap, and plugs or wedges inserted between said teeth after said coils are in place to keep them in engagement with the sides of said teeth, as set forth.

5. The method of applying separately constructed coils or windings to an armature core having overhanging or spreading teeth on the surface thereof, which consists in passing said coils through the narrow openings between said teeth, moving them into the recesses under the overhanging portions thereof, and inserting plugs or keys of insulating material to keep said coils in said recesses, as set forth.

In witness whereof I have hereunto set my hand this 15th day of November, 1893.

EDWIN WILBUR RICE, JR.

Witnesses:

JOHN W. GIBBONEY,
BENJAMIN B. HULL.