

No. 679,284.

Patented July 23, 1901.

W. LAU.
ARMATURE WINDING.

(No Model.)

(Application filed Mar. 19, 1900. Renewed June 27, 1901.)

Fig. 1.

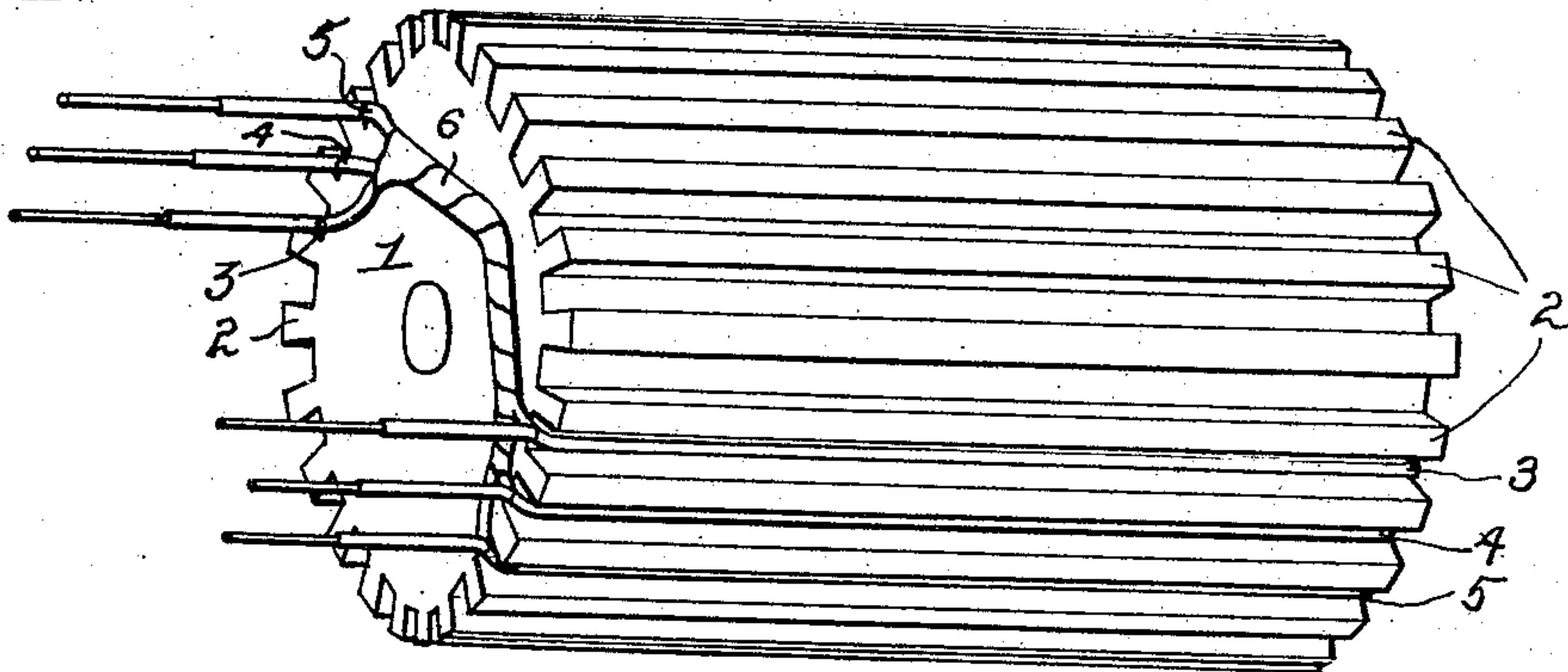
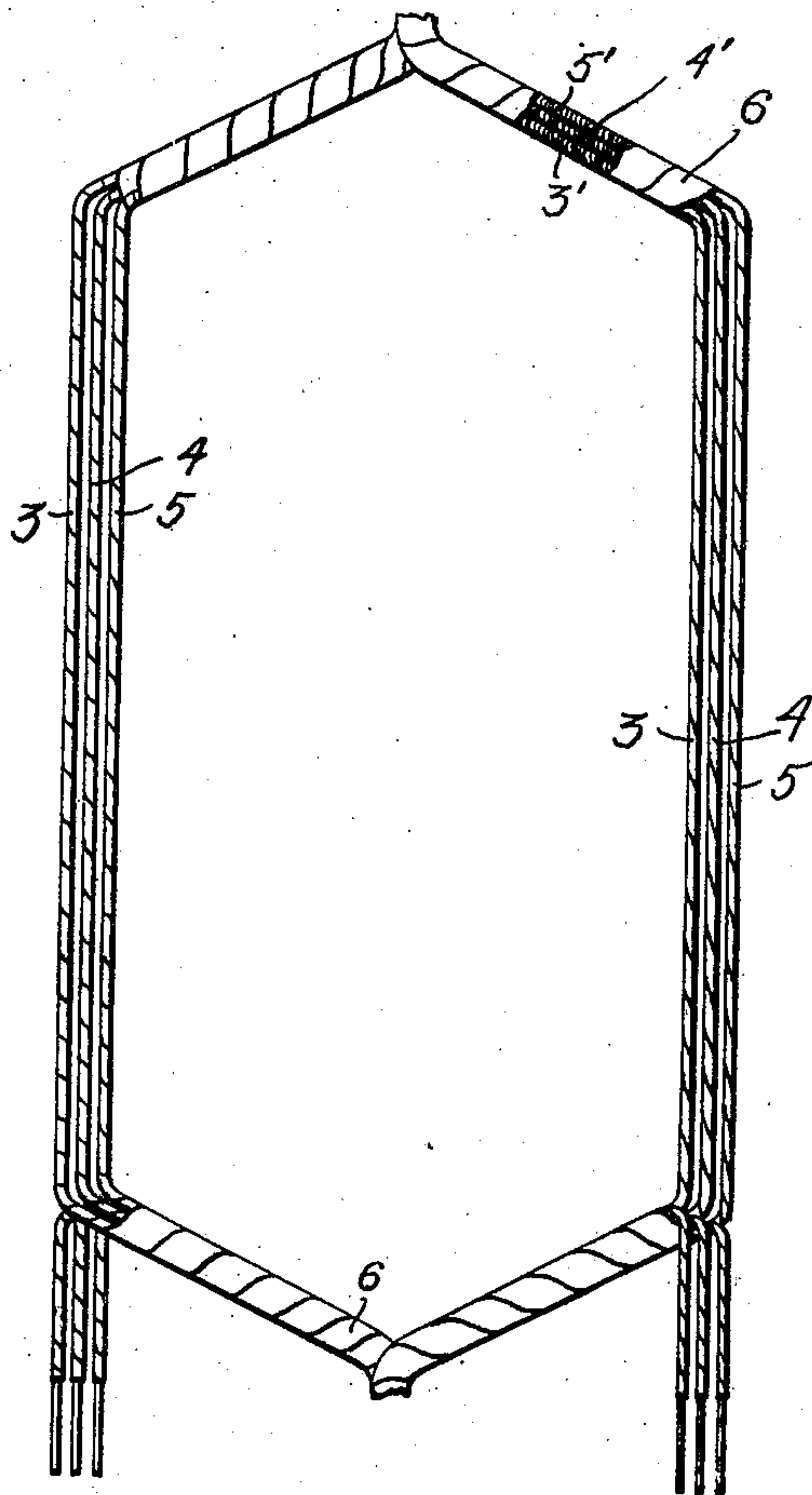


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILHELM LAU, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS & HALSKE
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ARMATURE-WINDING.

SPECIFICATION forming part of Letters Patent No. 679,284, dated July 23, 1901.

Application filed March 19, 1900. Renewed June 27, 1901. Serial No. 66,256. (No model.)

To all whom it may concern:

Be it known that I, WILHELM LAU, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a certain new and useful Improvement in Armature-Windings, (Case No. 350,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to armature-windings, and more particularly to the winding of such armatures in which the conductors thereof are placed in slots arranged radially upon the armature-surface, and has for its object the provision of improved means whereby the total length of armatures of this class may be decreased.

My invention is especially applicable to direct-current generators in which the cord-winding is employed. In winding armatures of this type the length thereof over the total length of the iron core of the armature-body is frequently very considerable, and for this reason the armature-conductors are arranged upon the end faces of the armature in a manner well known to those skilled in the art, whereby the least increase of length is secured.

It is the prime object of this invention to provide additional means for decreasing the total length of the completed armature, which consists in decreasing the amount of insulation required between the conductors upon the end faces.

It is a well-known fact that the difference of potential between conductors placed in neighboring slots in direct-current armatures is very small, and the insulation between such conductors need not therefore be of such a high character as insulation between conductors which are further displaced upon the armature-surface. In constructions of the prior art, however, the armature-conductors have been supplied with the same insulation throughout their entire lengths, and it is the prime object of my invention to decrease this insulation along certain portions of the conductors.

In accordance herewith I combine the end portions of the conductors in neighboring slots into coils, those portions of the conduc-

tors lying in the slots being preferably supplied with the ordinary insulation—i. e., being preferably double cotton-covered and provided with tape or insulation of a similar nature—while those portions of the conductors in neighboring slots which lie across the end faces of the armature are preferably supplied only with a single covering of cotton, a plurality of the end connections of the said conductors in neighboring slots being then combined upon the said end faces and together wound with one layer of tape, thereby saving a number of layers of tape and materially decreasing the total length of the armature.

I will describe my invention more particularly with reference to the accompanying drawings, illustrating the preferred embodiment thereof, in which—

Figure 1 represents a partially-completed armature constructed in accordance with my invention. Fig. 2 is a detailed view of an armature-coil constructed in accordance with my invention.

Like characters of reference indicate like parts in the two figures.

Referring now particularly to Fig. 1, I have shown an armature 1, supplied with teeth 2. I have shown three conductors 3 4 5, the said conductors occupying neighboring slots upon the armature-surface. Each of these armature-conductors is preferably cotton-covered and taped throughout the whole of its portion which lies in a slot and throughout the portion which is adapted to connect the same to the commutator or to connect the same with another set of coils. The portions 3' 4' 5' of the conductors 3 4 5 lying across the end faces of the armature are preferably supplied with, but a single layer of cotton covering, the three conductors being then preferably combined together and supplied with a covering of tape 6. It is obvious that a decreased length of the armature is hereby obtained, inasmuch as a number of thicknesses of tape are dispensed with, the extra tape which would have been wound about portions 3' 4' 5' not being necessary, as the conductors occupying neighboring slots have no very large difference of potential, and thereby need not be provided with such a high insulation.

I have herein shown and particularly de-

scribed one embodiment of my invention; but I do not wish to limit myself to the precise number of conductors employed nor to the precise adaptation to a certain class of machines; but,

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

1. Coil-winding for armatures of electric machines, characterized thereby, that the several conductors forming a coil are placed in neighboring slots, well insulated and taped in those portions within the slots, while the portions crossing the end faces of the armature are provided with less insulation but taped in common, thereby avoiding a lengthening of the armature.

2. The combination with an armature-core, provided with slots, of a plurality of conductors adapted to be placed in adjacent slots, the portions of each of the conductors within the slots being separately provided with insulating-tape, and those portions of the conductors extending across the faces of the armature being placed together and collectively wound with the insulating-tape, substantially as described.

3. An armature-winding unit comprising a plurality of conductors adapted to be placed in adjacent slots about an armature-core, the portions of each of the conductors adapted to be placed within the slots being singly taped, the portions of the conductors adapted to cross the end faces of the armature being placed together and collectively taped, substantially as and for the purpose herein set forth.

4. The combination with an armature-core provided with slots, of a plurality of conductors adapted to be placed in adjacent slots, the portions of each of the conductors within the slots being provided with insulating material and separately provided with insulating-tape, and those portions of the conductors extending across the faces of the armature being also provided with insulating material but placed together and collectively wound with insulating-tape, substantially as described.

5. An armature-winding unit comprising a plurality of conductors adapted to be placed in adjacent slots about an armature-core, the

portions of each of the conductors adapted to be placed within the slots being provided with insulating material and singly taped, the portions of the conductors adapted to cross the end faces of the armature being also provided with insulating material but placed together and collectively taped, substantially as and for the purpose herein set forth.

6. An armature-winding unit comprising a plurality of conductors adapted to be placed in adjacent slots about an armature-core, the portions of each of the conductors adapted to be placed within the slots being provided with a normal amount of insulation to insulate the same from the armature-core, and those portions of the conductors adapted to cross the end faces of the armature, being singly provided with less than the normal insulation but placed together and collectively provided with additional insulation to insulate the whole from the core and surrounding conductors, substantially as and for the purpose herein set forth.

7. The combination with an armature-core provided with slots, of a plurality of conductors adapted to be placed in adjacent slots, the portions of each of the conductors within the slots being provided with cotton covering and separately provided with insulating-tape, and those portions of the conductors extending across the faces of the armature being also provided with cotton covering but placed together and collectively wound with insulating-tape, substantially as described.

8. An armature-winding unit comprising a plurality of conductors adapted to be placed in adjacent slots about an armature-core, the portions of each of the conductors adapted to be placed within the slots being provided with cotton covering and singly taped, the portions of the conductors adapted to cross the end faces of the armature being also provided with cotton covering but placed together and collectively taped, substantially as and for the purpose herein set forth.

In witness whereof I hereunto subscribe my name this 14th day of February, A. D. 1900.

WILHELM LAU.

Witnesses:

WOLDEMAR HAUPT,
WILLIAM MAYNER.