(No Model.)

B. G. LAMME.

ARMATURE FOR ELECTRICAL GENERATORS AND MOTORS.

No. 589,839. Patented Sept. 14, 1897.

Fig. 1.

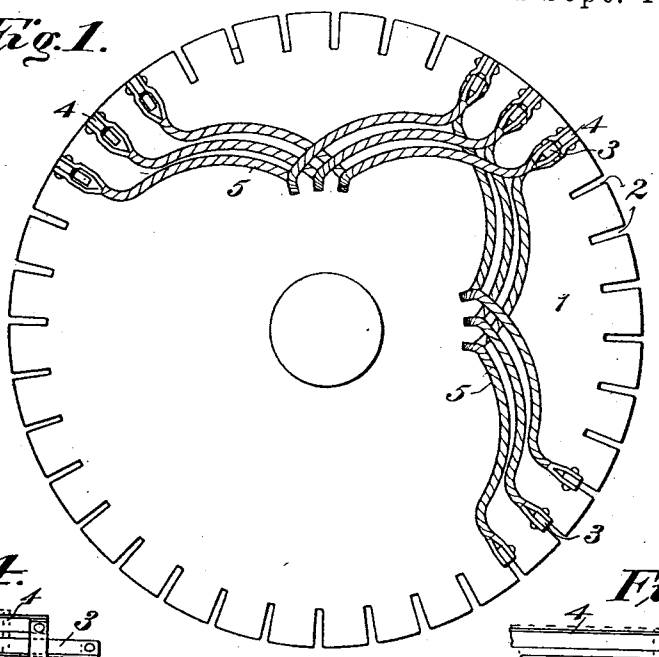


Fig. 4.

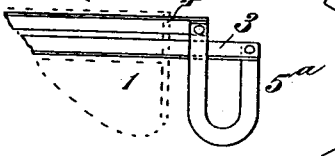


Fig. 2.

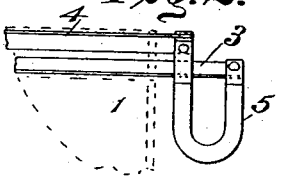
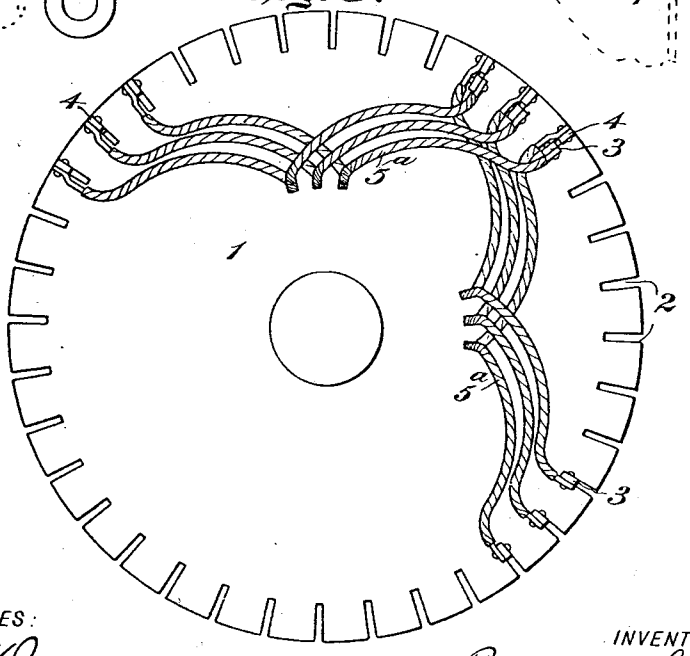


Fig. 3.



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ARMATURE FOR ELECTRICAL GENERATORS AND MOTORS.

SPECIFICATION forming part of Letters Patent No. 589,839, dated September 14, 1897.

Application filed July 2, 1897. Serial No. 643,199. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. LAMME, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Armatures for Electrical Generators and Motors, (Case No. 745,) of which the following is a specification.

My invention relates to electrical machines, and more particularly to the armatures of such machines as are provided with low-resistance windings in the form of bars or strips.

The object of my invention is to provide a winding which is suitable for machines of any size or capacity and which may be readily applied to the core and any portion of which may be readily removed without disturbing the other portions.

It was usual in the construction of machines of large size prior to my invention to place bar conductors in the slots of the core and to connect the ends of such conductors by means of connectors, which were riveted or otherwise fastened to the projecting ends. In every case, so far as I am aware, however, where there were two bar conductors per slot the end connectors were so fastened thereto that the inner connections were not easily or readily made, and it was practically impossible to remove any of the inner bars without disturbing some of the other connections. I obviate all such difficulties by making the inner bar conductors longer than the outer ones and by riveting or otherwise fastening the respective end of each connector to an inner long and an outer short bar in separate slots, so that when the entire winding is in position it is possible, by disconnecting any one bar from its connector, to drive that bar out of the slot without disturbing any of the other bars or connectors. The relative location of parts which I employ is also such that free access may be had to all of the bars for the purpose of riveting or otherwise fastening the ends of the bars or connectors together.

In the accompanying drawings, Figure 1 is an end elevation of an armature-core provided with a portion of its set of bar conductors and end connectors. Fig. 2 is a detail view showing, diagrammatically, in side elevation the long and short bar conductors and the end connectors for the same. Fig. 3 is a view similar to Fig. 1, showing a modified form of end connectors. Fig. 4 is a view corresponding to Fig. 2 and embodying the form of end connector shown in Fig. 3.

The details of construction illustrated in the drawings are as follows:

1 is an armature-core, the periphery of which is provided with longitudinal slots 2, as is usual. Each of the slots 2 is provided with a copper bar or strip 3, which projects a considerable distance beyond the ends of the core, as is indicated in Fig. 2. 4 are similar bars or strips located in the outer portions of the slots and projecting a less distance beyond the ends of the core 1.

Each of the conductors 3 and 4 may be a single bar, or it may comprise two or more strips placed side by side, as may be found desirable in practice.

5 are the end connectors in the form of curved bars or strips, and, as shown in Figs. 1 and 2, each of these bars or strips consists of two pieces placed side by side and covered with suitable insulation. Each connector 5 is fastened at one end to the outer end of a short outer bar 4 and at its other end to the corresponding outer end of a long bar 3, located in a different slot, the two strips of which the connector is composed being separated at the ends, so as to, in the one case, extend around the corresponding long bar without making contact with the same and at each end being fastened to the two sides of the bar 3 or the bar 4, as the case may be, by means of a rivet or rivets. The particular means for fastening the bars 3 and 4 and the connectors 5 may be different from that shown, however, if desired.

In the construction shown in Figs. 3 and 4 the core 1, slots 2, and conductor-bars 3 and 4 are the same as the corresponding parts shown in Figs. 1 and 2, but in this construction the end connectors 5^a are single bars or strips and are riveted or bolted to one side only of the corresponding conductor-bars 3 and 4.

It is to be understood that the number of slots and bars 3 and 4 spanned by each connector 5 or 5^a, as the case may be, will depend

upon the number of slots in the core and the number of poles of the machine.

It is apparent from the illustration and the foregoing description that the construction is such as to preclude the rubbing together of any of the end connectors and that each of the joints between the connectors and the bars 3 and 4 is readily accessible, so that the desired fastening may be effected without difficulty, and so that if it desired for any reason to remove any one of the conductor-bars this may be done by removing the rivet and driving the bar out of the slot without disturbing any of the other bars or end connectors or the fastenings between the same.

I claim as my invention—

1. An armature for electrical machines comprising a core provided with slots and a winding located in said slots, said winding comprising an inner long bar and outer short bar in each slot, and end connectors bolted or riveted to the projecting ends of the bars.

2. An armature for electrical machines comprising a core provided with slots, relatively long bar conductors in the inner portions of said slots, shorter bar conductors in the outer portions of the slots and connecting bars or strips each of which is fastened at one end to the extremity of a short bar and at the other end to the corresponding extremity of a long bar.

3. An armature for electrical machines comprising a core provided with slots and a set of coils composed of inner long bars, outer short bars and curved connecting strips or bars, the respective ends of which are fastened to the projecting ends of a long and a short bar located in different slots.

4. An armature for electrical machines comprising a core provided with slots and a winding consisting of relatively long inner bars and relatively short outer bars located in said slots, and connecting bars or strips the respective ends of each of which are riveted to the projecting end of a long bar and the projecting end of a short bar in different slots.

In testimony whereof I have hereunto subscribed my name this 30th day of June, A. D. 1897.

BENJ. G. LAMME.

Witnesses:
H. C. TENER,
ETHAN I. DODDS.