No. 854,897. PATENTED MAY 28, 1907.

B. G. LAMME.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

APPLICATION FILED SEPT. 20, 1906.

Fig. 1.

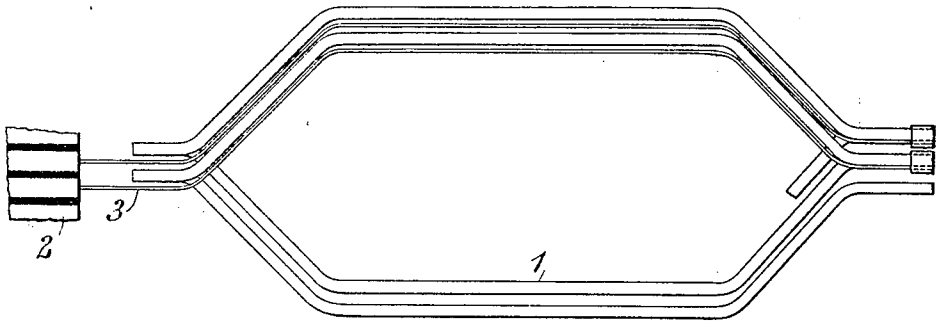


Fig. 2.

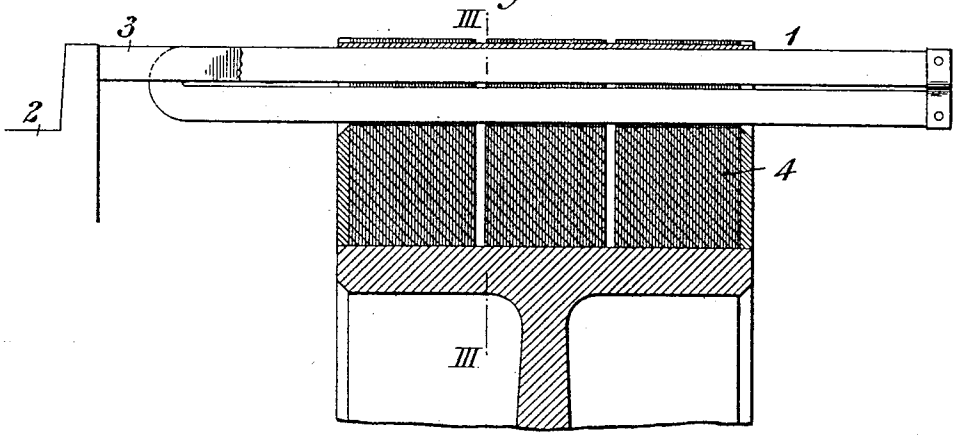
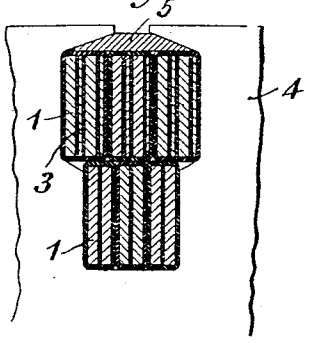


Fig. 3.



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ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

No. 854,897. Specification of Letters Patent. Patented May 28, 1907.

Application filed September 20, 1906. Serial No. 335,508.

To all whom it may concern:

Be it known that I, BENJAMIN G. LAMME, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Armatures for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to armatures for dynamo-electric machines and to windings therefor.

The object of my invention is to provide an armature core and a winding therefor from which the heat generated during operation may be more readily dissipated than has heretofore been feasible.

A further object is to so arrange the winding that it may be more readily applied to the armature core than others that are employed under similar conditions.

The armature of single phase motors of the commutator type of construction are usually provided with high-resistance connections between their windings and the commutator segments, such connections being sometimes located in the slots which contain the conductors of the armature winding.

In another application Serial No. 263,480, filed by me June 2, 1905, I have set forth an armature structure in which the resistance conductors are located in narrowed portions of the core slots beneath the conductors of the winding, the bases of the teeth being not materially less in width than their outer ends by reason of the narrow portions of the slots. In that structure, the heat generated in the resistance conductors, though greater in amount than that generated in the comparatively low-resistance conductors of the armature winding, cannot be as readily dissipated because of the less advantageous positions of the resistance conductors. In the present structure, however, the high-resistance conductors are so disposed that the heat generated therein may be as readily dissipated as that generated in the conductors of the armature winding, while the core slots are also so shaped that the widths of the teeth may not be less or materially less at their bases than at the outer ends, as in the aforesaid application.

Figure 1 of the accompanying drawing is a diagrammatic view of an armature winding illustrating the application of my invention. Fig. 2 is a longitudinal sectional view of a portion of an armature that is constructed in accordance with my invention, and Fig. 3 is a transverse sectional view on the line III—III of Fig. 2.

An armature winding, that comprises a plurality of coils 1, is connected to the segments of a commutator cylinder 2 by means of German silver or other comparatively high-resistance conductors 3 which are insulated from and preferably disposed adjacent to one side of the coils to the ends of which they are connected.

The armature winding is applied to a magnetizable core 4 having peripheral slots the deeper portions of which are narrower than the portions near the periphery and the openings into which are somewhat constricted so as to form what are commonly known as partially closed slots. The armature coils are so shaped and so arranged upon the armature core that the sides to which the resistance conductors 3 are adjacent may be located in the upper, wider portions of the core slots and the opposite sides in the deeper, narrower portions of the slots, substantially as shown in Fig. 3. The coils are preferably arranged in separately insulated groups, the sides of which are of not greater width than the slot openings through which the coils must be inserted in order to apply them to the core, and the resistance conductors 3 are included in the groups with the armature conductors that are placed in the upper, wider portions of the slots. Suitable wedges 5 may be inserted, if desired, in the upper portions of the slots, for the purpose of securely retaining the coils in position. When the armature core and winding are thus constructed and arranged, the heat generated in the resistance conductors may be readily dissipated, because the conductors are located near the periphery of the armature, while at the same time the core slots are of such form that no greater flux density need exist at the bases of the teeth than exists in other portions thereof. Since one-half of the armature winding and the resistance conductors lie adjacent to the periphery of the armature, by far the greater portion of the heat caused by resistance losses in the armature occurs near the periphery, which is bet-

ter ventilated than other portions of the structure and from which the heat may consequently be dissipated most readily. As the resistance conductors lie adjacent to the conductors of the armature coils, the armature coils will aid in conducting away the heat generated therein and the resistance conductors cannot become heated to a temperature greatly in excess of that of the armature coils.

No great amount of insulation need be applied between the resistance conductors and the armature winding if the resistance conductors are placed adjacent to the sides of the coils to the ends of which they are connected, since the only difference of potential existing between a resistance conductor and the armature coil conductors is that which results from the drop of potential over the resistances of the armature coil and of the resistance conductor.

A further advantage to be derived from the use of the invention is that the resistance conductors may be permanently secured to the ends of the armature coils and may be assembled in groups therewith prior to appllication of the winding to the armature core, and in this manner, considerable time and labor may be saved over what is required to assemble structures heretofore employed.

I claim as my invention:

1. The combination with a magnetizable core having peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the winding to a commutator cylinder that are also located in the outer and wider portions of the slots.

2. The combination with a magnetizable core having peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the winding to a commutator cylinder that are also located in the outer and wider portions of the slots and that are disposed adjacent to the conductors of the coils to which they are connected.

3. The combination with a magnetizable core having peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the windings to a commutator cylinder that are also located in the outer and wider portions of the slots and that alternate in position with the conductors of the coils.

4. The combination with a magnetizable core having partially inclosed peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the conductors of which are arranged in groups of not greater width than the slot openings and the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the winding to a commutator cylinder that are also located in the outer and wider portions of the slots.

5. The combination with a magnetizable core having partially closed peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the conductors of which are arranged in groups of not greater width than the slot openings and the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the winding to a commutator cylinder that are also located in the outer and wider portions of the slots and that are disposed adjacent to the conductors of the coils to which they are connected.

6. The combination with a magnetizable core having partially closed peripheral slots the outer portions of which are wider than the inner portions, of a winding that comprises a plurality of coils the conductors of which are arranged in groups of not greater width than the slot openings and the sides of which are located respectively in the outer and wider portions and in the inner and narrower portions of the slots, and conductors for connecting the winding to a commutator cylinder that are also located in the outer and wider portions of the slots and that alternate in position with the conductors of the coils.

In testimony whereof, I have hereunto subscribed my name this 13th day of September, 1906.

BENJ. G. LAMME.

Witnesses:
OTTO S. SCHAIRER,
BIRNEY HINES.