

(No Model.)

J. F. McLAUGHLIN.

ARMATURE FOR ELECTRIC MOTORS AND GENERATORS.

No. 541,380.

Patented June 18, 1895.

Fig. 1.

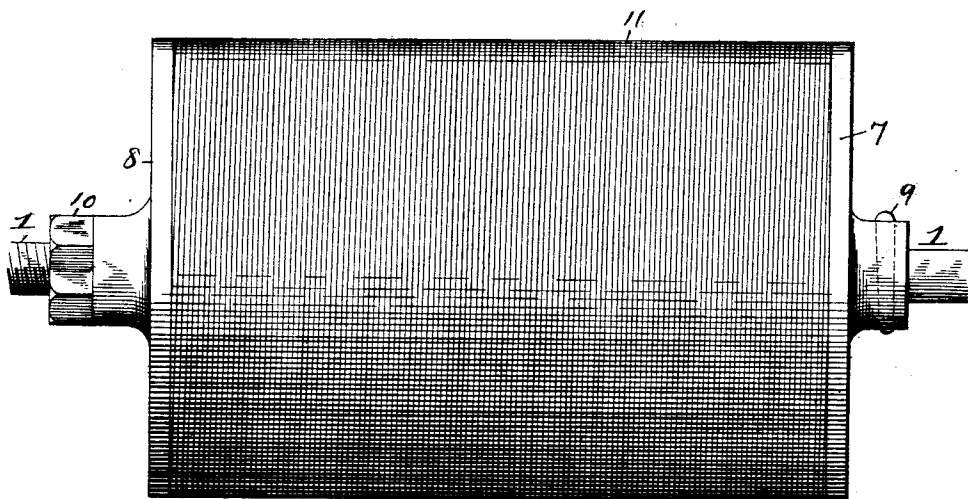
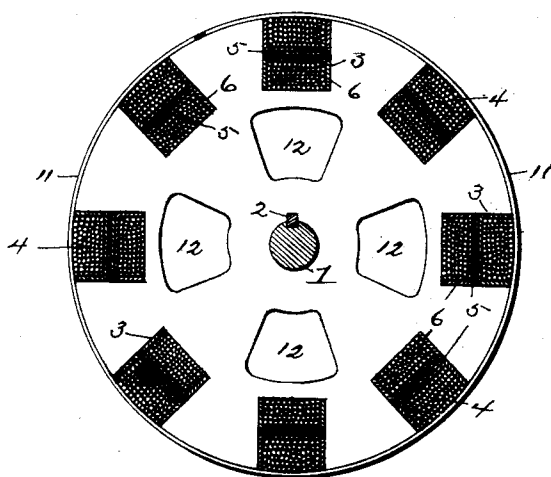


Fig. 2.



Witnesses:

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ARMATURE FOR ELECTRIC MOTORS AND GENERATORS.

SPECIFICATION forming part of Letters Patent No. 541,380, dated June 18, 1895.

Application filed December 5, 1891. Serial No. 414,116. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Armatures for Electric Motors and Generators, of which the following is a specification.

My invention has reference to improvements in armatures for electric motors and for dynamo electric machines, the object of the invention being to simplify the construction of such armatures in such manner that the armature coils may be made each separately without requiring the handling of the armatures as a whole and to permit the removal of any one of these coils for inspection or repair without dismantling the whole armature. At the same time the armature coils are on all sides protected against mechanical injury, being incased by the body of the armature near the circumference thereof, and by a magnetic shield composed of iron wire wrapping. This wire wrapping has, therefore, the double function of a magnetic shield and of a means for confining the armature coils in their positions.

My present invention is an improvement upon the armature shown and described in my Letters Patent No. 458,856, granted to me on September 1, 1891. In the said Letters Patent I have shown an armature, the main body of which is provided with a series of segmental and nearly rectangular channels formed near the periphery, but not opening into the periphery, and in these channels are placed the armature coils, which, by a thin web remaining at the periphery, are held in place against the action of centrifugal force, which tends to throw the coils outward. In this construction the outer walls of the channels, that is to say, the webs which remain at the periphery of the body of the armature, form a magnetic shield to the coils, and if the body of the armature is made laminated, as shown in the said Letters Patent, this shield is continuous circumferentially, but discontinuous axially, while in my present invention the magnetic shield is continuous, both circumferentially and axially, whether the body of the armature is made as a solid mass of iron

or is made laminated, with non-magnetic, and preferably insulating material, between the laminæ.

In the accompanying drawings, which form a part of this specification, Figure 1 represents an elevation of my improved armature; and Fig. 2, a cross-section of the same, showing one of the laminæ of which the body of the armature may be composed in elevation.

Like numerals of reference indicate like parts.

Upon the shaft 1, is fixed by a key 2, the main body of the armature, which looked upon as a whole, is a cylinder having a number of rectangular troughs 3, 3, cut into the periphery. These troughs extend throughout the whole length of the cylindrical body and are parallel with the axis of the cylinder, and they are of such size as to accommodate each an armature coil 4, which is wound upon a bobbin 5, of soft iron, the flanges 6, of which are in magnetic contact with the side walls of the trough. By preference, these bobbins are made of sheet-iron, in the manner shown in my aforesaid Letters Patent, although I am not necessarily confined to this construction. A coil is placed in each trough, and it is inserted into the same from the sides, instead of being pushed into a closed channel from the end, as in the construction shown in my Letters Patent, and the coils are held against endwise movement by two heads 7, 8, one of which, 7, is secured to the armature shaft by a key 9, while the other 8, is forced against the end of the body of the armature by a nut 10.

To confine the coils in their seats in the troughs 3, I apply a wrapping of bare iron wire 11, and this wrapping thus serves both as a means for holding the coils against lateral displacement, and as a thin magnetic shield for the coils.

The wire wrappings are applied over the cylindrical body after the latter has been assembled, if made of laminæ, and has been clamped between the heads 7, 8, with the coils seated in the troughs; so that when the wire wrapping is on, the troughs are converted into channels in which the coils are seated in the same manner as in the armature shown in my aforesaid Letters Patent; and if for inspection or repair a coil has to be withdrawn,

the head 8, is removed and any coil may then be drawn lengthwise from the channel in which it is seated.

By preference the body of the armature is provided with large perforations 12, which if the body is laminated, are made in each lamina; and there are like perforations in the heads 7, 8, so that a number of channels are formed through which the air circulates when the armature rotates, and which thus serve the purpose of cooling the armature and to reduce the weight of the same.

The armature coils are connected with each other and with the commutator in the usual manner, and preferably in the manner shown in my aforesaid Letters Patent; and this being well understood in the art, such connections have been omitted from the drawings, for the sake of simplicity of illustration.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. An armature for electric motors and dynamo electric generators, composed of a cylindrical iron body provided with troughs opening into the periphery, armature coils removably seated in the troughs, and an iron wire wrapping constituting a magnetic shield continuous both longitudinally and peripherally over the cylinder, substantially as described.

2. An armature for electric motors and dynamo electric generators composed of a cylindrical iron body formed with troughs opening into the periphery, armature coils removably seated in said troughs, and a magnetic shield, continuous both longitudinally and pe-

ripherally, over the said armature coils, substantially as described.

3. An armature for electric motors and dynamo electric generators composed of a cylindrical iron body having rectangular troughs opening into the periphery and extending parallel to the axis of the cylinder, armature coils with magnetic cores in magnetic contact with the iron body, seated in the troughs, and an iron wire wrapping over the cylinder, constituting a longitudinally and peripherally continuous magnetic shield and closing the troughs and confining the coils therein against lateral displacement, substantially as described.

4. An armature for electric motors and dynamo electric generators consisting of a cylindrical iron body having longitudinal troughs opening into the periphery, armature coils seated in said troughs, a wrapping of iron wire over the cylinder, constituting a longitudinally and peripherally continuous magnetic shield and closing said troughs and confining the coils against lateral displacement, and removable heads for the armature body for confining the coils against longitudinal displacement; whereby the coils may be removed and exchanged, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

J. R. RICHARD,
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