

(No Model.)

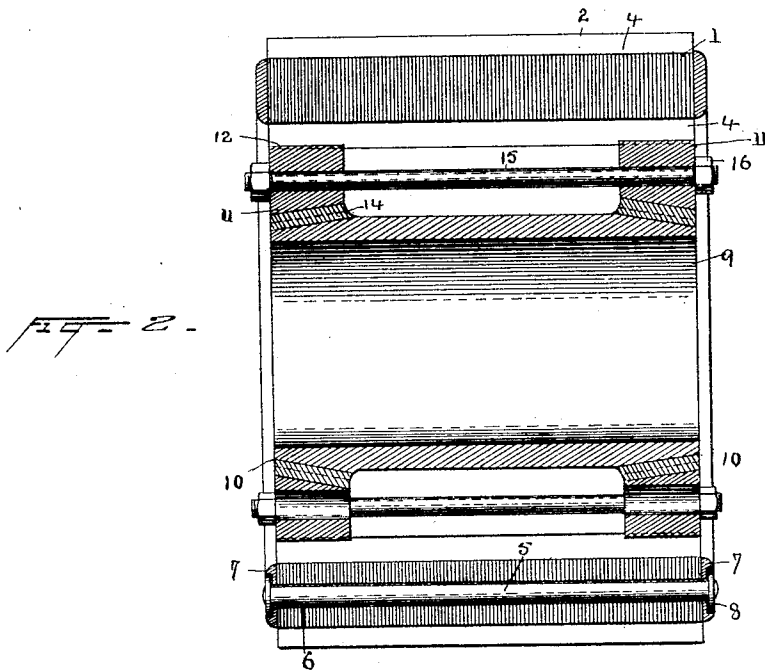
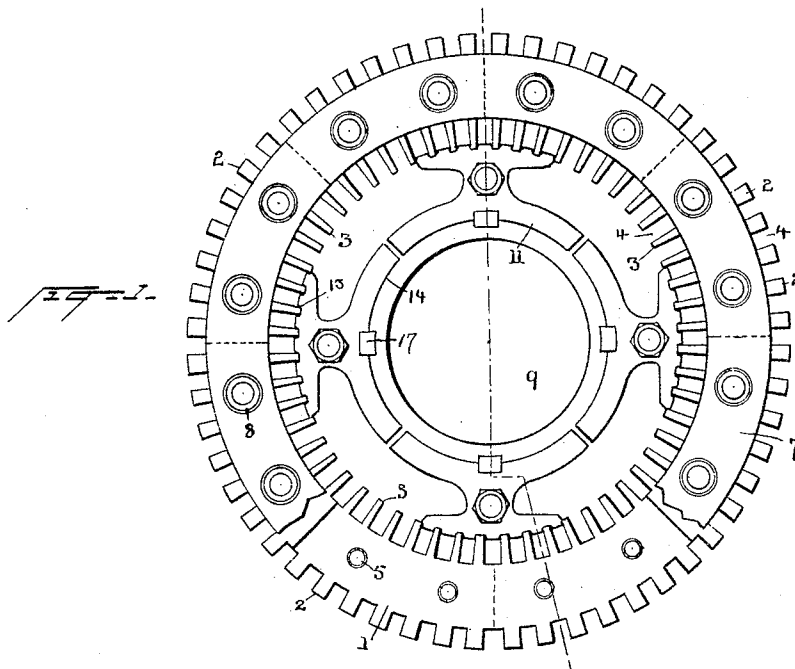
2 Sheets—Sheet 1.

R. LUNDELL.

ARMATURE FOR ELECTRIC MOTORS OR DYNAMOS.

No. 461,795.

Patented Oct. 20, 1891.



Witnesses
J. S. Clark.
R. F. Oberly

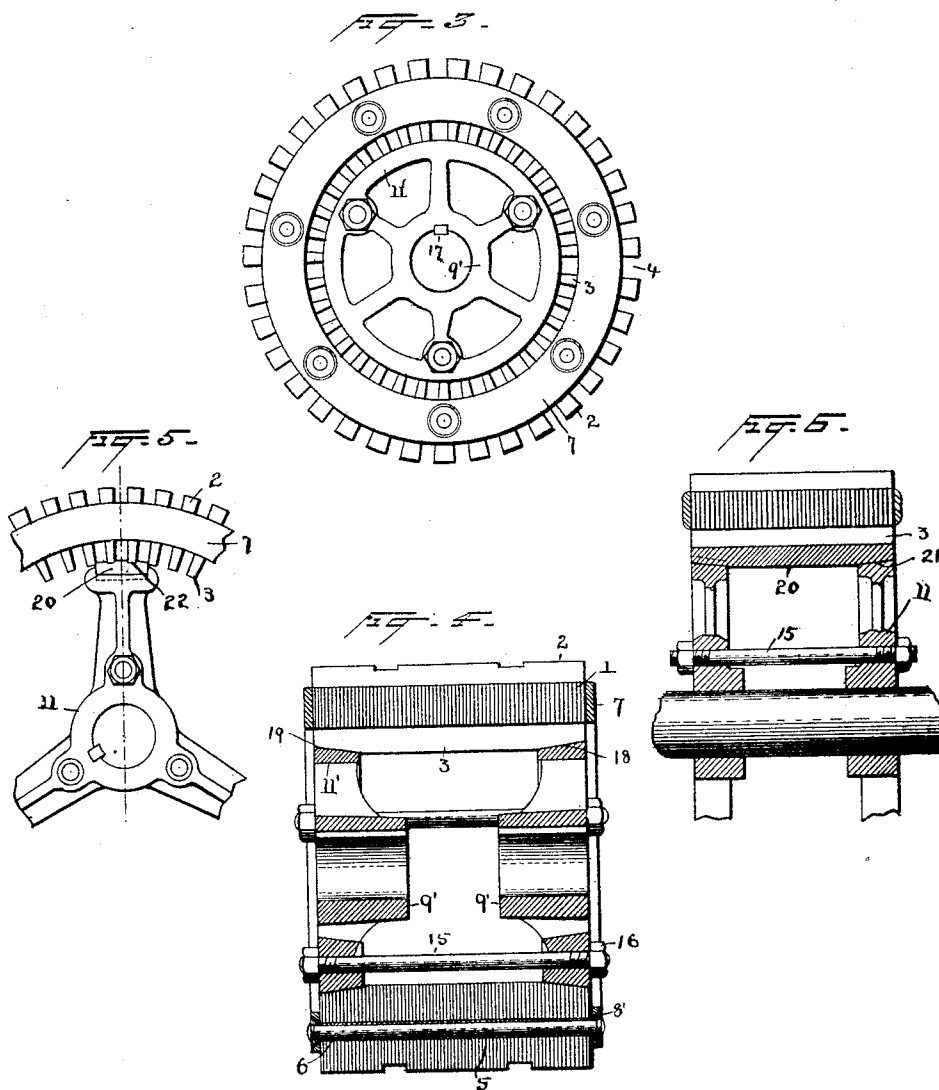
Inventor
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UNITED STATES PATENT OFFICE.

ROBERT LUNDELL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
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ARMATURE FOR ELECTRIC MOTORS OR DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 461,795, dated October 20, 1891.

Application filed April 4, 1891. Serial No. 387,605. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LUNDELL, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Armatures for Electric Motors or Dynamos, (Case B,) of which the following is a specification.

The present invention relates to improvements in the cores of armature rings or cylinders and to means for securing said cores to the armature-shaft.

The object of the invention is to so form the armature that it shall have increased efficiency, shall be easy to manufacture, and to provide ready means for rigidly supporting the armature on the shaft; and the invention consists in the several features and combinations hereinafter described and claimed.

In the accompanying drawings, illustrating the improvements, Figure 1 is a side view of the armature-core, a portion being broken away at the lower side and showing, also, means for supporting the armature. Fig. 2 is a central section of the same armature. Figs. 3 and 4 are similar views of a modified form, and Figs. 5 and 6 views showing an additional modification.

The main body of the armature ring or cylinder is built up of sheet-metal rings or washers 1, which may or may not be separated by paper or other insulating materials. These washers are stamped from sheet-metal plates and are formed with teeth or projections 2 3 on the inner and outer faces. When the washers are put together to build up the ring or cylinder, these projections are put in line with each other, so as to leave grooves 4 extending entirely across the ring and in which the armature-coils are to be wound. Said coils are omitted in the drawings to avoid unnecessary complications. In some cases the projections on one or both faces of the ring may be omitted. I find it preferable to build up the ring of short plates in the form of arcs and having teeth 2 3, instead of using washers in the form of rings, as above described. Several arc-shaped plates are arranged in a circle, and other plates similarly arranged are placed above the first series, the plates in one circle breaking joints with those in the

adjacent circle and all being secured together by soft-iron rods 5, surrounded by paper 6. In Fig. 1 each layer is composed of four pieces and twelve bolts 5 are employed. If an uneven number of divisions or coils is desired in the armature—for example, twenty-seven—when the armature is to be used with a four-pole field, instead of building up the different layers in the core of four pieces, as shown in Fig. 1, an uneven number of pieces, as three, may be used, each piece having an uneven number of teeth, say nine. In this case the number of bolts 5 employed would be nine. The bolts are arranged at regular intervals around the core, and this will cause some of them to come in line with the grooves in which the armature-coils are wound; but since the bolt-heads do not project the coils do not have to be bent around them, but can be wound regularly as though the bolts were absent. At either end of the ring is placed a thicker strengthening-ring 7, which is provided with recesses, in which are placed hard-metal washers or collars 8, into which the rods 5 fit. The ends of said rods are then riveted, whereby the laminations of the armature are securely held together. This means for securing the parts is found to be better than ordinary bolts with nuts, since the collars 8 can be much thinner than a nut of necessary strength and can be sunk into the ring 7. The mass of metal where the rods are secured to the rings is thus reduced to the minimum, and there are no projections in the way of a regular winding of the armature-coil on the core. After the armature is thus built up it is put in a lathe and the outer and inner faces are turned to make them true, if necessary. The bevels on the inner face of the ring, hereinafter described in connection with Fig. 4, are also formed at this stage of the manufacture.

The means for supporting the armature on the motor-shaft will now be described.

9 is a sleeve or hub adapted to be rigidly connected to the motor-shaft by means of a spline or otherwise. This sleeve has beveled faces 10 at both ends. Between the sleeve and the inner face of the armature-ring at each end is a spider, made in several pieces, as shown in Fig. 1, or in one piece, as shown in Fig. 3. In Fig. 1 the spider is formed of

four pieces 11. The outer face 12 of each of these pieces is curved and is provided with a series of grooves 13, adapted to receive the inner edges of the teeth 3. The inner face 14 is also curved, as shown in Fig. 1, and is inclined, as shown in Fig. 2, to correspond in shape to the end of sleeve 9. Extending parallel with the shaft of the armature between each pair of pieces 11 is a bolt 15, having nuts 16, by means of which the sections of the spider may be drawn toward each other and tightly wedged between the teeth 3 and the sleeve 9. 17 are splines between the spider and the hub 9.

In Figs. 3 and 4 the parts are designated, so far as practicable, as in Figs. 1 and 2. In the former figures, however, the spiders 11' are made in a single ring-shaped piece, the outer face 18 being beveled or inclined to correspond to a similar bevel or incline 19 on the inner face of the projections 3 of the armature-ring. Instead of using a hub 9, I form hubs 9' at the center of each spider. These are adapted to be rigidly connected with the motor-shaft. On the heads of the rods 5 are placed conical collars 8', instead of the form shown in Fig. 2, said heads being upset or riveted, as already described.

Figs. 5 and 6 illustrate another modification. The spiders 11 have several arms, the outer ends of which are grooved and beveled, as shown in Figs. 5 and 6, respectively. At the outer ends of the arms are keys 20, having beveled faces 21 and having grooves 22 adapted to receive the inner teeth 3 of the armature, so that when the two spiders are forced toward each other the spiders and armature will be rigidly connected.

It will be seen that the spiders in all the forms described are entirely within the circle

formed by the inner ends of the teeth 3, so that the spiders do not interfere with the regular winding of the ring or cylinder.

What I claim is—

1. The combination of an armature ring or cylinder having projections on its inner face, a shaft, and a spider or support between the shaft and the armature, the face bearing against said projections on the armature having grooves in which the projections rest, substantially as described.

2. The combination of an armature ring or cylinder having projections on its inner face, a shaft, a spider or support between the shaft and armature, said spider having grooves in which said projections bear, and means for wedging the parts together, substantially as described.

3. The combination of an armature ring or cylinder having projections on its inner face, a shaft, a spider or support between the shaft and the armature, and a key between the spider and armature, the face of the key bearing against said projections on the armature and having grooves in which the projections rest, substantially as described.

4. The combination of an armature ring or cylinder having projections on its inner face, two spiders having curved outer faces conforming to the inner face of the ring and beveled and grooved, and means for drawing the spiders toward each other, substantially as described.

This specification signed and witnessed this 28th day of March, 1891.

ROBT. LUNDELL.

Witnesses:

CHARLES M. CATLIN,
AUGS. HAVILAND.