(No Model.)

C. D. JENNEY.

ARMATURE.

No. 422,419. Patented Mar. 4, 1890.

Fig. 1.

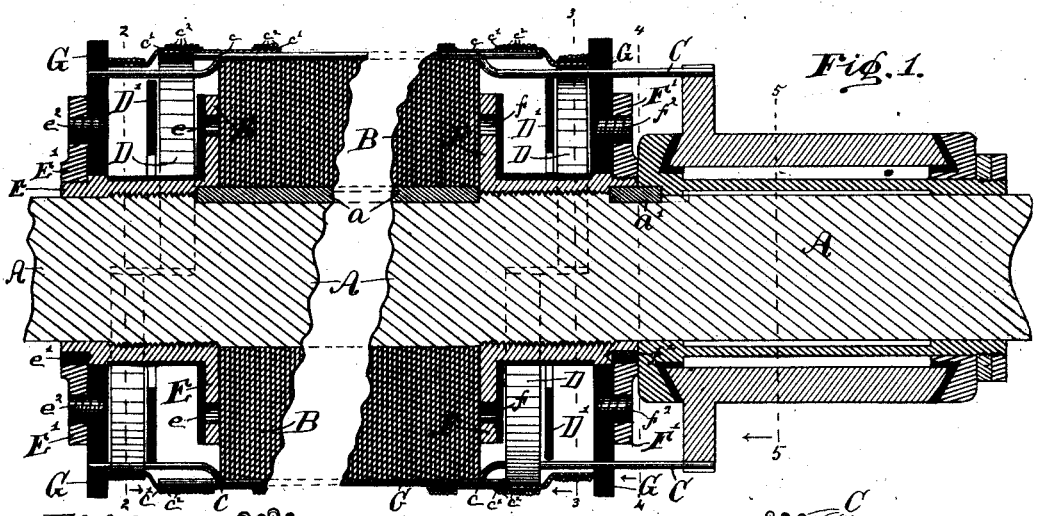


Fig. 2.

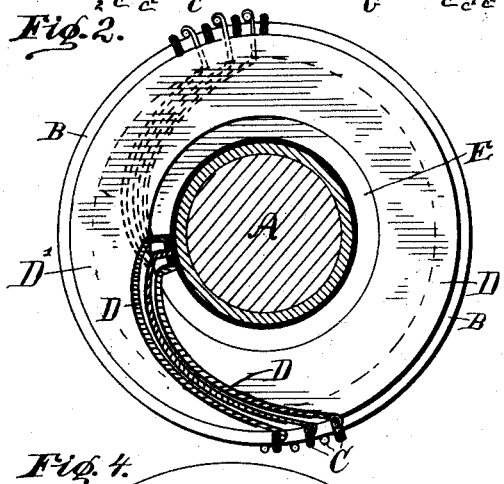


Fig. 3.

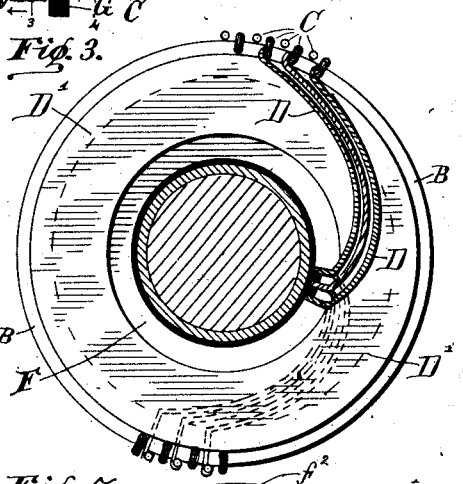


Fig. 4.

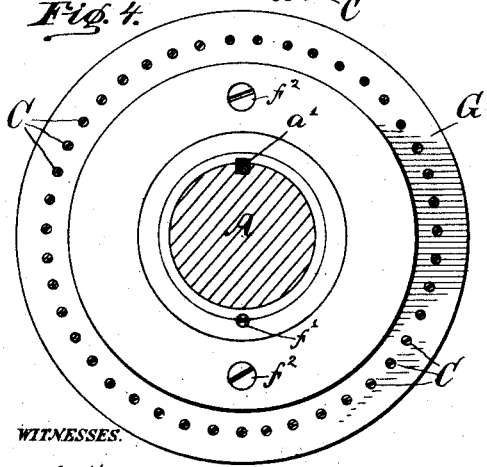
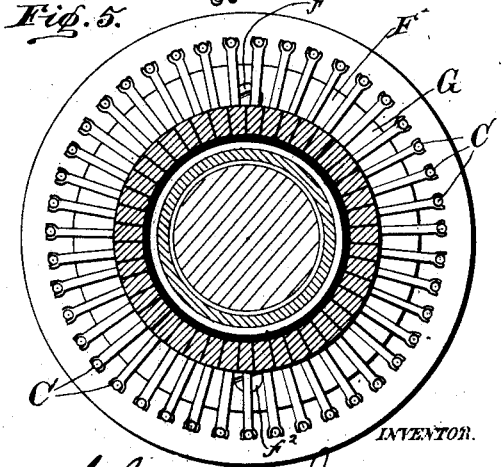


Fig. 5.



WITNESSES.

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CHARLES D. JENNEY, OF INDIANAPOLIS, INDIANA.

ARMATURE.

SPECIFICATION forming part of Letters Patent No. 422,419, dated March 4, 1890.

Application filed May 14, 1889. Serial No. 310,772. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. JENNEY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Armatures, of which the following is a specification.

The object of my said invention is to produce an armature for dynamo-electric machines or electric motors, which shall be strong and durable in its construction, efficient in its operation, and simple and inexpensive in its manufacture, and in which the danger of short-circuiting shall be reduced to a minimum.

Said invention consists in certain details of construction and arrangement of parts, which will first be fully described in the specification, and then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a longitudinal central sectional view of an armature embodying my said invention, the central portion being broken away; Fig. 2, a transverse sectional view looking toward the center from the dotted line 2 2 in Fig. 1, and Figs. 3, 4, and 5 similar views as seen from the dotted lines 3 3, 4 4, and 5 5, respectively.

In said drawings the portion marked A represents the armature-shaft; B, plates forming the core of said armature; C, insulated wires forming, with the connecting-strips, the armature-coils; D, said strips; E and F, the heads by which the plates forming the core are held in position, and G heavy disks of insulating material attached to said heads.

The shaft A is slightly larger in the center than at the ends, and the two ends of said larger central portion are screw-threaded. The space between said screw-threaded portions has a key-seat in which is a spline a, which holds the disks forming the core and one of the heads from turning, and a shorter spline a' is similarly provided for at the outer end of one of said screw-threaded portions, by which, when the parts are assembled, the head last placed in position is locked to its place.

The plates B are thin round disks of sheet-iron, and are separated by insulation, preferably of paper, as indicated by the heavy black lines separating them in Fig. 1. The holes in these plates are notched to fit over the spline a, and said plates are thus held securely from turning on the shaft.

The wires C are cut to exact lengths from insulated wire, such as is commonly used in building armatures, being, however, heavier than that which is used in most armatures. They are connected to the strips D alone at one end and to said strips and alternately to the commutator-sections at the other. The longer wires being continued through to the commutator-sections, are connected directly thereto, which makes a very strong and durable connection in this particular. The wires also pass through or into the heavy insulating-disks G. They are so arranged that one half the number enter one of said disks and the other half the other. Any of them can be removed without disturbing any of the others by simply removing the bands extending around the armature. This is of great advantage in cases where it becomes necessary to repair the armature, as it permits such repairs to be made at a greatly-reduced expense as compared with the cost of repairing ordinary armatures, as will be readily understood. After the wires are placed in position they are covered with canvas c at the ends, which canvas extends out to the disks G, and thus the space inside the head is inclosed and rendered dust-proof. Outside the canvas strips c', of pressed board or some other thin insulating material, are passed around the armature at suitable intervals and wound about with fine wire c^2, thus forming bands. The perfect exclusion of dust from these heads among the strips and wires, whence it would be difficult to remove it, is of great value.

The strips D are made from sheet metal and are formed by cutting a slit in a rectangular sheet and bending the legs in opposite directions, so that they shall extend from the point of union in parallel but different planes. They are curved, as shown in Figs. 2 and 3. Only one of these strips is shown at each end

in Fig. 1 and but three each in Figs. 2 and 3; but it will be understood of course that there is a sufficient number to complete the connections through all the coils. The ends of the wires are alternately extended out straight and bent down slightly, so that there shall be more room to make the connections, as will be readily understood, said connections being commonly made by bending the ends of the strips partly or wholly around the ends of the wires, as shown in Figs. 2 and 3. These strips D are of greater cross-sectional area than the wires C, and therefore the resistance is low and a free passage of the current is thus provided for at these points, which materially reduces the liability to overheating or burning out of the armature. The legs of the strips are divided when in position by the space left by the cutting of the slits in their manufacture. Said legs pass across one another when in position for use, and therefore, to guard against any possible short-circuiting of the coils from contact between these strips, I interpose an insulating-ring D′, whereby said strips are effectually separated both mechanically and electrically. Insulating material is also interposed between these strips and the sleeve and between the surfaces of the strips, as shown by black lines in Figs. 2 and 3, alongside said parts.

The heads E and F are in the form of flanged sleeves or nuts. The head E is first screwed onto the shaft A to the desired position by means of a spanner engaging with holes *e*, and the spline *a* is inserted in said shaft, with its end extending far enough into said head to hold it fast in position, as shown in Fig. 1. After the plates B are placed in position and the disk G slipped on, the nut E′ is screwed onto the sleeve portion of the head E and a small lock-screw *e′* inserted, which holds said nut from working off. Threaded studs e^2 are then inserted into suitable holes for the purpose and unite said nut and the flange G, thus holding said flange firmly in place. Previously to the completion of this work the head F and other parts are placed in position.

The head F is similar in form to the head E and is similarly secured to position, after the plates B are all in place, by a spanner engaging with the holes *f*. The disk G and the nut F′ correspond to the similar parts at the other end, and are similarly held by the lock-screw *f′* and threaded studs f^2. The head F is held in place on the shaft by the short spline *a′*, which is forced to its position after the head is placed, and a portion of which is left in position to aid in holding the commutator, as shown.

The disks G are made of insulating material and are thick and strong. They serve not only as heads for the inclosures containing the strips D, and as supports for the wires C, (whereby said wires are held apart and to exact position at their ends,) but, as they are of somewhat greater diameter than the body of the armature, to receive the weight of the armature when it is lying upon its side and protect the insulation on the wires from abrasion when out of the machine or when being removed from or inserted therein. As alternate wires C pass through each of these disks, said disks also serve as drivers for said wires, preventing them from being moved from position on the core by the magnetic force of the fields in operation, said disks, as before described, being connected strongly to the shaft through the nuts E′ F′ and heads E F.

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

1. The combination of the shaft A, having its central portion somewhat larger than its ends, screw-threaded portions on the end of said central portion, internally-screw-threaded heads adapted to screw onto said screw-threaded portions and hold the core in position between them, and splines adapted to be inserted in ways in said shaft and said heads after said heads are placed in position and thus secure them in said position, substantially as set forth.

2. In an armature, the combination of heads in the form of flanged sleeves, nuts adapted to be screwed onto the outer ends of the sleeve portions, lock-screws for holding said parts together, disks G, and studs for securing said disks and said nuts together, substantially as set forth.

3. The combination, in an armature, of the generating-wires C, bent down somewhat alternately at the ends, and the connecting-strips D, bent around said wires and connecting said wires into a continuous winding, substantially as shown and described.

4. The combination of the strips D, each having two legs extending away from each other in substantially parallel but different planes, and a ring D′ of insulating material interposed between and dividing the adjacent legs of a series of said strips when the same are arranged in position in an armature, substantially as set forth.

5. The combination, in an armature, of the shaft, the core, flanged sleeves or nuts E and F, faced with insulating material, the strips D, the central portions of which rest on said insulating material, and the wires C, connected to said strips and with them forming the coils, substantially as set forth.

6. The combination, in an armature, of the core, the generating-wires C, arranged longitudinally of the armature outside said core, the disks G, securely mounted upon the shaft, said wires C alternately passing through said disks and driven thereby, substantially as described, and for the purpose as specified.

7. The combination, in an armature, with the core and generating-wires, of flat insulat-

ing-disks G at or near the ends of said core, said disks being of a size somewhat greater than the diameter of the armature and extending out all around outside the same, and thus serving as supports for said armature when out of the machine or while being handled, substantially as shown and described.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 4th day of May, A. D. 1889.

CHARLES D. JENNEY. [L. S.]

Witnesses:
C. BRADFORD,
E. W. BRADFORD.