(No Model.)

C. BATCHELOR.

DYNAMO ELECTRIC MACHINE.

No. 372,447. Patented Nov. 1, 1887.

FIG. 1.

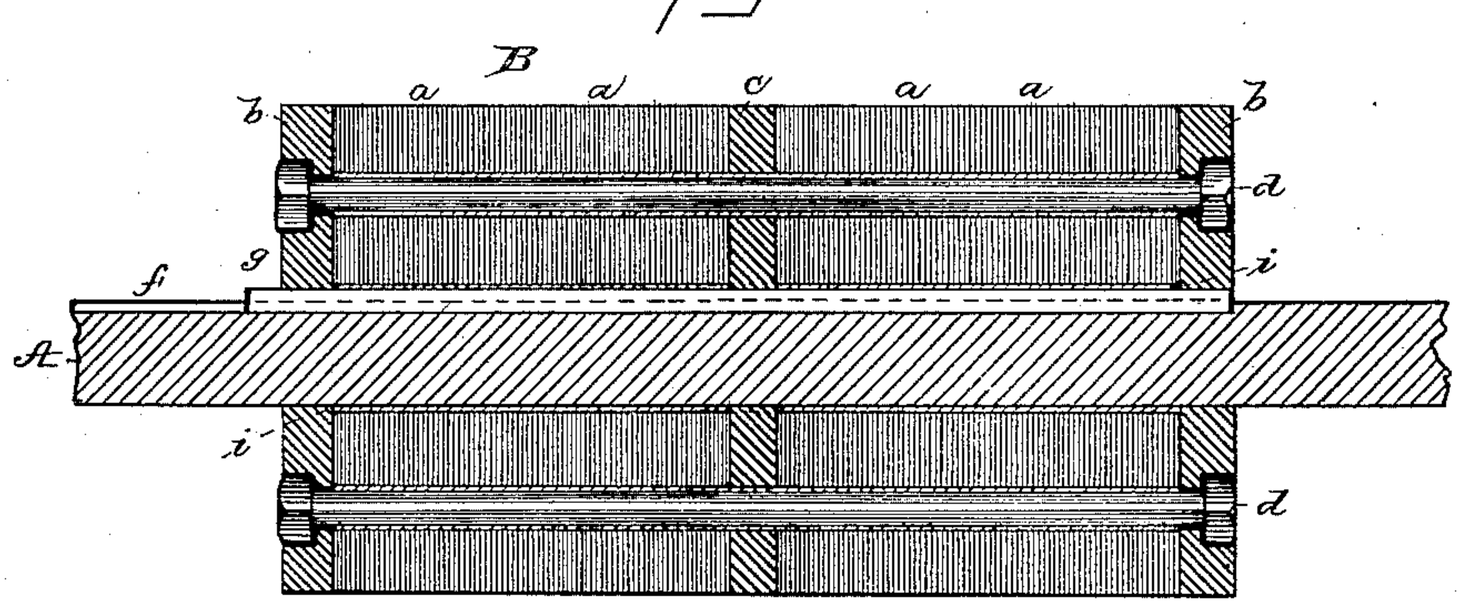


FIG 2.

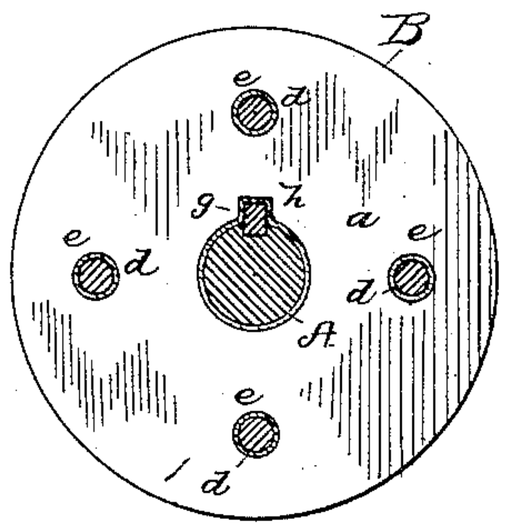
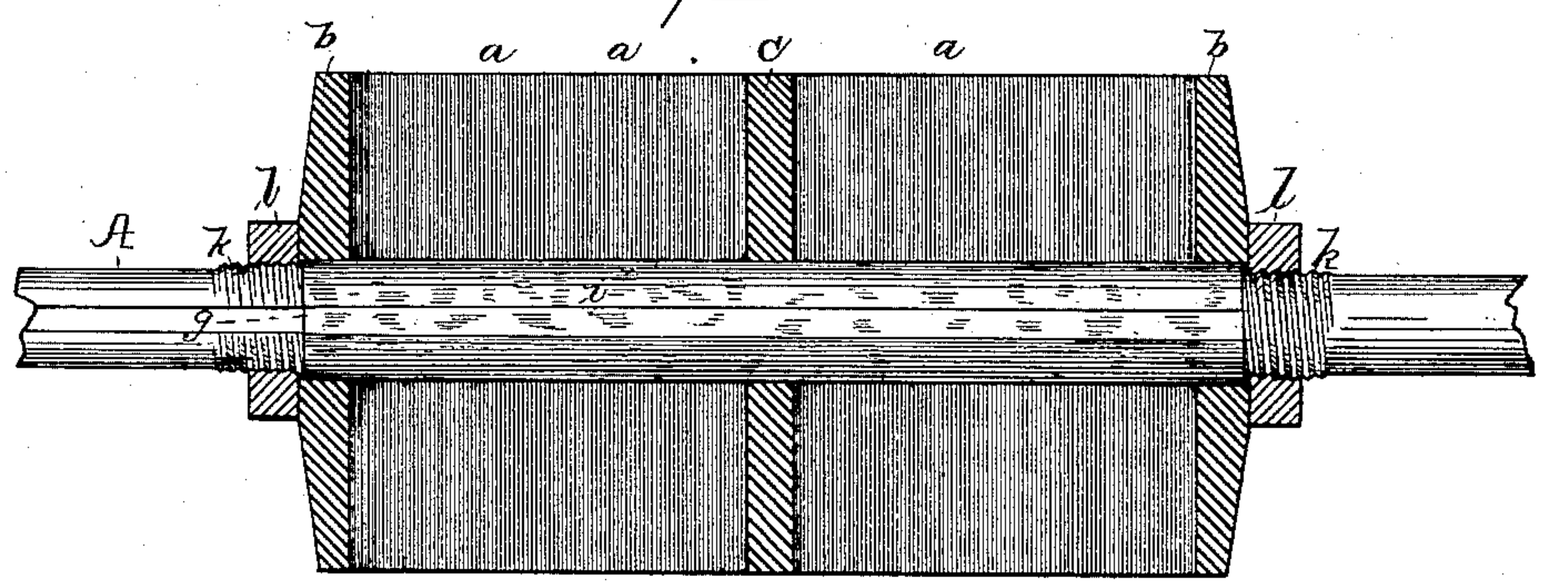


FIG. 3.



ATTEST

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UNITED STATES PATENT OFFICE.

CHARLES BATCHELOR, OF NEW YORK, N. Y.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 372,447, dated November 1, 1887.

Application filed February 23, 1887. Serial No. 228,480. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BATCHELOR, of the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Dynamo-Electric Machines, of which the following is a specification.

My invention relates to armatures for dynamo-electric machines of that class in which the armature-core is composed of a number of thin plates placed upon the shaft and massed closely together, with thin insulation interposed between them. In such armatures two ways of holding the core-plates together upon the shaft have heretofore been employed. In one construction the plates at the ends of the core are made thicker than the rest of the plates, which are of thin sheet-iron, and these end plates are keyed on the shaft, while the thin plates are placed loose thereon and secured by several bolts passing through the whole length of the core, by means of which the plates and insulation are drawn and held close together. In this construction it is found when the machine is in operation that the bolts after a time become loose, because when the machine is started, while the heavy plates keyed to the shaft receive the motion at once, such motion is transmitted to the plates which form the mass of the core through the bolts, and the inertia of the heavy mass tends to delay its starting, so that a considerable strain is brought on the bolts. The same occurs in stopping the machine, and the bolts and bolt-holes are thus gradually worn away, so that the plates become in time loose thereon and may move independently of one another, whereby, as will be readily seen, the usefulness of the machine is impaired. Another construction is to have, as before, the thicker end plates keyed to the shaft and the thin plates loose on the shaft between them, and to bring the plates close together by heavy nuts placed on screw-threaded portions of the shaft at the ends of the core and screwed up tightly against the end plates. In this construction, also, the plates work loose in time, though not to as great an extent as in the form first described. Such first-described form is, however, a better one for large machines than the other.

The object of my invention is mainly to so construct an armature of the character described as to avoid the defect referred to, and also to improve the insulation of such armatures; and my invention consists in the novel devices and combinations of devices employed by me in accomplishing these objects, as hereinafter set forth and claimed.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of an armature-core and its shaft embodying my invention, the core being of that class in which the plates are held together by bolts; Fig. 2, a transverse section of the same; and Fig. 3, a longitudinal section of a core in which the plates are held together by nuts on the shaft, the shaft being shown in elevation.

A is the shaft, and B the armature-core. Such core is made up of a large number of thin sheet-iron plates *a*, with thicker end plates, *b*, and, preferably, also a thicker middle plate, *c*. These plates are all insulated from each other, either by thin sheets of paper or similar material between them or by an insulating varnish placed upon the plates.

In Figs. 1 and 2, bolts *d* extend through all the plates of the core, having nuts upon their ends, by means of which the plates are drawn as close together as possible. The bolts are surrounded by insulating material, *e*, preferably a wrapping of mica.

Upon that portion of the shaft on which the core is placed is formed a continuous keyway, *f*, and in the same is inserted a key, *g*, extending continuously the whole length of the core. All the plates, both the thick end and middle plates and the thin plates which make up the body of the core, are provided with slots *h*, which fit the key *g*. Thus the whole length of the closely-massed core is keyed upon the shaft, whereby all parts of the core receive motion directly from the shaft, and the difficulty above described is obviated.

In order to insulate the core from the shaft, whereby the heating which would otherwise occur at points of contact of the core and shaft, due to local currents in the core, is done away with, I wrap or surround the shaft and the continuous key with mica, *i*.

I have shown the mica, *i*, as not extending

under the thick end and middle disks, since this is not usually necessary. It may, however, be extended to these parts, if desired. I prefer to use mica as the insulating material; but other suitable material may be employed.

In the construction shown in Fig. 3 the shaft A has screw-threads *k k* at each end of the core B, and the key *g* extends continuously between these screw-threads. The thick end plates, *b*, preferably, are beveled on their outer sides. All the core-plates are provided with slots fitting the key *g*, as before. A heavy nut, *l*, is placed on the shaft at each end of the core, and these nuts are screwed up tightly against the core, so as to bring all the plates into close mechanical contact, they being insulated from each other, as already described. The insulating-wrapping, *i*, surrounds the shaft and its key. In this case I have shown it as placed beneath the thick core-plates as well as the main body of the core.

It will be seen that by the construction above described I provide a compact, strong, durable, and well-insulated form of armature, free from the defects which I have mentioned.

What I claim is—

1. An armature-core having in combination a shaft provided with a continuous rib or key, a number of thin iron plates slotted to fit the rib or key, insulating material between said plates extending throughout their opposing surfaces, and means clamping said thin iron plates and intervening insulating material together into a solid body without air-spaces between the plates, substantially as set forth.

2. An armature-core having in combination a shaft provided with a continuous rib or key, a number of thin iron plates slotted to fit the rib or key, insulating material between said plates extending throughout their opposing surfaces, and bolts extending longitudinally through the armature and clamping said thin iron plates and intervening insulating material together into a solid body without air-spaces between the plates, substantially as set forth.

3. The combination of a shaft having a continuous rib or key, a covering of insulating material upon the shaft and key, and an armature-core consisting of a number of thin iron plates insulated from each other and massed closely together upon the shaft, and all of said plates being provided with slots fitting said key, substantially as set forth.

4. The combination of a shaft having a continuous rib or key, a wrapping of mica around the shaft and key, and an armature-core consisting of a number of thin iron plates insulated from each other and massed closely together upon the shaft, and all of said plates being provided with slots fitting said key, substantially as set forth.

This specification signed and witnessed this 19th day of February, 1887.

CHARLES BATCHELOR.

Witnesses:
WM. PELZER,
E. C. ROWLAND.