

G. KOPPELMANN.
ARMATURE CORE FOR ELECTRICAL MACHINES.
(Application filed June 15, 1901.)

(No Model.)

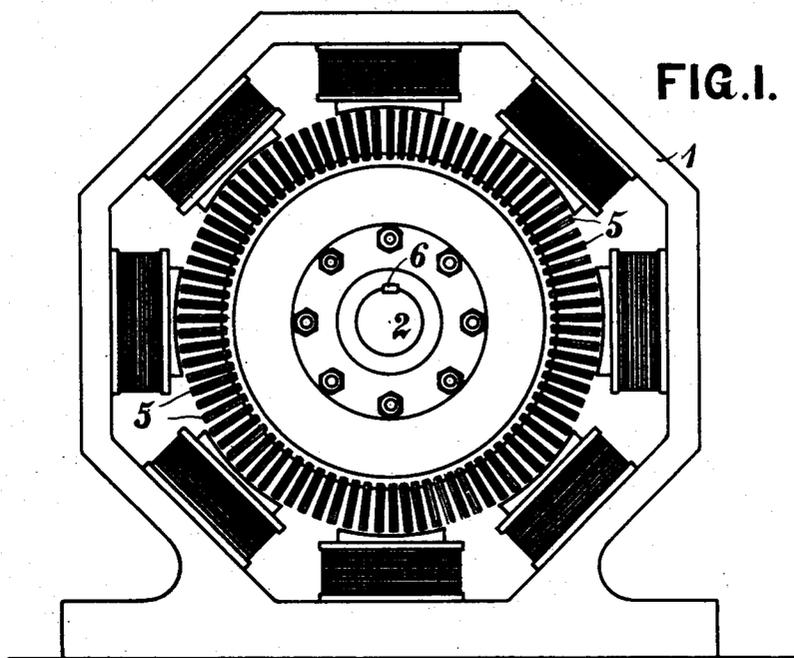


FIG. 2.

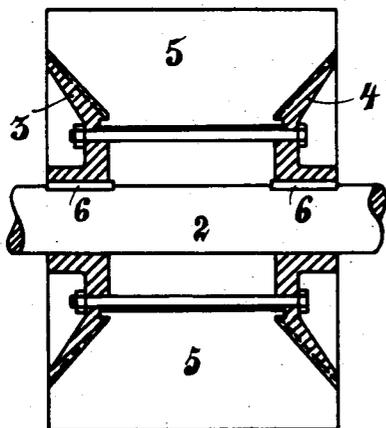
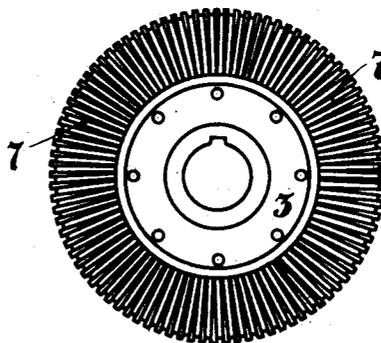


FIG. 3.



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ARMATURE-CORE FOR ELECTRICAL MACHINES.

SPECIFICATION forming part of Letters Patent No. 683,052, dated September 24, 1901.

Application filed June 15, 1901. Serial No. 64,764. (No model.)

To all whom it may concern:

Be it known that I, GERHARD KOPPELMANN, engineer, a subject of the King of Prussia, German Emperor, residing at Schüttorf, Han-

5 over, Germany, have invented certain new and useful Improvements in Armature-Cores for Electrical Machines; and I do hereby declare that the following is a full, clear, and exact description.

10 The present invention relates to an improved armature-core for electrical machines which has longitudinal air-gaps. The invention is designed to augment the cooling-surface of the armature and conse-

15 quently to increase the output capacity of the machine. In former methods of constructing armatures the endeavor was made to attain the above result by dividing the armature-cores composed of annular metal disks into a num-

20 ber of divisions by means of interposed corrugated disks or by means of disks with strips of metal riveted thereon, these divisions being separated by air-gaps. This method of construction, however, involves an increase in the length of armature, and the more completely the object aimed at is attained the longer must be the armature. Moreover, the air still cannot pass unimpeded through the

30 air-passages, as they are covered throughout the greater part of their circumference by the coils of the armature-winding. In order to obviate the former defects, according to the present invention the armature is provided with a large number of air-passages, which run axially. The path of the induced fields of the lines of magnetic force is so arranged that the magnetic resistance in the way of the lines of force of these fields is not increased.

40 The new armature consists of single bundles of metal consisting of thin metal disks of special form. These latter are insulated from each other. The separate metal bundles are supported by two front plates connected with each other by means of screw-

45 bolts. Owing to this new method of construction air can pass unhindered axially between the various divisions of the armature-plate. The length of the armature underneath the poles is not increased in the least by the air-passages. As there may be an exceedingly large number of metal bundles, there results

an extremely great cooling. Experiments have shown that dynamos of this new construction generally show no noticeable heating after many hours working with full excitation and without giving off current, while, as is well known, armatures of the former construction under the same conditions undergo an increase of temperature of more than 30°. By employing the new method of construction the output capacity of a dynamo otherwise limited by the heating can be considerably increased.

In the accompanying drawings is illustrated a dynamo provided with the new armature, in which—

Figure 1 shows the dynamo in elevation. Fig. 2 is a vertical section of the armature-core. Fig. 3 is a view of a front plate.

Referring to the drawings, 1 is the magnet-casing of an eight-pole alternating-current dynamo. The armature-core is keyed on the shaft 2 and consists of the two front plates 3 and 4 and the metal plates 5, which are united to form a large number of metal bundles. The single bundles, each bundle being composed of a series of metal plates or disks, are separated from each other by air-gaps. The two plates 3 and 4 are connected with each other in the well-known manner by means of screw-bolts and are fixed to the axle by means of wedges 6. The inner part of the front plates is parallel to the plane of rotation, while the outer side is spherical. The outer side is preferably provided with grooves, Fig. 3, in which the metal bundles are inserted. The parts between the grooves 7 determine the air-gaps between the single metal bundles.

This new method of construction is adapted for dynamos of all kinds, not only for alternating current, but also for continuous and polyphase current dynamos, whether the armature is stationary or rotatory and whether the poles of the magnetic field are placed on the inner or outer peripheries of the armature or on the front plates. The new armature furthermore presents the advantage that faultlessly-smooth grooves may be obtained for receiving the winding without any manipulation of the prepared armature-core.

Each bundle 5, as shown in Fig. 1, consists of sheets.

Having now described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

In armature-cores for electrical dynamos the combination of front plates between which
5 are fixed metal bundles each comprising a number of metal plates insulated from each other, said bundles being separated from each other by air-gaps so that air can pass axially unimpeded through the armature and thus

effecting a thorough cooling without increasing the magnetic resistance in the way of the fields of the lines of force.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GERHARD KOPPELMANN.

Witnesses:

FR. HAYERMANN,
F. A. BRYCE.