

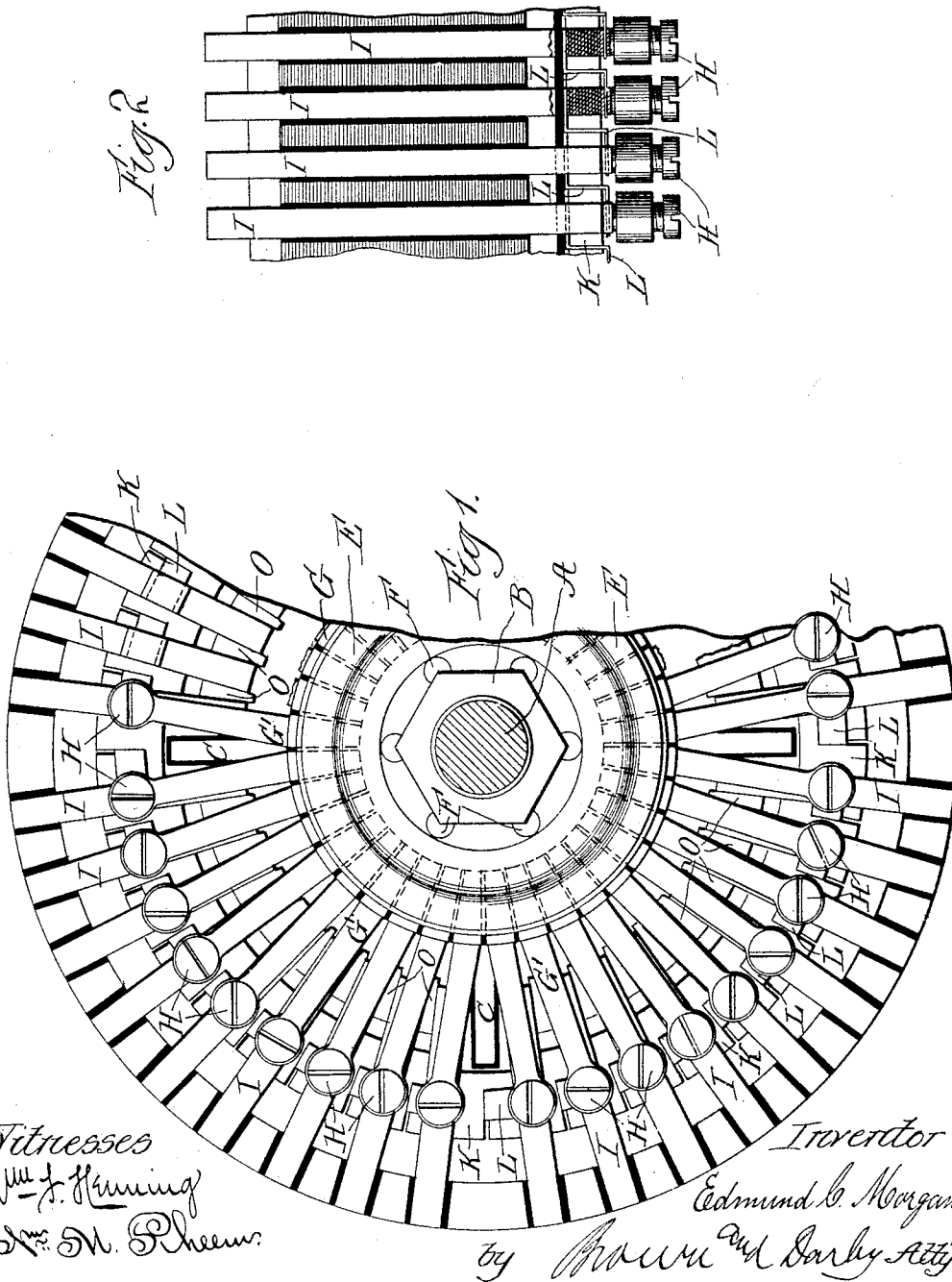
(No Model.)

2 Sheets—Sheet 1.

E. C. MORGAN.
ARMATURE FOR ELECTRIC MACHINES.

No. 536,439.

Patented Mar. 26, 1895.



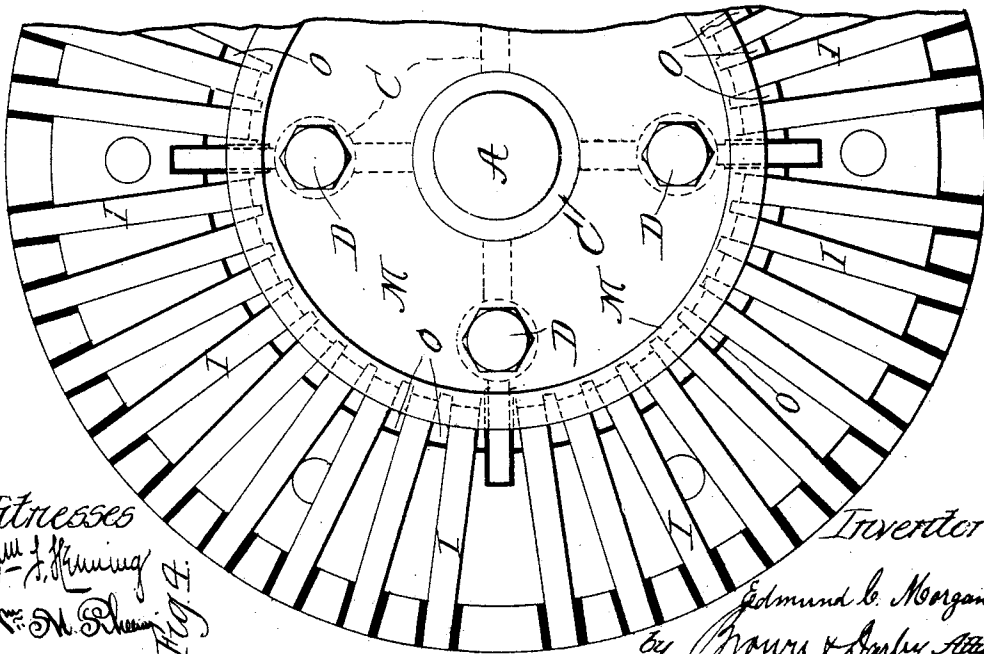
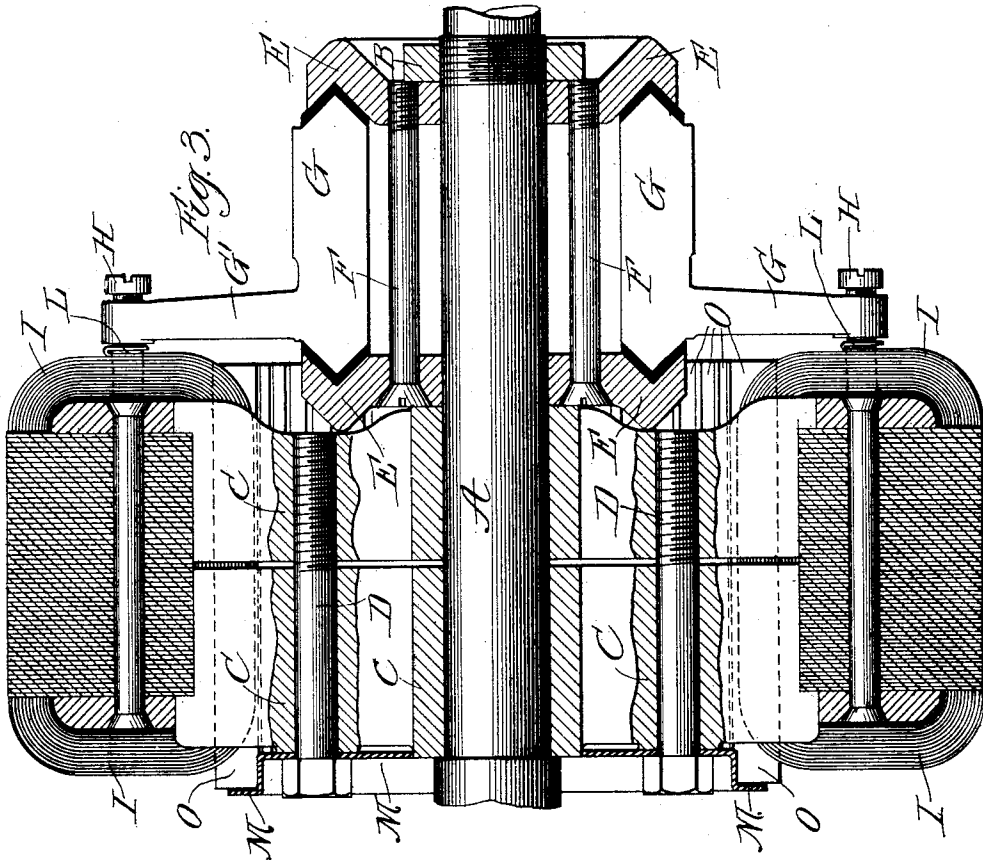
(No Model.)

2 Sheets—Sheet 2.

E. C. MORGAN.
ARMATURE FOR ELECTRIC MACHINES.

No. 536,439.

Patented Mar. 26, 1895.



Witnesses
Wm. J. Hanning
St. M. D. Hanning
Fig. 4.

Inventor
Edmund C. Morgan
by *Traver & Sonby Atty.*

UNITED STATES PATENT OFFICE.

EDMUND C. MORGAN, OF CHICAGO, ILLINOIS.

ARMATURE FOR ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 536,439, dated March 26, 1895.

Application filed July 18, 1894. Serial No. 517,874. (No model.)

To all whom it may concern:

Be it known that I, EDMUND C. MORGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Armatures for Electric Machines, of which the following is a specification.

This invention relates to improvements in the construction of the armatures of dynamo electric machines, and is more particularly designed for use in connection with the motors of electric mining machines.

The invention consists substantially in the construction hereinafter described, and more particularly pointed out in the claims.

Like letters refer to the same parts in the several figures of the drawings, in which—

Figure 1 is a plan view of a portion of the armature. Fig. 2 is a view of the small portion of the armature, looking from the periphery and showing a fraction of such portion in section. Fig. 3 is a vertical central section; and Fig. 4 is a bottom view of a portion of the armature.

The shaft of the armature is designated by the letter A, and is of the usual construction and material, but is preferably secured to the spider or frame of such armature by having a shoulder formed near its lower end, against which the central hub of the armature bears, and having a screw-threaded portion near its other end adapted to a nut B, which may rest on the bottom of the recess or valley formed in the outer frame of the commutator, as shown, or otherwise bear against said commutator frame.

The spider forming the armature frame is preferably made in two portions and joined together by bolts, as shown in Fig. 3. The spider is designated by the letter C and the bolts by D.

The commutator is preferably composed of two end plates E, E, joined together by bolts F, F, and inclosing between them segments G, with interposed insulation, said segments having extensions or arms G', extending at right angles therefrom, which latter support and form ends for the set screws H, H, whose purpose will be hereinafter described. The coils are of suitable material and wound upon the cores, supported by the spider in the usual way, except as to the arrangement of their

ends, the arrangement of which will now be specified, the coils being designated by the letters I.

The arrangement of the ends of the coils, which will now be described, is best illustrated in Figs. 2 and 3 of the drawings. Instead of having the upper and lower ends of the coil extending up and connected with and soldered to the segment of the commutator, as is a customary method, they are in the present construction bent over upon themselves to form an open loop, as shown in Fig. 3, in which loop is placed and confined one end of the angular connector, formed of copper, brass, or other suitable conducting material. A firm and secure contact is maintained by the adjustment of the screw H, which bears upon the upper ply of the loop and forces it against the end of the coil. This is the arrangement of the end of the coil at the top, but the connector passes out beyond the edge of the loop and then is bent down to approximately the level of the lower portion of the next coil, where it is again bent horizontally and passes underneath said coil, bearing against a bared end of the coil on its upper surface and the lower surface of the connector resting upon a piece of insulation, which insulation also supports the remainder of the coil. In this manner the upper and lower ends of additional coils are electrically connected and are also similarly connected to the segments of the commutator through the medium of the screw and arms. For the purpose of supporting the connectors between the coils an insulated wedge is slipped over the outer end of the connector before it is bent, and is forced down tightly between the coils. This insulating wedge is designated by the letter K, and the connector is designated by the letter L. The wedge is best shown in Figs. 1 and 2, and especially in Fig. 1, which shows the slot cut into the wedge to permit it to be passed over the connector.

In many electrical machines, and especially in the motors of mining machines, there is necessarily considerable jarring in actual operation, and this tends in time to crystallize the metal of the coils, rendering them brittle and causes much delay and trouble from breakage, and it is the purpose of the construction just described to reduce this trouble to a minimum.

It will be seen that by the present construction the coils are connected with each other and with the commutator segments in a positive manner and with very little strain, and
5 are supported against displacement in almost any direction, as are the commutators.

To further avoid trouble from jarring and displacement, it has been found advisable to lock the coils themselves in suitable position,
10 and to this end there is in the present construction provided insulating wedges made of wood, fiber, or other suitable material and driven tightly in between the coils adjacent to their connection with the armature ring. These
15 are shown in Fig. 4 of the drawings and are designated by the letters O. A confining ring, M, is held by the bolts D against one end of the wedges just referred to, and prevents their lateral displacement. Any danger of lateral
20 displacement at the other end is obviated by the extensions or arms of the commutator segments.

It is obvious that many variations may be made in the exact construction shown and described without departing from the principle
25 thereof, and I therefore do not wish to be understood as limiting myself to said exact construction.

I claim—

30 1. An armature for an electric machine having its coils connected by an independent conducting plate and an insulating wedge through which the plate passes and by which it is braced; substantially as and for the purpose set forth.
35

2. In an armature for an electric machine the combination with a series of coils and an angular independent conducting plate connecting the lower end of one coil with the upper end of another, with a commutator segment positively and electrically bearing upon one end of such plate; substantially as and for the purpose set forth.

3. In an armature for electric machines, the combination with a series of coils, an angular independent conducting plate, having one end
45 in contact with the lower end of one coil and at its other end in contact with the upper end of the adjacent coil, of a commutator segment having a screw for contacting with and positively holding one end of such plate; substantially as and for the purpose set forth.
50

4. In an armature for an electric machine the combination with a series of coils, angular plates upon one end of which the lower portion
55 of one coil contacts and the other end of which plate is inclosed within a loop formed of the upper end of the adjacent coil, of a series of segments having arms and set screws, which latter bear upon and contact with the coils;
60 substantially as and for the purpose set forth.

5. In an armature for electric mining machines, the combination with a series of coils and insulating wedges between their lower ends, independent conducting connecting
65 plates between such coils, slotted insulated wedges through which said plates pass, serving to brace the same, of commutator segments provided with set screws bearing upon the ends of the wires of the coils and preserving
70 contact between the same and the connecting plates; substantially as and for the purpose set forth.

6. An armature for an electric machine provided with coils and interposed insulating
75 wedges, in combination with a confining plate or ring for preventing lateral displacement of such wedges; substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand this 12th day of June, 1894.

EDMUND C. MORGAN.

Witnesses:

FRANK T. BROWN,
M. I. CAVANAUGH.