(No Model.)

H. R. BOISSIER.

ARMATURE FOR DYNAMO ELECTRIC MACHINES.

No. 335,105. Patented Feb. 2, 1886.

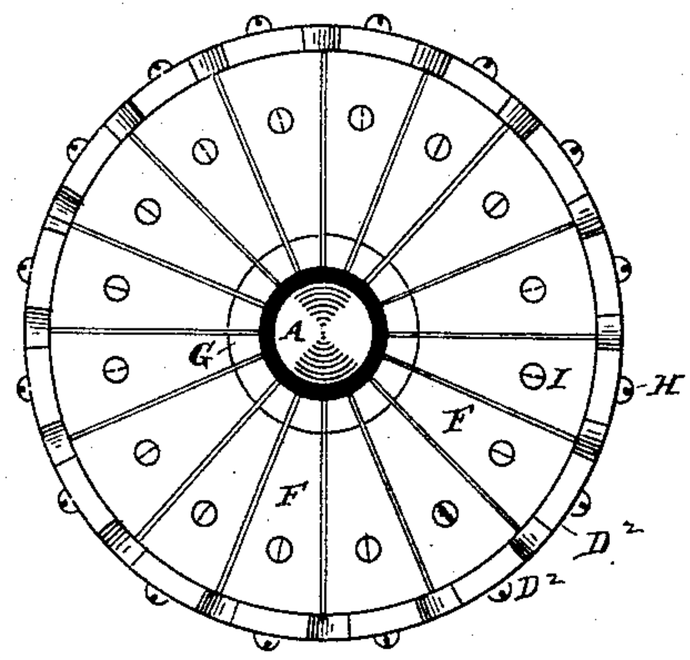

Fig. 1

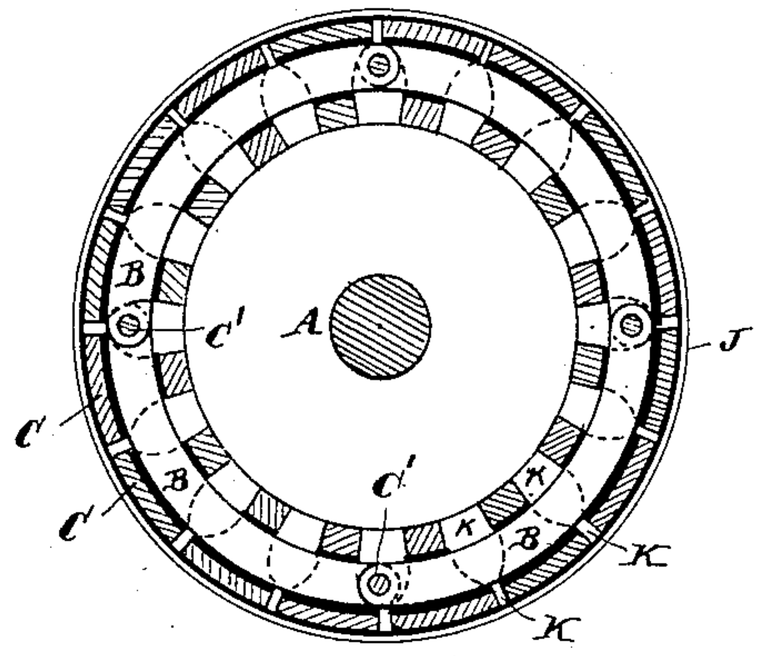

Fig. 2

Fig. 3

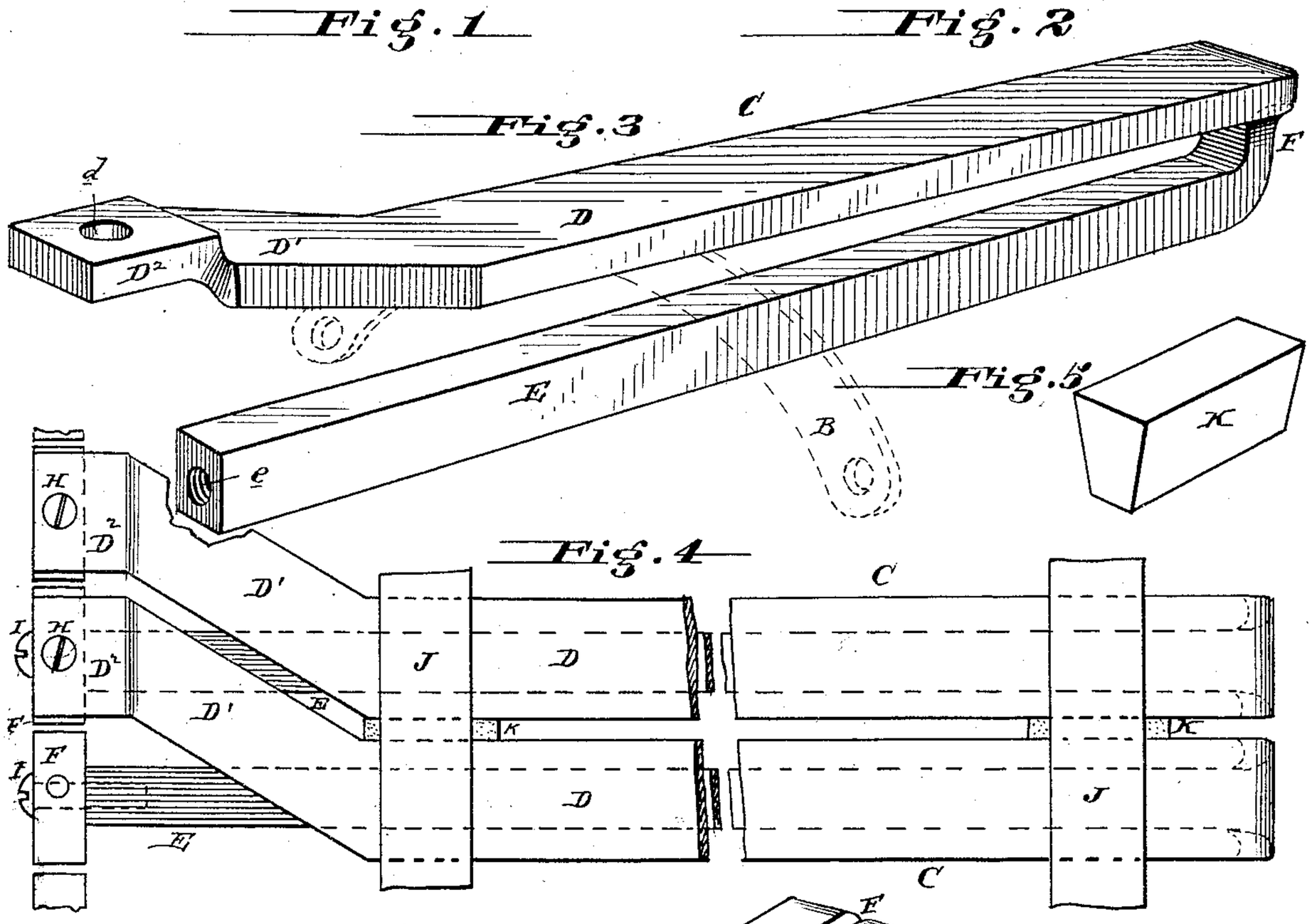

Fig. 4

Fig. 5

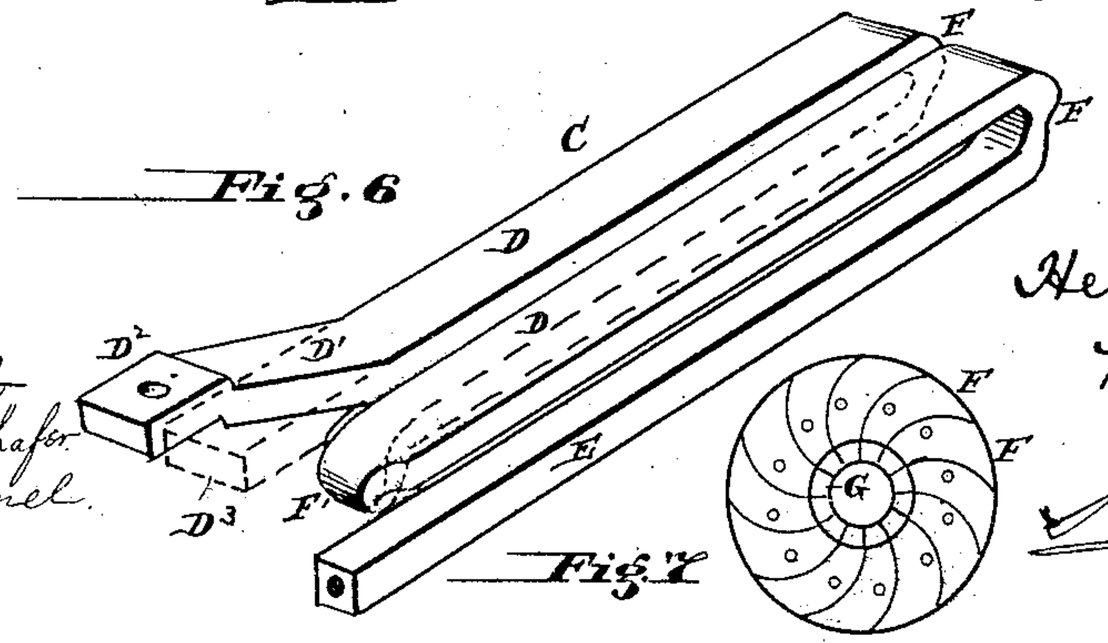

Fig. 6

Fig. 7

Attest
Harry R. Schafer
G. C. Hummel.

Inventor
Herman R. Boissier
By his Atty.
A. Huntington

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HERMAN R. BOISSIER, OF NEW YORK, N. Y.

ARMATURE FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 335,105, dated February 2, 1886.

Application filed July 20, 1885. Serial No. 172,089. (No model.)

To all whom it may concern:

Be it known that I, HERMAN R. BOISSIER, of the city, county, and State of New York, have invented new and useful Improvements in Armatures for Dynamo-Electric Machines, of which the following is a specification.

My invention has reference to the construction of armatures for dynamo-electric machines; and it consists in forming the coils of cast-copper, made essentially U-shaped, and having their free ends coupled with adjacent commutator-sections; further, in a heavy U-shaped section for the armature and adapted to straddle the armature-core, in which one of the legs has its end bent so as to fit upon one commutator-section and the straight leg to fit upon another section, and in details of construction, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

Heretofore it has been customary to wind Gramme armatures with heavy wire or flexible strips of copper; but this is expensive and unsatisfactory in the construction of low-intensity dynamo-electric machines which are used for plating and incandescent electric lighting. Bars of copper have been used upon drum or Siemens armatures, as in the case of the Edison and Siemens machine; but in these simple flat bars are screwed to rings at each end, and are in no wise adapted to the Gramme or ring armature.

My object is to form a Gramme armature having its coils of heavy cast, forged, or rolled copper, and so shaped that they shall fit upon the soft-iron core, and adapted to have both their free ends directly connected with the commutator, and also to greatly simplify the construction as an entirety.

In the drawings, Figure 1 is an end elevation of my improved armature. Fig. 2 is a cross-section of the same. Fig. 3 is a perspective of one of the cast-copper coils removed. Fig. 4 is a plan view showing two sections of coils and their connection with the commutator. Fig. 5 is a perspective view of one of the wedging-blocks to keep these sections of coils equidistant and out of contact. Fig. 6 is a perspective view showing the heavy cast-copper coils made double the length of that shown in Fig. 3, and to be used where more intensity of current is required; and Fig. 7 is an end elevation of a modified form of commutator.

A is the armature-shaft.

B is the soft-iron core, and is preferably made up of small pieces (see dotted lines, Fig. 3) united together by rods C′, to form a continuous ring.

C are the heavy cast or rolled copper coils, and are preferably made U-shaped, the outer leg, D, being wide, as compared with the inner leg, E, which is made practically square in cross-section, and these legs are united at one end by bend F, and the outer leg, D, has its free end somewhat longer than the leg E, and preferably bent to one side, as shown, as at D′, so that its end D^2 shall be in line with the main part of the outer leg of the next section C, as shown in Fig. 4, and this end D^2 has a hole, *d*, through which a screw, H, passes to secure it firmly down to the outer edge of one of the commutator-sections F, and the end of the leg E has a hole, *e*, into which a screw, I, fits, and to which the next adjacent commutator-section F to the one to which end D^2 is secured is clamped, so as to make an electrical contact. These commutator-sections F terminate in the horizontal pieces which make up the commutator proper, G. From this it is seen that the current passes from one section F through leg E and leg D to the next section F, and then to the next coil C, and so on.

In practice, where a very few sections C are used on the armature, it is desirable to make them slightly curved in cross-section, and the legs D and E are insulated from core by one or more layers of asbestus paper, (indicated by black lines in Fig. 2,) and the adjacent coils C are separated from each other by wedge-shaped blocks K, of wood or other suitable material. These blocks are retained in position in virtue of their shape on the interior of the armature, and on the outer surface they are placed between the legs D, under bands J, which are insulated from the coils and are adapted to bind them firmly together.

When simple U-shaped sections C are used, the core of the armature may be completed and these placed on afterward; but when more intensity is required, as is necessary in nickel-plating machines, owing to the greater resist-

ance of the bath, and in which the sections C must be looped, as shown in Fig. 6, then these sections must be slipped on the core B before it is completed.

In place of bending the leg D to one side, as shown at D′ D², it might be made straight when the section C is looped, for the double coil will bring this end in juxtaposition with the next commutator-section. This is indicated in dotted lines D³ in Fig. 6. Also, in the simple U-shaped section the legs may be both in line, and the commutator-sections may be curved, as shown in Fig. 7. Instead of the end D² being screwed down upon the end of the commutator-sections, it may be secured to the side thereof, as in the case of the leg E.

It is immaterial to my invention what the details of construction of the core or frame-armature may be, the essential feature being the cast or forged copper U or looped sections C and their connection to the commutator, whereby simplicity of construction and great capacity for generating electricity without heating is attained.

In making the section C, I place about one-third more metal in the inner leg, E, than in the outer one, D, so as to reduce its resistance. This offers less resistance to the passage of the current where its electro-motive force is weakest, as it always is on the inside of the armature ring-core. In practice heretofore the resistance has been made the same throughout, and the defect was particularly noticeable in low intensity or quantity machines, such as used in electroplating. Of course, it is evident that I do not limit myself to any particular difference in its sectional area of the legs D and E, as the difference in resistance required would vary with the construction of the machine.

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

1. An armature having a ring-core surrounded by heavy cast or forged copper sections having inner and outer legs arranged parallel, and in which the former are of less width than the latter, substantially as and for the purpose specified.

2. In an armature, a ring-core, in combination with heavy cast or forged copper sections having inner and outer legs, which surround the said core, made parallel, and all terminating at one end of the armature, and the commutator-sections, each of which is connected to the inner leg of one section and the outer leg of the next adjacent one, substantially as and for the purpose specified.

3. An armature having a ring-core surrounded by heavy cast or forged copper sections having inner and outer legs arranged parallel, but having their free ends arranged out of line, substantially as and for the purpose specified.

4. The copper section C, having legs D and E, united at F, the free end of leg D being bent substantially as indicated by D′ D², substantially as and for the purpose specified.

5. The combination of core B, sections C, having legs D and E, commutator-sections F, commutator G, blocks K, and bands J, substantially as and for the purpose specified.

6. The sections C for the armature, formed or cast integral or in one piece, excluding joints, and consisting of the legs D and E, the resistance of the inner leg, E, being less than that of the outer leg, D, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

HERMAN R. BOISSIER.

Witnesses:
IRVING MYERS,
JOHN G. DAVIS.