(No Model.)

E. WESTON.

DYNAMO ELECTRIC MACHINE.

No. 277,644. Patented May 15, 1883.

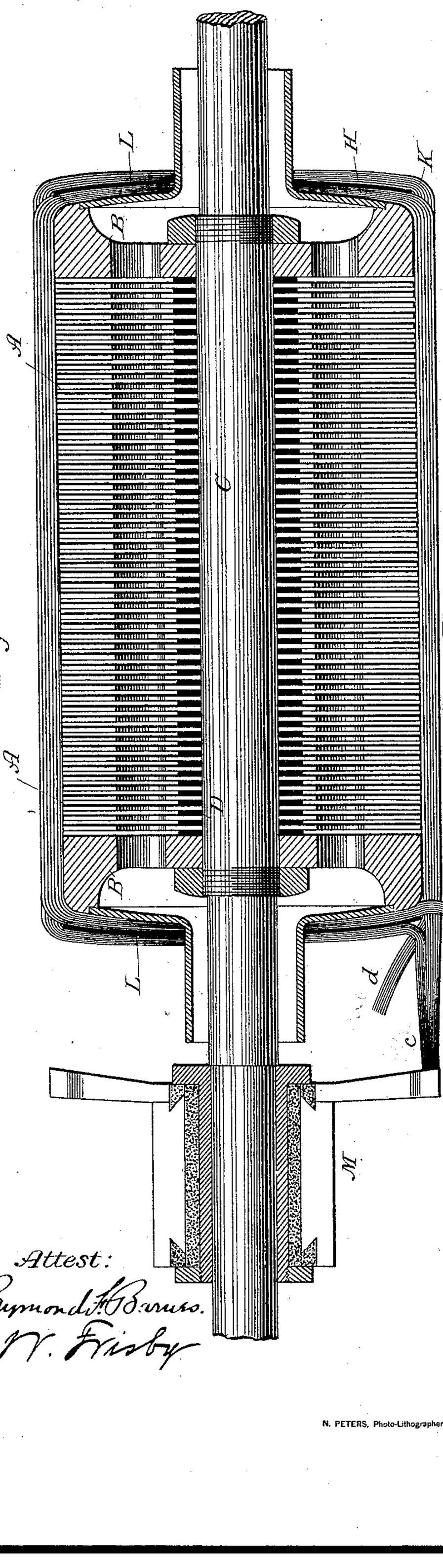

Fig. 1.

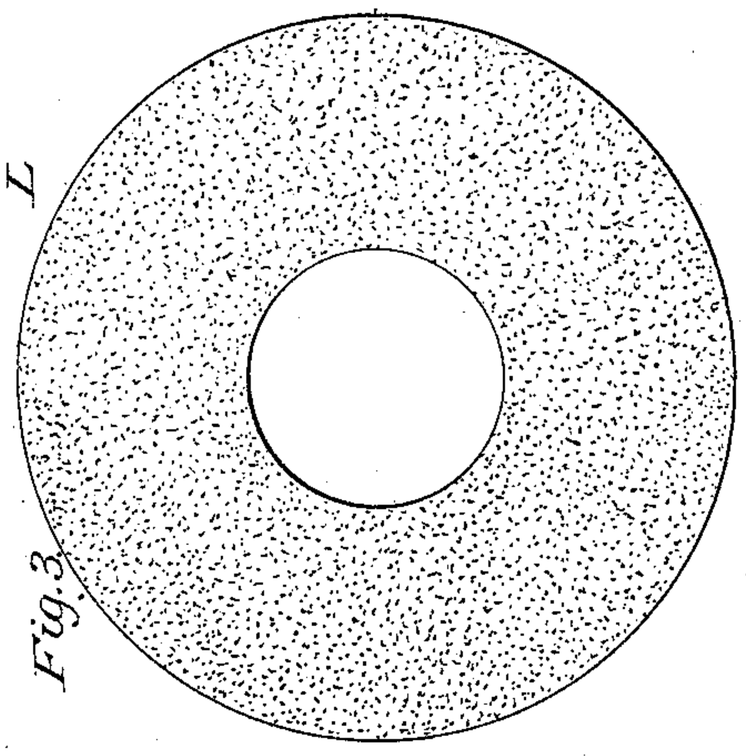

Fig. 3.

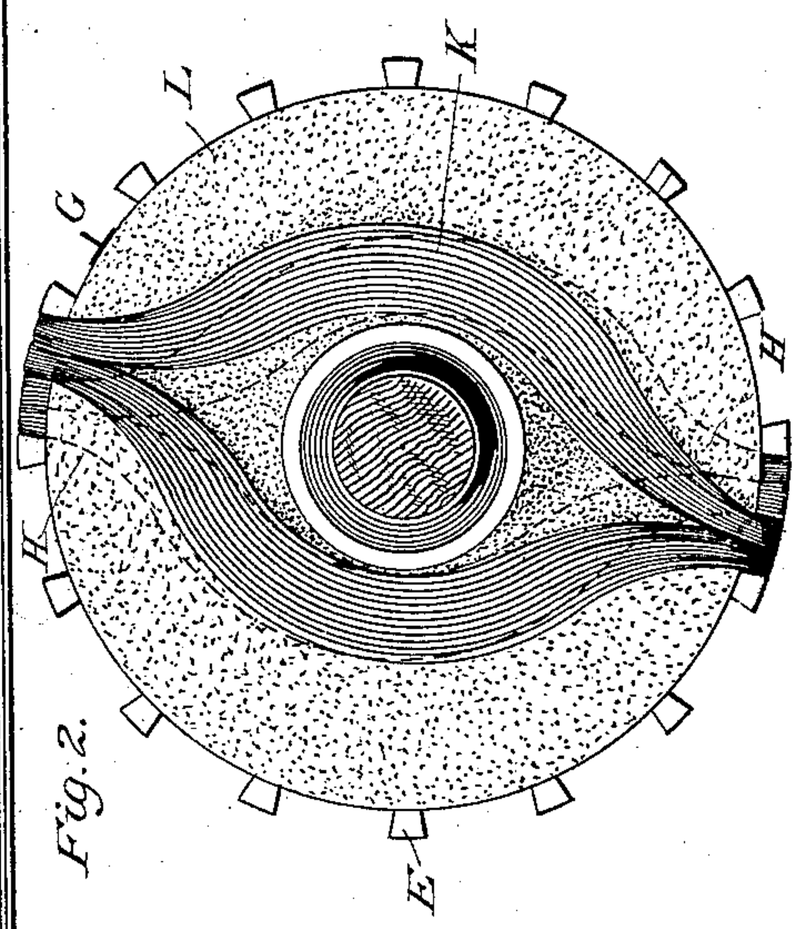

Fig. 2.

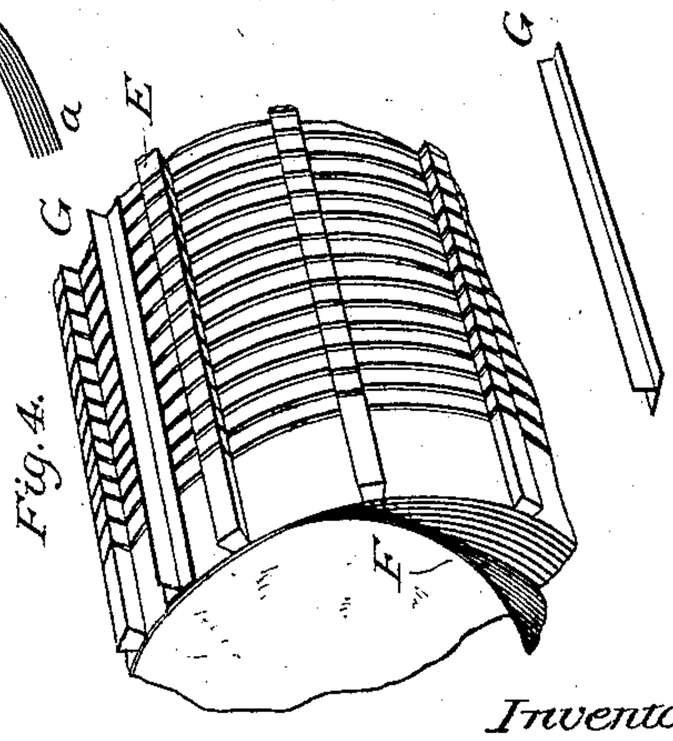

Fig. 4.

Attest:

Raymond F. Burns.

W. Frisby

Inventor:

Edward Weston

By Parker W. Page Atty

UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE UNITED STATES ELECTRIC LIGHTING COMPANY, OF NEW YORK, N. Y.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 277,644, dated May 15, 1883.

Application filed January 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the Queen of Great Britain, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

My invention relates to dynamo or magneto electric machines, in which the armature consists of a cylindrical core wound in a direction parallel with its axis of rotation with conductors of large size.

The main object of the invention is to economize space and reduce the internal resistance in large machines of this character, whereby they are rendered more practicable and efficient, particularly for running incandescent lamps, depositing metals, or similar uses which require currents of great quantity. When a cylindrical armature is wound with conductors of large size, great difficulty is experienced in bending them over the ends of the core, while a large mass of inert conductor is formed at the ends, which adds greatly to the bulk of the armature and increases the resistance of the armature-circuit. Another difficulty in these machines results from the fact that the outside portions, or those farthest from the axis of revolution, travel at a higher rate of speed than the inner portions. Differences of potential are therefore set up, that cause what may be termed an "eddying" of the currents in the conductors. In a patent granted to me I have shown a means of avoiding the first-named objections by using separate end connections—such as plates or disks—to which the longitudinal conductors are secured.

My present invention consists in the combination, with a cylindrical core, of conductors formed of separate strands of wire or thin strips, which may be more readily bent than solid wires or bars, and which may be spread out over the ends of the core, so as to add but little to the total length of the armature.

The invention is an improvement over the separate connecting-pieces, in that the numerous joints which these require are dispensed with and the winding in many ways facilitated.

The invention will be described by reference to the annexed drawings, where—

Figure 1 shows in central longitudinal section an armature wound in accordance with my invention. Fig. 2 is an end view of the armature, showing the disposition of the coils; Fig. 3, a view of an insulating plate or ring used between the layers of wire. Fig. 4 is a perspective of a portion of the armature-core on a reduced scale.

The core which I employ is composed of a number of independent sections or plates, A A, with heavier end pieces, B B, strung on a shaft, C, and bolted together. Washers or rings D, of metal or non-magnetic material, are interposed between the sections of the core to facilitate the circulation of air. The surface of the cylinder formed in this manner is grooved or recessed, polar projections E being left, between which the coils are wound.

For the conductors I use a number of strands of pliant wire, which may be insulated or not. In either event the plan of winding is substantially similar. The core is entirely covered with thick paper or similar material in thin sheets, (indicated by the letter F in Fig. 4.) Strips G, of paper or similar material, are then secured in the recesses, as shown in Figs. 2 and 4, to form insulating-partitions between the coils. The strands of wire forming a conductor or coil are then laid singly or in a bundle of the desired dimension in the same manner that one wire is wound in the ordinary machines, except that at the ends of the core the strands are spread out on either or both sides of the shaft, as shown in Fig. 2, and held in this position until the next coil is wound. After winding a coil over the end of the core a sheet or plate, L, of pliant insulating material—such as muslin, felt, or the like—is laid over the wires, and to facilitate the spreading of the wires of the next group it is heavily coated with a plastic insulating substance, such as shellac.

The specific method of winding and connection is not material, any of the methods which I have illustrated in patents granted to me be-

ing suitable. I prefer, however, to wind part of the coils in pairs and part singly, beginning alternately from opposite sides of the same end of the core, so that there will be formed an even number of convolutions in a single layer. The coils, when wound, are connected together and to the commutator by connecting the last end of one coil and the first end of the next succeeding coil to the same commutator-segment. This is shown in Figs. 1 and 2, where H K indicate two coils or convolutions. At the end of the core the strands composing each coil are spread out on each side of the shaft C upon a circular piece of felt or muslin, L. The coil H is shown in dotted lines, it being under the sheet L. Of the two coils shown in Fig. 1, *a* and *b* are the beginning and end of the one and *c* and *d* the beginning and end of the other, respectively. The ends *b* and *c* are brought together and joined to the same commutator-segment, M. The remaining coils are connected in a similar manner until a complete circle of connections is formed. The insulating material on the armature-core, together with the strips G and sheets L, keeps the coils from contact with the metal core and with each other, so that they are effectually insulated, whether they be covered with fibrous material or not. By the use of conductors composed of numerous strands it is apparent that the masses of inert conductor at the ends of the core are very greatly reduced, while the resistance of the armature-circuit may be made very low.

What I claim is—

1. The combination, with an armature-core, of a system of conductors composed of massed strands or strips of conducting material, substantially as described.

2. The combination, with a cylindrical armature-core, of a system of conductors wound thereon, and composed of groups or bundles of fine wire, each group being spread out at the ends of the core, as and for the purpose set forth.

3. The combination, with a cylindrical armature-core, of conductors composed of groups or bundles of fine wire wound longitudinally around the core and spread out over the ends around the shaft, and sheets of insulating material interposed between the groups or bundles of wires at the ends, substantially as set forth.

In testimony whereof I have hereunto set my hand this 3d day of January, 1883.

EDWARD WESTON.

Witnesses:
RAYMOND F. BARNES,
W. FRISBY.