(No Model.)

# E. WESTON.

## DYNAMO ELECTRIC MACHINE.

No. 401,669. Patented Apr. 16, 1889.

*Fig. 1.*

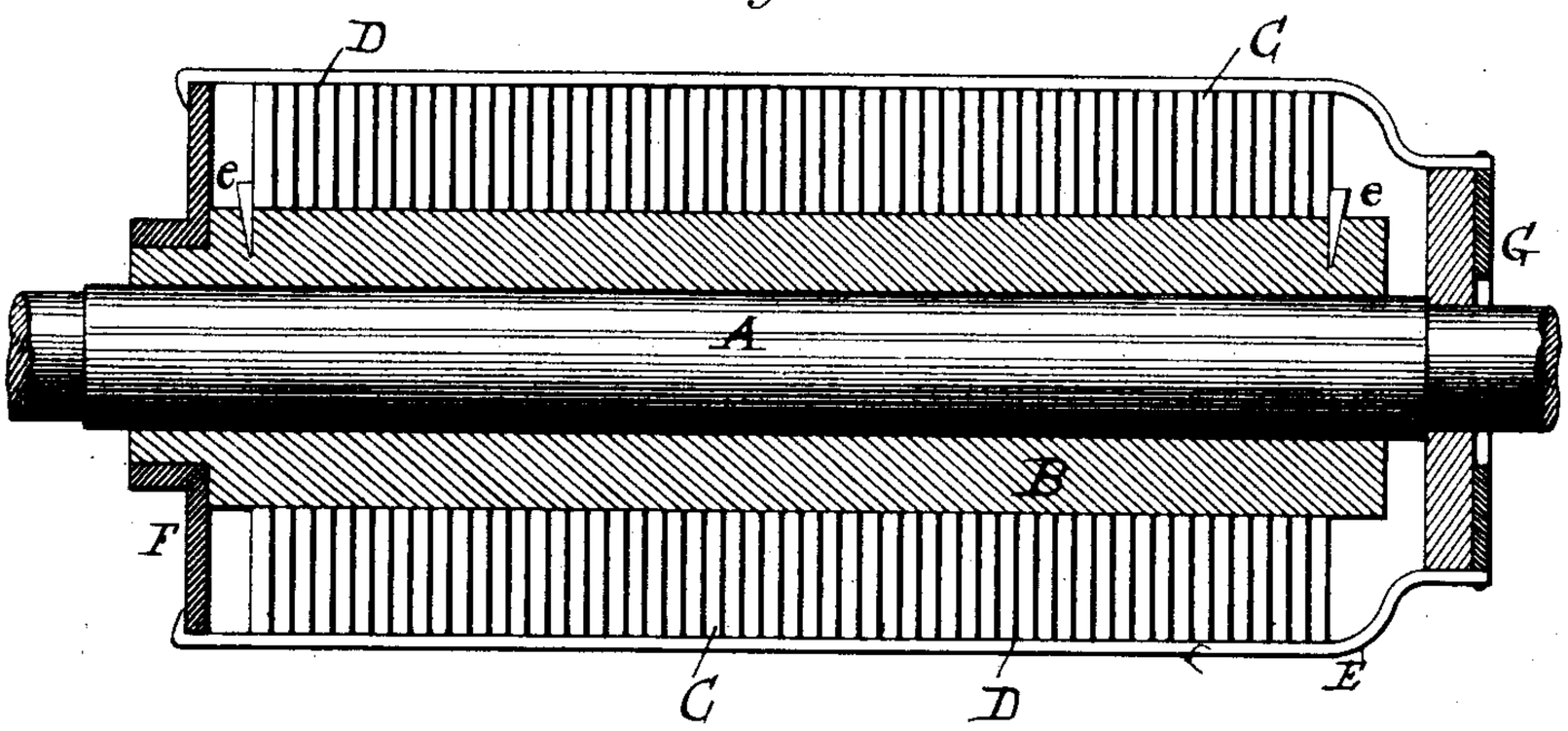



*Fig. 2.*

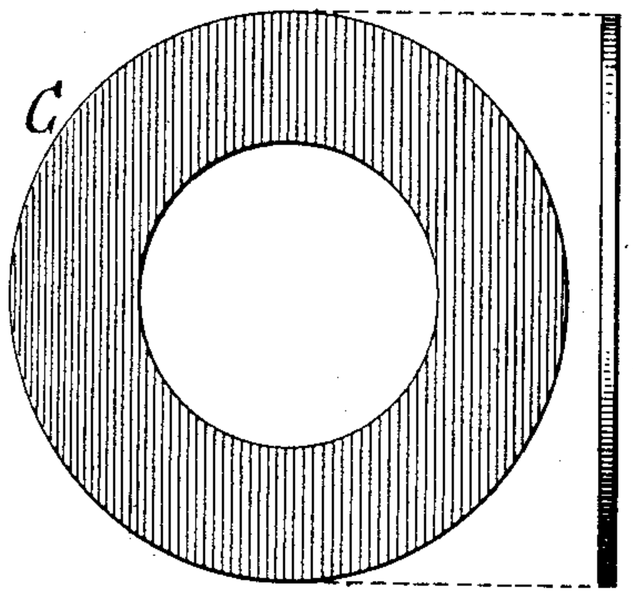
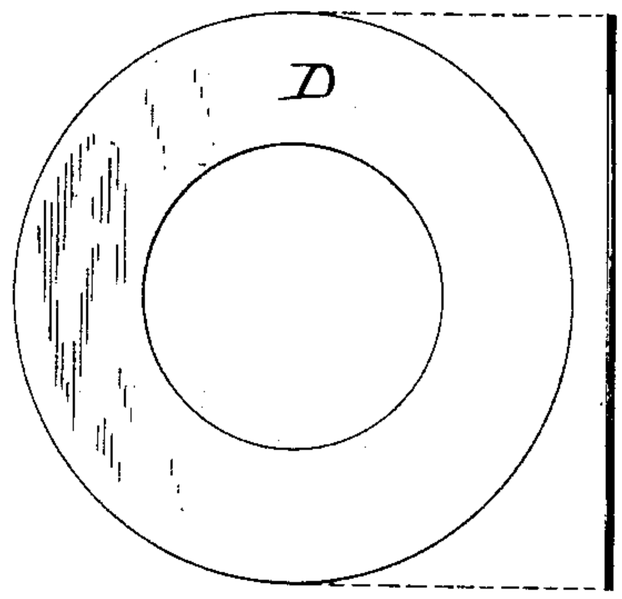



*Fig. 3.*

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# 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. 401,669, dated April 16, 1889.

Original application filed September 22, 1882, Serial No. 72,475. Divided and this application filed November 14, 1882. Serial No. 76,757. (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 the construction of cores for electrical generators of that class the operation of which depends upon inductive action, 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 electrical apparatus in which the coil or coils for the development of electric currents by inductive action is formed by winding an insulated wire or conductor around a core formed of magnetic material.

Primarily the invention relates to magneto or dynamo electric generators, or, in other words, to machines in which the magnetic core, wound with an insulated coil, is moved with reference to a magnetic field or the field moved with reference to the core in such manner, in either case, that the lines of magnetic force will be cut by the conductors at right angles, or as nearly so as practicable; but the invention is also applicable to other forms of electrical apparatus in which use is made of a magnetic core wound with an insulated coil or coils in which currents are developed by inductive action, and in which, in other respects, similar electrical conditions obtain to those met with in the ordinary form of dynamo-electric machines. In all such machines where the coils wound on an iron core are subjected to inductive action by their movement with respect to the lines of force, or conversely, it is obvious that the same inductive action tends to generate currents in the body of the core itself, and this would occur if the core were formed of a solid mass of iron, or if it were so constructed as to present closed paths in the body of the material composing it parallel to the convolutions of the coils. Such development of currents in the core would obviously involve a waste of energy, and it would also operate injuriously by heating the core and coils, so as to render their continued use difficult or impracticable.

My invention consists in a novel and useful construction of such cores, whereby the injurious results due to the generation of induced currents in the body of the core are avoided, the process of manufacture facilitated and cheapened, the mass of iron in the core more effectively increased, and its magnetic continuity in the direction of the lines of force traversing it more nearly preserved. These objects I attain by constructing or building up the core of alternate sections of magnetic and insulating material, by preference using a number of disks or plates of iron, arranged at right angles to the direction of the coils wound upon the core, with rings, sheets, or plates of insulating material interposed between them.

I have shown this invention in the drawings as applied to an armature-core of a dynamo-electric machine of special construction.

Figure 1 illustrates in central longitudinal section a cylindrical core built up in the manner described. Fig. 2 shows one of the iron rings, plates, or disks; and Fig. 3, one of the plates or sheets of insulating material employed in the construction of the core.

A is the shaft upon which the core is mounted, and B a supporting-cylinder of wood or other proper substance, which is slipped over the shaft and secured in place.

On the wooden hub or cylinder B are strung a number of iron rings, C, and paper rings D alternately, so that the iron rings will be insulated from one another. The rings are held together by pins *e*, driven into the hub B, by collars, or by any other suitable means.

The conductors are designated by the letter E. They are wound longitudinally upon the surface of the cylinder formed by the iron and paper rings, connected across the end of the cylinder by a plate, F, and their free ends brought to the segments of a commutator, G. (Shown in section in Fig. 1.) The method of winding and connecting may, however, be greatly varied without departure from

the invention, that shown being a system described by me in previous Letters Patent.

It may be stated with reference to the construction of the core that the plates or rings C need not of necessity be made cf the precise shape shown, but may be made of various other shapes, according to the requirements of particular cases. They may be, for instance, indented, as described by me in United States Letters Patent, No. 209,532, of October 29, 1878, so that when placed together they form a cylinder with grooves or recesses in its periphery for the reception of the coils. The intervening sheets or rings or insulating material may also vary somewhat in character and composition, as is evident from the nature of the case. By this construction the plates of iron may be made quite thin and brought very close together, so that the local induced currents will be effectively broken up, and a greatly increased mass of iron will be present in a core of given dimensions, while the iron is practically continuous in planes parallel to the lines of force traversing the core.

The hub or cylinder B, while it forms a convenient and economical base for building up the core, may be dispensed with, and other devices used for holding the plates together as may be required by the necessities of particular cases.

Though described in connection with a core cylindrical in its general configuration, it will be readily seen that the invention applies equally to other forms of core—as, for instance, the ring or annular cores now in use in machines of the Gramme type.

I do not here claim the combination, in a dynamo-electric machine with the shaft, of a cylinder or hub of wood or other insulating material, iron plates or rings strung over said hub, and plates or sheets of insulating material interposed between said rings, inasmuch as this feature is the subject-matter of my application for Letters Patent filed September 22, 1882, Serial No. 72,475 of which my present application is a division.

I am aware that cores have heretofore been made with air-spaces between the several magnetic sections, and also that cores composed of bundled wires have been used, and I do not claim, broadly, herein a sectional or compound core; but

What I claim is—

1. A core for electrical generators operating by inductive action, composed of alternate sections, plates, or disks of magnetic and insulating materials, in combination with insulated coils wound thereon, as set forth.

2. A core for electrical generators operating by inductive action, composed of iron plates, sections, or disks, with interposed plates or sections of insulating material, in combination with insulated coils wound thereon at right angles to the planes or lines of the insulating sections, as set forth.

3. A core for electrical generators operating by inductive action, composed of iron sections, plates, or disks, with interposed plates or sections of insulating material, in combination with means for binding and holding the same together and insulated coils wound thereon at right angles to the planes or lines of the insulating sections, as set forth.

In testimony whereof I have hereunto set my hand this 10th day of November, 1882.

EDWARD WESTON.

Witnesses:
G. W. HEBARD,
H. A. BECKMEYER.