(No Model.) 2 Sheets—Sheet 1.

# E. WESTON.

## DYNAMO OR MAGNETO ELECTRIC MACHINE.

No. 266,243. Patented Oct. 17, 1882.

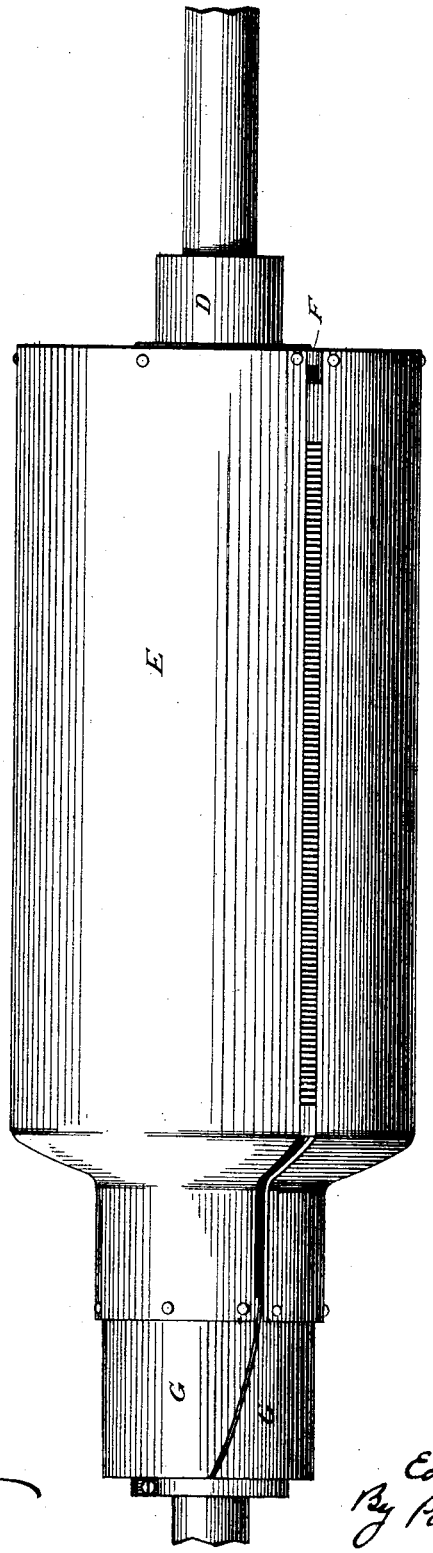


Fig. 1.

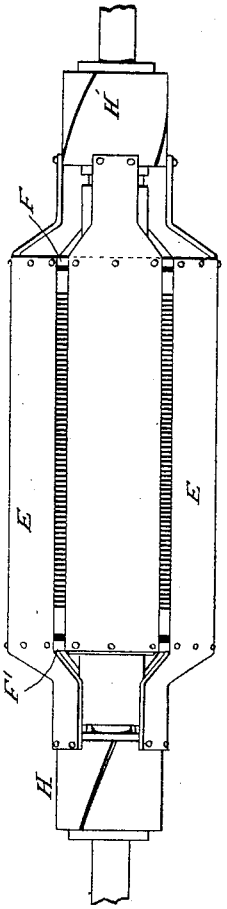


Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

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## DYNAMO OR MAGNETO ELECTRIC MACHINE.

No. 266,243. Patented Oct. 17, 1882.

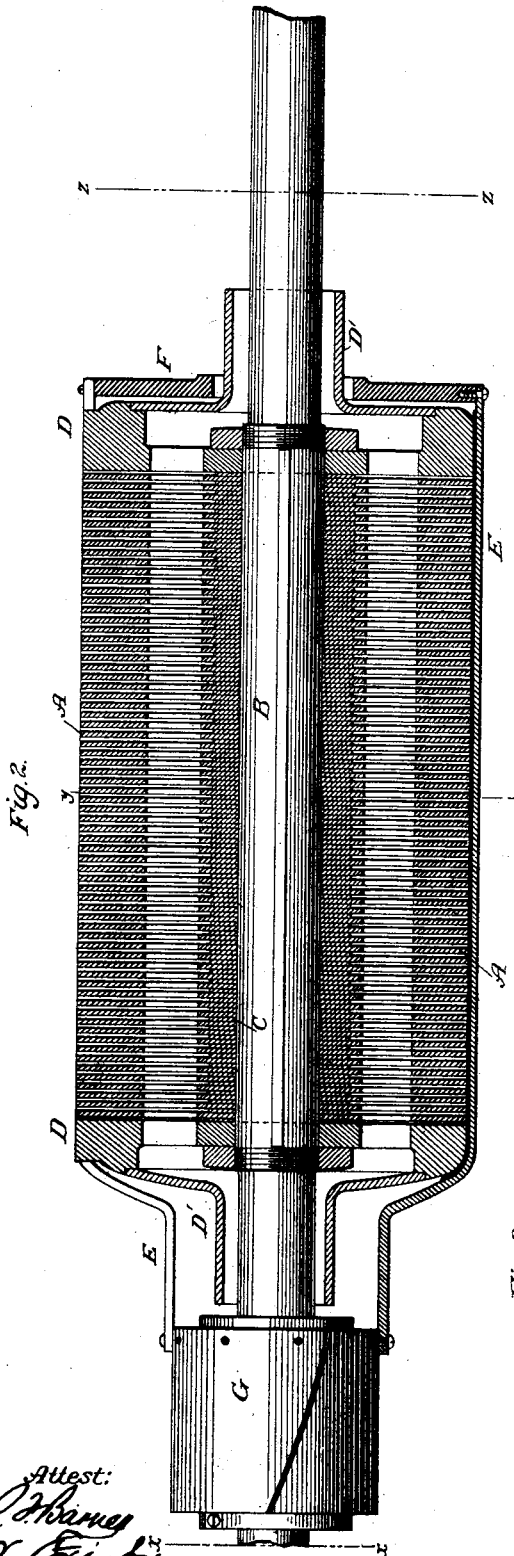


Fig. 2.

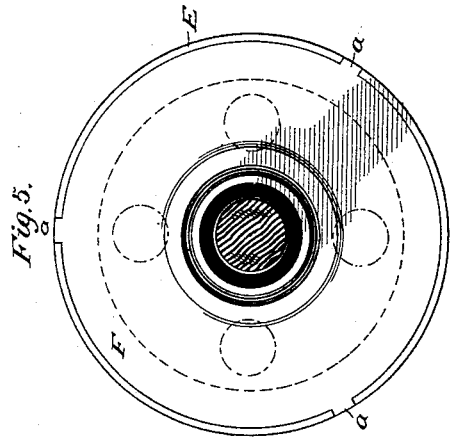


Fig. 5.

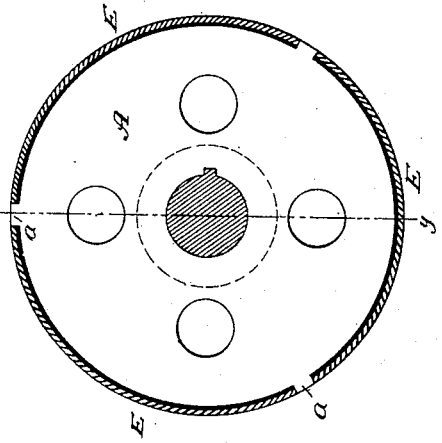


Fig. 4.

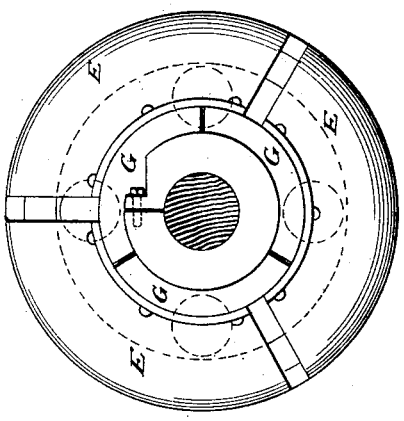


Fig. 3.

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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 OR MAGNETO ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 266,243, dated October 17, 1882.

Application filed March 27, 1882. (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 or Magneto Electric Machines, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The object of my invention is to simplify and cheapen the construction of dynamo or magneto machines which are intended for the production of currents of low electro-motive force but great volume, and which in consequence require conductors of great size. In such machines as constructed heretofore the armature-coils have been composed of insulated wires of large size wound about the armature and connected to the commutator-segments, or of bars of copper, whether insulated or naked, which, instead of being bent around the armature-core, have been suitably connected to end connecting disks or their equivalents. In the present instance I take advantage of the well-known fact that a conductor which passes through a magnetic field at right angles to the lines of force is capable of generating an electric current to construct an armature adapted for certain purposes, which possesses many advantages in simplicity of design and economy of construction over the forms above described.

My improvements consist in forming the conductors of a cylindrical armature of sheets or plates of metal bent or rolled to conform to the shape of the cylinder connecting them to a common end piece at one end and to the independent sections of a commutator at the other. In other words, the conductors form sections of a cylinder closed at one end and conforming to the shape of the core, having of necessity an internal diameter slightly greater than that of the core.

The character of the armature and the method of forming the same will be more fully explained by reference to the accompanying drawings.

In Figure 1 a complete armature having three sections is shown in elevation. Fig. 2 is a central section of the same, taken along the line of the shaft; Fig. 3, an end view of the same, the shaft only being shown in section on line *x x* of Fig. 2. Fig 4 is a vertical section on line *y y* of Fig. 2. Fig. 5 is a rear view of the armature, the shaft being shown in section on line *z z;* and Fig. 6 is a modification of the principle as applied to a machine having two commutators.

Similar letters of reference indicate corresponding parts in the several figures.

The core of the armature is composed of a number of perforated iron plates, A A, which are strung on a shaft, B, and held apart by their disks or rings of insulating material, C. End pieces, D D, having caps D′ D′, are clamped to the shaft at opposite ends of the core, and serve to hold the plates A together, and also to form annular air-spaces around the shaft, through which air is drawn in when the machine is in motion.

The conductors are designated by the characters E. They are formed of sections of a cylinder of copper, the internal diameter of which is slightly greater than the diameter of the core. In the present case the sections are three in number, and the surface of the core is cut away, except at the points *a a a*, to receive them. The sections E are not themselves insulated, unless so desired. They are, however, prevented from coming into contact with the armature by sheets of insulating material, such as asbestus paper.

At one end of the armature the sections G are screwed, soldered, or otherwise united to an annular plate or ring, F, of copper, which is passed over the shaft and cap D′. At the opposite ends the sections E are bent over and suitably tapered and screwed or soldered to the insulated segments G of a commutator fixed to the shaft B inside the bearings. The armature thus constructed is designed to be mounted in bearings of the ordinary kind, and to rotate between the poles of a powerful field-magnet.

The principle of action is as follows: There are three segments on the commutator. Each will therefore cover an angle of one hundred

and twenty degrees, or thereabout, so that the segments remain in contact with the collecting-brushes during the whole of that portion of the revolution of the armature in which the sections of cylinder E connected therewith are generating a useful current. In practice I make the segments so that the divisions between them shall be at an angle to the axis of revolution, whereby the brushes make contact with one segment before leaving another. As the conductors E are connected electrically at the rear end of the armature, it follows that the end of any conductor which is generating a useful current will be connected to ends of opposite polarity of the other conductors, and the circuit will be completed through the brushes and the external circuit. The commutator-brushes for this purpose are to be placed at points ninety degrees from the neutral points, so that the segments in contact with one of said brushes at any time will be of opposite polarity to those in contact with the other. The same plan of winding and connecting the conductors may be obviously applied to a number of sections greater than three. In case this is done, the commutator-segments should be inclined to the axis of the commutator, so as to remain in contact with the collecting-brushes during such time as the conductors connected therewith are generating a useful current.

The conductors E are formed of sheet-copper bent or rolled to conform to the shape of the core and then connected to the plate F and fitted to the core. Their free ends are then tapered to permit of connection with the segments G. They are then bent down and screwed or clamped to the commutator, as shown. On the other hand, the conductors may be formed by slotting the sides of a cylinder closed at one end and then applying to the core, as above.

The character of the core may be greatly varied, as well as the specific construction of the other parts of the machine. So, also, instead of the arrangement of the conductors described, others may be adopted which lie within the scope of my present invention. For instance, two independent sets of conductors may be used, each constructed and connected in a manner similar to that described, but arranged as shown in Fig. 6, where one set of conductors E is connected to a plate, F, and to a commutator, H, while the other set is applied to the core in the spaces between the sections of the first set and connected to a plate, F′, and to a commutator, H′, placed at opposite ends of the core respectively to the connecting-plate F and commutator H.

A machine thus constructed may be run with two external circuits; or the two commutators may be connected in multiple arc or in series in connection with the same external circuit.

Without reference, therefore, to the special character of the machine to which my invention is or may be applied,

What I claim is—

1. In a dynamo or magneto electric machine, a cylindrical core, in combination with longitudinal conductors composed of sheets or plates of metal bent or rolled to conform to the shape of the core, and connected together and to the segments of a commutator, in substantially the manner described.

2. In combination with a cylindrical core, an insulated circular plate at one end, a commutator at the other, and conductors composed of sheets or plates conforming to the shape of the core, the said plates being insulated from the core and connected to the insulated plate and to the segments of the commutator, in substantially the manner described.

EDWARD WESTON.

Witnesses:
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H. C. HUNTEMANN.