(No Model.)

T. A. EDISON.

DYNAMO OR MAGNETO ELECTRIC MACHINE.

No. 263,133. Patented Aug. 22, 1882.

Fig. 2

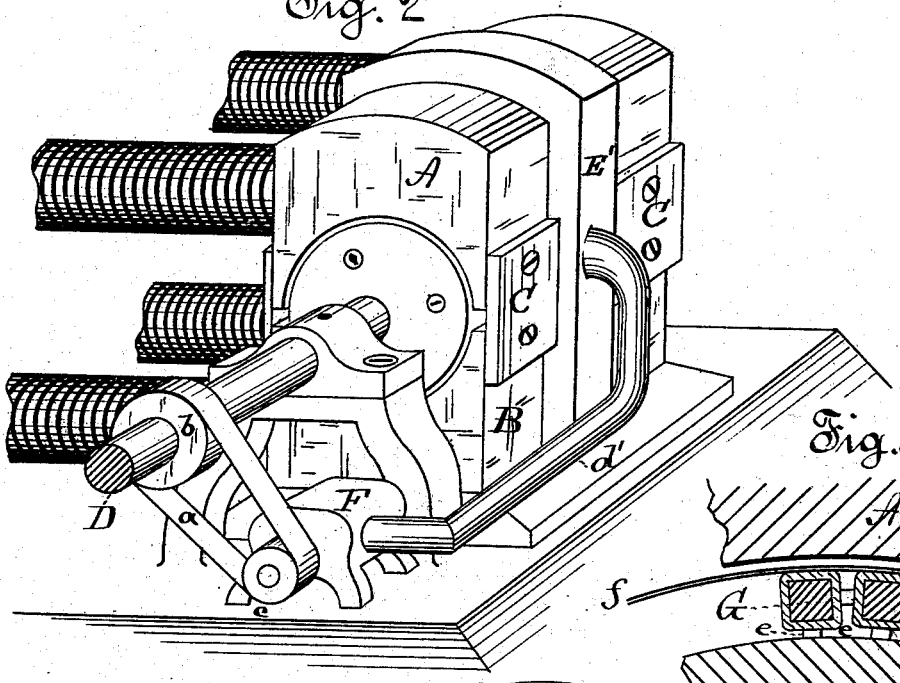


Fig. 3.

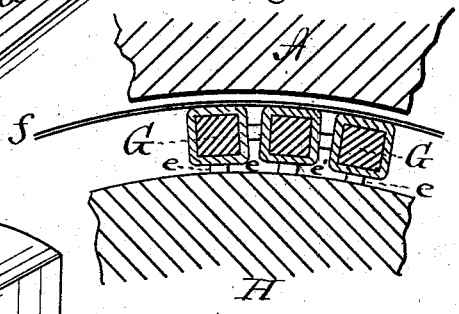
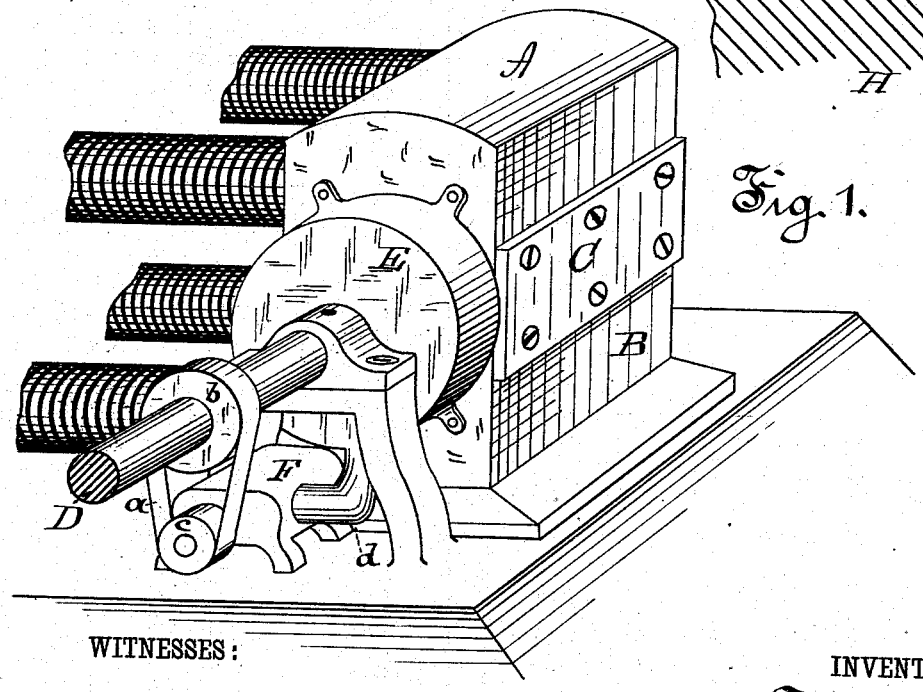


Fig. 1.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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DYNAMO OR MAGNETO ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,133, dated August 22, 1882.

Application filed November 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Dynamo or Magneto Electric Machines, (Case No. 346;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object I have in view is to produce means for cooling the armature of a dynamo or magneto electric machine.

In carrying out my invention I close the spaces between the polar extensions of the exciting magnet or magnets at the sides of the armature by means of brass plates or other non-magnetic metal or material. At the non-commutator end of the machine the shaft is surrounded by an air-chamber, which is a drum having an open side secured to the ends of the polar extensions and covering the ends of the armature, so as to inclose the space between the inductive portion of such armature and the polar extensions. To this air-chamber is connected by pipe the case of an air-blower, which blower is driven preferably by the armature-shaft by means of a belt and pulleys; or the blower may be driven by power from the same source applied in a different manner, or power from any other source. During the operation of the machine the blower is driven and air is forced from end to end of the armature through the space between the same and the polar extensions of the exciting magnet or magnets. By connecting the edges of the polar extensions the space around the armature is closed, except at the ends causing the currents of air to traverse the whole length of the armature. Instead of having the air-chamber at the end of the armature, the polar extensions of the field-magnets may be divided at the center and the space covered by exterior plates. A number of pipes—say three—will lead from the blower to this space, and the air will be forced in both directions from the center toward the ends of the armature. This latter construction has the advantage that there is but one-half the resistance to the passage of the air that there is with the first construction, and consequently with same power four times the amount of air can be forced over the armature. In addition, the air will not be heated to such an extent, and both ends of the armature will have the same temperature.

To allow the currents of air supplied in either way before described to circulate freely around the inductive portion of the armature and between such inductive portion and the core, I have devised the following construction: Instead of using wire coils for the inductive portion of armature, copper bars and cross-connections are employed, the copper bars being preferably wound with suitable insulating and heat-conducting material, as described in an application for patent of even date herewith. These bars are arranged parallel upon the armature-core and spaced a certain distance apart, and are raised off of the core and separated by small blocks or by projections either on the core or bars. The bars are held in this position by their end connections and by being bound at a number of points by wire drawn tightly around the armature. In this manner air-spaces are formed entirely around the inductive bars, through which the currents of air from blower pass. Air-passages are also made longitudinally through the core of the armature, and radial passages extend from the longitudinal passages to the exterior of the core at various points. A portion of the air from the blower is forced through these passages and assists to cool the armature.

The foregoing will be better understood from the drawings, in which Figure 1 is a perspective view of the principal parts of a dynamo or magneto electric machine embodying my invention; Fig. 2, a similar view of a modified form of the cooling devices; and Fig. 3, a cross-section, showing spacing of the copper inductive bars.

A B are the polar extensions of the exciting magnet or magnets, and C the plates for closing the spaces between the side edges of such polar extensions.

D is the armature-shaft.

E is the air chamber or drum inclosing the non-commutator end of armature.

F is the air-blower, driven by belt *a* and pulleys *b c* from armature-shaft D, and having its case connected by pipe *d* with air-chamber E. In the modified form the pipe *d'* of the

blower (or several pipes therefrom) passes to the air-chamber E′, formed by a vertical cut through the center of the polar extensions A B and covering-plates.

G represents the wrapped copper inductive bars, supported off of the armature-core H and separated by blocks or projections *e e′*, and *f* is the wire wrapping for holding bars in place.

What I claim is—

1. The combination, with a dynamo or magneto electric machine, of an air-blower situated outside of the machine and a duct or ducts connecting said air-blower with the space around the armature of said machine, substantially as set forth.

2. The combination, with a dynamo or magneto electric machine, of an air-blower driven by the armature-shaft of such machine, and a duct or ducts connecting said blower with the space between the armature of the machine and the polar extensions of its exciting magnet or magnets, substantially as set forth.

3. In a dynamo or magneto electric machine, the polar extensions of the exciting magnet or magnets connected at their side edges, so as to form a chamber surrounding the armature, and open only at the ends of such armature, in combination with a blower forcing air through said chamber, substantially as set forth.

4. The combination, with the core of the armature of a dynamo or magneto electric machine, of the inductive bars and means for supporting each of said bars, so placed that each bar is separated from the armature-core, a space being left entirely around each bar, substantially as set forth.

5. In a dynamo or magneto electric machine, the combination of the inductive bars supported off of the armature and separated from each other with a blower for forcing air into the space between the armature and the polar extensions of the exciting magnet or magnets, substantially as set forth.

This specification signed and witnessed this 24th day of August, 1881.

THOMAS A. EDISON.

Witnesses:

RICHD. N. DYER,

H. W. SEELY.