(No Model.) 3 Sheets—Sheet 1.

G. D. BURTON & E. E. ANGELL.

VENTILATING APPARATUS FOR DYNAMO ELECTRIC MACHINES.

No. 537,010. Patented Apr. 9, 1895.

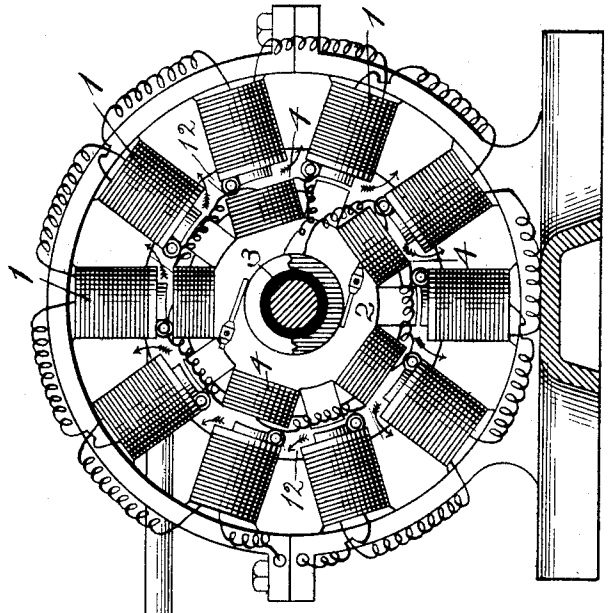

Fig. 1.

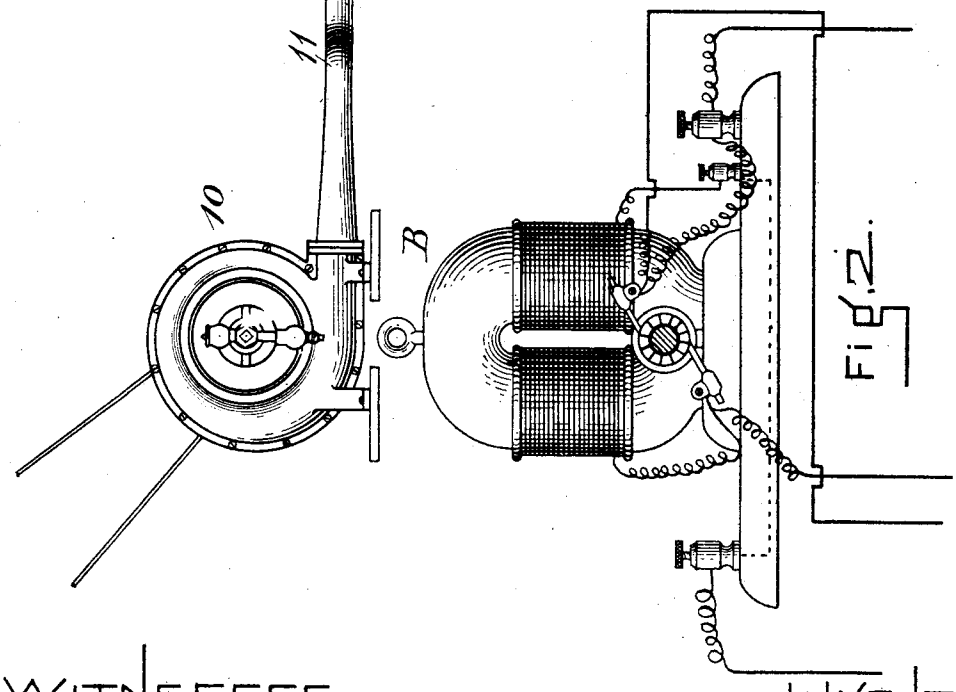

Fig. 2.

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(No Model.) 3 Sheets—Sheet 2.

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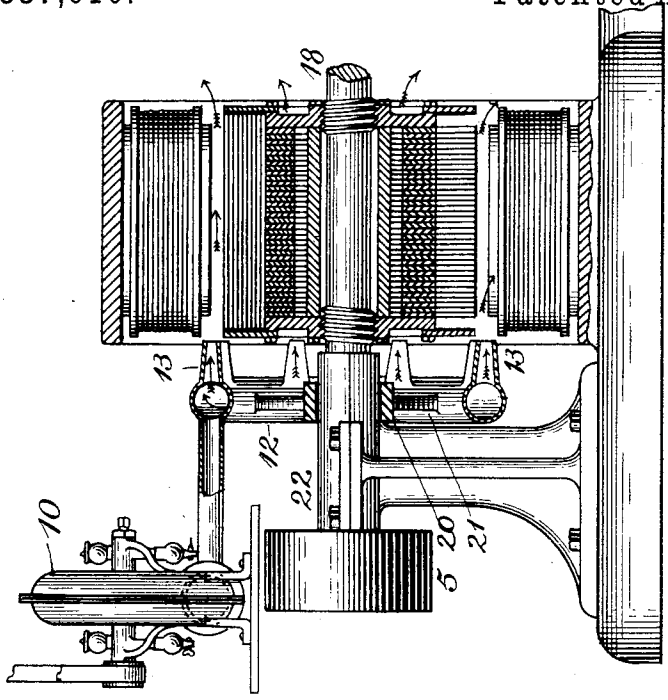

Fig. 3.

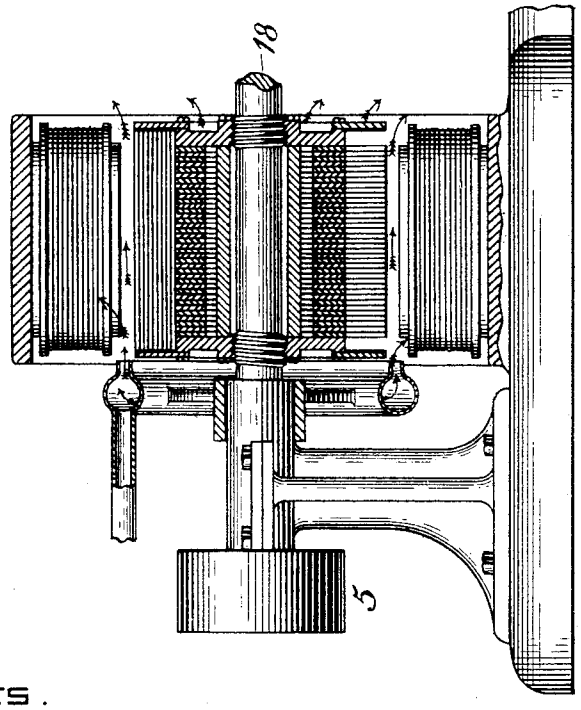

Fig. 4.

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(No Model.) 3 Sheets—Sheet 3.

G. D. BURTON & E. E. ANGELL.

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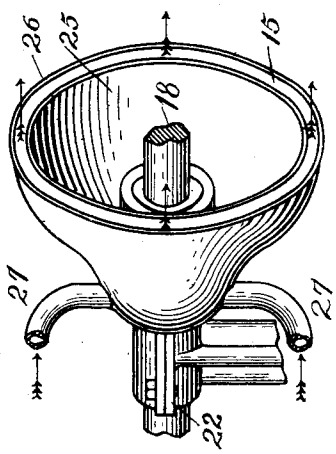

Fig. 8.

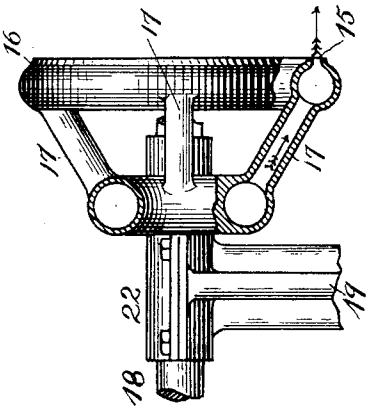

Fig. 6.

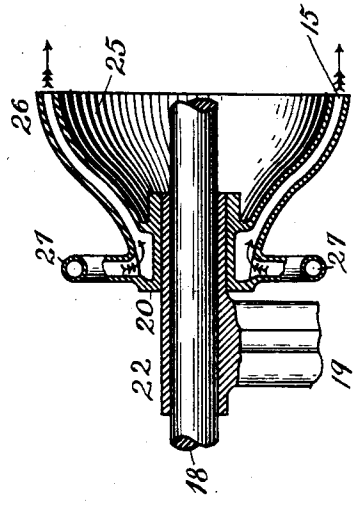

Fig. 7.

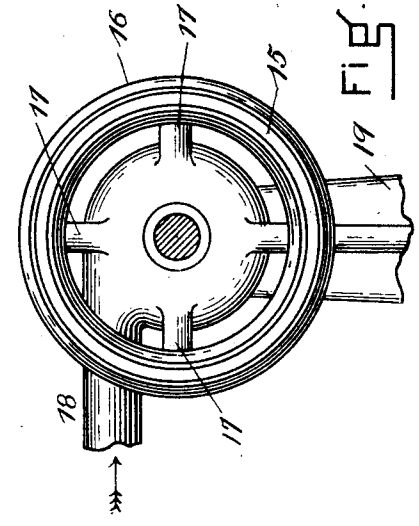

Fig. 5.

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INVENTORS:
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UNITED STATES PATENT OFFICE.

GEORGE D. BURTON, OF BOSTON, AND EDWIN E. ANGELL, OF SOMERVILLE, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO SAID BURTON.

VENTILATING APPARATUS FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 537,010, dated April 9, 1895.

Application filed December 7, 1892. Serial No. 454,399. (No model.)

To all whom it may concern:

Be it known that we, GEORGE D. BURTON, of Boston, in the county of Suffolk, and EDWIN E. ANGELL, of Somerville, in the county of Middlesex, State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Electric Generating Machines, of which the following is a specification.

Our improvement relates to machines for generating electricity, commonly known as dynamo machines, and it consists of certain combinations of parts and attachments thereto for the purpose of preventing and breaking up interfering currents of electricity, which pass through different parts of the machine counter to the effective working current, generated by it, and which greatly weaken the latter and cause the machine to heat up, and thus impair its efficiency. These cross or counter currents depend for their effects upon the saturation of the space between the field coils and the armature of the dynamo with electricity, and their evil effects are not experienced until that occurs, and by constantly changing the air in this space for other air brought from outside the influence of the dynamo these effects may be avoided.

In the drawings: Figure 1 is an end elevation of an alternating current dynamo, partly in section, provided with our attachment. Fig. 2 is an end elevation of an exciter of the constant current type for exciting the field magnets of the alternating current dynamo. Fig. 3 is a central vertical sectional view of the field and armature of the dynamo and attachments shown in Fig. 1; the driving mechanism not being sectional. Fig. 4 is a central vertical section the same as Fig. 3, with a modification in our attachment thereto. Figs. 5 and 6 are respectively a face view and a side view partly in section, of a part of our air blast apparatus detached from the machine. Figs. 7 and 8 are respectively a sectional and a perspective view of a modification of Figs. 5 and 6.

A is a dynamo machine, of the type described in the patent of Burton, Eddy and Briggs, No. 475,232, dated May 17, 1892.

1, 1, are the field coils mounted on spools on the frame of the machine, and 2 is the revolving armature mounted upon the shaft, 3, and provided with a series of coils, 4, mounted on cores projecting radially from the armature. Every other core of the armature is left without a coil. The field coils, 1, are energized by the exciter, B, (Fig. 2) in the usual way. The armature, 2, is revolved by the pulley, 5, on its shaft, 18, and the operation of the machine will be readily understood without a more detailed description.

In order to prevent the electrified air from remaining between the revolving armature and the field coils and continually circling around between them as it usually does, we provide a rotary blower, 10, of the usual type driven from any suitable countershaft, and from this we conduct the pipe, 11, to a circular pipe, 12, (Fig. 1) which has a series of nozzles, 13, 13, (Fig. 3) pointed across the space between each field coil and the revolving armature, 2, so that a blast from each nozzle will sweep across the end of the coil and change the air constantly between them. The nozzles, 13, project from the annular tube, 12, which is attached to a central sleeve, 20, by radial arms, 21. This sleeve is mounted upon and surrounds the exterior of the box, 22, of the stand 19, which supports the dynamo shaft 18.

In Figs. 5, 6, 7, and 8, is shown a different type of nozzle intended to blow a cylindrical sheet of air all around between the field coils, 1, and the armature 2, which may be preferable in some cases, especially where the field magnets are numerous and the armature of the dynamo runs at high speed. The mouth, 15, of the nozzle is annular and is formed in Figs. 5 and 6 by a slot opening into the side of the annular tube 12. The air is supplied to this tube through the radial pipes, 17, 17, leading from the air supply pipe, the latter being enlarged at its end so as to surround the box, 22, supported by the bracket, 19, which carries the shaft 18 of the dynamo.

In Figs. 7 and 8 the annular mouth, 15, of the nozzle is formed by two cup-shaped disks attached at their smaller ends to the sleeve, 20, so as to leave a cone-shaped space between them. Into this space are led the air

pipes, 27, 27, from any suitable source of air supply, and the air is forced from the mouth 15 in a cylindrical stream as before described.

The operation of the mechanism is as follows: The dynamo armature being set in motion by its pulley, 5, the blower, 10, is also set in motion by its driving belt and forces constant currents of air transversely across those circling around the dynamo armature, and this interrupts the action of centrifugal force which, if undisturbed, would throw these armature air currents outward against the field coils. These currents of air thrown out by the centrifugal action of the armature become highly charged with electricity by coming in contact and circling around with it before being centrifugally thrown outward, and forcibly brought in contact with the field magnets, when the dynamo is operated in the usual way. These electrified air currents thus flowing in a constant stream past the field magnets affect by induction and not only weaken the electric currents flowing through their field coils, but also in so doing generate heat, which heats up the dynamo and impairs its operation. By our invention, however, the centrifugal propulsion of the air from the armature to and against the field magnets is broken up, even if comparatively warm air is passed through the blower, and the dynamo may be run constantly and kept cool on work where it would become heated up if our invention were not employed. It is, of course, obvious that the same effect can be accomplished by an exhaust mechanism arranged to suck the air through between the armature and field coils of the dynamo as by blowing it through. If, for example, the pipe, 12, (Figs. 1, 3, and 4) be connected with the center of the blower 10, where it receives air, instead of with the exterior, then the air would be drawn through between the armature and field coils instead of blown through.

Instead of air any other kind of gas may be employed which will accomplish the same purpose when forced through between the armature and field coils of the dynamo, and still be within our invention.

What we claim as new and of our invention is—

1. The combination with a dynamo electric machine, of an apparatus for producing a current of air comprising a nozzle having a mouth disposed opposite the space between the field magnets and the armature, and adapted to direct a current of air through said space parallel with the adjacent surfaces of said armature and magnet, substantially as set forth.

2. The combination with a dynamo electric machine, of an annular nozzle disposed opposite the space between the field magnets and the armature and provided with an annular mouth adapted to direct a current of air between said magnets and armature in a line parallel with their adjacent faces, and means for supplying air to said nozzle.

3. The combination with a dynamo electric machine of a flaring or bell-shaped nozzle having an annular mouth disposed opposite the space between the field magnets and armature and adapted to direct a current of air between said armature and magnets in a plane parallel with their adjacent faces, and means for supplying air to said nozzle.

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