Dec. 26, 1922. 1,439,990.

H. S. BALDWIN.

VENTILATION FOR DYNAMO ELECTRIC MACHINES.

FILED MAR. 5, 1921.

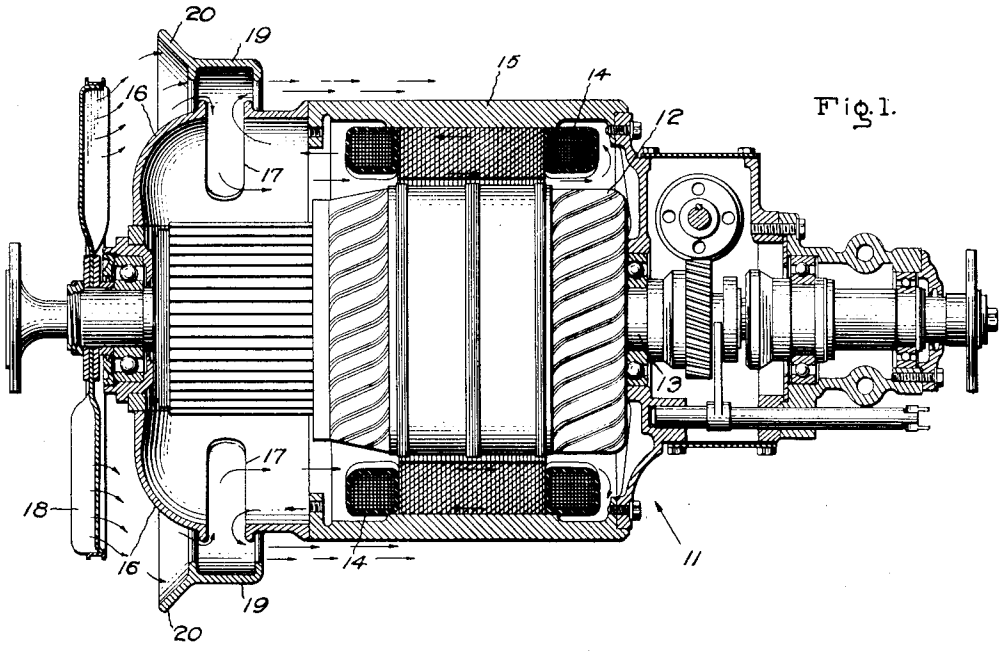


Fig. 1.

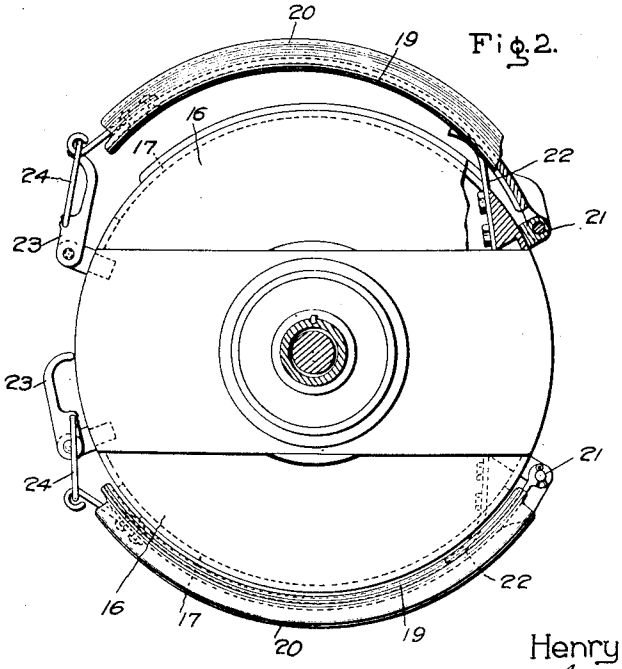


Fig. 2.

Inventor:
Henry S. Baldwin,
by Albert G. Davis
His Attorney.

Patented Dec. 26, 1922. 1,439,990

UNITED STATES PATENT OFFICE.

HENRY S. BALDWIN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

VENTILATION FOR DYNAMO-ELECTRIC MACHINES.

Application filed March 5, 1921. Serial No. 449,672.

To all whom it may concern:

Be it known that I, HENRY S. BALDWIN, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Ventilations for Dynamo-Electric Machines, of which the following is a specification.

My invention relates to the ventilation of dynamo electric machines.

The most usual mode of ventilating electrical machines is by creating a draft of air within the machine itself. While this is efficient, in some cases it becomes of importance to save as much space as possible on the inside of the machine and thus to reduce its size and weight.

The main object of my invention is to provide ventilation in such a way that no extra space is needed inside the enclosed machine, and another object is to enable such a ventilating scheme to be used in any existing enclosed machine. I attain these objects by providing means exterior of the machine for creating a blast of air and directing this blast over openings in the machine frame which otherwise totally encloses the machine. This blast of air operates on the principle of an ejector and creates a partial vacuum in the enclosed machine. This partial vacuum serves to set up a circulation of air within the machine. Air is sucked into the casing of the machine either through the same apertures over which the blast flows, or through other holes located in the casing. For a better understanding of my invention, reference is to be had to the following specification, together with the accompanying drawings, in which Fig. 1 is a longitudinal sectional view of a dynamo electric machine utilizing my invention; and Fig. 2 is an end view partly in section showing how the ventilation may be easily controlled.

Referring now more in detail to the drawings, in which like reference characters refer to like parts throughout, the dynamo electric machine 11 has a rotating armature 12 mounted in any appropriate manner on a rotatable shaft 13. This shaft 13 in the present instance is shown as supported in roller bearings at several points along the axis. Various mechanisms may be included within the frame; in the present instance gear drives are shown. The field system comprises a plurality of field coils 14, all of them appropriately supported in the magnet frame 15. The machine is totally enclosed as by means of the end shields 16. These end shields 16 have radial openings or apertures 17, each extending approximately for 135° around a circle, and forming long, narrow slits. Appropriate means are provided, such as a fan 18, for producing a blast of air across these apertures 17. This fan is mounted so as to be directly driven by the shaft of the machine. In order to direct the blast of air opposite these apertures 17, I may provide appropriately hinged ventilation covers 19, most clearly shown in Fig. 2, each carrying integral baffle plates 20 so located angularly with respect to the blast of air that it deflects it down close to the apertures 17. It is evident that by this means a draft of air produced by the fan is forced past the apertures 17 and creates in a well known manner a partial vacuum within the casing.

The ventilation covers 19, as stated heretofore, are hinged, as for example, at 21, and are so arranged that limited angular movement about these hinges is permitted. This arrangement is shown most clearly in Fig. 2 wherein the upper ventilation cover 20 is opened up so as to leave the aperture 17 uncovered, while the lower ventilation cover 19 is closed so that the lower aperture 17 is covered. A spring 22 appropriately supported on the stationary portion of the end shield or frame is so arranged that it tends to open the ventilation cover 19. To close the ventilation covers, the pivoted handles 23 are utilized, which handles are located at opposite ends from the pivots 21. These pivoted levers by means of the links 24 pull the ventilation covers 19 toward the apertures and retain them in that position in the manner clearly shown in Fig. 2. When the handles 23 are rotated about 180° so as to open the ventilation covers, the springs 22 are free to act and serve to rotate the ventilation covers 19 slightly above the pivots 21, until they are restrained from further movement by the links 24. This is clearly illustrated in the upper half of Fig. 2.

The directions taken by the currents of air in ventilating the machine may be as shown by the arrows in Fig. 1. Although in this instance I have shown arrows lead-

ing into the casing through the apertures 17, it is evident that the air to the interior of the casing may be supplied through other apertures. Furthermore, it is also evident that the dynamo electric machine may be operated either as a generator or as a motor. Hardly any extra space is occupied by the ventilating means and it has been found that efficient cooling has been obtained by this means.

While I have shown and described a preferred embodiment of my invention, I do not wish to be limited thereto but aim to embrace in the appended claims all modifications falling fairly within the scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A ventilating system for a dynamo electric machine of the enclosed type in which an aperture is provided in one end of the enclosing frame, and in which the ventilating fluid is caused to move by an exterior fan mounted on the shaft of said machine adjacent said end, characterized by the fact that said aperture is provided with a cover adapted to be held in a partially open or entirely closed position, said cover being so shaped that when it is in a partially opened position, it causes ventilating fluid to flow through the interior of said machine and around the exterior of said machine.

2. A dynamo electric machine having a shaft, end shields provided with apertures closing up one end of said machine, covers for said apertures, means whereby said covers may be opened slightly, a fan mounted on the shaft of said machine outside of the end shields for producing a blast of air, and baffle blades formed integral with said covers so arranged as to guide the air over the apertures.

3. In a dynamo electric machine having a shaft, end shields closing up one end of said machine, long narrow apertures in the end shields, hinged covers for said apertures, means whereby said covers may be lifted slightly away from said apertures, a fan mounted on the shaft of said machine outside of the end shields for producing a blast of air, and baffle plates formed integral with the hinged covers so arranged as to guide the air over the apertures.

In witness whereof, I have hereunto set my hand this 2nd day of March, 1921.

HENRY S. BALDWIN.