

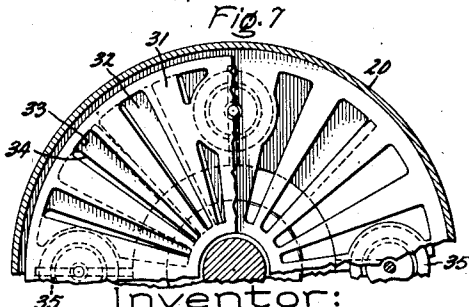
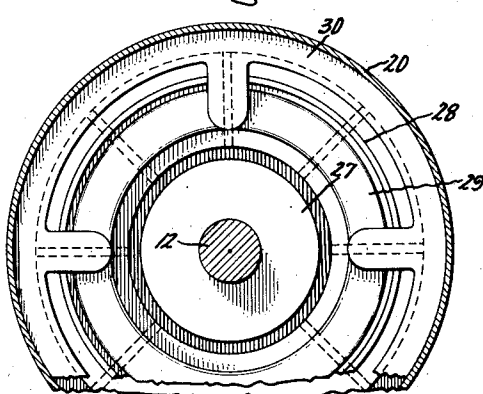
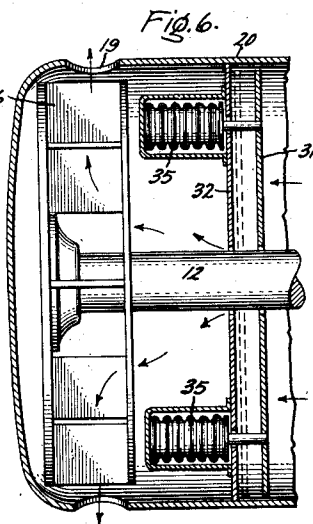
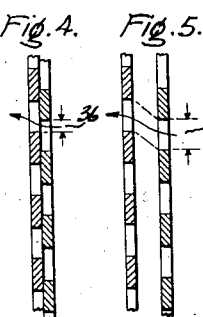
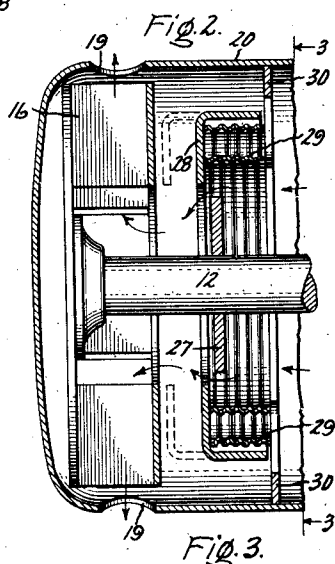
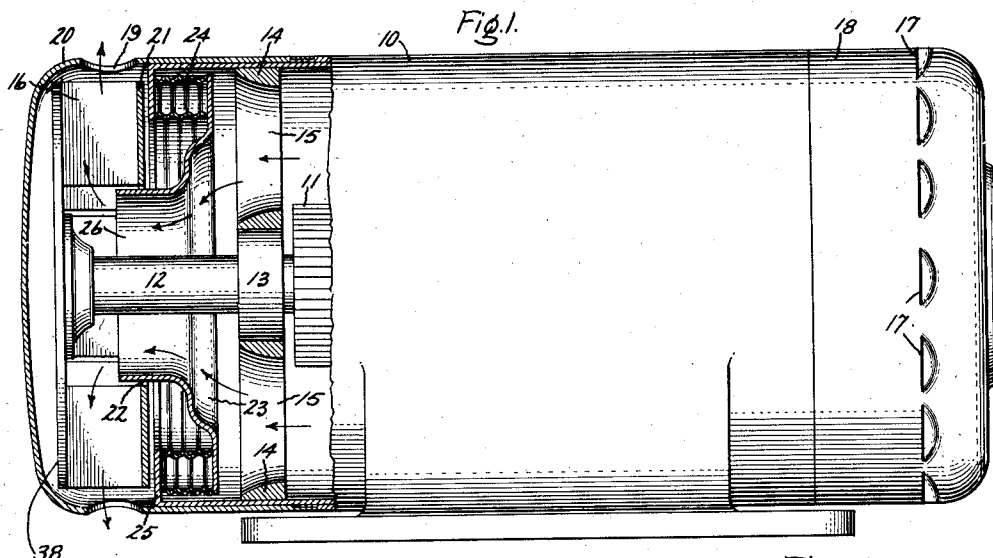
Feb. 5, 1946.

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2,394,414

DYNAMO-ELECTRIC MACHINE VENTILATING SYSTEM

Filed May 11, 1943



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UNITED STATES PATENT OFFICE

2,394,414

DYNAMOELECTRIC MACHINE
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Application May 11, 1943, Serial No. 486,603

6 Claims. (Cl. 171-252)

My invention relates to ventilating systems and particularly to a ventilating system adapted to be used for cooling a dynamo-electric machine which may be subjected to wide variations in atmospheric pressure.

An object of my invention is to provide an improved ventilating system baffling construction.

Another object of my invention is to provide a dynamo-electric machine having a ventilating system adapted to supply a substantially constant weight flow of ventilating medium through the machine.

Further objects and advantages of my invention will become apparent and my invention will be better understood from the following description referring to the accompanying drawing, and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In the drawing, Fig. 1 is a side elevational view, partly broken away, of a dynamo-electric machine provided with an embodiment of my improved ventilating system; Fig. 2 is a partial sectional view of the end of a dynamo-electric machine illustrating another embodiment of my invention; Fig. 3 is a view of the construction shown in Fig. 2 taken along line 3-3; Figs. 4 and 5 show the relative positions of a pair of baffling plates shown in the construction of Figs. 6 and 7; Fig. 6 is a partial sectional view of a further embodiment of my invention; and Fig. 7 is an end view, partly broken away, showing the relative arrangement of the construction of Figs. 4, 5, and 6.

Referring to the drawing, I have shown in Fig. 1 an embodiment of my improved ventilating system applied to a dynamo-electric machine having a stationary member 10 and a rotatable member provided with a commutator 11 mounted on a shaft 12. The shaft 12 is supported by a bearing 13 mounted in a supporting disk 14 formed with a plurality of axially extending ventilating openings 15 to provide for the passage of ventilating medium therethrough. A ventilating impeller fan 16 is provided with a supporting plate 38 mounted on the shaft 12 and is adapted to be driven thereby to provide for the circulation of ventilating medium through the machine by drawing air in through openings 17 in an end shield 18 at the opposite end of the machine and blowing this air out through openings 19 in an end shield 20 mounted on a stationary member 10 of the machine. The im-

pellor fan construction includes a plate 21 mounted on the inner side of the impeller blades and provided with a central opening 22 through which ventilating medium is adapted to pass. A baffle plate 23 is arranged in axially movable relationship relative to the fan supporting plate 38 axially spaced from the plate 21 and is supported by an annular pressure-responsive bellows member 24 which is secured at one end to the baffle plate 23 and at the other end to a stationary support 25. The baffle plate 23 is formed with a cylindrical axially extending portion 26 having an opening therethrough arranged in communication with the central opening 22 of the plate 21, and the cylindrical baffle portion 26 is adapted to extend through the opening 22 so as to direct ventilating medium passing from the dynamo-electric machine to the impeller fan 16. The pressure-responsive bellows 24 is filled with a gas at a pressure such that the baffle plate 23 shuts off a portion of the intake opening to the impeller fan blades by the position of the cylindrical baffle portion 26 extending towards the outer side plate 38 of the impeller fan 16 when the bellows 24 is in its collapsed position under normal sea level atmospheric conditions. If the motor is used under atmospheric conditions such that the pressure about the machine is considerably reduced from sea level atmospheric pressure, the sealed bellows member 24 will expand and move the baffle plate 23 away from the same baffle plate 38 so as to vary the effective size of the ventilating medium opening between the baffling members by moving the cylindrical baffle portion 26 away from the outer side plate 38 of the impeller fan 16, thereby increasing the size of the intake opening to the blades of the fan. In this manner, the effective size of the ventilating medium opening through the baffling members is varied substantially inversely with the pressure around the machine, such that a substantially constant weight flow of ventilating medium through the machine is maintained. This is particularly desirable where such a machine is adapted to be used at varying altitudes, as it is not necessary to provide a large capacity machine at low altitudes in order to enable it to operate satisfactorily at higher altitudes and in a rarefied atmosphere when it is possible to provide for the dissipation of substantially the same heat under both conditions by providing for a more effective use of the impeller fan on the machine. Furthermore, this also provides for a more efficient operation of the machine by requiring the impeller fan 16 to draw a smaller volume of air through the ma-

chine at higher atmospheric pressures and lower altitudes than would be the case if no provision were made to provide for a reduction of the ventilating medium drawn through the machine under these conditions as compared to those required for a higher altitude and lower atmospheric pressure condition.

In Figs. 2 and 3 I have shown another embodiment of my invention wherein the rotatable member shaft 12 is adapted to drive a ventilating impeller fan 16 for drawing air through the machine. In this construction, a baffle plate 27 is mounted on the shaft 12 and a relatively axially movable cooperating baffle plate 28 is supported on an annular pressure-responsive bellows member 29 which is supported by a stationary plate 30 mounted in the stationary member end shield 20. In this construction under relatively high sea level atmospheric pressure about the machine, the annular supporting bellows member 29 is adapted to be substantially collapsed, and the relatively movable baffles 27 and 28 are arranged to be substantially in radial alignment, such that very little ventilating medium may pass therebetween to the fan 16. If the atmospheric pressure surrounding the machine is decreased, the pressure of the gas in the bellows member 29 is adapted to expand the bellows and move the baffle plate 28 to a position such as that shown in dotted lines away from the baffle plate 27, enlarging the size of the ventilating medium opening between the baffle plates. This operation of the baffle plates by the supporting bellows member 29 provides for a variation in the size of the ventilating medium opening through the baffle members substantially inversely with the pressure about the machine in a manner similar to that shown in Fig. 1.

In Figs. 4, 5, 6, and 7, I have shown another embodiment of my invention wherein the rotatable member shaft 12 of a dynamo-electric machine is adapted to drive a ventilating medium impeller fan 16 mounted thereon for drawing ventilating air through the machine. In this construction, a pair of relatively movable baffle plates 31 and 32 are mounted about the shaft 12 and are provided with a plurality of ventilating medium openings 33 and 34 arranged out of axial and circumferential registry. The baffle plate 31 is mounted in relatively axially movable relationship to the plate 32 and is supported by a plurality of pressure-responsive bellows members 35 which are mounted on the baffle plate 32. These bellows members are filled with a fluid at a pressure such that under sea level atmospheric conditions, the bellows 35 are substantially collapsed and the baffle plate 31 is supported as shown by dotted lines in Fig. 6. In this position, the effective size of the ventilating medium opening through the two baffle plates is relatively small, as indicated in Fig. 4, wherein the offset arrangement of the ventilating medium openings results in a net effective size 35. Under relatively low atmospheric pressure conditions about the machine, the fluid pressure within the bellows 35 causes the bellows to expand and move the baffle 31 away from the baffle plate 32, so as to vary the relationship of the openings 33 and 34 to vary the effective size of the ventilating medium opening between the baffles, as shown in Fig. 5 at 37. This arrangement provides for varying the effective size of the ventilating medium opening through the two baffle plates substantially inversely with respect to the pressure about the machine in a manner similar to that shown by the constructions of Figs. 1 to 3 with corresponding advantages.

While I have illustrated and described particular embodiments of my invention, modifications thereof will occur to those skilled in the art. I desire it to be understood, therefore, that my invention is not to be limited to the particular arrangements disclosed, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of my invention.

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

1. A dynamo-electric machine having a stationary member and a rotatable member provided with a ventilating system construction including a ventilating medium impeller arranged to be driven by said rotatable member, a baffling member mounted on said stationary member and having an opening therein, a relatively movable baffling member having an opening therein for varying the flow of ventilating medium through said impeller, and pressure-responsive means for movably supporting said relatively movable baffling member in axially movable relationship to said first-mentioned baffling member for varying the effective size of the ventilating medium opening through said baffling members substantially inversely with the pressure around said machine maintaining a substantially constant weight flow of ventilating medium through the machine.

2. A dynamo-electric machine having a stationary member and a rotatable member provided with a ventilating system construction including a baffling member having an opening therein and mounted on said stationary member, a relatively movable baffling member having an opening therein for varying the flow of ventilating medium through the machine, and pressure-responsive means for movably supporting said relatively movable baffling member in axially movable relationship to said first-mentioned baffling member for varying the effective size of the ventilating medium opening through said baffling members substantially inversely with the pressure around said machine maintaining a substantially constant weight flow of ventilating medium through the machine.

3. A dynamo-electric machine having a stationary member and a rotatable member provided with a ventilating system construction including a ventilating medium impeller arranged to be driven by said rotatable member, a baffling member mounted on said stationary member and having an opening therein, a relatively movable baffling member having an opening therein for varying the flow of ventilating medium through said impeller, and means including a pressure-responsive member for supporting said relatively movable baffling member in axially movable relationship to said first-mentioned baffling member for varying the effective size of the ventilating medium opening through said baffling members substantially inversely with the pressure around said machine maintaining a substantially constant weight flow of ventilating medium through the machine.

4. A dynamo-electric machine having a stationary member and a rotatable member provided with a ventilating system construction provided with a baffling member having an opening therein mounted on said stationary member, a relatively movable baffling member arranged to close off part of said first-mentioned baffling member opening and having an opening therein arranged to provide communication

through said first-mentioned baffling member opening for varying the flow of ventilating medium through the machine, and pressure-responsive means for varying the relationship of said openings in said baffling members to vary the effective size of the ventilating medium opening therebetween substantially inversely with respect to the pressure around said machine maintaining a substantially constant weight flow of ventilating medium through the machine.

5. A dynamo-electric machine having a stationary member and a rotatable member provided with a ventilating system construction provided with a ventilating medium impeller arranged to be driven by said rotatable member, a relatively stationary baffling member having an opening therein mounted on said stationary member, a relatively movable baffling member having an opening therein for varying the flow of ventilating medium through said impeller, and means including a pressure-responsive bellows member for supporting said movable baffling member in axially movable relationship to said stationary baffling member for varying the relationship of said openings in said baffling

members to vary the effective size of the ventilating medium opening therethrough substantially inversely with respect to the pressure around said machine maintaining a substantially constant weight flow of ventilating medium through the machine.

6. A ventilating system baffling construction including a casing, a baffling member arranged transversely of said casing, a relatively movable baffling member having an opening therein and arranged transversely of said casing and axially movable therein, and an annular pressure responsive means with a central opening therein substantially in alignment with the opening in said movable baffling member for passage of fluid through said openings and providing the only positioning means for said relatively movable baffling member for supporting said movable baffling member and varying the relative position of said baffling members to vary the effective size of the ventilating medium opening therebetween substantially inversely with the pressure around said pressure responsive means and said baffling member.

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