

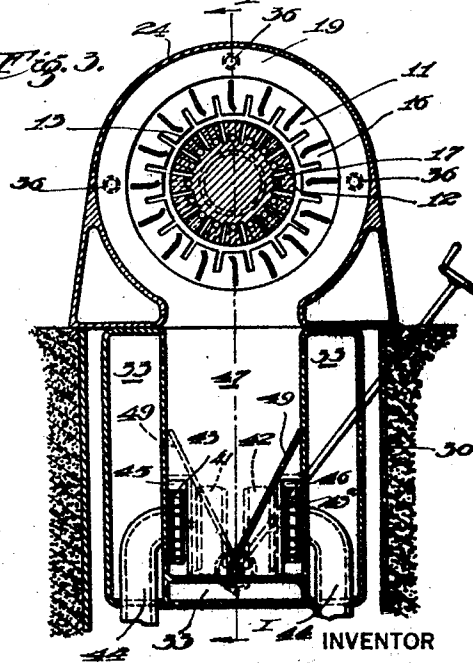
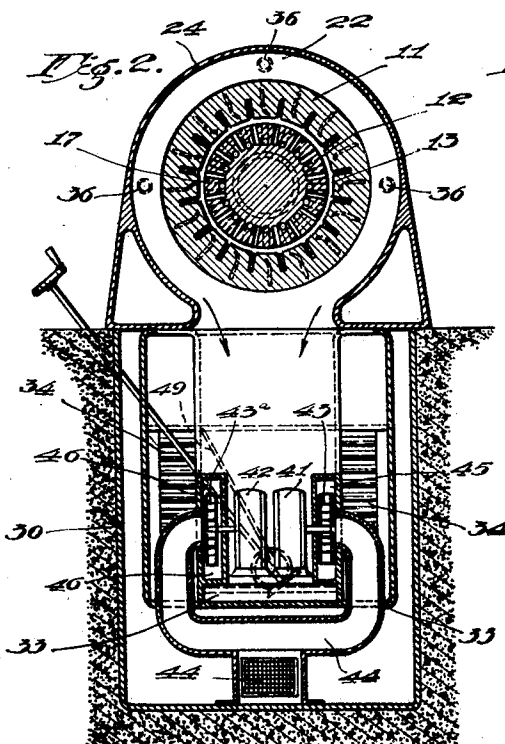
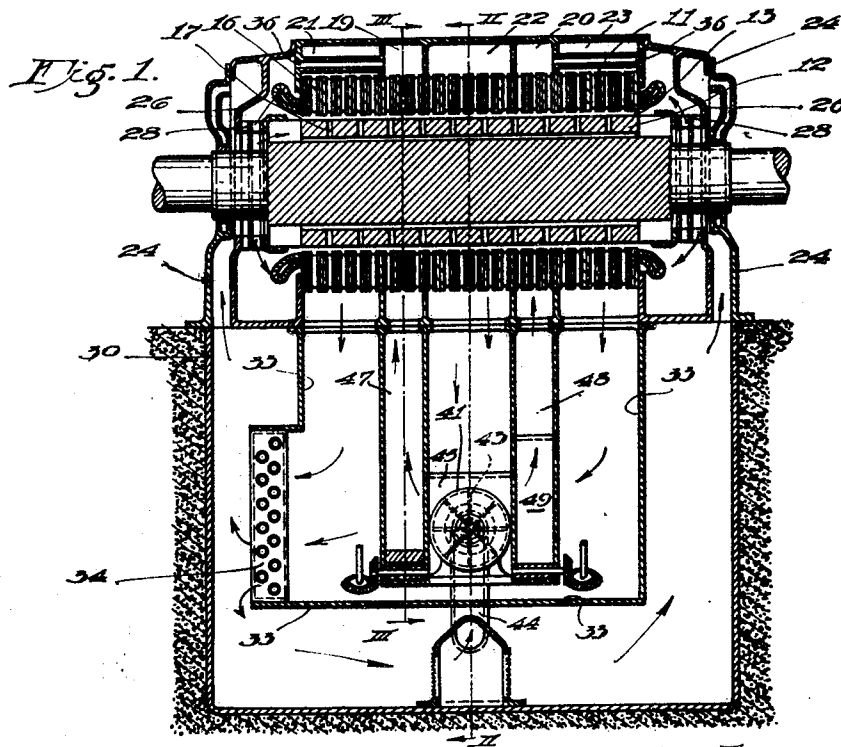
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TURBO GENERATOR VENTILATION

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TURBO-GENERATOR VENTILATION

Application filed December 5, 1929, Serial No. 411,818, and in Great Britain December 6, 1928.

My invention relates to the ventilation of turbo-generators which have an extremely great length and a very limited cross-sectional area of air gap, so that it becomes
5 necessary to introduce cooling air through annular intake chambers surrounding the middle portions of the stator members, from which it is conducted inwardly through radial ventilating ducts provided for the
10 purpose in the stator member.

My invention relates to novel means for providing an auxiliary system of ventilation to supplement that which usually is provided by means of fans disposed on the ends
15 of the rotor member.

Referring to the accompanying drawings, Fig. 1 is a central longitudinal sectional view of a turbo-generator ventilating system embodying my invention, the section plane
20 being indicated by the line I—I in Fig. 3, and

Figs. 2 and 3 are transverse sectional views taken on the planes indicated by the dotted lines II—II and III—III of Fig. 1, respectively.
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As shown in the drawings, my invention is preferably applied to a turbo-generator comprising a stator member 11 and a rotor member 12 separated by an air gap 13. The stator and rotor members are both preferably
30 provided with radial ventilating ducts 16 and 17, respectively, and the stator member is surrounded by a plurality of annular chambers which are alternately outlet and
35 inlet chambers, two inlet chambers being shown at 19 and 20, and three outlet chambers being indicated at 21, 22 and 23.

The machine is completely enclosed in a frame 24 having a double end-bell construction, the inner end bell 26 having its inner
40 periphery terminating close to a fan 28 which is provided at each end of the rotor member.

The machine is mounted on a foundation 45 consisting of a ventilating casing 30 for

providing a closed ventilation system. The air from the annular discharge chambers 21, 22 and 23 of the machine is led downwardly into an exhaust chamber 33 within the foundation casing 30. From this exhaust
50 chamber, the air passes through a suitable cooler 34 into the main body of the foundation casing 30, which thus constitutes an intake chamber for the machine, from which the air passes upwardly into the spaces between the double end bells at each end of the machine, as indicated by the arrows. The
55 air then passes through the rotor fans 28 and is delivered to the spaces within the inner end bells, from which it flows partially into the ends of the air gap and partially into a plurality of ducts 36 which conduct it from the end-bell spaces to the several
60 annular intake chambers 19 and 20 surrounding the stator member.

According to my present invention, auxiliary ventilating means are provided, in parallel, so to speak, with the rotor fans 28, so that a separate supply of air, other than that which flows through the ducts 36 connecting with the end-bell spaces, is supplied
70 to the annular intake chamber or chambers 19 and 20 surrounding the stator member. By way of illustration, I have shown two independent means for furnishing two independent supplies of air for the two annular
75 intake chambers 19 and 20. Thus, in the bottom of the exhaust chamber 33, as indicated in Fig. 2, two motors 41 and 42 are shown, driving fans 43 and 43a which receive cooled air from the general body of the foundation chamber; as through the intake
80 ducts 44, and deliver it into two horizontal channels 45 and 46, respectively. There are also provided two vertical air ducts 47 and 48 which are both connected, at their bottom ends, to both of the channels
85 45 and 46 which are connected to the delivery sides of the fans 43 and 43a. The vertical ducts are in communication, at
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their top ends, with the annular intake chambers 19 and 20, respectively, of the stator member. At the bottoms of the two vertical ducts 47 and 48 just mentioned, I have provided dampers 49 which may be swung over to close off the communication with either of the fans 43 and 43a.

Normally, each fan 43 or 43a delivers air to only one of the vertical ducts 47 and 48. When, however, one of the fans is shut down, as, for instance, the fan 43, which normally supplies air to the vertical duct 47, the damper 49 in that duct is moved to shut off its communication with the shut-down fan 43 and to place it in communication with the remaining fan 43a, as indicated by dotted lines in Fig. 3. When both of the fans 43 and 43a are shut down, the annular intake chambers 19 and 20 of the stator member receives their air solely from the ducts 36 leading to the end-bell spaces, as previously described.

While I have described and illustrated a single preferred form of embodiment of my invention, it will be obvious that I am by no means limited thereto, as one of the essential features of the invention is to provide an auxiliary source of cooling air for the annular intake chamber or chambers surrounding the stator member, and, when damper means are utilized, it is obvious that any damping means having the effect of closing or opening the auxiliary intake ducts of the machine or of placing them in communication with each other in order to be supplied by a single fan, may be adopted without departing from the essential spirit and scope of my invention. I desire, therefore, that the appended claims be given the broadest scope consistent with their language and the prior art.

I claim as my invention:

1. A ventilation system for a dynamo-electric machine having a plurality of ventilating ducts, said system comprising at least two external fans each normally supplying ventilating fluid to its own special group of ducts, and means for putting either fan into or out of operation independently during the operation of the machine, characterized by means whereby, when one or more of said fans is or are rendered inactive, the remainder which remain operative may be caused to circulate air through the ventilating ducts appertaining to such inactive fan or fans.

2. A ventilation system according to claim 1, characterized by having a rotor fan upon each end of the rotor, means for providing an air-intake chamber, and means communicating with said air-intake chamber for delivering said air into ducts adjacent to the intake sides of said rotor fans and further characterized by the fact that the two independently operating fans are disposed to

pass air from an intake chamber to annular intake chambers around portions of the stator member intermediate the ends, said external fans having damper means associated therewith whereby, when one or both of said independently operable fans is or are rendered inactive, the ducts pertaining thereto may be included in circuit with the fans which remain operative.

In testimony whereof, I hereunto subscribe my name this 11th day of November, 1929.

JAN ARTHUR KUYSER.