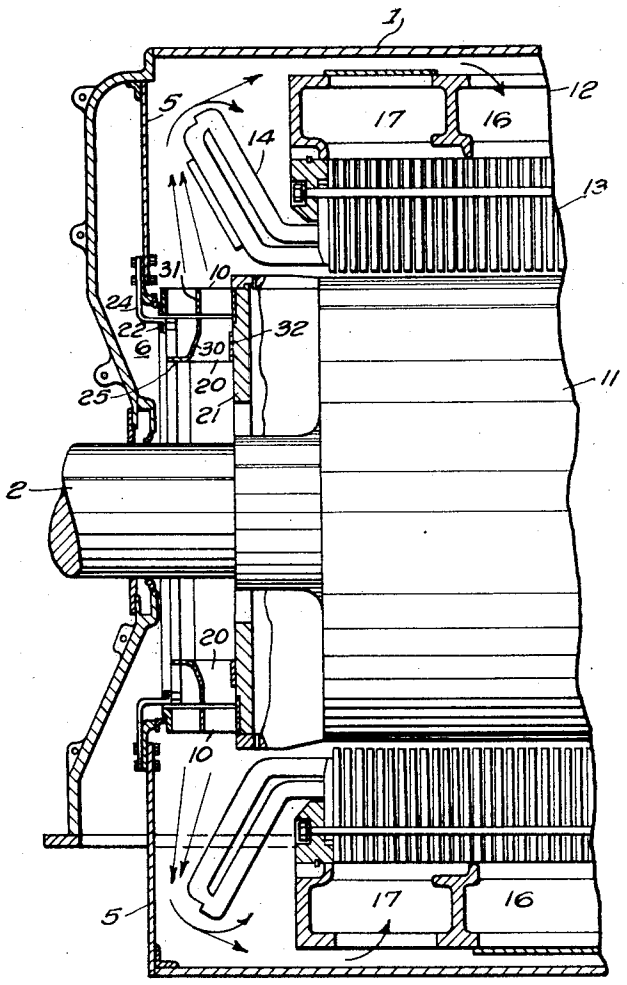
Feb. 7, 1933. C. M. LAFFOON 1,896,749

STATIONARY BLOWER INTAKE FOR LARGE TURBINE GENERATORS

Filed April 4, 1930 2 Sheets-Sheet 1

Fig. 1.



INVENTOR
Carthrae M. Laffoon.
BY
Wesley G. Carr
ATTORNEY

Feb. 7, 1933. C. M. LAFFOON 1,896,749

STATIONARY BLOWER INTAKE FOR LARGE TURBINE GENERATORS

Filed April 4, 1930 2 Sheets-Sheet 2

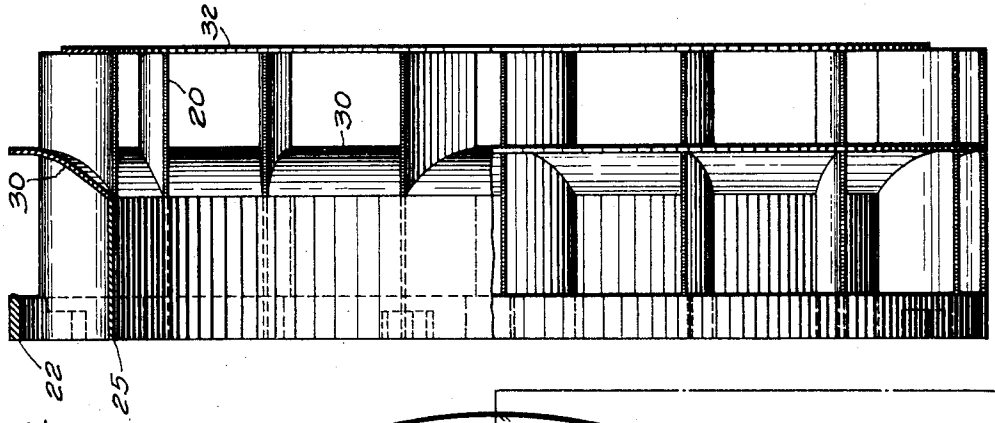


FIG. 3.

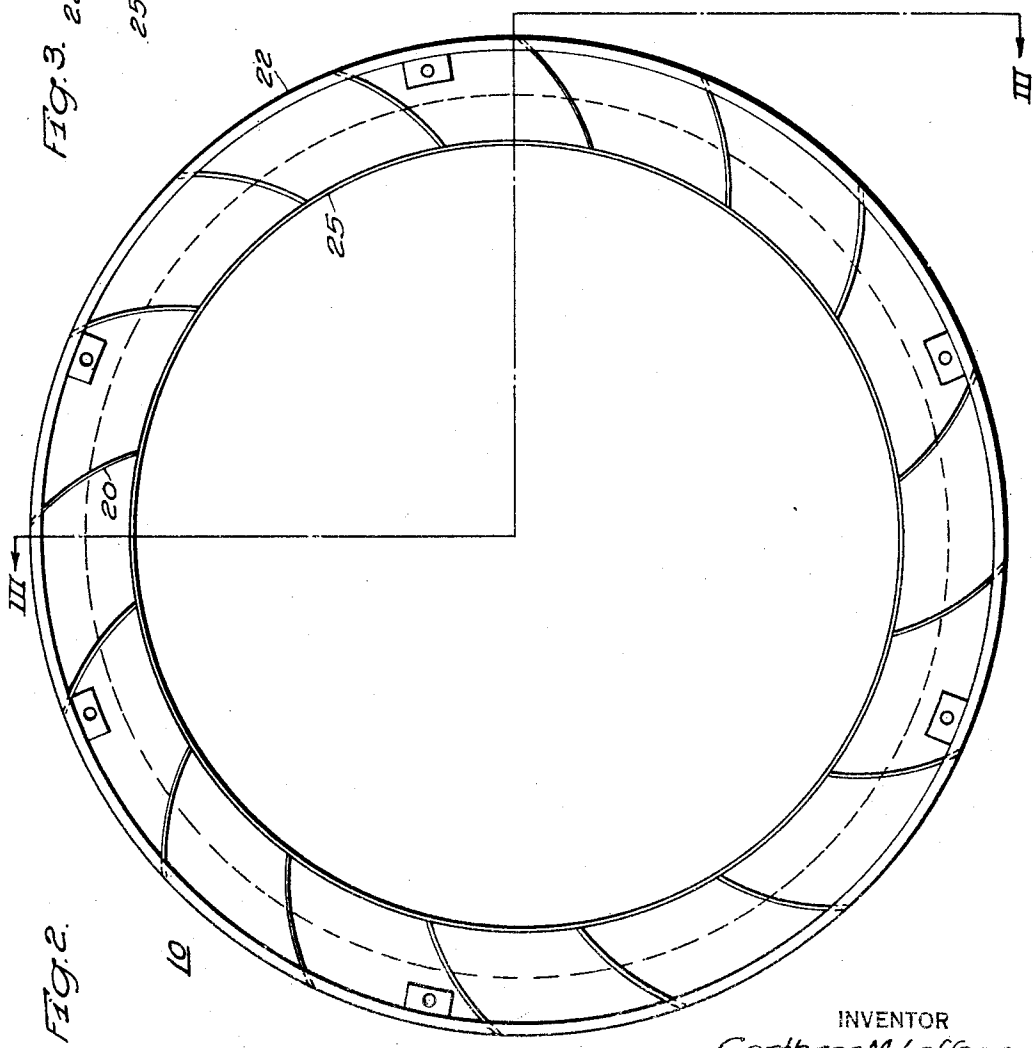


FIG. 2.

INVENTOR
Carthrae M. Laffoon.

BY
Wesley G. Carr
ATTORNEY

Patented Feb. 7, 1933 1,896,749

UNITED STATES PATENT OFFICE

CARTHRAE M. LAFFOON, OF IRWIN, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA

STATIONARY BLOWER INTAKE FOR LARGE TURBINE GENERATORS

Application filed April 4, 1930. Serial No. 441,588.

My invention relates to dynamo-electric machines and more particularly to stationary blower intakes for such machines.

Prior to my invention, the cooling systems for dynamo-electric machines, such as high-speed turbine generators provided with blowers attached to the rotors, have not been satisfactory, since the blowers have not delivered the estimated quantity of cooling fluid to the machines.

Investigation discloses that this lack of volume delivered by the fan is caused by the high velocity of the fluid in the intake of the blower, causing the fluid to over-shoot a portion of the blower element and, consequently, rendering inactive a portion of the blower.

It is an object of my invention to provide an improved cooling system capable of delivering a larger quantity of cooling fluid to a machine.

It is a further object to provide a blower intake for such a system.

Other objects and advantages of my invention will be apparent from the following detailed specification taken in conjunction with the appended drawings, in which:

Figure 1 is a sectional elevation of a generator with my invention attached;

Fig. 2 is an enlarged front elevation of my blower intake; and

Fig. 3 is a side elevation of my blower intake, parts being broken away.

Referring to the drawings, the apparatus disclosed in Fig. 1 comprises a high-speed turbo-alternator having an outer casing 1 in fluid-tight relation to the shaft 2, and an inner casing 5 providing a space between said casings for the inlet of cooling fluid, the inner casing having an opening 6 concentric with the shaft 2 of the machine for admitting fluid from the space between the casings to a blower 10 attached to the rotor 11 for circulating cooling fluid through the machine.

Enclosed within the casing is a frame 12 carrying the stator-core pieces 13 and the windings 14 of an alternator. The framework of the stator is provided with passages 16 and 17 to conduct the ventilating fluid into and out of the machine.

Attached to the inner casing 5 and in operative relation to the blower element 10 is placed a stationary nozzle or intake comprising a series of curved vanes 20 inclined from a radial direction so that the compound inclination and curvature will direct a fluid stream flowing through the vanes toward the blower 10 in such manner that it will be flowing in a direction to facilitate movement through the blower. These vanes extend from the opening 6 of the inner casing 5 to the vicinity of a rotating ring 21 on which the blower 10 is supported.

The vanes 20 are supported by a base ring 22 secured to the casing 5 by means of bracket arms 24. Attached to the inner edges of the vanes 20 is a dividing ring 25 of cylindrical shape, extending back, along the inner edges of the vanes 20, for less than half of the axial extent thereof, so that the volumes of cooling fluid passing under and over the partition ring 25, respectively, will be substantially equal. The passages between the vanes 20 are divided axially into a plurality of sections by a curved baffle ring 30 which extends from a point on the outer peripheries of the vanes 20 adjacent to the central portion of the blower 10, to the inner end of the cylindrical dividing ring 25, to which it is rigidly attached. The blower 10 is usually divided into two equal portions by a central partition 31, as shown in Fig. 1. In order to impart rigidity to the vanes 20 a shroud ring 32 is usually attached at the rear ends of the vanes.

The cylindrical dividing ring 25 and the curved baffle ring 30 provide a plurality of substantially parallel curved passages through the blower intake so that substantially equal quantities of cooling fluid are delivered to each portion of the blower 10 to the end that the total capacity of the blower may be used, thus greatly increasing the amount of cooling fluid delivered to the machine being ventilated.

The operation of my device is as follows:

Cooling fluid having been admitted into the space between the casings, and directed to the blower intake openings, the rotating blower 10 creates a suction which causes a flow of fluid through the blower intake. A

portion of this fluid is received above the cylindrical dividing ring 25 and, by means of the curved baffle 30, is directed upward and into the first half of the rotating blower 10. Another portion of the incoming fluid passes under the cylindrical dividing ring 25 and behind the baffle 30, thus being directed into the remaining half of the rotating blower 10.

The air, having been blown into the machine, is distributed to the core of the stator by passing through the air passages in the framework of the machine or by passing through the air gap between the rotor and the stator cores of the machine.

Although I have shown and described certain specific embodiments of my invention, I am fully aware that many modifications thereof are possible. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. A blower system for a dynamo-electric machine comprising a casing having fluid passages therein, a stationary blower intake coaxial with the machine having fluid-inlet passages in communication with the fluid passages in the casing, a rotary blower having a plurality of axially displaced passages, the said blower intake having a dividing ring coaxial with the shaft of the machine to provide a plurality of concentric passages in the inlet end of the blower intake, curved means for diverting the concentric passages to outlet ports angularly disposed in respect to the inlet passages and in communication with the blower passages, and radially curved vanes in said outlet ports, the direction of curvature of the vanes being in the direction of rotation of the blower.

2. A rotatable blower comprising a rotor member mounted on a shaft, a plurality of fan-blades carried by said rotor member and extending axially outward therefrom in spaced relation to the shaft, and a stationary intake member disposed between said fan blades and the shaft in close proximity to the fan-blades, said intake member having a plurality of curved vanes inclined from the radial direction so that they will deliver a plurality of fluid streams, at their outer periphery, in an angular direction having a rotating component as well as an outward radial component, partition-means between said fan-blades for dividing the spaces therebetween into a plurality of radial passages axially displaced from each other in side-by-side relation, and partition-means between said curved intake vanes for dividing the spaces therebetween into a plurality of passages, the outer peripheries of which are axially displaced from each other in side-by-side relation, and the inner peripheries of which are more nearly radially displaced from each other in concentric annuli, the partition-means between the intake vanes being, for this purpose, further away from the plane of the rotor member at the inner end thereof than at the outer end thereof.

3. A rotatable blower comprising a rotor member mounted on a shaft, a plurality of fan-blades carried by said rotor member and extending axially outward therefrom in spaced relation to the shaft, and a stationary intake member disposed between said fan blades and the shaft in close proximity to the fan-blades, said intake member having a plurality of intake-member vanes inclined from the radial direction so that they will deliver a plurality of fluid streams, at their outer periphery, in an angular direction having a rotating component as well as an outward radial component, and partition-means between said intake-member vanes for dividing the spaces therebetween into a plurality of passages, the outer peripheries of which are axially displaced from each other in side-by-side relation, and the inner peripheries of which are more nearly radially displaced from each other in concentric annuli, the partition-means between the intake-member vanes being, for this purpose, further away from the plane of the rotor member at the inner end thereof than at the outer end thereof.

In testimony whereof, I have hereunto subscribed my name this 31st day of March 1930.

CARTHRAE M. LAFFOON.