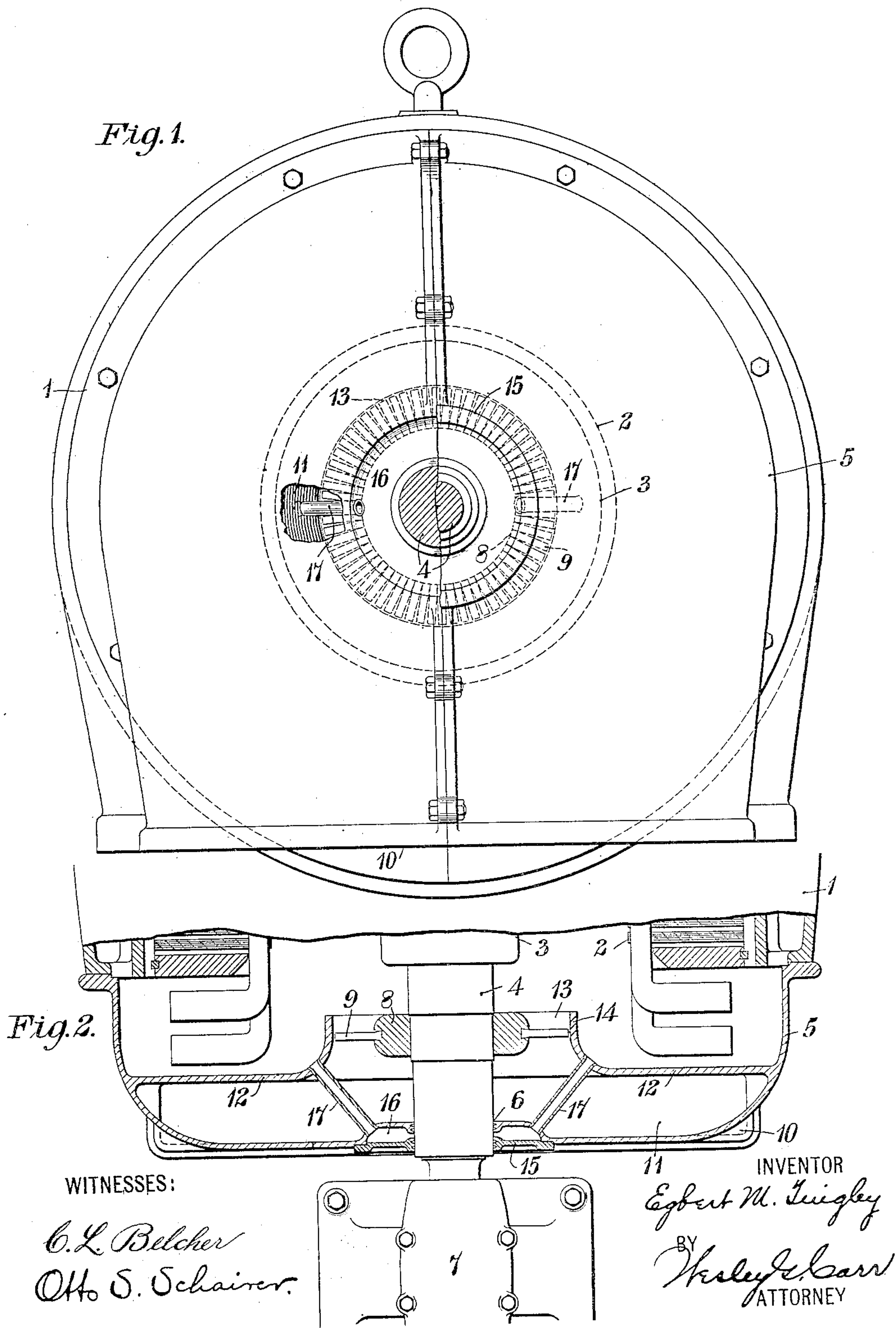


No. 819,820.

PATENTED MAY 8, 1906.

E. M. TINGLEY.  
VENTILATING MEANS FOR INCLOSED MACHINES.  
APPLICATION FILED MAR. 17, 1905.





# UNITED STATES PATENT OFFICE

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## VENTILATING MEANS FOR INCLOSED MACHINES.

No. 819,820.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed March 17, 1905. Serial No. 250,615.

*To all whom it may concern:*

Be it known that I, EGBERT M. TINGLEY, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ventilating Means for Inclosed Machines, of which the following is a specification.

My invention relates to means for establishing and maintaining forced ventilation for machines, and particularly to inclosing casings for such means.

The object of my invention is to provide means to be employed in combination with machine-casings for preventing leakage at undesired locations.

In order that the heat due to the losses in the electrical and magnetic circuits of certain types of dynamo-electric machines may be readily dissipated, it has been found desirable to provide means for enforcing ventilation of the machine structure. Such a means and an improved machine structure constitute the subject-matter of another application, Serial No. 250,614, filed by me of even date herewith, and comprise inlet-ports, inlet-chambers surrounding the shaft, a chamber containing the dynamo-electric machine, passages between the chambers, and suitable propellers or blowers carried by the shaft and located in the passages to produce a draft from each inlet-chamber into the machine-chamber.

Since there is a tendency to exhaust the air from the inlet-chambers, leakage-currents from the exterior into those chambers may occur through the openings in their walls which receive the ends of the shaft, and if the shaft-bearings are located in proximity to the apertures in the chamber-walls leakage-currents may convey particles of oil from the shaft into the machine-chamber, which may then be deposited in the ventilating-passages or upon the windings of the machine. Even if the bearings are not located in proximity to the apertures in the ends of the inclosing casing it is desirable to prevent leakage of air that may be warm and laden with moisture and particles of dust and oil into the machine from the engine-room in which the machine is located.

It is the specific object of my invention to

provide means for preventing leakage from the exterior into interior chambers through apertures in the chamber-walls that accommodate the projecting ends of a shaft or any other movable members.

My invention is illustrated in the accompanying drawings, Figure 1 of which is a view in end elevation of a dynamo-electric machine constructed in accordance therewith, certain parts being broken away for the sake of clearness of illustration; and Fig. 2 is a view, partially in horizontal longitudinal section and partially in plan, of the machine shown in Fig. 1.

The dynamo-electric machine 1, that comprises a stationary armature 2, a rotatable field-magnet 3, and a shaft 4, may be of any suitable construction known in the art, except as regards the ventilating devices which embody my present invention, and since these devices are alike at the two ends of the machine I have illustrated them at one end only, it being understood that a similar illustration of the other end of the machine would be a mere duplication. The ends of the machine-frame are provided with inclosing end bells 5, having centrally-located apertures 6, through which the ends of the shaft 4 project, suitable bearings 7 being provided for the projecting ends of the shaft.

Mounted upon the shaft 4 in proximity to the ends of the rotatable field-magnet 3 are collars 8, in the peripheries of which propeller-blades 9 are secured at such angles as to produce drafts of air toward the field-magnet when the machine is in operation. The end bells 5 are provided with inlet-ports 10 at the bottom of the machine, which communicate with inlet-chambers 11, that are formed by the end bells and partitions 12, having centrally-located apertures 13 surrounded by inwardly-extending short cylindrical shells 14, the collar 8 and its propeller-blades 9 being located within the cylindrical shell.

The portions of the walls of the inlet-chambers that surround the apertures 6 are depressed, and annular plates 15 cover the depressions, thereby forming chambers 16, that surround the shaft. Communication between the chambers 16 and the chamber containing the armature and field-magnets is



provided by means of tubes 17, the ends of which perforate the partitions 12 and the inner walls of the chambers 16, substantially as shown.

5 When the machine is in operation, the propeller - blades 9 establish a circulation from the inlet-port 10 and the inlet-chamber 11 to the chamber containing the armature and field-magnets, and as a consequence the  
10 air in the machine-chamber is under compression while the air in the inlet-chamber 11 is being exhausted. As the tubes 17 provide communication between the machine-chamber and the chambers 16, the air in the chambers 16 is also under compression, and escape  
15 therefrom is provided only through the clearance-spaces between the edges of the apertures and the shaft. Currents will therefore be established from the chambers 16 to  
20 the exterior and into the inlet-chamber 11, which will prevent the ingress of air through the clearance-spaces between the shaft and the end bells.

From the description and drawings it is  
25 seen that leakage from the exterior to the inlet-chamber is effectually prevented by means of the chambers 16, in which the air is maintained under pressure, and that no air which is saturated or laden with particles of oil will  
30 be supplied to the machine for ventilation purposes.

I desire it to be understood that my invention is not limited to electrical machines, since it may be applied to any machine in  
35 which fluid packings are desired for a member that has either a rotary or a reciprocatory motion.

I claim as my invention—

1. The combination with a shaft, an inlet-  
40 chamber, a pressure-chamber, and means for effecting a circulation from the inlet-chamber to the pressure-chamber, of a third chamber surrounding the shaft, and one or more communicating passages between the pressure-  
45 chamber and the third chamber.

2. The combination with a shaft, an inlet-chamber, a pressure-chamber, and means for establishing a circulation from the inlet to the pressure chamber, of an outer chamber  
50 surrounding the shaft, and one or more communicating passages between the pressure-chamber and the outer chamber.

3. The combination with a shaft, inlet and pressure chambers, and means for establishing a circulation from the inlet-chamber to the pressure-chamber, of a third chamber  
55 surrounding the shaft and one or more com-

municating passages between the pressure-chamber and the third chamber.

4. The combination with a shaft, an inlet- 60 chamber, and a pressure-chamber, of a third chamber surrounding the shaft and means for maintaining a fluid-pressure in the third chamber.

5. The combination of an inlet-chamber, a 65 movable member that projects through the walls of the chamber, and a chamber surrounding the said movable member in which a fluid-pressure is maintained.

6. The combination of a chamber from 70 which fluid is exhausted and having an apertured wall, a movable member that projects through the wall-aperture, and a chamber that surrounds the movable member adjacent to the aperture and in which a fluid- 75 pressure is maintained.

7. The combination of an apertured chamber-wall the fluid-pressures on opposite sides of which differ, a member that is movably located in the aperture in the chamber-wall, 80 and a chamber that surrounds the movable member adjacent to the aperture and in which a fluid-pressure is maintained.

8. The combination with an apertured chamber-wall the fluid-pressures on opposite 85 sides of which differ, of a member that is movably located in the wall-aperture and an annular cover that coöperates with the chamber-wall adjacent to the aperture to form an auxiliary chamber, and means for supplying 90 fluid-pressure to said auxiliary chamber.

9. The combination with a shaft and a casing having two chambers between which exists a difference of fluid-pressure, of an annular chamber the inner wall of which is the 95 shaft, and a conduit between said annular chamber and the casing-chamber in which exists the higher pressure.

10. The combination with a casing having a chamber in which the fluid-pressure exceeds that of the atmosphere, of a member 100 that movably projects through the walls of the casing, a chamber that surrounds the movable member adjacent to the casing-wall, and one or more conduits between said surrounding chamber and the high-pressure 105 chamber.

In testimony whereof I have hereunto subscribed my name this 11th day of March, 1905.

EGBERT M. TINGLEY.

Witnesses:

WESLEY G. CARR,  
BIRNEY HINES.