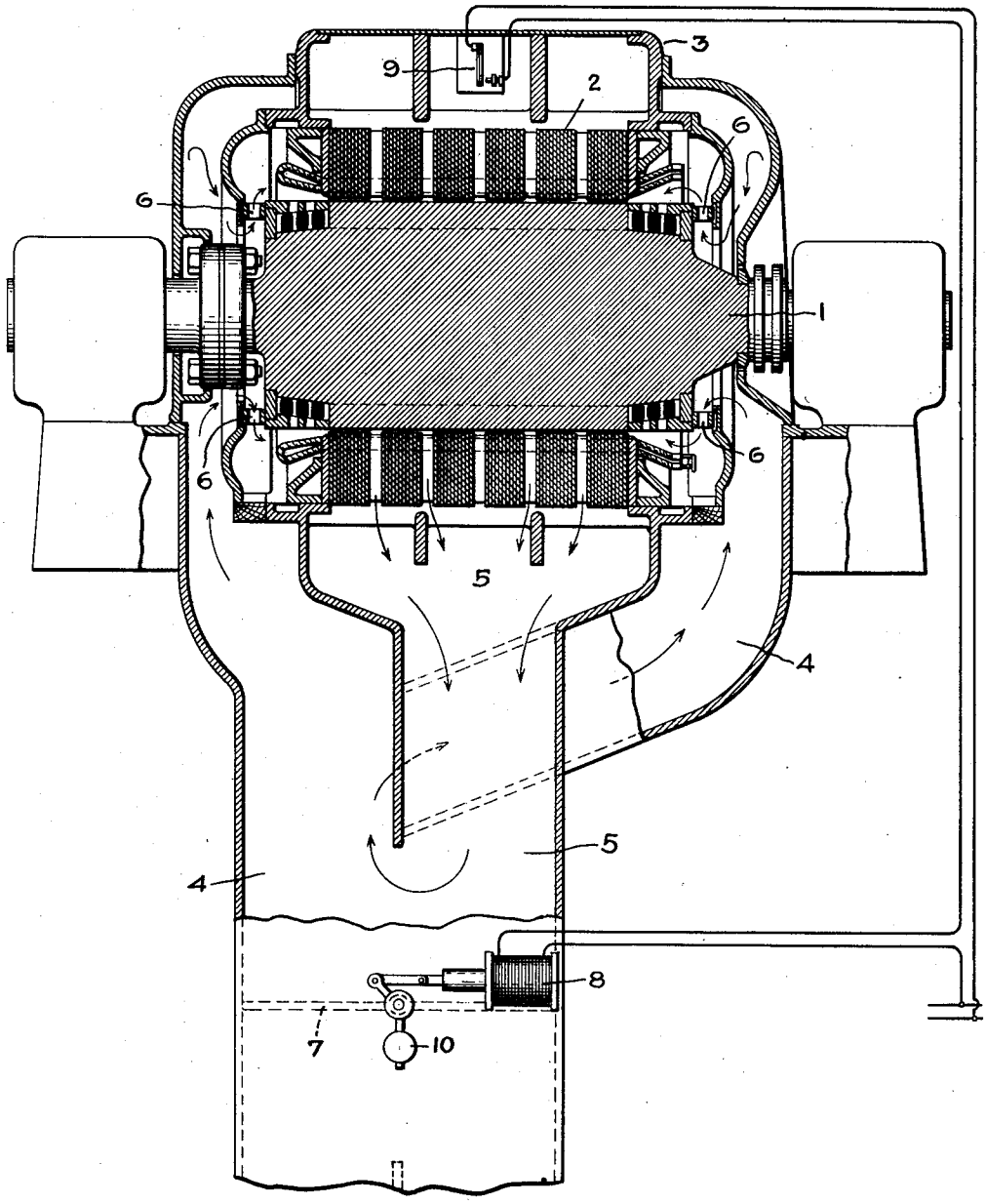
H. TREITEL & K. SULZBERGER.

DYNAMO ELECTRIC MACHINE.

APPLICATION FILED SEPT. 23, 1914.

1,190,048. Patented July 4, 1916.



Witnesses:
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UNITED STATES PATENT OFFICE.

HEINRICH TREITEL, OF CHARLOTTENBURG, AND KARL SULZBERGER, OF BERLIN, GERMANY, ASSIGNORS TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

DYNAMO-ELECTRIC MACHINE.

1,190,048. Specification of Letters Patent. Patented July 4, 1916.

Application filed September 23, 1914. Serial No. 863,069.

To all whom it may concern:

Be it known that we, HEINRICH TREITEL, a subject of the King of Prussia, residing at Charlottenburg, Germany, and KARL SULZBERGER, a citizen of the Swiss Republic, residing at Berlin, Germany, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification.

Our invention relates to dynamo-electric machines and particularly to such machines provided with an inclosing casing having inlet and outlet passages through which cooling fluid, such as air, may be circulated in order to cool the machine. In such machines, the cooling air is often conducted through filters in order to remove particles of dust therefrom. For this purpose both cloth filters and so-called "wet" filters are used. The latter filters are those in which the cooling air is washed by means of a fine spray of water. There is danger in the use of wet filters that the cooling air flowing therethrough may take up so much moisture that there will be an injurious deposition of moisture in the machine if the parts to be cooled have a lower temperature than the cooling air, as is often the case when the machine is starting or is operating at light load. When the air is moistened in this way, the danger of depositing moisture on parts of the machine has been obviated heretofore by shutting down the source of water supply when the machine was starting or operating under light load; that is, by allowing the air to enter the machine without being filtered and putting the filter into operation only when the machine has warmed up. This, however, involves the difficulty that while the wet filter is not in operation, the cooling fluid brings particles of dust into the machine.

When the cooling air is cleaned by means of cloth filters there is danger of the filter catching fire and the fire being communicated to the dynamo-electric machine by the draft of air drawn or forced into the machine by the ventilating fan. Furthermore, there is always danger in such a machine, whether provided with filters or not, of it catching fire due to a short-circuit in the machine or the like, in which case the continued supply of cooling air would feed the fire with fresh oxygen until the machine is entirely destroyed.

In accordance with our invention such difficulties are avoided by closing the inlet and outlet passages and connecting them together so as to provide for only a local circulation of air within the machine. When such an arrangement is used in a machine in which the cooling air is conducted through wet filters, the deposition of water on the machine is avoided without the necessity of bringing unfiltered air into the machine. When it is used in a machine provided with cloth filters, the machine may be closed against any fire that may occur in the filter or outside of the machine. Our invention may also be used in machines which may or may not be provided with filters to avoid the destructive effect of fire occurring in a machine. In the latter case the fire soon uses up the oxygen in the small amount of air that is circulated and is consequently smothered.

For a better understanding of our invention reference may be had to the following description taken in connection with the accompanying drawings, in which the single figure shows a dynamo-electric machine embodying one form of our invention.

In the drawing, we have illustrated our invention in an alternating-current dynamo-electric machine having a revolving field member 1 and a stationary armature 2. The machine however may be of any well known type or construction. The machine is inclosed by a casing 3 having an inlet passage 4 and an outlet passage 5. In order to circulate cooling fluid through the machine, fans 6 are provided, which may be mounted on the member 1 as shown. The inlet and outlet passages are closed against the outside air by a valve member 7, which at the same time connects the inlet passage to the outlet passage. As shown in the drawing, the inlet and outlet passages are preferably situated side by side and the valve member 7 is common to both passages. The valve member may be operated either by hand or automatically as by a solenoid 8. This solenoid may be

controlled by a thermostat 9, the operation of which depends on the temperature of the dynamo-electric machine.

When the valve member 7 is in the position shown in the drawing, air is drawn through the inlet passage 4, forced through the dynamo-electric machine as shown by the arrows, then through the outlet passage 5, through the opening between the outlet and inlet passages as shown by the dotted arrow and then continues in this local circulation, as both inlet and outlet passages are closed against the outside of the machine. If the inlet passage outside of the valve member is provided with a wet filter, no moisture can be drawn into the machine, nor can any dust-laden air be drawn therein, because of the closure of the passages. The closure of the passages also prevents any sparks being drawn into the machine in case of a fire outside of the machine, and in case of a fire within the machine the local circulation of air soon causes the supply of oxygen to be consumed and the fire therefore smothered.

The thermostat 9 is shown as having its circuit open when the machine is cool, in which the valve 7 is closed and no cooling air can be drawn into the machine. When the machine warms up, the contacts of the thermostat come together and close the circuit of the solenoid 8, which moves the valve member so as to close the connecting passage between the inlet and outlet passages and to open the inlet and outlet passages to the outside, whereby the air cooled by passing through the wet filter may be drawn in the machine. The valve member stays in this position as long as the machine is warm, but as soon as it cools off due to a decrease in load or to the machine being shut down, the contacts of the thermostat separate, deënergizing the solenoid 8, whereupon the valve member 7 returns to the closed position by means of a spring or gravity. A weight 10 is shown in the drawing for returning it to the closed position. If desired the thermostat 9 or a second thermostat may be arranged to move the valve member 7 into position shown in the drawing in case the machine catches fire.

In certain cases, as in case of a fire in the machine, the thermostat may be adjusted to close the contacts at a certain temperature and to open them at a different temperature.

We desire it to be understood that our invention is not limited to the particular arrangements shown and described and we aim in the appended claims to cover all modifications which do not depart from the spirit and scope of our invention.

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

1. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, means for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circulation within said machine, and automatic means for operating said first mentioned means.

2. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, means for closing said passages and connecting said inlet passage to said outlet passage to provide for local circulation within said machine, and means dependent upon the temperature of said machine for operating said first mentioned means.

3. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, and a valve member for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circulation within said machine.

4. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, a valve member for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circulation within said machine, and automatic means for operating said valve member.

5. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, a valve member for closing said passages and for connecting said inlet passages to said outlet passages to provide for local circulation within said machine, and means dependent upon the temperature of said machine for operating said valve member.

6. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, said inlet and outlet passages being situated side by side, and a valve member common to both of said passages for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circulation within said machine.

7. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, said inlet and outlet passages being situated side by side, a valve member common to both of said passages for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circula-

tion within said machine, and automatic means for operating said valve member.

8. In combination with a dynamo-electric machine, an inclosing casing provided with inlet and outlet passages, means for circulating cooling fluid through said machine, said inlet and outlet passages being situated side by side, a valve member common to both of said passages for closing said passages and for connecting said inlet passage to said outlet passage to provide for local circulation within said machine, and means dependent upon the temperature of said machine for operating said valve member.

In witness whereof, we have hereunto set our hands this first day of September, 1914.

HEINRICH TREITEL.
KARL SULZBERGER.

Witnesses:
JULIUS RÖNNLAND,
ALFRED WOLF.

Correction in Letters Patent No. 1,190,048.

It is hereby certified that in Letters Patent No. 1,190,048, granted July 4, 1916, upon the application of Heinrich Treitel, of Charlottenburg, and Karl Sulzberger, of Berlin, Germany, for an improvement in "Dynamo-Electric Machines," an error appears in the printed specification requiring correction as follows: Page 2, line 28, after the word "which" insert the word *case;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22d day of August, A. D., 1916.

[SEAL.] F. W. H. CLAY,

Acting Commissioner of Patents.

Cl. 171—252.