

J. E. TRUITT AND E. ACKERMAN.

SELF COOLED MOTOR.

APPLICATION FILED JUNE 16, 1919.

1,383,883.

Patented July 5, 1921.

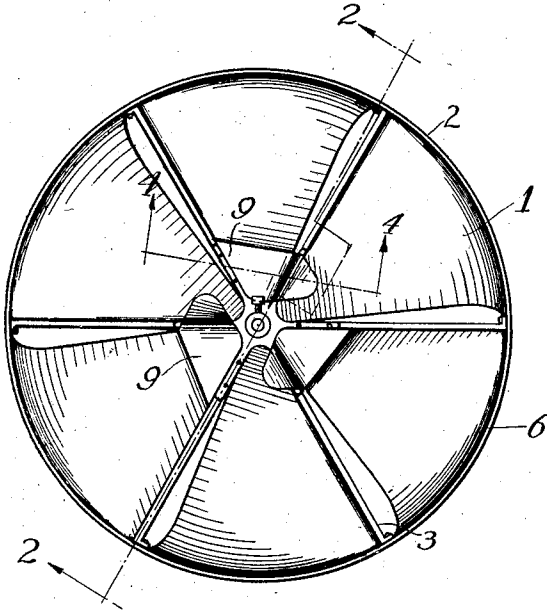


Fig 1

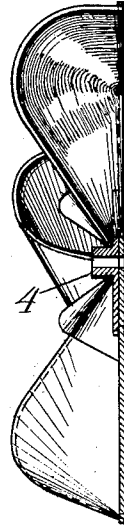


Fig 2



Fig 4

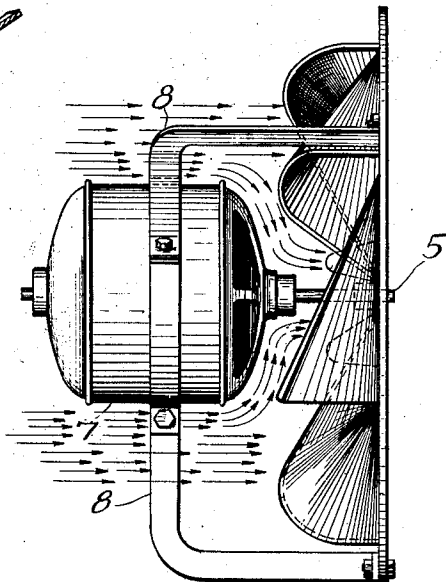


Fig 3

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UNITED STATES PATENT OFFICE.

JOSEPH EUGENE TRUITT AND EMIL ACKERMAN, OF CHICAGO, ILLINOIS.

SELF-COOLED MOTOR.

1,383,883.

Specification of Letters Patent.

Patented July 5, 1921.

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To all whom it may concern:

Be it known that we, JOSEPH EUGENE TRUITT and EMIL ACKERMAN, both citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Self-Cooled Motors, of which the following is a specification.

The invention relates to fan motors, and particularly to self-cooled motors.

The method previously adopted to cool motors consisted in cooling the motor either by exposure or by passing air currents through the coils and utilizing a fan for this purpose. The disadvantages of this method are obvious, for the air that is being discharged by the ventilating fan, especially in plants, shops, and other places in which machinery is used, is usually laden with gases, acids, steam, grease, and other impurities depending upon the character of the work and place which is being ventilated. The deposits left in the motor by the passing of the impure air through the motor will cause deterioration of the coils by destroying their insulation, and consequently will result in an interruption of service. Although the employment of pure air no doubt would improve conditions, the coils would be affected thereby eventually, for even so-called "pure air" possesses properties harmful to a satisfactory operation of the motor.

It therefore constitutes the principal object of our invention to provide for the cooling of the motor with a fan and preventing the air currents from acting directly on the motor coils.

It is a further object of the invention to provide a motor which is cooled by radiation.

A further object embraces the provision of means between the motor and the fan whereby the neutral space created at the center of the fan and increased by the presence of the motor behind the fan is reduced, so that air currents flowing through the fan are compelled to contact more closely with the motor casing, thus carrying away the heat developed by the motor.

It is also an object of the invention to provide means secured to the fan whereby air currents are forced to contact with the motor casing.

It is another object of the invention to provide auxiliary or centripetal blades secured to the propeller blades of the fan, which are adapted to divert the air currents

so as to hug the shaft and assist in obtaining cooling of the motor by radiation.

With these and other objects in view, which will become apparent upon perusal of the specification, the invention comprises the means described in the specification, specifically pointed out in the appended claims, and illustrated in the accompanying drawing, in which—

Figure 1 is a front view of a fan wheel constructed in accordance with our invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a side view of the fan and of the motor;

Fig. 4 is a detail section on the line 4—4 of Fig. 1.

Referring to the drawing, 1 designates the fan as a whole and it is composed of a ring 2, having radially extending members or spokes 3, terminating in a hub 4 by which the fan is securely mounted on a shaft 5. The vanes 6 of the fan are arranged between radially extending members 3, and in the design shown there are six vanes of well known construction used.

Upon rotation of the fan it will act on the surrounding atmosphere imparting motion to it and creating an air current to provide the necessary circulation. The propulsion of air currents on one side of the fan will result in a suction or negative pressure on the other or rear side of the fan, so that air currents will be intermittently set up adapted to be passed through the fan to replace the air which has been propelled in a forward horizontal direction. The particular construction of the fan, vanes or blades, their arrangement with respect to one another, to obtain the result indicated, are matters so well known not only to the expert, but to the general public that further reference thereto is thought to be superfluous.

As shown in Fig. 3, the motor 7 is mounted on the shaft 5, which extends through the hub 4 of the fan and by reason of the presence of the motor, the casing of which is secured to the frame of the fan by suitable brackets 8, there is a tendency caused by the interference of the motor casing with the air currents passing through the fan to create a neutral space. In other words, the air which is drawn into the fan by the propulsion of the forwardly extending air col-

umn has to clear the motor casing to reach the fan proper. In the present invention, special means are provided to cause the inner air currents between the motor and the fan to converge closely around the motor and tend to hug the shaft, at the same time increasing the velocity of these air currents through the fan at the axis, thus providing a conical wall of cool air around the motor and shaft.

These means comprise a plurality of centripetal vanes 9, which, as indicated in Figs. 1 and 4, are plates secured at the body portion to the inner ends of the propeller blades and which at the other ends are upturned so that the air currents in flowing to the fan are deflected toward the fan end of the motor, thus taking up and carrying away the heat radiated from the fan end of the motor. In other words, the vanes 9 reduce the neutral space normally existing between the motor and the fan and move the air to contact with the fan end or open end of the motor thus carrying away the heat generated by the motor.

The particular form of the vanes, their arrangement and the number employed can be varied according to the particular requirements of the case. It is therefore not our intention to confine ourselves to the details exactly as shown in the drawing, but to avail ourselves of any alterations, changes,

variations, and departures constituting modifications within the scope of the invention as indicated by the appended claims. 35

We claim:

1. In combination with a motor, a propeller fan secured to the motor shaft, and a plurality of vanes secured to certain of the fan blades and projecting over adjacent blades for diverting air currents passing into said fan to the motor casing for cooling the same. 40

2. In combination with a motor, a propeller fan secured to the motor shaft, and a plurality of vanes secured to the inner ends of certain of the fan blades and projecting over adjacent fan blades for diverting air currents passing into said fan to the motor casing for cooling the same. 45

3. In combination with a motor, a propeller fan secured to the motor shaft, and a plurality of vanes secured to the inner ends of the fan blades and having upturned free ends for diverting air currents passing into said fan to the motor casing for cooling the same. 50

In testimony whereof we affix our signatures in the presence of two witnesses.

JOSEPH EUGENE TRUITT.

EMIL ACKERMAN.

Witnesses:

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WALTER M. MOWERY.