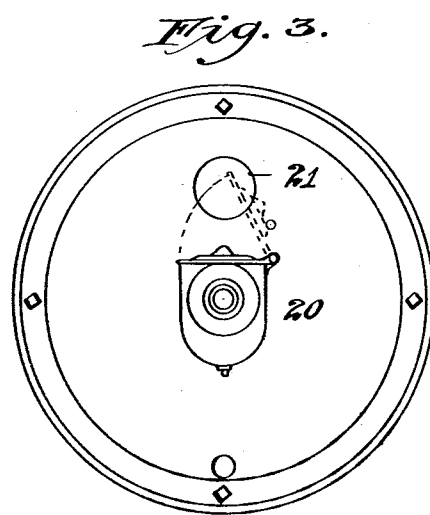
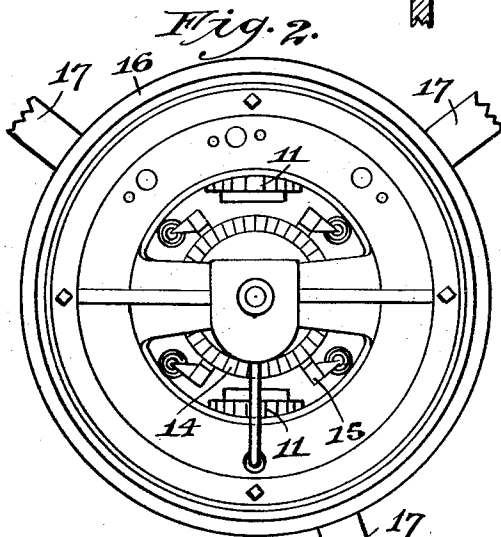
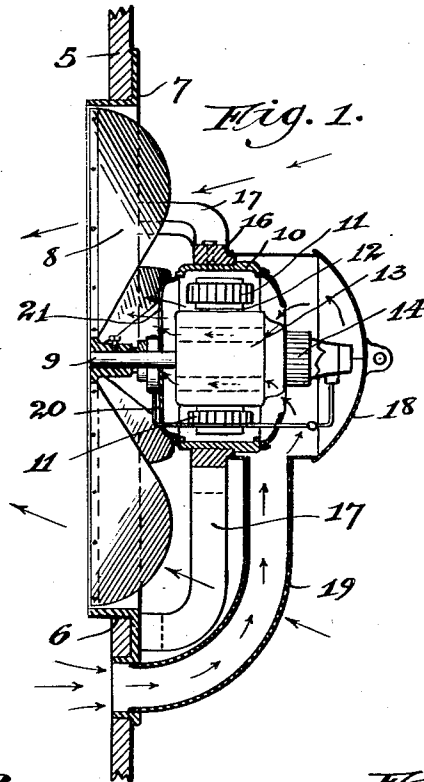


R. A. ILG.
 PROTECTIVE DEVICE FOR VENTILATING FANS.
 APPLICATION FILED MAR. 9, 1914.

1,244,334.

Patented Oct. 23, 1917.



Witnesses,
 J. B. Mann,
 S. N. Ford

Inventor,
 Robert A. Ilg,
 By Offield, Soule, Crane & Offield
 Attys.

UNITED STATES PATENT OFFICE.

ROBERT A. ILG, OF CHICAGO, ILLINOIS.

PROTECTIVE DEVICE FOR VENTILATING-FANS.

1,244,334.

Specification of Letters Patent.

Patented Oct. 23, 1917.

Application filed March 9, 1914. Serial No. 823,558.

To all whom it may concern:

Be it known that I, ROBERT A. ILG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Protective Devices for Ventilating-Fans, of which the following is a specification.

This invention relates to ventilating fans of that type known as "direct driven" fans wherein the electric or other motor is applied directly to the shaft of the fan. Such fans are commonly located in openings in walls and serve the function of drawing off the more or less foul or tainted air in the rooms to which they are applied. Where such fans are driven by electric motors applied directly to the fan shaft, the current of air drawn off by the fan necessarily passes over and in contact with the frame and windings of the motor, and where this air is more or less charged with corrosive fumes and gases such as are found in chemical and other laboratories, paint shops, kitchens, foundries, machine shops, and the like, the latter exert an injurious effect upon the parts of the motor.

In Letters Patent No. 831,284, granted to me on the 18th day of September, 1906, I have disclosed and claimed a protective device which also embodies an automatic cooling of the motor, and consisting substantially of a hood completely covering the motor with a suction pipe leading from a point exterior to the room or chamber containing the motor and tapping said hood, and said hood having a relatively large central open end adjacent to the suction side of the fan, whereby, when the fan is in operation, a current of cooling air from out doors or an adjacent room to that being ventilated is drawn over and through the motor.

An extended experience in the installation and operation of ventilating fans such as that shown and claimed in my Letters Patent above referred to has developed the fact that, for efficient cooling of the motor it is unnecessary to conduct the cooling current around the outer side or shell of the motor, and also that the relatively large opening on the end of the motor adjacent to the suction side of the fan has permitted a more or less back-flow of foul air through and around the motor when the fan was idle.

The object of the present invention is to reduce and eliminate as far as possible this fault; and I have discovered that by applying a hood or covering to the end of the motor remote from the fan with a suction pipe leading outside the room in which the motor is located, and applying another hood or covering to the end of the motor adjacent to the suction side of the fan and providing this latter hood with an opening in the upper portion thereof of substantially the same cross-sectional area as that of the suction pipe, not only is all of the cooling air drawn through the motor, but the tendency to back-flow of corrosive gases is greatly reduced and, under most conditions, practically eliminated.

In the accompanying drawings I have illustrated a practical embodiment of the improvement forming the subject-matter of the present invention, and referring thereto—

Figure 1 is a central vertical section through a ventilating fan and motor equipped with my present improvement. Fig. 2 is an elevation of the outer end of the motor, or that end remote from the ventilating fan; and Fig. 3 is a similar elevation of the inner end of the motor, or that adjacent to the suction side of the fan, with the inner apertured hood applied thereto.

Referring to the drawings, 5 designates a wall, which may be assumed to be an external wall of a kitchen or laboratory, having an opening 6 in which is set an annular fan-casing 7. As herein shown, the space to the right of the wall 5 may be assumed to represent the interior of the chamber to be ventilated, and the space to the left of said wall may be assumed to represent the outer atmosphere or another room or chamber into which the fan discharges.

8 designates a ventilating fan of the usual form and type, which is mounted on a suitably journaled fan-shaft 9 disposed centrally of the fan-casing 7. The shaft 9 is directly connected to the armature of an electric motor of a well known type, wherein 10 designates the field frame, 11 the field coils, 12 the pole pieces, 13 the armature, 14 the commutator, and 15 the brushes. The motor is supported from the fan-casing 7 by a ring 16 surrounding and secured to the field frame and connected to the fan-casing 7 by a plurality of radial arms 17. As the inven-

tion is not concerned with the particular type of motor, the latter need not be further herein described.

Covering the outer end of the motor, or
5 that which is remote from the fan 8, is a hood 18, the inner or open end of which is preferably secured to the motor-supporting ring 16, as indicated in Fig. 1. From the lower side of the hood 18 a suction pipe 19 leads
10 through the wall 5 to the space on the opposite side of said wall.

Secured to the inner or front end of the field frame 10 and covering the inner end of the motor, or that which is adjacent to the
15 suction side of the fan, is another hood or cover-plate 20, centrally through which extends the fan-shaft 9. This front hood or cover 20 is provided in the upper portion thereof, with a circular opening 21 that has
20 substantially the same cross-sectional area as that of the suction pipe 19, whereby said exit opening 21 for the cooling air flowing through the suction pipe 19, hood 18, and
25 the motor offers no check or hindrance to the flow of said cooling current of air at the maximum capacity permitted by the suction pipe 19. At the same time, the limited cross-sectional area of the exit opening or
30 aperture 21 and its location in the upper portion of the front hood or cover substantially prevent the return or back-flow of foul air into and through the motor from the room in which the latter is located, repeated tests and experience having shown
35 that where the exit opening is of the limited dimensions and has the relative location specified, the flow, if any, is, under almost all conditions, in the same direction as when the fan is in operation, so that the parts of

the motor are effectively protected from the 40 injurious effects of foul air or gases when the fan is idle as well as cooled and protected when the fan is in operation.

The arrows shown in Fig. 1 indicate generally the directions of flow of the air currents both around the motor and its hood 45 and through the suction pipe, hood and motor, when the fan is in operation.

I claim—

In a ventilating apparatus designed to 50 draw off foul air and gases from rooms, the combination with an electric motor located in the room to be ventilated, and a ventilating fan located in an opening in a wall of said room and mounted directly on the ar- 55 mature shaft of said motor with its suction side toward the latter, of a hood covering the end of said motor remote from the fan, a suction pipe leading from a point exterior to the room or chamber containing the motor 60 and communicating directly with the lower side of said hood, and another hood covering the end of said motor adjacent to the suction side of the fan and having a single unobstructed opening located in the upper 65 portion thereof, said opening having substantially the same cross sectional area as that of said suction pipe, whereby, when the fan is idle, a natural draft is induced through said suction pipe, motor and open- 70 ing serving to protect the motor from the injurious effects of foul air or gases in the room or chamber where the same is located.

ROBERT A. ILG.

Witnesses:

SAMUEL N. POND,
EDMUND G. INGERSOLL.