H. H. LIND & D. K. SWARTWOUT.

VENTILATOR.

APPLICATION FILED APR. 8, 1914.

1,271,333.

Patented July 2, 1918.

3 SHEETS—SHEET 1.

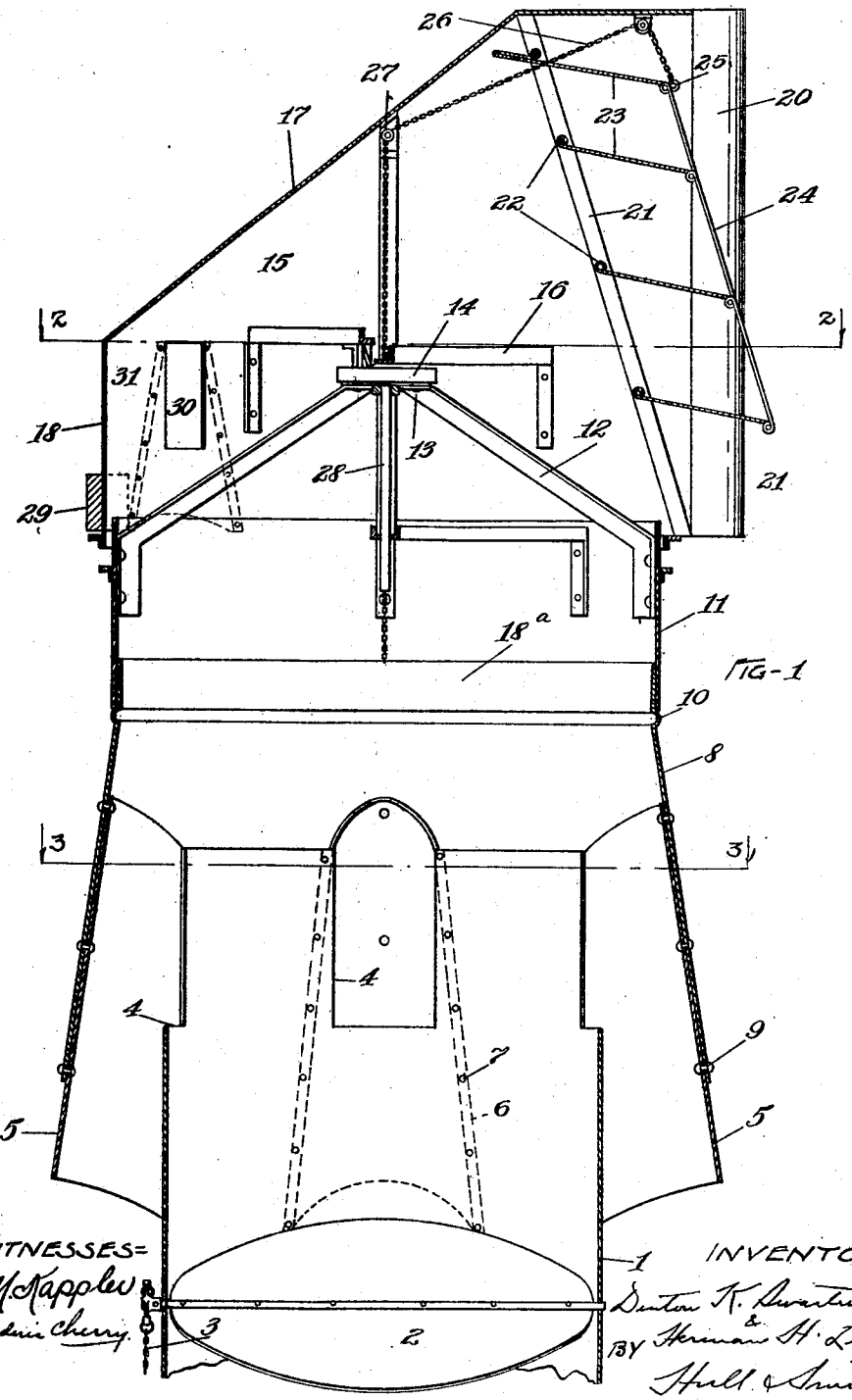


FIG-1

WITNESSES=
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3 SHEETS—SHEET 2.

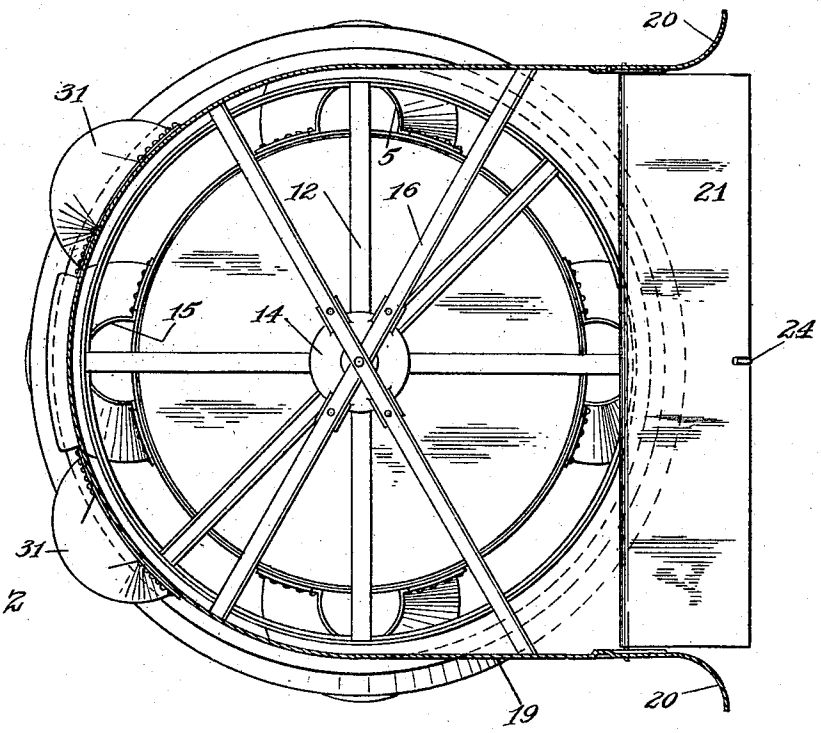


FIG. 2

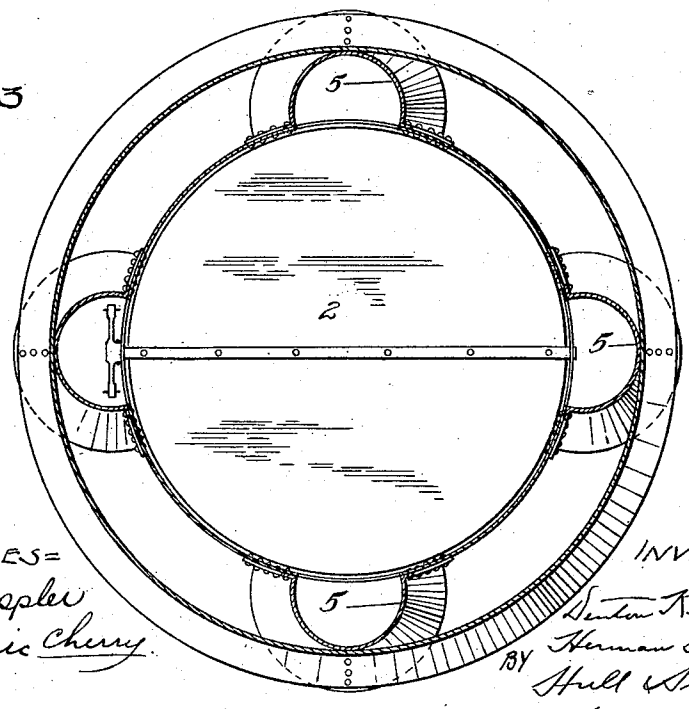


FIG. 3

WITNESSES=

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3 SHEETS—SHEET 3.

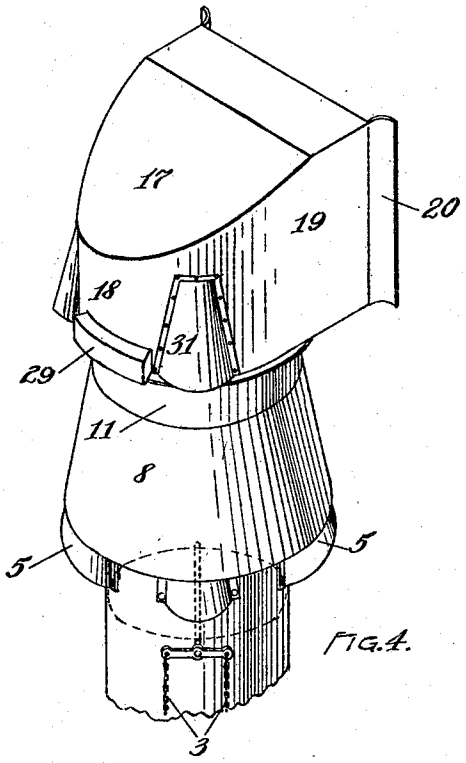


FIG. 4.

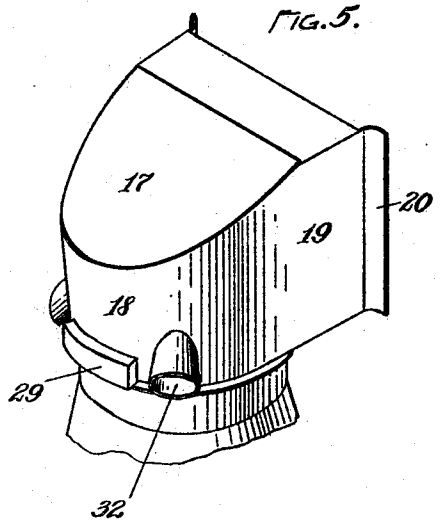


FIG. 5.

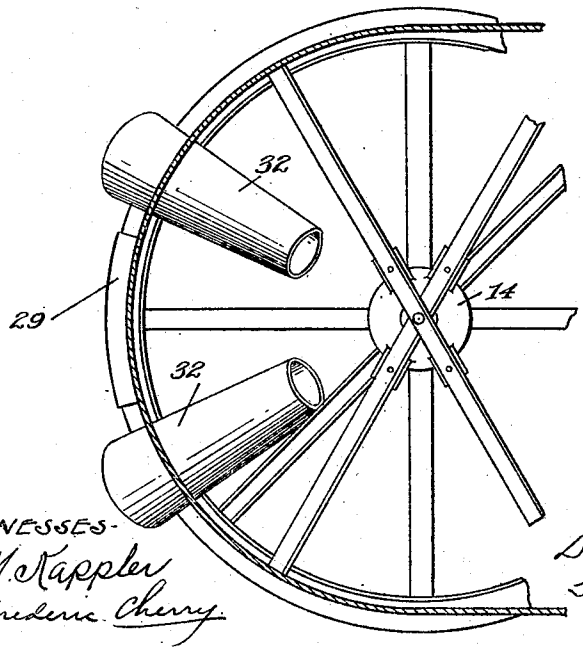


FIG. 6.

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UNITED STATES PATENT OFFICE.

HERMAN H. LIND, OF LAKEWOOD, AND DENTON K. SWARTWOUT, OF MAYFIELD HEIGHTS, OHIO.

VENTILATOR.

1,271,333. Specification of Letters Patent. Patented July 2, 1918.

Application filed April 8, 1914. Serial No. 830,357.

To all whom it may concern:

Be it known that we, (1) HERMAN H. LIND, (2) DENTON K. SWARTWOUT, citizens of the United States, residing at (1) Lakewood, (2) Mayfield Heights, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Ventilators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to ventilators and more particularly to ventilators of the rotary cowl type, such as disclosed in the application of Denton K. Swartwout No. 761,221, filed April 15, 1913.

It is the general object of this invention to improve the efficiency of ventilators of this type, and particularly in the matter of exhaust capacity thereof. Further objects of the invention will appear hereinafter in connection with the detailed description and may be stated generally as consisting of the combinations of elements embodied in the claims hereto annexed and illustrated in the drawings forming part hereof, wherein Figure 1 represents a vertical sectional view through a ventilator constructed in accordance with our invention; Figs. 2 and 3 transverse sectional views corresponding respectively to the lines 2—2 and 3—3 of Fig. 1; Fig. 4 a perspective view of the ventilator shown in the preceding figures; Fig. 5 a perspective view showing a modified form of the cowl; and Fig. 6 an enlarged sectional detail through a portion of the cowl of the ventilator shown in Fig. 3.

Describing by reference characters the various parts illustrated herein, 1 denotes a section of the air shaft of a ventilator, said section being preferably cylindrical in form and having a damper 2 therein provided with operating chains 3. At its upper end, the shaft section 1 is provided with a plurality of slots 4, preferably rectangular in outline and extending downwardly from the top of the shaft. Four such slots may be provided having their centers located approximately 90° apart. Each slot is provided with a tapered hood 5 which may be secured to the body of the air shaft by means of flanges 6 and rivets 7. Each of the hoods extends downwardly below its slot a sufficient distance to cover and protect the same against the weather and to coöperate with the ducts provided by the hoods in the upward movement of air in the air shaft 1. Each hood is preferably wider at the base than at the top and is so shaped as to diminish gradually in cross sectional area from its bottom toward its top, while the outer wall converges inwardly toward the axis of the shaft from the bottom toward the top, the hoods extending above the upper ends of the slots.

8 denotes a frusto conical casing which forms another section of the air shaft and is applied to the hoods 5, being conveniently riveted thereto, as indicated at 9. The upper end of this section 8 is cylindrical, as indicated at 8^a, the bottom of the cylindrical portion being provided with a bead 10 whereby it supports a cylindrical section 11.

By the construction and arrangement of the hoods 5 and the casing 8, passageways are formed through and between the hoods, which passageways communicate with the air shaft sections 8 and 11. 12 denotes a plurality of angle iron arms riveted to the top of the air shaft section 11 and projecting upwardly thereabove and having their upper ends horizontally deflected, as shown at 13, to support the lower member of an anti-friction bearing the upper member whereof is indicated at 14. 15 denotes a rotary cowl which is provided with angle iron arms 16 whereby it is connected to the upper member 14 of the said bearing. The manner of supporting the cowl forms no part of this invention, the same being preferably described in the aforesaid application of Denton K. Swartwout.

As is the case with the construction shown in the aforesaid Swartwout application, the cowl is preferably provided with an upwardly and rearwardly inclined roof 17 and with a cylindrical front wall 18 and substantially parallel sides 19, which sides have their rear ends flared outwardly, as shown at 20. The cowl is also preferably provided with in-

clined supports 21 for the wires 22 to which the front ends of the louvers 23 are pivoted. The rear ends of the louvers are shown as connected to a common rod 24 having an eye 25 at its upper end to which there is connected a chain 26 extending around a pulley 27 above the anti-friction bearing 14, the chain extending through a guide tube 28 depending from the bottom of the bearing. The cowl is also provided at its front end with a counterweight 29. The construction of cowl as thus far described is substantially identical with that of the Swartwout application aforesaid.

For the purpose of increasing the exhaust of gases through the ventilator shaft, the front (or wind-facing) portion of the cowl is provided with openings 30 similar to the slots 4, the openings being located preferably on each side of the counterweight 29. Each opening will be covered by a tapered hood 31, similar to the hoods 5, and the top of each opening is preferably in about the horizontal plane of the bottom of the inclined roof 17, the hoods being secured to the body of the cowl and surrounding the openings.

In Figs. 5 and 6 there is illustrated a modification of the invention wherein, instead of using the openings 30 with the hoods 31, inclined frusto conical induction tubes 32 are inserted into the front of the cowl, on each side of the counterweight 29. These tubes project inwardly toward the axis of the cowl and also upwardly toward the roof 17, this arrangement securing an efficient aspirating action within the lower part of the cowl and the parts of the air shaft therebeneath.

In operation, it has been found that the ducts formed within the hoods 5 deliver air downwardly from the slotted openings 4, this action being secured by the aspirating effect of the wind blowing past the bottoms of these ducts. It has also been found that a similar movement of air, but in less degree, is produced in the conduits of passageways formed between the ducts provided by the hoods 5, this aspirating effect being exerted at the top of the air shaft section 1. It will thus be seen that the two sets of ducts operate upon the air blowing through the shaft 1 to produce an upward movement thereof, these ducts acting or operating upon vertically spaced parts of the air shaft. It has also been found that the air blowing over and around the sides of the cowl exercises an aspirating effect upon the air in the air shaft and that the ducts provided by the hoods 31 or 32 also exercise an aspirating effect upon the air within the air shaft at a point intermediate of the discharge opening of the cowl and the points at which an aspirating effect is applied to the air shaft section 1. Through the coöperation of these aspirators, a high efficiency in the movement of the air through the air shaft is produced.

Having thus described our invention, what we claim is:—

1. In a ventilator, the combination of an air shaft section having a plurality of circumferentially spaced externally located downwardly extending ducts communicating therewith, a second series of similarly located and extending ducts communicating with another vertically spaced portion of said shaft, and a rotary cowl mounted above said shaft, said cowl being provided with aspirating means also operating upon said shaft.

2. In a ventilator, the combination of an air shaft section having circumferentially spaced openings in the upper portion thereof, there being ducts extending downwardly from said openings, a second air shaft section having a frusto conical skirt surrounding said ducts but leaving the bottoms of said ducts exposed to currents of air and forming aspirating passages between said ducts operating upon the top of the first air shaft section, and a rotary cowl above the last mentioned section and coöperating therewith and having ducts extending thereinto through which air is directed from outside to exercise an aspirating effect upon the air shaft sections therebelow.

3. In a ventilator, the combination of an air shaft section having circumferentially spaced openings in the upper portion thereof, there being ducts extending downwardly from said openings, a second air shaft section having a frusto conical skirt surrounding the said ducts leaving the lower ends thereof exposed to currents of air and forming therewith ducts extending downwardly from the top of the first mentioned section, and a rotary cowl mounted above the second air shaft section and having a discharge at the rear thereof and having one or more ducts in the front thereof adapted to conduct air into said cowl above the said air shaft sections.

4. In a ventilator, the combination of an air shaft section having circumferentially spaced openings in the upper portion thereof, there being ducts extending downwardly from said openings, a second air shaft section having a skirt surrounding the said ducts but leaving the lower ends thereof exposed to currents of air and forming therewith ducts extending downwardly from the top of the first mentioned section, and a rotary cowl mounted above said shaft, said cowl being provided with aspirating means also operating upon said shaft.

5. In a ventilator, the combination of an air shaft section having circumferentially

spaced openings in the upper portion thereof, there being ducts extending downwardly from said openings, a second air shaft section having a frusto conical skirt surrounding the said ducts, but leaving the lower ends thereof exposed to currents of air and forming therewith ducts extending downwardly from the top of the first mentioned section, and a rotary cowl mounted above said shaft, said cowl being provided with aspirating means also operating upon said shaft.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HERMAN H. LIND.

Witnesses:

BRENNAN B. WEST,

HUGH B. MCGILL.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

DENTON K. SWARTWOUT.

Witnesses:

WM. P. LIGHTHOLDER,

GEO. SCHUBERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."