No. 45,357. PATENTED DEC. 6, 1864.

E. H. STRONG.
VENTILATOR.

Fig. 2.

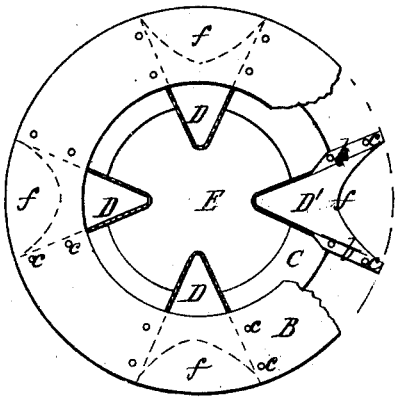


Fig. 1.

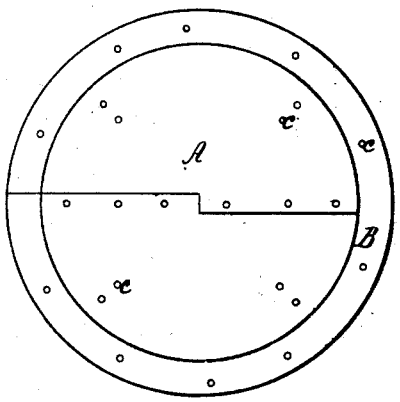


Fig. 4.

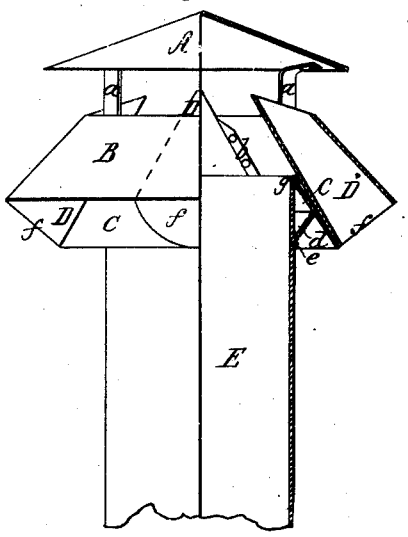
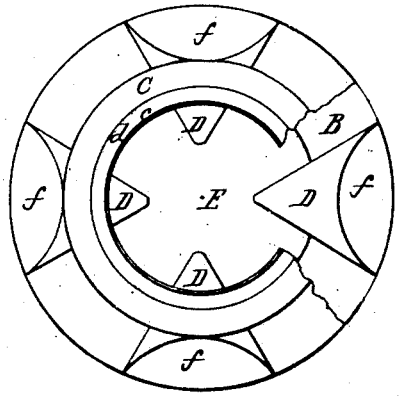


Fig. 3.



Witnesses;

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UNITED STATES PATENT OFFICE.

E. H. STRONG, OF JANESVILLE, WISCONSIN.

IMPROVED VENTILATOR.

Specification forming part of Letters Patent No. **45,357**, dated December 6, 1864.

To all whom it may concern:

Be it known that I, E. H. STRONG, of the city of Janesville, in the county of Rock and State of Wisconsin, have invented a new and Improved Mode of Constructing and Operating a Ventilator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, like characters referring to like parts in each figure.

The nature of my invention consists, first, in arranging a series of ejecting-surfaces in the form of frustums of cones of varying diameters and widths, at such an angle with the horizon and with one another, and such a distance apart, and at such an angle with the cap, as to secure a steady upward, or, by reversion of the several parts, a downward, current of air; second, in combining tapering curvilinear air-tubes, with a series of ejecting-surfaces, of a form nearly corresponding with a flattened cone, of which the upper frustum, B, forms one side, and terminating a certain proportionate distance inside of the discharge-pipe, and cut at their apex by a plane passing through them at a specific angle with the upper one of the series of ejecting-surfaces, so as to destroy and prevent spiral currents of air, and secure an upward, or, by reversion, a downward, current, regardless of the force or angle at which the wind impinges upon it.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by referring to the accompanying drawings, in which—

Figure 1 is a top view of the ventilator. Fig. 2 is a top view having the shield A, Figs. 1 and 4, removed, and a part of the upper ejecting-surface broken away, so as to show one of the tapering curvilinear air-tubes, D′, in section. Fig. 3 is a view of the under side of the ventilator, having the under ejecting-surface broken away, showing the general form of the tapering air-tubes D. Fig. 4 shows a vertical half-elevation and half-section of the ventilator, representing its general construction and angles.

In order to cut the several parts hereinbefore mentioned in a proper manner, and arrange them in their proper positions, and at their relative angles, so as to secure the results herein set forth, the following rule must be observed:

The diameter of the base of the ventilator or discharge-pipe E, Figs. 2, 3, and 4, being assumed, is divided into ten equal divisions, forming a scale by which all the parts of the ventilator are cut and arranged, as herein described, commencing with Fig. 1.

A is the cap or shield, to cut which we take as a radius nine-tenths, and describe a circle, and then take out four-tenths on the outside and run to the center, close up the cut, rivet together and we have the form and angle of the shield or cap, which may be made in one or more parts, as the constructor shall elect.

B, Figs. 1, 2, 3, and 4, shows the upper ejecting-surface or frustum of cone. To make this in the proper form we take as a radius nine-tenths and describe a circle, which gives the inside size and form. For the outside, a radius of fifteen-tenths is taken, which gives as the width or height of the frustum, six-tenths, measured on the surface. Remove from this rim an arc equal to what would be included between two radii, diverging from the center at an angle of one hundred and twenty-one degrees, which will make the inside diameter of this frustum when finished two-tenths larger than the diameter of the discharge-pipe E, Figs. 2, 3, and 4.

C, Figs. 2, 3, and 4, shows the lower ejecting-surface or frustum of cone. To get the form of this frustum, we take, as for the other, nine-tenths for radius of inside circle and thirteen-tenths for radius of outside, making it four-tenths wide or high, measured on the surface. Remove from this rim an arc equal to what would be included between two radii, diverging from the center at an angle of one hundred and fifty-eight degrees, which will make the inside diameter of this frustum equal to the diameter of the discharge-pipe E, Figs. 2, 3, and 4.

c represents rivets used in the construction of the cap or ventilator.

D are curvilinear air-tubes, in form corresponding with a flattened cone, the upper side of which is formed by securing it to the upper frustum or ejecting-surface, B, by flanges *b* and rivets *c*, as shown at D′, Fig. 2, or by an equivalent device securing the upper and lower frustums together, as shown. To

get the proper form of these curvilinear air-tubes D, we take as a radius twelve-tenths and sweep a circle whose arc shall be equal to the radius, and draw lines to the center. Bisect this arc and draw a line to the center. Now, measure down from the outside on this last line toward the center nine-tenths and draw a line at right angles to it, and make the line one-half-tenth long. Now, draw a line parallel with each of the sides and a sufficient distance from them to make a flange, *b*, Fig. 2. Measure from the outside toward the center on this line six-tenths from this point, draw lines to the end of the line crossing the center or bisecting line at right angles, cut, form, and secure to the other parts, as afore described—the inside opening or space between the two frustums, and between the upper frustrum and cap or shield, being three tenths.

E, Figs. 2, 3, and 4, represents the discharge-pipe, which is in length six-tenths.

a, Fig. 4, shows the standards secured to the upper ejecting-surface or frustum, and to the shield or cap A, Figs. 1 and 4, supporting the shield or cap, as shown.

d, Figs. 3 and 4, is a metallic rim, taking bearing on the raised projection *e* of the tube E, extending to, and giving bearing and support to, the lower ejecting-surface or frustum C.

f marks the base-opening to the air-flues D.

g shows the manner of securing the air-tube E to the lower ejecting-surface, C, by turning it over the edge of the latter, as there shown.

I am aware that series of frustums of cones of equal widths, arranged at equal angles with each other, protected with a cap or shield of various forms, have been used for ejecting and injecting air, and also that air-tubes, or frustums of cones, perfect in themselves, and introduced between ejecting-surfaces, have also been employed, aiming to secure the results herein set forth and fully attained. I do not therefore claim a ventilator, irrespective of the manner and form of its construction and principle of operation; but

I do claim—

The combination of a series of tapering curvilinear air-tubes, of a form nearly corresponding with a flattened cone, with a series of ejecting or injecting surfaces, of which the upper frustum, B, forms one section of the cone, and terminating a certain proportionate distance inside of the discharge-pipe, and cut at their apex by a plane passing through them at a specific angle with the upper one of the series of ejecting-surfaces, so arranged and disposed as to prevent spiral currents of air and secure an upward, or, by reversion of parts, a downward, current, regardless of the force or angle of impingement of the wind upon it, substantially as shown and described.

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Witnesses:

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