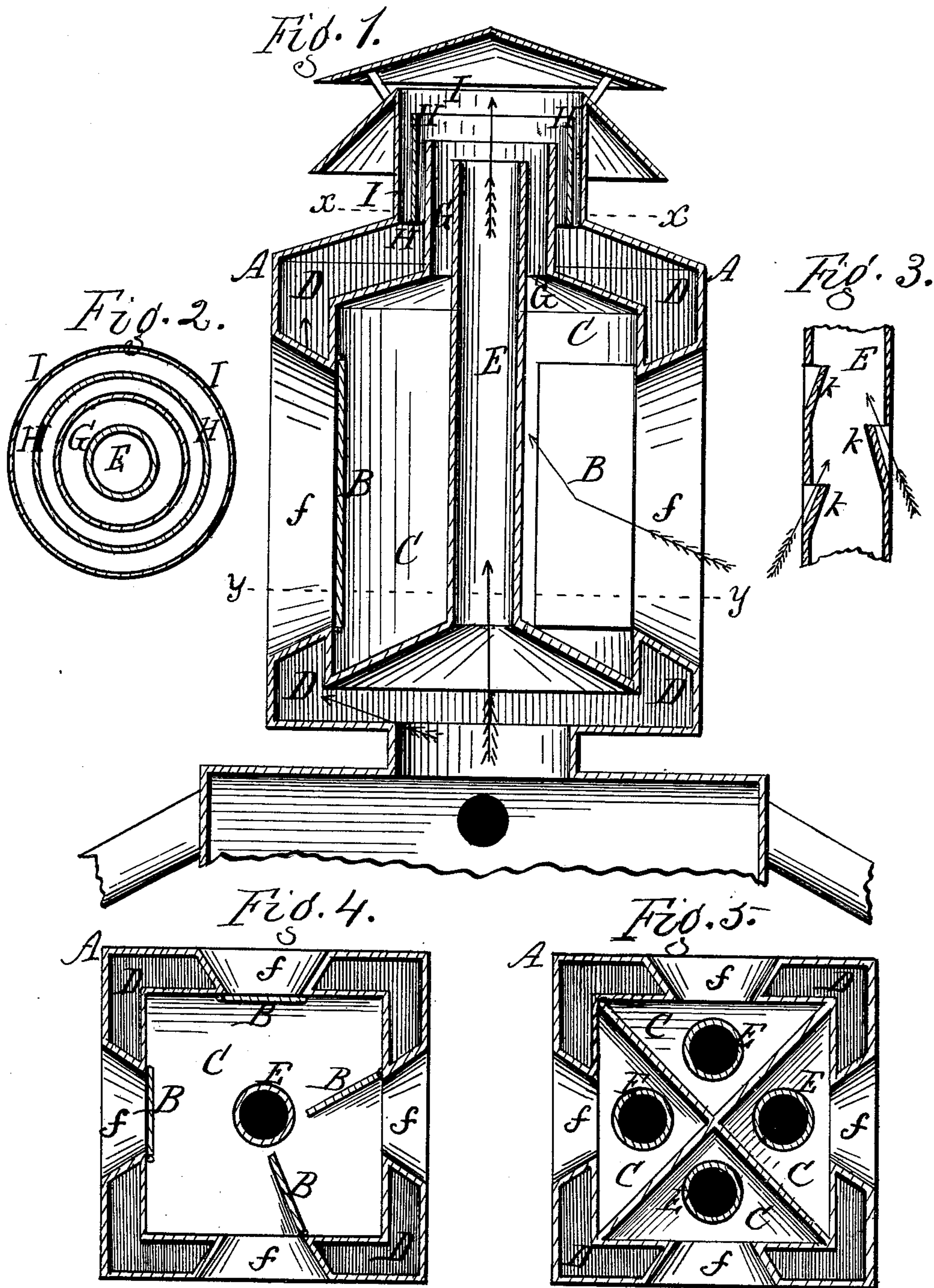


G. W. HARROLD & L. R. SATTERLEE.  
VENTILATOR.

No. 189,456.

Patented April 10, 1877.



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# UNITED STATES PATENT OFFICE

GEORGE W. HARROLD AND LE ROY SATTERLEE, OF ROCHESTER, NEW YORK;  
SAID HARROLD ASSIGNOR TO AURELIA S. STRONG, OF SAME PLACE.

## IMPROVEMENT IN VENTILATORS.

Specification forming part of Letters Patent No. 189,456, dated April 10, 1877; application filed August 2, 1876.

*To all whom it may concern:*

Be it known that we, GEORGE W. HARROLD and LE ROY SATTERLEE, both of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Ventilators; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of our improvement applied to a house-ventilator. Fig. 2 is a cross-section in line *x x* of Fig. 1. Fig. 3 is a longitudinal section of the inner dead-air tube. Fig. 4 is a section in line *y y* of Fig. 1. Fig. 5 is a view similar to Fig. 4, but showing a modification.

Our improvement relates to ventilators for buildings, &c. The object is to produce a more active motion of the dead air by injecting a current or currents of live air through the same, said current being carried up in the center of the dead-air column, whereby greater friction, and consequently greater drawing force, is produced.

The invention consists in the construction and arrangement of parts hereinafter more fully described.

A represents a ventilator placed on top of a building, being of square, cylindrical, or other form. Its bottom communicates with various apartments in the building by suitable pipes or passages. B B B B are valves on the sides, resting in windows *f f f f*, and opening inward. These valves are placed in opposition, and are accurately hung, so that they will close of their own gravitation, but open at slight impulse of the wind. C is a chamber, which receives the active current of outside air. D D is a dead-air space surrounding the central chamber, communicating at the bottom with the pipes or other passages leading to the rooms, and opening at the top, through the dead-air passage I, into the open air. E is a dead-air tube connecting with the dead-air space D below, passing up through the chamber C, and opening into the top of the ventilator. G is the live-air passage leading from the chamber C. H is a dividing-

tube, resting between the neck G and the outer tubular top I of the case. The tubes E, G, and H do not extend quite to the top of the tube I; but the tube H preferably extends some distance higher than the others.

The action is as follows: The wind, blowing into the chamber C through the windows *f f*, opens the valves B B on that side and closes the valves on the opposite side, as shown in Fig. 2. This wind, having no other exit, is deflected in the chamber C, and passes up through the passage G, and escapes through the top of the ventilator, as indicated by the arrows. In doing so it passes between two distinct strata of the dead air, which respectively pass up the dead-air space D D and the central tube E. Coming between these two dead currents, the active current is freely intermingled, and by its friction and the momentum which it has attained it drags the dead air up with it on both sides, and discharges it at the top. By thus insulating or confining the live current within the two dead ones a much more active draft is produced than can be produced by simply drawing up by the suction of the air at the top, as is done in some devices for this purpose. The effect in our invention is due principally to this confining of the impelling current within the body of dead air, so as to become intermingled therewith, and drive the same upward by the friction between the particles and the positive lifting force of the impelling current. By locating the ends of the tubes some distance below the ventilator-top, as shown, the impelling current obtains direction, and the lifting power is imparted before the air can escape from the ventilator. The tube H serves as a divider, cutting the dead air in the outside tube I into two thin sheets, confining the active current within the inner one, and thereby preventing too much diffusion where the currents of the dead air mingle at the top, also preventing any eddying or reaction of the currents that might otherwise occur in a large dead space. The top of this tube H, rising above the others, serves to give a direct upward motion to all the uniting columns that mingle at the top over the other tubes, which, acting upon the thin sheet in the outer space below said divid-



ing and outer tubes of the ventilator, draws it up and discharges it effectually.

The central tube E may be closed at the sides, as shown in Fig. 1; but it preferably has deflectors or injectors *k k*, formed by cutting slits in the metal and bending the strips inward, those on one side alternating or breaking joints with those on the other. A portion of the active current is carried through these passages, and, being deflected upward in the tube E, they materially assist in lifting the dead air within said tube.

If desired, the chamber C of the ventilator may be divided into sections, which are not connected, and one of the tubes E may be employed in each section, as indicated in Fig. 5. In such case the valves B B are not required, since the sections will face the four quarters, to receive the wind whichever way it blows.

This invention may be applied to a chimney-cap in a similar manner.

What we claim herein as new is—

1. In a ventilator, the pivoted valves B B, hung in windows *ffff* of the ventilator A, and opening inward, in combination with a live-air chamber, C, located above said valves, and a dead-air space, D or E, opening above said live-air chamber, whereby the air that enters the ventilator by the opening of the valves on one side is arrested by the closing of the valves on the opposite side, and deflected up through the chamber C to exert a lifting power upon the dead air, in the manner and for the purpose specified.

2. In a ventilator, the body A, constructed with a live-air chamber, C, receiving its supply from the outer air through windows *ff*, in combination with a dead-air space, D, surrounding said live-air chamber, and a dead-air tube, E, passing up through the live-air chamber, said dead-air space and dead-air tube communicating at the bottom with a common dead-air supply, and opening at the top above the live-air chamber to receive the impetus of the live-air currents, in the manner and for the purpose specified.

3. In a ventilator, the combination, with the live-air chamber C, the dead-air space D, and the dead-air tube E, of the dividing-tube H, located between the top of the live-air chamber and the exterior of the case, for the purpose of giving an upward direction to the currents that mingle at the top, in the manner and for the purpose specified.

4. In a ventilator, the tube E, constructed with the deflectors *k k*, in combination with the surrounding live-air chamber C, whereby a portion of the live air is carried within said tube to impel the dead air upward, as herein shown and described.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

GEORGE W. HARROLD.  
LE ROY SATTERLEE.

Witnesses:

R. F. OSGOOD,  
EDWIN SCOTT.