(Model.)

2 Sheets—Sheet 1.

P. MIHAN.

VENTILATOR.

No. 248,601. Patented Oct. 25, 1881.

Fig. 2

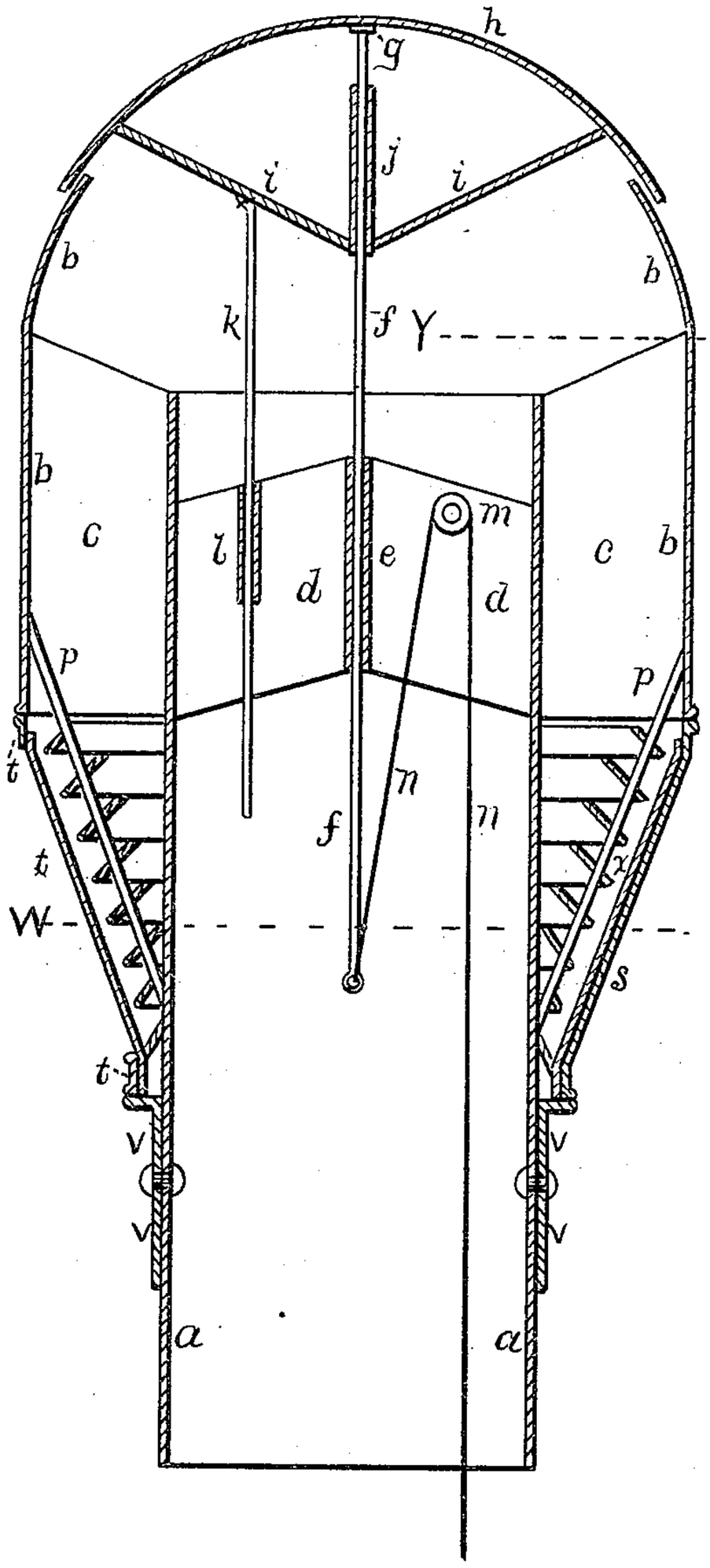
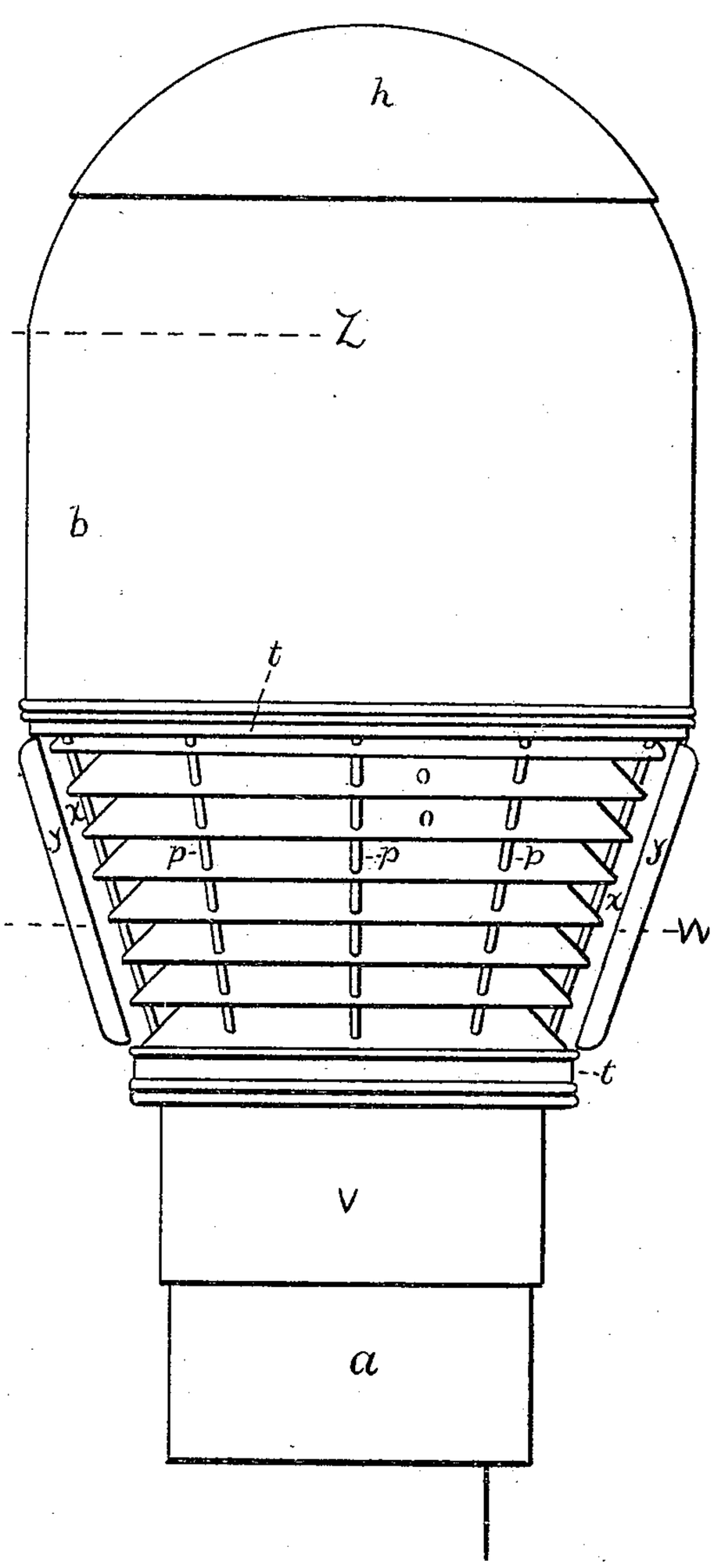


Fig. 1.



Witnesses:
W. J. Dudley.
Samuel O'Kelley.

Inventor:
Patrick Mihan
By Porter & Hutchinson
Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(Model.)

2 Sheets—Sheet 2.

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Fig. 3.

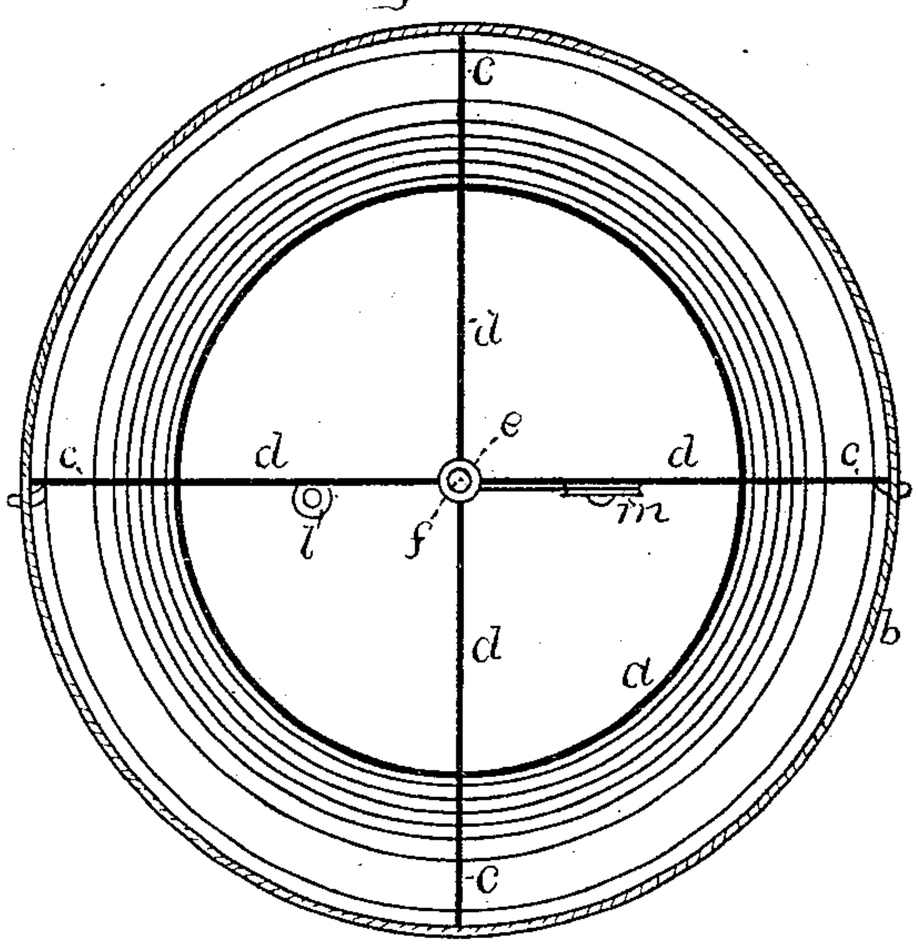

Fig. 4.

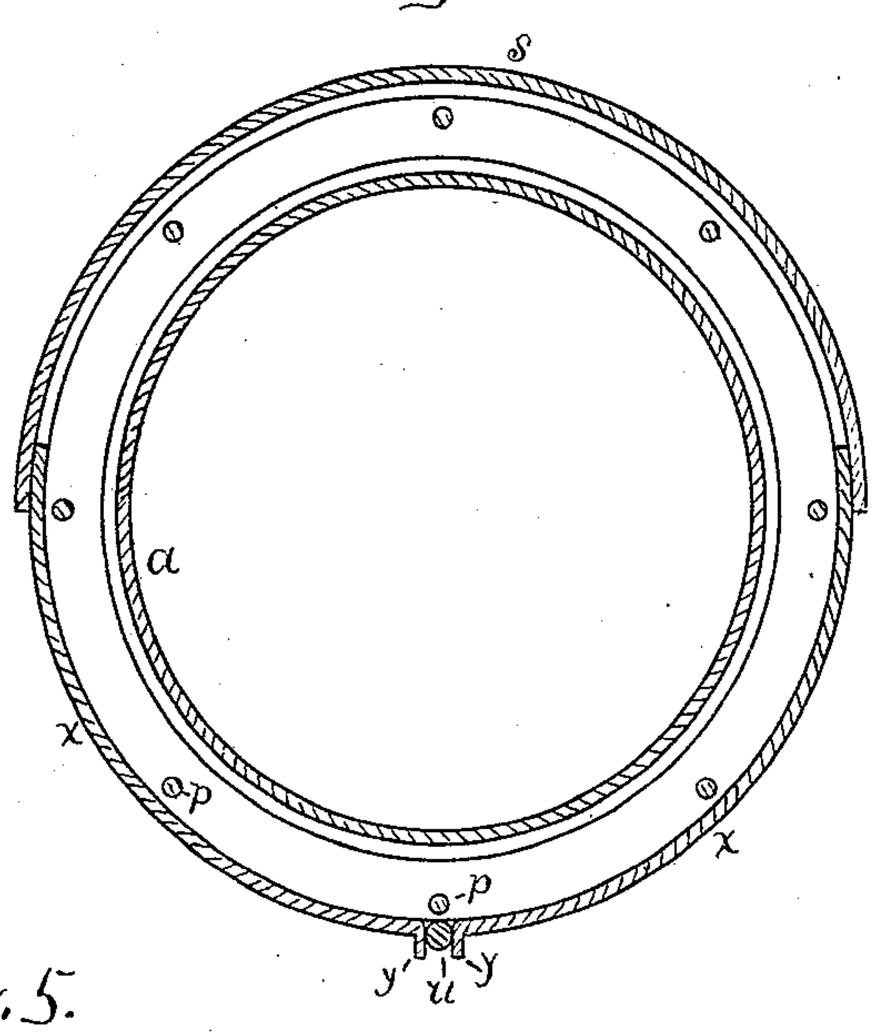

Fig. 5.

Witnesses:
W. J. Dudley.
Samuel D. Kelley.

Inventor:
Patrick Mihan
By Porter & Hutchinson
Attys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PATRICK MIHAN, OF CHELSEA, MASSACHUSETTS.

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 248,601, dated October 25, 1881.

Application filed May 23, 1881. (Model.)

To all whom it may concern:

Be it known that I, PATRICK MIHAN, of Chelsea, State of Massachusetts, have invented an Improved Ventilator, of which the following is a specification.

This invention relates more especially to that class of ventilators which are employed for securing purity of air in the cabins and other compartments below decks in ships and other marine structures; and the invention consists in a ventilator which may at will be changed from an air-injector to an air-escape, which preferably is circular in cross-section at all points in its height; which may be entirely closed at its sides, either for the purpose of excluding water or when used as an escape-flue for bad air; which is non-rotative, but is supplied with a rotary shell or shield which encompasses one-half the circumference of the air-space or draft-cones, and which is provided with two sliding doors, which may be slid within the said shield when the full force of the ventilator is required; or they may be moved to cover any part or all of the space which is not inclosed by said shield.

Figure 1 is a side elevation, showing the ventilator as opened and in use. Fig. 2 is a longitudinal vertical section of the ventilator. Fig. 3 is a horizontal or transverse section of the ventilator, taken at the line Y Z, Figs. 1, 2, and showing, in plan, that portion which is below said line. Fig. 4 is also a horizontal or transverse section taken as on line W W, Figs. 1, 2, and 5. Fig. 5 is a longitudinal vertical section taken through and showing the conical or air-admitting portion of the ventilator.

In said views, *a* represents a sheet-metal tube, circular in cross-section, which may be of such height, diameter, and thickness of metal as the exigencies of its use may require; and at its base it should be rigidly secured to the deck, cabin-roof, or other position, in any of the numerous and well-known methods. An outer shorter and larger tube, *b*, encircles the upper portion of tube *a*, as shown, and is thereto secured by the radial sheet-metal partitions *c*, as shown. That portion of tube *b* which extends above partitions *c* is converged or contracted upon curved lines, as shown in Figs. 1 and 2. The upper portion of the interior of tube *a* is also subdivided by their partitions *d*, as shown, and at the intersecting center of said partitions is formed the tube *e*, in which is fitted to freely slide the rod *f*, which at its upper end is threaded in nut *g*, secured in the apex of cap *h*, which latter overlaps and fits upon the converging walls of outer tube, *b*, as shown in Figs. 1 and 2.

An inverted sheet-metal cone, *i*, is united to cap *h*, as shown in Fig. 2, and for the purpose to be described. A tube, *j*, is centrally secured to cone *i*, to aid in securing said cap axially upon rod *f*.

To the lower end of rod *f* is secured a cord, *n*, which leads thence over a pulley, *m*, secured to one of the partitions *d*, and thence downward, so as to be of ready access, in order that by pulling thereon cap *h* may be raised by the action of its rod *f*.

A steadying-rod, *k*, secured to cone *i*, passes through tube *l*, formed or secured to another partition, *d*, and thereby prevents rotation of cap *h*, and the consequent derangement of cord *n* relatively to rod *f* and pulley *m*.

Below tube *b* are arranged a series of truncated cones or oblique metal bands, (marked *o*,) which by a regular gradation in size vary from an interior diameter—at the lower band—which equals the diameter of tube *a*, to an exterior diameter—at the upper band—which equals the interior diameter of tube *b*, said bands being secured to and supported by the rods *p*, which latter at their upper ends are secured to the interior of tube *b*, and at their lower ends to the exterior of tube *a*, as shown in Fig. 2, said bands being each of such width and arranged at such distance apart that the upper edge of each is at the level of the lower edge of the band next above, and the spaces between said bands serve to admit the air which passes in through the ventilator, as will be hereinafter described.

For the purpose of adjusting the quantity of air admitted, and also for the purpose of closing the ventilator entirely to prevent the admission of either air or water, I employ a shield, (shown at *s*,) which incloses or covers one-half the circumference of said bands *o*, said shield being secured in place by a narrow band, *t*, at its upper and lower edge, which extends around the half circumference of the ventilator which is not covered by the shield itself, and thus the shield and its bands encircle the ventilator.

A shouldered sleeve, *v*, secured to the lower

portion of tube *a* by bolts or rivets, serves as the vertical support of shield *s*, which by its own lower edge and its lower bands *t* has a continuous bearing around the entire circle of the shoulder of said sleeve. A rod, *u*, is secured at its extremities to said bands *t*, as shown in Figs. 1 and 4, and serves the purpose of a handle when it is desired to slide said shield *s* around the ventilator. For the purpose of closing the space (one-half circumference) around bands *o*, which is not covered by shield *s*, I employ the two sliding doors *x*, which are secured between bands *o* and the shield *s*, and its bands *t t*, the front or meeting edges of each of said doors being turned outwardly, as shown at *y*, to serve the various purposes of handles for sliding said doors, and as stops when brought in contact with the edge of shield *s* when fully opened, or when brought in contact with the edge stop-rod, *u*, when the ventilator is entirely closed. Thus one half of the air-space between bands *o* is always closed by the shield *s*, and of the other half any desired portion may be economized for admission of air by means of sliding doors *x*, which may be opened (slid apart) to any desired extent, and by the rotation or sliding of shield *s* around the ventilator the open space between doors *x* may always be placed to windward, if desired.

When cap *h* is closed and air is admitted between bands *o*, it passes up between tubes *a* and *b*, being deflected inwardly by the contracted lines of tube *b*, until it strikes the inverted cone *i*, which turns the current downward through tube *a*.

When it is desired to employ the ventilator as a vent or escape-pipe for foul air, the cap *h* is raised by means of cord *n* and rod *f*, as before described, and if a strong updraft is desired, doors *x* are partially opened to admit an inflow of air between bands *o*, which, passing out between cap *h* and the upper wall of tube *b*, facilitates the draft.

The especial advantages of this ventilator are that it is entirely smooth, and hence is not liable to entangle ropes or other lines when being used on shipboard. It can be entirely closed, either to exclude water in a heavy sea or when not required for ventilation. The amount of air admitted may be graduated as desired, and it may be changed at once, by closing doors *x* and raising cap *h*, from an air-injector to an escape-flue for foul air. Any slight amount of water which by passing waves might enter through the joints between doors *x*, or between said doors and shield *s*, would escape at the joint between tube *a* and the shield *s* and its bands *t*, which, for the ready sliding of said shield, fit loosely on tube *a*. When used solely as a ventilator, a separate escape-pipe for foul air should, of course, be provided.

I claim as my invention—

1. In a ventilator, the combination of the inner main tube, *a*, and the shorter and longer tube *b*, secured to tube *a*, with a concentric air-space between them, the oblique bands *o*, in graduated diameters, an overarching inclosing top, and an inverted deflecting-cone, *i*, at the apex of said top, all substantially as specified.

2. In a ventilator having the inner tube or wall, *a*, and the outer tube or wall, *b*, the combination therewith of cap *h*, provided with the elevating-rod *f* and cord *n*, or equivalent means for elevating said rod and cap, all substantially as specified.

3. In a ventilator, the combination of concentric tube *a*, the outer tube, *b*, thereto secured, the oblique graduated bands *o*, and their supporting-rods *p*, secured at their respective ends to tubes *a* and *b*, substantially as specified.

4. In a ventilator, the combination of tubes *a* and *b*, concentrically arranged, a series of oblique bands, *o*, of graduated diameters, and a shield, *s*, arranged to cover a circumferential section of said bands, and to be moved around the outer periphery thereof, substantially as specified.

5. In a ventilator, and in combination with shield *s*, a sliding door or doors, *x*, arranged to slide within or upon said shield when the ventilator is being opened, and to be extended around the outer line of the ventilator to close the air-spaces not covered by said shield, substantially as specified.

6. In a ventilator, and in combination with shield *s* and doors *x*, the meeting rod *u*, secured to bands *t* of said shield, and arranged to serve as a stop to said doors when extended, and as a means of sliding and adjusting said shield, substantially as specified.

7. In a ventilator, the combination of shield *s*, provided with its securing-bands *t*, the doors *x*, and the dividing-rod *u*, secured to said bands, all substantially as specified.

8. In a ventilator, the combination of tubes *a* and *b*, oblique bands *o*, of graduated diameters, cap *h*, and partitions *c* and *d*, to unite said tubes and to support and guide the cap-rod *f*, all substantially as specified.

PATRICK MIHAN.

Witnesses:
T. W. PORTER,
H. H. LETTENEY.