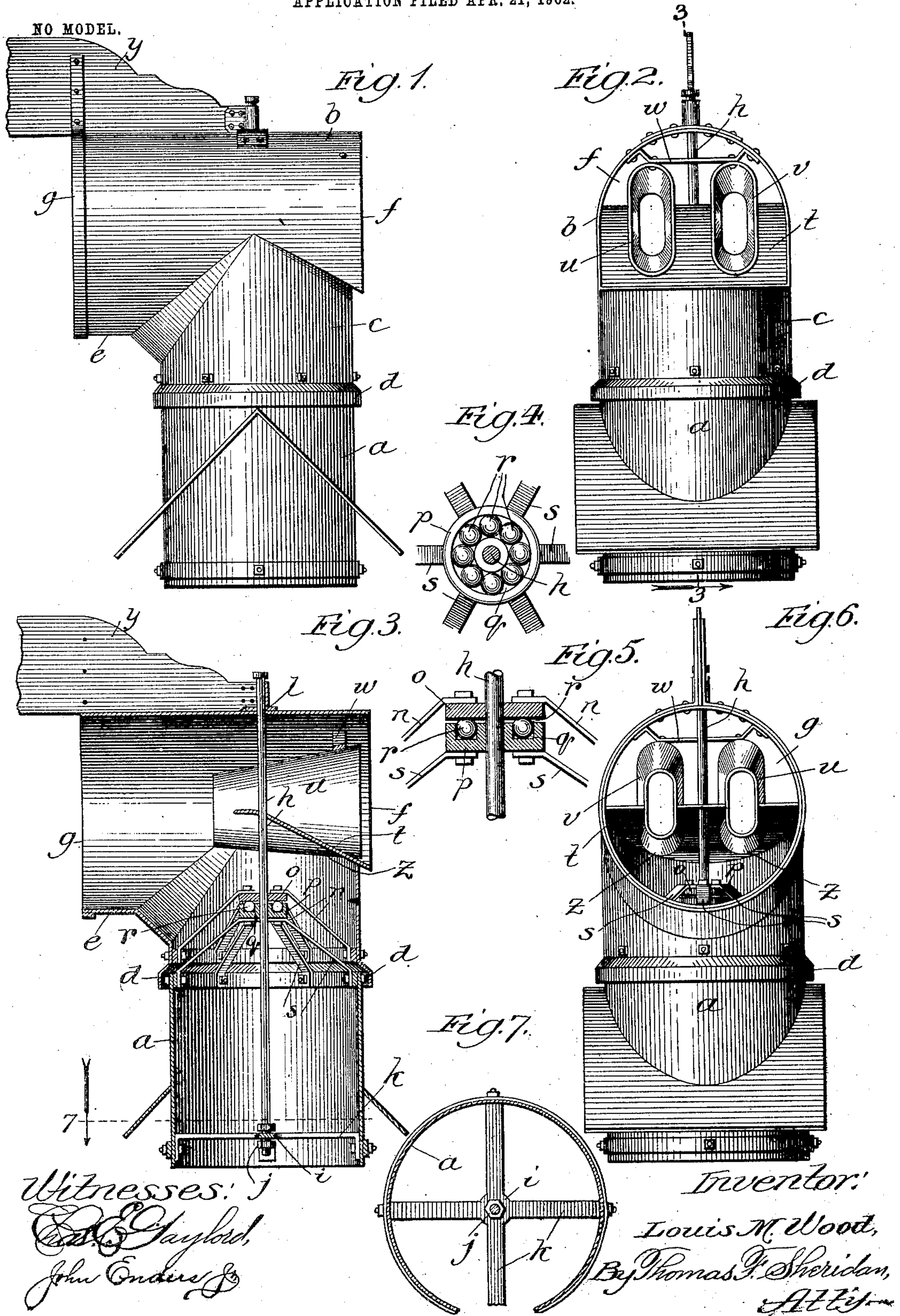


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PATENTED APR. 5, 1904.

L. M. WOOD.
VENTILATOR.

APPLICATION FILED APR. 21, 1902.



UNITED STATES PATENT OFFICE.

LOUIS M. WOOD, OF TOPEKA, KANSAS.

VENTILATOR.

SPECIFICATION forming part of Letters Patent No. 756,762, dated April 5, 1904.

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To all whom it may concern:

Be it known that I, LOUIS M. WOOD, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Ventilators, of which the following is a specification.

This invention relates to that class of ventilators known as "revolving" ventilators, and particularly to ventilators having a revolving portion which may be mounted at the top of an air-shaft or chimney to revolve thereon in conformity with the direction of the wind and having an air or draft passage communicating with the upright air-shaft upon which such revolving portion is mounted.

It relates, further, to the means employed for mounting the revolving portion upon and in communication with the air-shaft or rigid portion.

It relates, further, to the relative size and shape of the inlet and outlet openings in the revolving hood portion and to the means for dividing the main draft-passage into a plurality of passages and compressing the air admitted and permitting its expansion within the ventilating or main draft passage.

It relates, further, to the position and shape of the air-compressing means with relation to the air-shaft passage and to the revolving air or main draft passage, whereby such air-compressing means is enabled to perform its functions without materially obstructing either of such passages or injuriously affecting the connections therebetween.

It relates, further, to the combination of the above elements in the manner herein shown, described, and claimed whereby a simple, economical, and efficient ventilator is formed having a hood or cowl portion provided with a main draft-passage adapted to revolve in conformity with the direction of the wind, and provided with means for compressing the air which enters the inlet-opening and permitting such air to expand within the main draft-passage and dividing such passage into a plurality of passages of the desired shape and length, whereby the action of the wind is so controlled and modified within the passage as to produce an artificial draft.

It relates, further and finally, to the features, combinations, and details of construction hereinafter described and claimed.

The principal object of the invention is to make simple, economical, and efficient ventilator and provide it with means whereby it may be revolvably mounted upon an air-shaft having a revolving main draft-passage in communication with such air-shaft.

A further object of the invention is to provide such ventilator with means for compressing the air admitted thereto at desired points and permitting its expansion while in the main draft-passage, so as to produce an artificial current or draft in the air-shaft or chimney.

A further object of the invention is to provide means whereby the expansion of the air will be caused to take place at different desired points in the ventilating-passage by dividing the main draft-passage into separate passages of various lengths and of the desired conformation, thus also producing currents of different density and volume flowing in the direction of the outlet-opening and so proportioned and located as to cause the desired artificial draft and the minimum of eddying currents within such passage.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved ventilator; Fig. 2, an end elevation looking from the wind; Fig. 3, a vertical sectional view taken on line 3 of Fig. 2 looking in the direction of the arrow; Fig. 4 a detail of the roller-bearing on which the ventilating-cowl revolves; Fig. 5, a vertical sectional detail view of such roller-bearing mechanism; Fig. 6, an end elevation of the ventilator looking oppositely to Fig. 2 and toward the wind, and Fig. 7 a detail plan view of the open-work base in which the bottom of the vertical cowl-supporting shaft is pivotally mounted.

In constructing a ventilator in accordance with my improvements I provide an upright cylindrical air-shaft portion *a* of the desired dimensions which forms the top of the main air-shaft, to which it may be attached or of

which it may be made an integral part. Above this cylindrical air-shaft portion is mounted a cowl *b*, having a downwardly-extending cylindrical lower portion *c*, which is termed the "neck," preferably of the same diameter as the top of the air-shaft and having a bottom rim or hood portion *d* overlapping the upper edge of the air-shaft and fitting as closely thereto as possible, while permitting of the rotation of the cowl thereon. The cowl is provided with an elbow portion *e*, extending at an angle to the upright neck and communicating therewith and forming a substantially horizontal main draft-passage having an inlet-opening *f* and an outlet-opening *g* to permit the passage of air therethrough at an angle with the air-shaft. In order to enable the cowl to revolve so as to present the inlet-opening to the wind at all times, I provide a vertical sustaining-shaft *h*, fastened at the top of the cowl, through which it extends. The lower end of this shaft is pivotally mounted in an open-work base *i*, having a central opening *j*, into which the end of the shaft is loosely inserted. This base is provided with integral outwardly-extending arms *k*, rigidly fastened to the inner wall of the air-shaft by means of nut-and-bolt mechanism in any ordinary and well-known manner. To facilitate the rotation of the cowl and hold it rigidly upright, the sustaining-shaft above described is made to extend downward into the air-shaft a considerable distance beyond the bottom of the cowl, as shown, and is rigidly fastened to the top of the cowl at the point *l* and again to the bottom of the cowl by means of a central base-plate *o* and outwardly-extending arms *n*.

To insure the desired perpendicular rigidity necessary to withstand the force of severe winds and sustain the weight of the cowl in an efficient manner, while permitting its easy rotation under all conditions, I provide a rigid base-plate *p*, having an annular slot *q* in the upper surface thereof adapted to contain and hold in operative position antifriction-balls *r*, which plate I rigidly mount adjacent to and immediately beneath the revolving base-plate *o* of the cowl by means of arms *s*, which are rigidly fastened to such ball-bearing plate and extend outwardly and downwardly to the inner wall of the stationary air-shaft portion, to which they are fastened by means of bolt-and-nut mechanism in any ordinary and well-known manner.

In order to increase the draft in the air-shaft, I provide a diaphragm *t*, which is arranged to extend from the bottom of the inlet-opening in the revolving portion of the ventilator upward and inward at an angle to a point preferably beyond the center of the air-shaft and centrally of the horizontal air-passage, leaving the upper half of the elbow or head portion open from end to end to form the main draft-passage. I then mount two funnel-shaped portions *u* and *v* in the inlet-

opening, with their small ends extending inward past the end of the diaphragm toward the outlet-opening and with their enlarged ends extending toward the inlet-opening, as shown in Fig. 3. These funnels I prefer to make oblong in cross-section, as shown, and mount them so that they extend through the diaphragm and beyond its inner end, the upper central portion and the entire rear portions thereof being above the diaphragm and held in place partly by means of the diaphragm through which they extend. A brace *w* is riveted to each funnel and extends upward to the top of the hood, to which it is fastened by means of rivets in any ordinary and well-known manner. By this arrangement the funnels form dividing-walls which separate the main draft-passage into distinct passages, forming currents of different density, which converge within the main draft-passage at the desired points to produce the draft effects sought.

In order to enable the cowl to be readily turned by light winds, so as to present the inlet-opening in the desired direction, a vane *y* is mounted upon the elbow portion extending in line with the axis thereof, and the elbow or hood is made to extend outwardly beyond the side of the neck portion on the side which is intended to form the outlet-opening.

By this arrangement it will be readily seen that the diaphragm, extending upward at an angle, diminishes the main draft-passage at the desired point to permit the air to escape from the vertical air-shaft practically without an interruption, while at the same time extending upwardly and inwardly, as it does, from the inlet-opening of the the main draft-passage it causes the incoming air to be compressed. Upon leaving the edge of the diaphragm the air as it proceeds in the direction of the outlet-opening is permitted to expand and flow rapidly and unreservedly toward such outlet-opening, thus producing the desired draft. The two funnel portions being arranged, as described, with their expanded ends at the inlet-opening and their inner ends beyond the upper edge of the diaphragm operate in a similar manner to compress the air which passes through them, permitting it also to expand within the horizontal or main draft-passage and unite with the air which passes over the edge of the diaphragm in forming the draft in the main draft-passage and indirectly in the air-shaft. It is desirable that the eddies which would result from the closing of the space between the funnels and the outer wall of the elbow be prevented from forming. In order to accomplish this purpose and freely admit the air therethrough, as above described, such space is left entirely open, affording a free passage for the air between the funnels and the top of the hood and in the direction of the outer opening. To prevent the current of air from the funnels being retarded

by a too acute contact with the current from the air-shaft, the lower edge of the outlet ends of each of such funnels forms an outwardly and downwardly extending flange or lip 2, Figs. 3 and 6, which in combination with the elements above described causes the air from the funnels to unite with that from the air-shaft and also with that passing over the funnels while all of the currents are proceeding in practically identical directions, thus affording the greatest possible speed of current and the minimum of eddies and producing an effective draft under all conditions.

I claim—

1. In an apparatus of the character described, the combination of a rotatable cowl provided with a main draft-passage extending entirely therethrough in a horizontal direction and having unobstructed open ends and a vertical downwardly - extending neck portion forming an air-passage communicating at its upper end with said main draft-passage, and a plurality of open-ended funnels arranged in the main draft-passage longitudinally thereof with the enlarged ends of the funnels adjacent to the inlet end of said passage, said funnels being disposed side by side and surrounded by the main draft-passage.

2. In an apparatus of the character described, the combination of a rotatable cowl provided with a main draft-passage extending entirely therethrough in a horizontal direction and having unobstructed open ends and a vertical downwardly - extending neck portion forming an air-passage communicating at its upper end with said main draft-passage, a plurality of open-ended funnels arranged in the main draft - passage longitudinally thereof with the enlarged ends of the funnels adjacent to the inlet end of said passage, said funnels being disposed side by side and surrounded by

the main draft-passage, and an upwardly and inwardly inclined wall dividing the inlet end of the main draft-passage from the vertical air-passage, said wall embracing the lower portions of the funnels.

3. In an apparatus of the character described, the combination of a rotatable cowl provided with a main draft-passage extending entirely therethrough in a horizontal direction and a vertical downwardly - extending neck portion forming an air-passage communicating at its upper end with said main draft-passage, a funnel arranged in the main draft-passage longitudinally thereof with the enlarged end of the funnel adjacent to the inlet end of said passage, said funnel being surrounded by the main draft-passage, both said funnel and main draft-passage have unobstructed open ends, and an upwardly and inwardly inclined wall dividing the inlet end of the main draft-passage from the vertical air-passage, said wall embracing the lower portion of the funnel.

4. In an apparatus of the character described, the combination of a stationary air-shaft, a rotatable cowl therein, said cowl having a vertically-disposed neck registering with the upper end of the stationary air-shaft, and an antifriction-bearing for the cowl comprising a centrally-arranged base-plate in the neck portion thereof located somewhat above the lower end thereof, upwardly and inwardly inclined braces for said plate, a correspondingly-disposed bearing-plate also arranged within the neck of the cowl, similarly-arranged braces for said bearing-plate securing the same to the air-shaft, and balls between the base and bearing plates.

LOUIS M. WOOD

Witnesses:

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I. O. GRANT.