J. H. OTTEN.

VENTILATOR.

APPLICATION FILED APR. 17, 1911.

1,044,565.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

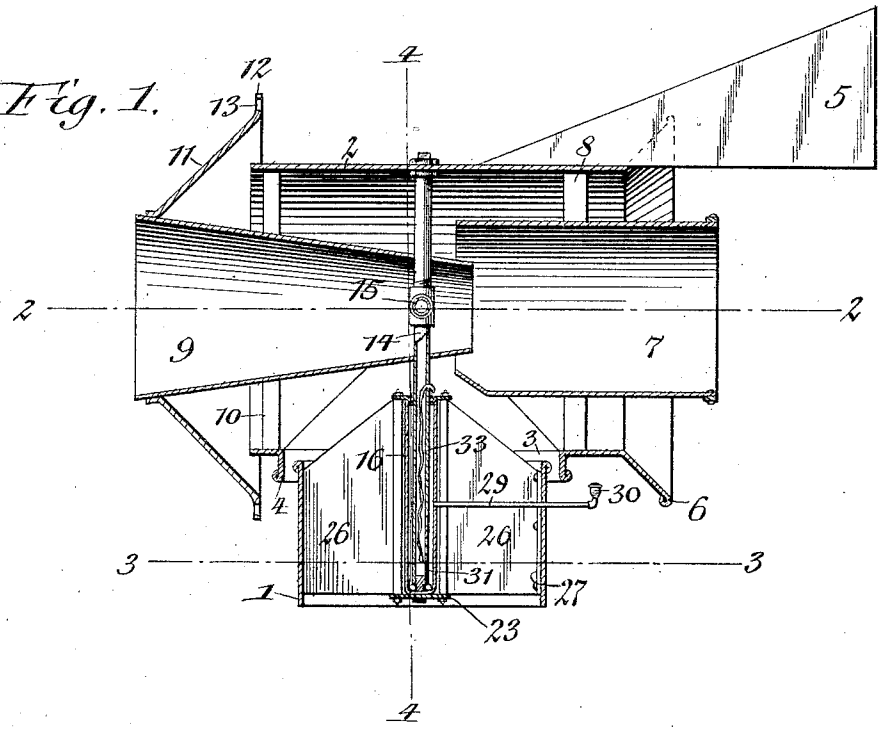
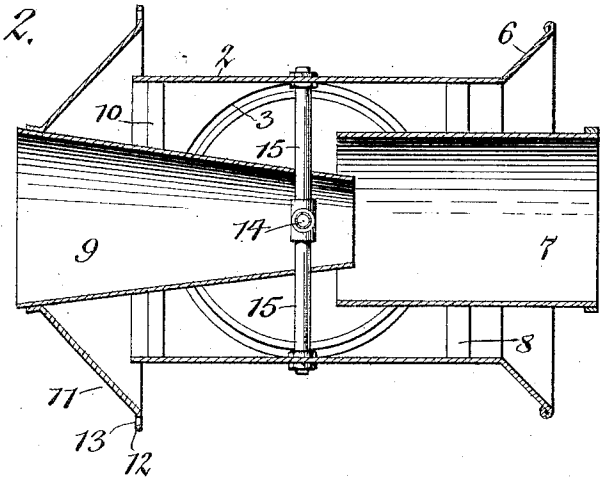


Fig. 2.



Witnesses:-
Alfred Bakenhagen.
Richard Sommer

Inventor
John H. Otten
by Geyer & Popp
Attorneys.

J. H. OTTEN.

VENTILATOR.

APPLICATION FILED APR. 17, 1911.

1,044,565.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 2.

Fig. 4.

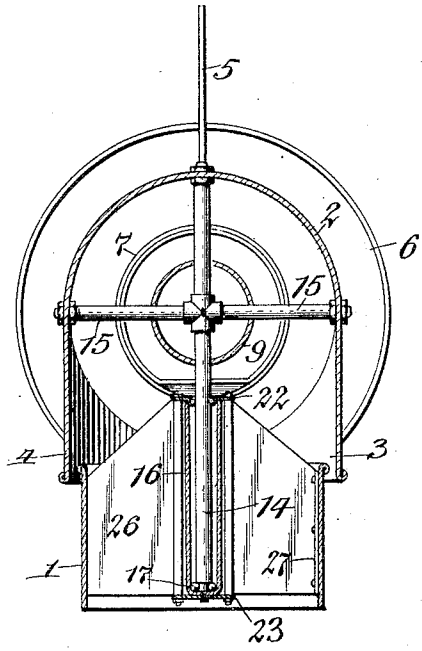


Fig. 6.

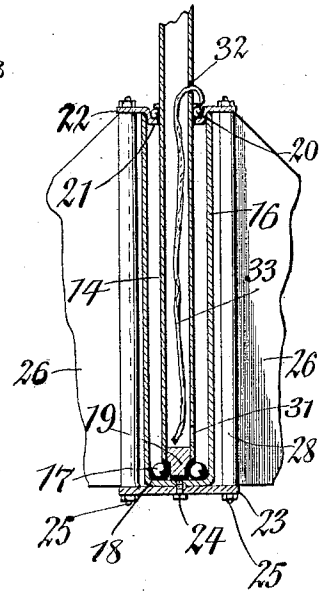


Fig. 3.

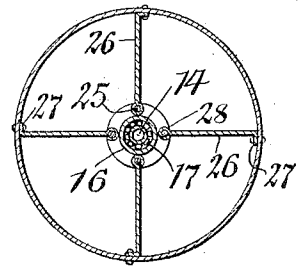
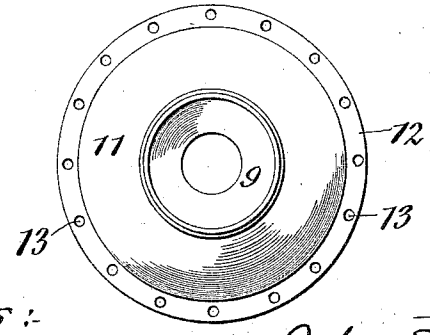


Fig. 5.



Witnesses:-
Alfred Bakenhagen.
Richard Sommer

Inventor
John H. Otten
by Geyer & Popp
Attorneys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN H. OTTEN, OF BUFFALO, NEW YORK.

VENTILATOR.

1,044,565. Specification of Letters Patent. Patented Nov. 19, 1912.

Application filed April 17, 1911. Serial No. 621,442.

To all whom it may concern:

Be it known that I, JOHN H. OTTEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Ventilators, of which the following is a specification.

This invention relates to ventilators or cowls which are more particularly designed for automatically ventilating the interior of a building or other space and which are provided with means whereby the ventilator is automatically shifted into a position in which the wind will operate upon the same for withdrawing the air from the building.

It is the object of this invention to provide a ventilator of this character in which a triple suction effect is produced through the main supply flue or conduit without any material increase in cost and without complicating the structure and to provide simple and efficient means for pivotally supporting the movable parts of the ventilator and to insure thorough lubrication of the same.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a vertical longitudinal section of a ventilator embodying my improvements. Figs. 2 and 3 are horizontal sections thereof in the correspondingly numbered lines in Fig. 1. Fig. 4 is a vertical transverse section in line 4—4 Fig. 1. Fig. 5 is a front view, on a reduced scale, of the wind condensing and wind spreading deflectors. Fig. 6 is a fragmentary vertical section, on an enlarged scale, of the pivotal support and lubricator for the movable parts of the ventilator.

Similar letters of reference indicate corresponding parts throughout the several views.

1 represents the upright tubular supply flue or head of the ventilator which is adapted to be mounted on the upper end of a pipe or conduit connecting with the space to be ventilated. Above this head is arranged a horizontal tubular hood 2 preferably of cylindrical form which is opened at its front and rear ends and provided on its under side intermediate of its ends with an inlet opening or passage 3 which communicates with the upper end of the head 1. Around this inlet opening the head is provided with a depending flange or neck 4 of tubular form which extends downwardly on the outer side of the head below the upper end of the latter so as to guard against the wind blowing downwardly into the head at this joint and still permit the hood to rotate horizontally about a vertical axis arranged in line with the axis of the head. The hood is always maintained substantially in parallelism with the direction of the wind and with its front end foremost or facing the wind by means of a vane or tail 5 secured in an upright position on the upper rear part of the hood, as shown in Figs. 1 and 4. At its rear end the tubular hood is provided with an annular rearwardly flaring spreading flange or deflector 6 which may be formed either integrally with the hood or made separate therefrom and secured thereto by any suitable means.

Concentrically within the rear part of the hood is arranged a cylindrical ejecting tube 7 which is separated from the bore of the hood by means of an annular passage and has its front and rear ends open. The front end of this ejecting tube is arranged slightly in rear of the axis about which the hood rotates and the rear end of this tube is arranged in rear of the rear edge of the rear spreading deflector. This ejecting tube may be supported in any suitable manner so as to turn with the hood, the means for this purpose which are shown in the drawings consisting of arms or brackets 8 connecting the ejecting tube with the hood, as shown in Figs. 2 and 4.

9 represents a rearwardly tapering conical wind condensing deflector which is arranged concentrically relatively to the hood and ejecting tube and so that its central part is within the front part of the hood while its rear end projects into the front end of the ejecting tube and its front end projects forwardly beyond the front ends of the hood. This wind condensing deflector is preferably supported upon the hood by means of radial arms 10 connecting these

parts although other means may be provided for this purpose. This arrangement of the wind condensing deflector relatively to the hood and ejecting tube forms an annular air passage between the periphery of this deflector and the bore of the hood and a similar passage between the rear end of the deflector and the bore of the ejecting tube.

11 represents an annular rearwardly flaring wind spreading deflector which is secured at its small front end to the front end of the wind condensing deflector and projects with its large rear end rearwardly beyond the front end of the hood and is separated therefrom by an annular air passage. At its rear edge the wind spreading deflector is provided with an outwardly projecting annular flange 12 having an annular row of perforations 13.

As the wind moves lengthwise of the ventilator from the front to the rear end thereof a part of this wind enters the condensing deflector and passes lengthwise through the same and the ejecting tube, whereby air is drawn from the central part of the space within the hood and flue head connecting therewith through the annular space between the condensing deflector and ejecting tube and delivered from the rear end of the latter. Another part of the wind which strikes the front side of the front spreading deflector and passes the rear edge thereof produces a suction upon the air within the front part of the hood and the tubular head connecting therewith and causes this air to be drawn outwardly through the annular space between the front end of the hood and the front spreading deflector. The suction effect of the front spreading deflector is increased by the action of the plurality of perforations in the annular flange thereof inasmuch as each of these openings permits the rearward passage of a jet current of air through the same and produces a vacuum in rear of this flange which assists in withdrawing the air within the hood outwardly through the annular space between the hood and the front spreading deflector. As the wind sweeps rearwardly along the outer side of the hood it is again spread by the rear spreading deflector thereof, whereby a vacuum is produced in rear of the hood which operates to draw the air from the flue head into the hood and rearwardly out through the annular space between the ejecting tube and the hood. It will thus be observed that this ventilator produces a triple suction effect upon the interior of the head and the flue connected therewith viz: through the annular space between the condensing deflector and the ejecting tube, the annular space between the hood and the front spreading deflector, and the annular space between the rear spreading deflector at the rear end of the hood and the rear end of the ejecting tube. A strong and powerful suction effect is thus produced upon the flue or ventilating passage connected with the building which operates to thoroughly and rapidly remove the air from the space to be ventilated and enables the latter to be maintained pure and fresh by ordinary wind pressure.

Various means may be provided for pivotally mounting the above mentioned air guiding devices on the head of the ventilating flue so as to permit the same to turn horizontally and adapt themselves to the direction of the wind. The means shown in the drawings are suitable for the purpose and are constructed as follows: 14 represents an upright spindle preferably of tubular form which is arranged within the central part of the hood and the rear end of the condensing deflector and secured at its upper end to the top of the hood. On opposite sides of the upper part of the spindle the same is provided with horizontal arms 15 which extend through the rear part of the condensing deflector and are secured at their outer ends to the adjacent part of the hood. The lower part of the spindle is arranged within an upright tubular column 16 and is journaled therein for horizontal rotation by means of upper and lower bearings which are preferably of the ball type. The lower bearing preferably consists of an annular row of balls 17 arranged between an outer ball race 18 formed by the cup-shaped lower end of the tubular column and an inner ball race 19 formed by a cowl secured in the lower end of the spindle. The upper bearing preferably comprises an annular row of balls 20 interposed between the central part of the spindle and an outer ball race 21 formed on a downwardly dished central part of a supporting plate 22, this dished central part of this supporting plate fitting into the upper end of the tubular column while that part of this supporting plate immediately adjacent to the dished central part thereof rests upon the upper edge of the tubular column, thereby centering this upper ball bearing within the column and retaining these parts in their proper position relatively to each other. The lower end of the column rests upon a lower supporting plate 23 and is secured thereto by a screw 24 or other means connecting the lower end of the column with the central part of the lower supporting plate. The upper supporting plate and the lower supporting plate are connected by a plurality of upright tie rods 25 arranged equidistant around the outer side of the column and each connected at its upper and lower ends with the outer edges or marginal parts of the supporting plates. By this means these plates are drawn firmly against opposite ends of the column and these parts are reliably connect-

ed so as to form a substantial support for the bearings of the ventilator spindle. The spindle bearings and associated parts are supported within the head of the ventilator by means of a plurality of upright radial webs 26 arranged between the bore of the head and the periphery of the bearing column, each of these webs being provided at its outer edge with a flange 27 which is riveted to the inner side of the flue head while its inner vertical edge is connected with one of the tie rods preferably by curling or bending this edge of the web around the respective tie rod, as shown at 28. The upper bearing of the ventilator spindle is arranged some distance above the lower side of the hood and in order to permit of reliably supporting this bearing and still avoid undue obstruction to the passage of the air through the hood the upper edge of each web is beveled from its upper inner corner adjacent to the upper bearing downwardly to the upper edge of the flue head, as shown in Figs. 1 and 4. By this means a reliable pivotal support is provided for the movable parts of the ventilator which enable the same to offer the maximum resistance to the pressure of the wind and the greatest freedom to the flow of the air through the ventilator. Lubrication of the bearings is effected from the exterior of the ventilator by means which comprise an oil duct 29 leading horizontally through the flue head and the supporting column and provided outside of the flue head with an oil cup or filler 30 so that upon introducing oil into the cup the same will be delivered into the column and be conducted by the latter to the lower ball bearing. At the lower end of the hollow pivot spindle the same is provided with a laterally extending opening 31 and above the upper ball bearing the same is provided with a similar opening 32. Within the hollow spindle is arranged a wick 33 which is arranged with its lower end in the lower part of the spindle adjacent to the opening 31 while its upper end projects outwardly through the upper opening 32 thereof and into engagement with the upper balls. Sufficient oil is supplied to the column that the level of the same rises therein above the level of the opening 31 and the lower end of the wick. This permits a part of the oil to be lifted by the wick and discharged by the upper end thereof to the balls and the raceway of the upper bearing, thereby lubricating both the upper and lower bearings and preventing the same from wearing unduly.

I claim as my invention:

1. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet, a wind condensing deflector projecting into the front end of said hood, and a wind spreading deflector projecting from the front end of said condensing deflector laterally beyond the outer side of the adjacent front end of the hood.

2. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet, a wind condensing deflector projecting into the front end of said hood, and a wind spreading deflector projecting from the front end of said condensing deflector laterally beyond the outer side of the adjacent front end of the hood and provided at its margin with an annular row of perforations.

3. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet, a rearwardly tapering tubular wind condensing deflector arranged within the front part of the hood, and a rearwardly flaring annular wind spreading deflector projecting laterally from the front end of the wind condensing deflector beyond the outer side of the adjacent front end of said hood.

4. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet, an ejecting tube arranged lengthwise within the rear part of the hood, a tubular wind condensing deflector arranged within the front parts of the ejecting tube and hood, and a wind spreading deflector projecting laterally from the front end of the wind condensing tube laterally beyond the front end of the hood.

5. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet and at its rear end with a rearwardly flaring annular flange, a wind condensing deflector projecting into the front end of said hood, and a wind spreading deflector projecting from the front end of said condensing deflector laterally beyond the outer side of the adjacent front end of the hood.

6. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet and at its rear end with a rearwardly flaring annular flange, a rearwardly tapering tubular wind condensing deflector arranged within the front part of the hood, and a rearwardly flaring annular wind spreading deflector projecting laterally from the front end of the wind condensing deflector beyond the outer side of the adjacent front end of said hood.

7. A ventilator comprising a tubular hood which is open at its front and rear ends and provided intermediate of its ends with an air inlet and at its rear end with a rearwardly flaring annular flange, an ejecting

tube arranged lengthwise within the rear part of the hood, a tubular wind condensing deflector arranged within the front parts of the ejecting tube and hood, and a wind spreading deflector projecting laterally from the front end of the wind condensing tube laterally beyond the front end of the hood.

Witness my hand this 15th day of April, 1911.

JOHN H. OTTEN.

Witnesses:
THEO. L. POPP,
E. M. GRAHAM.