Nov. 27, 1923. 1,475,317

J. K. ROBINSON

VENTILATOR

Filed Aug. 23, 1922

Fig. 1.

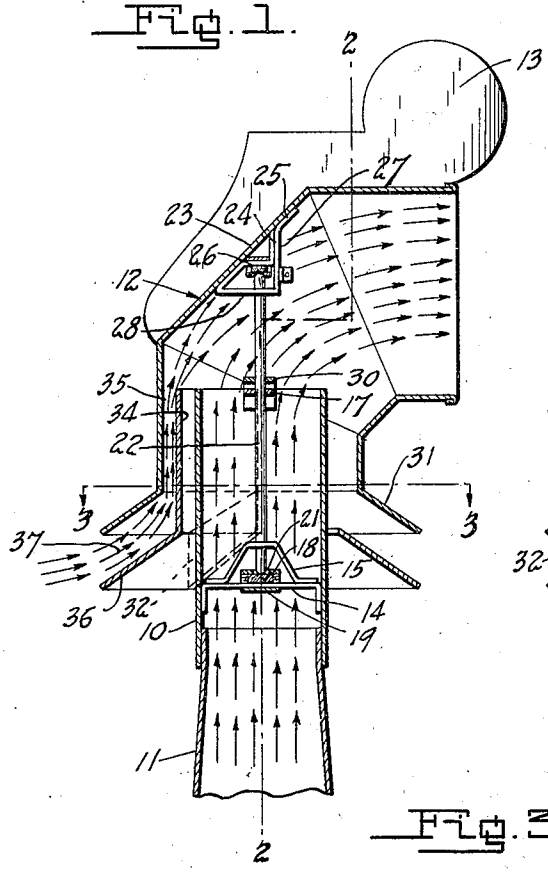


Fig. 2.

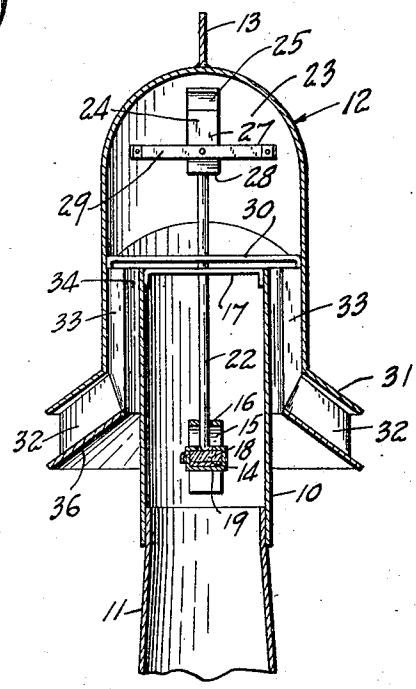


Fig. 3.

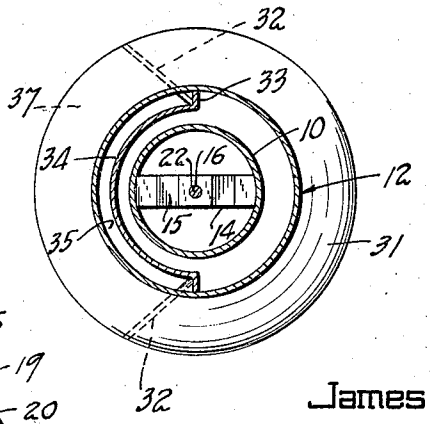
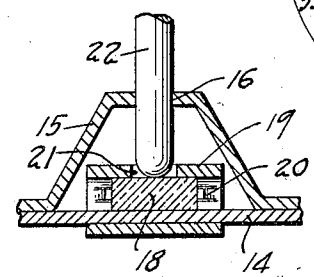


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES K. ROBINSON, OF LITTLE ROCK, ARKANSAS.

VENTILATOR.

Application filed August 23, 1922. Serial No. 583,827.

To all whom it may concern:

Be it known that I, JAMES K. ROBINSON, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Ventilators, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in ventilators, and more particularly to that type of ventilator employed for removing from the rooms and hallways of buildings foul and heated air.

An important object of the invention is to provide an improved construction of that type of ventilator illustrated in my Patent No. 1,076,451, granted under date of October 21, 1913, for improvements in ventilators. In the said patent I have illustrated a ventilator embodying a cowl rotatably mounted upon a draft member, and means coacting with the draft member and carried by the cowl for directing and deflecting wind so that a partial vacuum is formed in the draft member to cause eduction of air in the building to which the ventilator is applied. While the construction illustrated in this patent has been found in practice to be practical and operative, it has been found that the same does not operate with the desired efficiency under light winds, and an important object of this invention accordingly becomes the construction of a ventilator which, when operating under light winds, will cause a partial evacuation of the draft member to draw the foul and heated air from the building to which the ventilator is applied.

A further object of the invention is to provide a device of this character which is simple in its construction and operation, very durable in service, and which will not rattle and cause unpleasant noises when in use.

These and other objects of the invention will become apparent throughout the course of the following description.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein like reference characters designate like parts throughout:—

Figure 1 is a vertical sectional view taken through a ventilator constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1; and

Figure 4 is a detail view showing the manner of mounting the bearings for the pivot rod.

Referring now more particularly to the drawings, the numeral 10 indicates a draft member, adapted at its lower end for engagement with a pipe 11 leading from the space to be ventilated, and the numeral 12 a cowl having the usual fin 13 for directing the eduction mouth of the cowl to leeward. Mounted within the draft member 10 adjacent the lower end thereof is a cross bar 14 having its ends bent at right angles and secured to the wall of the draft member. Upon the upper surface of this cross bar adjacent the ends thereof are mounted the ends of a yoke 15, the central portion of which is vertically spaced from the cross bar 14 and provided with an opening 16 axially aligned with the draft member 10. At its upper end the draft member 10 is provided with a second cross bar 17 having an opening therein aligned with the opening 16 of the yoke 15. This cross bar is preferably arranged at right angles to the cross bar 14 for a purpose presently to appear.

Mounted upon the cross bar 14 in alignment with the yoke opening 16 is a bearing plate 18 preferably formed of glass and held in position upon the cross bar by means of a binding strap 19 surrounding the bearing and the cross bar 14. This binding strap is preferably of greater width than the bearing plate 18 and has struck in portions 20 maintaining the bearing plate 18 in position. The strap in alignment with the opening of the cross bar 17 and the opening 16 of the yoke is provided with an opening 21 exposing the bearing plate, and a pivot rod 22 having its lower end ground in the form of a hemisphere extends through the openings of the cross bar and yoke and abuts against the upper surface of the bearing plate.

Secured to the inner surface of the cowl at that portion thereof forming the angle of the cowl and hereinafter referred to as the angular section 23 of the cowl is a member 24 formed from a single sheet of strap iron bent at one end to form spaced attaching portions 25 connected by a horizontal portion 26 and a vertically extending portion

27 extending upwardly from the end of the horizontal portion. The opposite end of the member 24 is bent out to form a horizontal section 28 in spaced relation to the horizontal section 26, and the extremity bent upwardly and engaged with the under surface of the uppermost attaching portion 25 and being connected thereto. The horizontal portion 28 forms a guide and has an opening therein axial to the vertical portion of the cowl, and the horizontal portion 26 forms a bearing rest and has a bearing similar to the bearing carried by the cross bar 14. Secured to the member 24 is a transversely extending bracing bar 29 of any suitable construction, the ends of which are extended to the sides of the cowl and secured thereto. The upper end of the pivot rod 22 is provided with a hemispherical head, such as previously described, which extends through the opening of the horizontal portion or guide 28 and engages against the bearing carried by the guide rest 26. A cross bar 30 has its ends secured to the cowl and extends above the upper end of the draft member 10, this cross bar having an opening formed therein through which the pivot rod 22 is directed.

The lower end of the cowl 12 is provided with a frustro-conical flange 31. Secured to and extending downwardly from the lower face of the frustro-conical flange at the sides of the windward portion thereof are vanes 32, the inner ends of which extend inwardly beyond the central opening of the flange and are secured to the side flanges 33 of an arcuate plate 34. The lower edge of this arcuate plate is secured to the inner edge opening of a second frustro-conical flange 36 disposed below and in spaced relation to the frustro-conical flange 31 but concentric therewith, and the plate extends upwardly from the flange 36 in spaced relation to the wall of the cowl 12 and has its flanges 33 secured to the lower frustro-conical flange 36, and the vanes, plate, cowl and flanges co-act to form a fresh air duct 35 directed upwardly and terminating approximately level with the upper end of the draft member 10 and having an intake duct 37 which is directed to windward by the normal action of the cowl 12 under the influence of the wind.

In the operation of my device, the wind having directed the eduction mouth of the cowl to leeward and the induction conduit 37 to the windward, a portion of the wind entering in the induction mouth 37 and passing upwardly through the fresh air duct 35 sweeps upwardly through the cowl, causing a suction at the upper end of the draft member 10 and partially evacuating the same, thereby speeding up the movement of the foul air passing from the room or building through the draft member 10. While the construction illustrated is very similar to that shown in my prior patent, it will be noted that the construction of the fresh air duct and the inlet therefor is such that no air losses are encountered after the fresh air has entered in the mouth of the port 37, the vanes, flanges and plate coacting to form a closed mouth through which this air must pass, whereas in the construction of the patent, during light winds air losses are encountered due to the passage of the incoming air about the edges of the plates corresponding to the flanges 33 and between the vanes corresponding to the vanes 32 and the lower frustro-conical flange. Attention is directed to the fact that the arrangement of the braces or cross bars by means of which the pivot rod maintains the cowl and draft member in the proper spaced relation and supports the cowl for pivotal movement is such that transverse movement or wobbling of the cowl is effectually prevented, thereby preventing in a large measure the unpleasant noises accompanying the operation of these ventilators.

It will be noted from an inspection of the drawings that that portion of the frustro-conical flanges 31 and 36 lying to the leeward of the vanes 32 perform no function. This portion of the flanges may accordingly be omitted if desired, being only retained for the purpose of giving the ventilator a balanced appearance in its construction.

From the foregoing it is believed to be obvious that a ventilator constructed in accordance with my invention will be efficient in that the arrangement is such that eduction losses during light winds is avoided and for the further reason that the construction of the same is such that the device will be very durable in service. It will furthermore be obvious that the construction as hereinbefore set forth is capable of some change and modification without materially departing from the spirit of my invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. A ventilator comprising a draft member, a cowl revolubly mounted upon and surrounding the upper end of said draft member and provided at its lower end with spaced frustro-conical flanges, a fresh air duct carried by the cowl upon the interior thereof and terminating in approximate alignment with the upper end of the draft member, and vanes connecting said frustro-conical flanges and forming an induction port communicating with said fresh air duct, said induction port being directed to windward by the normal operation of said cowl, the inner wall of said fresh air duct paralleling the wall of said draft member in spaced relation thereto.

2. In a ventilator, a draft member, a cowl revolubly mounted upon and surrounding the upper end of said draft member, an arcuate plate disposed interiorly of the cowl member and provided at its side edges with flanges extending toward and secured to the wall of the cowl, the lower end of said plate extending beneath the lower end of the cowl and having secured thereto a downwardly and outwardly extending flange, a downwardly and outwardly extending flange secured to the lower end of the cowl, and vanes connecting said flange members and combining therewith to form an induction port, said plate combining with said cowl to form interiorly of the cowl an upwardly extending fresh air conduit, said cowl having the outlet thereof arranged in a plane above the upper end of the draft member and at the opposite side thereof from said fresh air duct from said arcuate plate.

In testimony whereof I hereunto affix my signature.

JAMES K. ROBINSON.