H. F. MARANVILLE.

VENTILATOR.

APPLICATION FILED AUG. 3, 1907.

938,067. **Patented Oct. 26, 1909.**

2 SHEETS—SHEET 1.

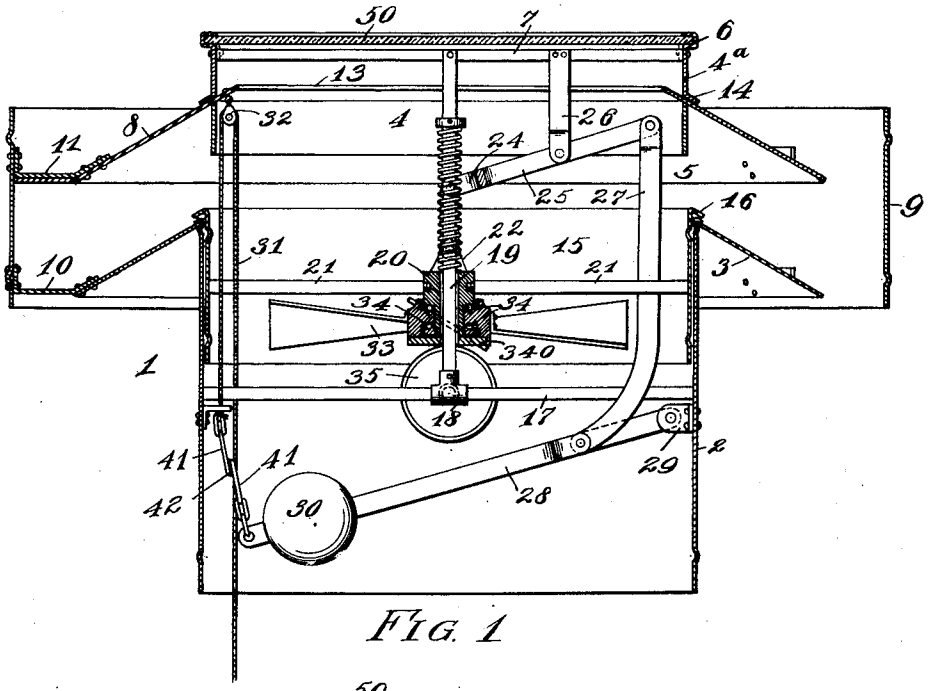


FIG. 1

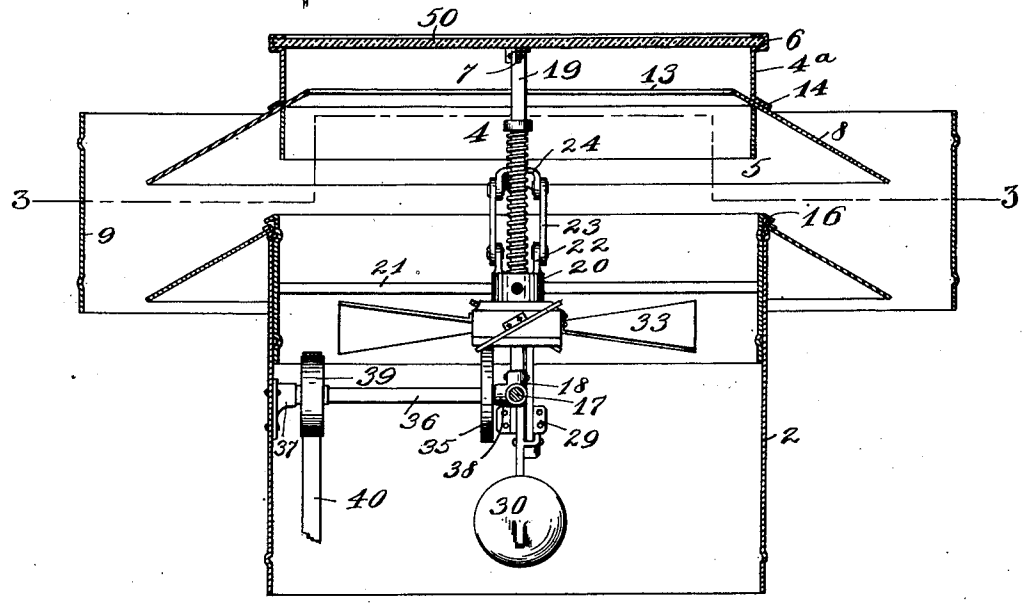


FIG. 2

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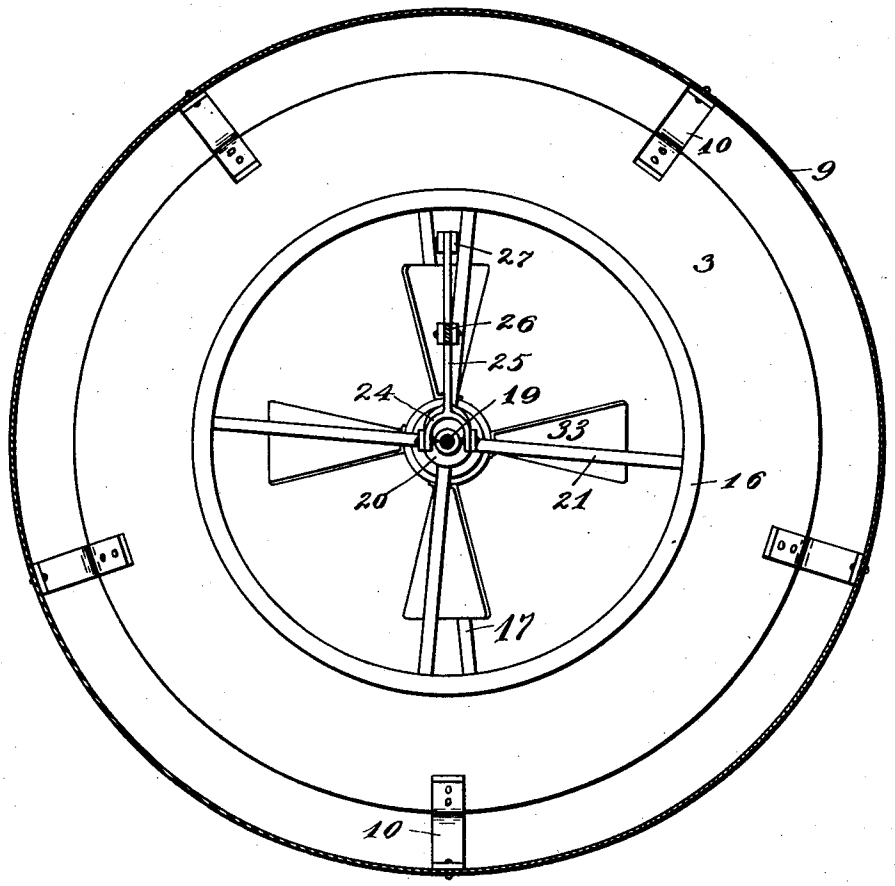


FIG. 3

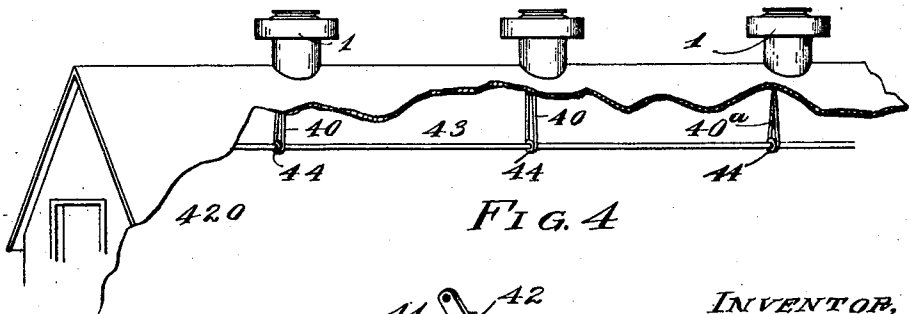


FIG. 4



FIG. 5

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UNITED STATES PATENT OFFICE.

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VENTILATOR.

938,067. Specification of Letters Patent. Patented Oct. 26, 1909.

Application filed August 3, 1907. Serial No. 386,878.

To all whom it may concern:

Be it known that I, HARVEY F. MARANVILLE, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Ventilators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to ventilators and ventilating systems.

In the use of ventilators, it frequently happens that, owing to the location of the building or factory wherein the ventilators are employed, it is impossible to obtain sufficient draft to change the air with such frequency as to relieve the occupants from excessive heat and from inhaling injurious gases and vapors. It has been suggested, to cure this defect in the operation of ventilators, that fans or other positive draft-creating mechanism be combined therewith, but the constructions heretofore suggested have been liable to such objections as to prevent them from coming into general use.

The objects of my invention are to provide for ventilators and ventilating apparatus draft-creating mechanism which can be automatically placed into and out of operation as occasion may require; to combine such mechanism with the dampers of ventilators in such manner that, when it is desirable to close the damper partly or wholly, the closing movement of the damper will automatically place the draft-creating mechanism out of operation, while the opening of the damper will automatically place said mechanism into operation; to provide means whereby ventilator dampers may be automatically closed in case of fire; also to provide efficient means for operating from a common source of power the fans or draft-creating mechanisms of a system of ventilators.

More limitedly, my invention contemplates combining the draft-creating mechanism with dampers in such manner that, in case of fire, the dampers will be automatically closed and the draft-creating mechanism placed out of operation.

Generally speaking, the invention may be defined as consisting of the combinations of elements, for the purposes set forth, embodied in the drawings forming part hereof and included in the claims hereto annexed.

In the drawings, wherein one embodiment of my invention is illustrated, Figure 1 represents a vertical sectional view through a ventilator having my invention applied thereto; Fig. 2 represents a corresponding sectional view, taken at right angles to Fig. 1, the fan, the driving mechanism therefor and the weighted lever which automatically close the damper being shown in elevation; Fig. 3 represents a sectional view on the correspondingly numbered line of Fig. 2; Fig. 4 represents a portion of a building having applied thereto a ventilator equipped with my invention and showing means whereby the draft-creating mechanisms may be operated by a common shaft, and Fig. 5 represents a perspective view of the fusible link through which the weighted damper is supported.

Describing the parts by reference numerals, 1 represents a ventilator of approved construction, the same comprising a vertical air shaft 2, carrying at the upper end thereof a downwardly inclined deflecter 3. The top of the air shaft is covered by means of a hood 4 comprising a skirt 4^a which is spaced from the upper end of the air shaft to provide a free annular space or port 5 for the escape or admission of air. The upper end of 4^a is closed by means of a top 50, which is preferably of glass, the glass being retained in place by means of a flange 6 and being supported by one or more angle bars 7 extending beneath the same and secured to the casing 4. A deflector 8 is carried by section 4 and projects downwardly parallel with deflector 3, providing therebetween a space for the air which flows to or escapes from the port 5. A sleeve 9 surrounds the outer ends of deflectors 3 and 8 and is spaced therefrom to shield the ventilator from violent drafts or air currents. The shield 9 may be supported from the body of the ventilator in any approved manner, as by straps 10 and 11 which connect the lower ends of the deflectors 3 and 8 respectively with said shield, the shield thus forming a means for supporting the hood from the air shaft. The upper end of deflector 8 may project into the interior of the skirt 4^a, providing therein an upwardly projecting ring or flange 13 to which the adjacent portion of 4^a may be secured. This securing means is shown as a flange 14 formed on the portion of skirt 4^a which is immediately above the deflector 8 and secured to said deflector by soldering. The lower portion of skirt 4^a may be a cyl-

indrical section of the same diameter as the upper portion and having its upper end secured to deflector 8, the upper and lower sections of the skirt constituting in effect a continuous skirt.

Within the upper portion of air shaft 2, there is slidably fitted the damper 15. This damper comprises a cylindrical casing of sufficient length to close the port 5 and at the same time retain a guiding connection with the air shaft 2. At its upper end, damper 15 is provided with a downwardly extending flange 16, which is adapted to engage the upper end of the air shaft and thereby support the damper in its open position. As a convenient means for operating the damper, I have provided the following construction: 17 denotes a cross bar extending across the air shaft 2 and connected at its opposite ends with said shaft. At the central portion of said bar there is provided a support 18, shown as a tee, to the upwardly extending branch of which there is fitted a guide rod 19, the upper end of said rod being secured to the angle bar 7, at the central portion thereof. On this guide rod there is slidably fitted a hub 20 which supports the inner ends of rods 21, said rods being connected at their outer ends with damper 15 and forming with said hub a spider. The inner ends of the rods may be threaded or otherwise suitably secured to the hub. The hub is shown as provided with a pair of upwardly extending lugs 22 to which are connected links 23, the upper ends of said links being connected to a yoke 24 carried by the inner end of a lever 25. This lever is supported, intermediate of its ends, by a strap 26, the upper end of which may be carried by angle bar 7. To the outer end of lever 25, which is adjacent to the inner surface of the skirt 4^a, there is connected a downwardly extending link 27, the lower end whereof is curved inwardly and is pivotally connected to the weighted lever 28, intermediate of the ends thereof. The outer end of said lever is pivotally supported from the air shaft, as by means of lugs 29 secured to said shaft. The lever extends across the air shaft and is provided, near its free end, with a weight 30. To the free end of said lever there is connected a small rope 31 passing through a block or pulley 32 which may be suspended from the flange 13, or any other convenient portion of the hood. The lower end of rope 31 may be secured to any fixed object. It will be apparent that, by merely slacking off on rope 31, the weight 30 will automatically lift the damper 15, through the interposed connections. Owing to the fact that the link 27 is connected to the lever 28 intermediate of the weight 30 and the pivot 29, it will be evident that a comparatively small weight may be applied to lever 28 and that it will be effective in operating the damper. When it is desired to open the damper, it is only necessary to hoist the free end of lever 28 and the weight thereon, whereupon the damper will automatically open by its own gravity.

I have provided the damper with draft-creating mechanism, in the shape of a fan 33, which may be carried by the hub 20, roller bearings 34 being provided between a spindle on hub 20 and the interior of the fan hub. The fan hub is provided on its lower surface with a suitable driven device, as a disk 340, which is engaged by and adapted to be driven by a suitable driving device, as a friction disk 35. This disk is supported by a shaft 36, which is preferably mounted within the air shaft, the outer end of the shaft being supported by a bearing 37 carried by the air shaft and the inner end being supported in a bearing 38 which may be conveniently carried by the tee 18. Shaft 36 may be driven from any suitable source of power, as by a pulley 39 driven by belt 40.

It will be apparent that, when the damper 15 is moved in a closing direction, it will carry with it the fan 33 and will automatically break the driving connection between said fan and shaft 36. When the damper is lowered to its full open position, disk 340 will be engaged by disk 35 and the fan will be rotated. This capability of operation is of great importance in the ventilator art. When it is desirable or necessary to close the damper even partially, it will be evident that there will be no occasion for the fan to operate; in fact, under such conditions, it would be highly undesirable to have the fan operate. On the other hand, when maximum draft is desired, the damper will be opened to its full extent, at which time the fan will be automatically placed in operation.

My invention contemplates also the automatic closing of the damper and the suspension of operation of the fan in case of fires. It will be readily appreciated that in such event, the draft through the ventilators should be cut off in order to limit the spread of the flames as much as possible. To accomplish this result, I employ a fusible connection between the free end of lever 28 and the rope 31. This connection is shown clearly in Figs. 1 and 5 and comprises a pair of metallic members or straps 41 connected together by fusible metal 42, which will melt at a temperature of about 165 degrees F. In the event of fire, the metal 42 fuses and the weight 30 drops, simultaneously closing the damper and breaking the connection between the fan 33 and its drive shaft.

I have shown in Fig. 4, somewhat diagrammatically, means by which the fans in a system of ventilators may be operated. In

this view, 420 denotes a building provided with a number of my ventilators. Extending beneath said ventilators there is a shaft 43 which may be driven continuously from any source of power. This shaft is provided, beneath each ventilator, with a drive pulley 44 to which is applied the belt 40 by means of which pulley 39 and shaft 36 are rotated. As will appear from this figure, one of these belts, 40^a, may be crossed, to cause the fan within the ventilator thereabove to operate in the reverse direction from the fan in one or more of the other ventilators. In this manner, air may be positively drawn into one ventilator while being forced out of the other, thereby insuring an effective ventilation of the building. The location of the shaft 36 entirely within the air shaft enables my ventilator to be applied to existing types of buildings without any alteration thereof for the purpose of accommodating this shaft.

Having described my invention, I claim:

1. In a ventilator, the combination of a damper, and draft-creating mechanism carried by said damper, substantially as specified.

2. In a ventilator, the combination of an air shaft, a damper therein, and a fan movable with said damper, substantially as specified.

3. In a ventilator, the combination of an air shaft, a hood spaced from said air shaft to provide an air port, a sleeve-damper combined with said air shaft and adapted to close said port, and draft-creating mechanism movable therewith.

4. In a ventilator, the combination of an air shaft, a hood therefor, a port being provided between said hood and said air shaft, a ring damper combined with said air shaft, means for moving said damper to close said port more or less, a fan carried by said damper and having a driven member, and a driving member for said driven member supported within said air shaft, substantially as specified.

5. In a ventilator, the combination of an air shaft, a damper movable longitudinally with respect thereto, a fan movable with said damper and having a driven member, and a driving member for said driven member, substantially as specified.

6. In a ventilator, the combination of an air shaft, a hood forming with said shaft an air port, a guide rod extending longitudinally of said ventilator, a fan rotatably mounted on said guide rod, a driven member for said fan, a damper movable longitudinally of said ventilator, means for supporting said fan whereby it may move with said damper, a driving member adapted to engage said driven member, and a spring on said rod tending to force said members into engagement.

7. In a ventilator, the combination of an air shaft, a fan rotatably mounted in said air shaft, a driven member for said fan, a damper movable longitudinally of said ventilator, means connecting said fan with said damper, a driving member adapted to engage said driven member, and a spring tending to force said members into engagement, substantially as specified.

8. In a ventilator, the combination of an air shaft, a hood forming therewith an air port, a damper movable longitudinally of said ventilator to close the air port more or less, a spider connected with said damper, one or more links connected to said spider, a lever pivoted intermediate of its ends and having one end connected to said link or links, a link connected to the opposite end of said lever, and a weighted lever connected intermediate of its ends to the last mentioned link, substantially as specified.

9. In a ventilator, the combination of an air shaft, a damper movable longitudinally of said ventilator, a lever pivoted intermediate of its ends and having one end connected to said damper, a link connected to the opposite end of said lever, and a weighted lever connected intermediate of its ends to said link, substantially as specified.

10. In a ventilator, the combination of an air shaft, a damper movable therein, a lever pivoted intermediate of its ends and having one end connected to said damper, a link connected to the opposite end of said lever, and a weighted lever pivoted at one end to the air shaft and connected intermediate of its ends to said link, substantially as specified.

11. In a ventilator, the combination of a hollow ventilator body having an air port, a sliding damper adapted to control said port, and means for operating said damper, said means comprising a centrally located member connected with said damper, a lever pivoted intermediate of its ends and having one end connected with said member, a link connected with the opposite end of said lever, a weighted lever pivoted at one end to the ventilator body and having a connection intermediate of its ends to the first mentioned lever, substantially as specified.

12. In a ventilator, the combination of a hollow ventilator body having an air port, a sliding damper adapted to control said port, and means for operating said damper, said means comprising a centrally located member connected with said damper, a lever pivoted intermediate of its ends and having one end connected with said member, a link connected with the opposite end of said lever, a weighted lever pivoted at one end within the ventilator body and having a connection with the first mentioned lever, substantially as specified.

13. In a ventilator, the combination of a

ventilator body having an air port, a damper adapted to control said port, a weighted lever, connections between said lever and said damper for automatically closing the latter, and means, including a fusible connection, for supporting said lever, substantially as specified.

14. In a ventilator, the combination of a ventilator body having an air port, a slidable damper adapted to control said port, a weighted lever, connections between said lever and said damper for automatically closing the same, and means, including a fusible connection, for supporting the weighted end of said lever, substantially as specified.

15. In a ventilator, the combination of an air shaft, a fan associated therewith, means for rotating said fan, a weighted lever, and a connection between said fan and said lever adapted to automatically break the connection between the fan and its rotating means, substantially as specified.

16. In a ventilator, the combination of an air shaft, a fan associated therewith, means for rotating said fan, a weight connected with said fan and adapted to break the connection between the same and its rotating means, and a fusible connection adapted to maintain said weight in inoperative relation to said fan, substantially as specified.

17. In a ventilator, the combination of an air shaft, draft-creating mechanism associated therewith, means for operating said mechanism, means for automatically breaking the connection between the draft-creating mechanism and its operating means, and a fusible connection adapted to maintain the last-mentioned means out of operation, substantially as specified.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HARVEY F. MARANVILLE.

Witnesses:
M. E. METZGER,
C. E. KILLINGER.