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VENTILATORS

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2 Sheets-Sheet 1

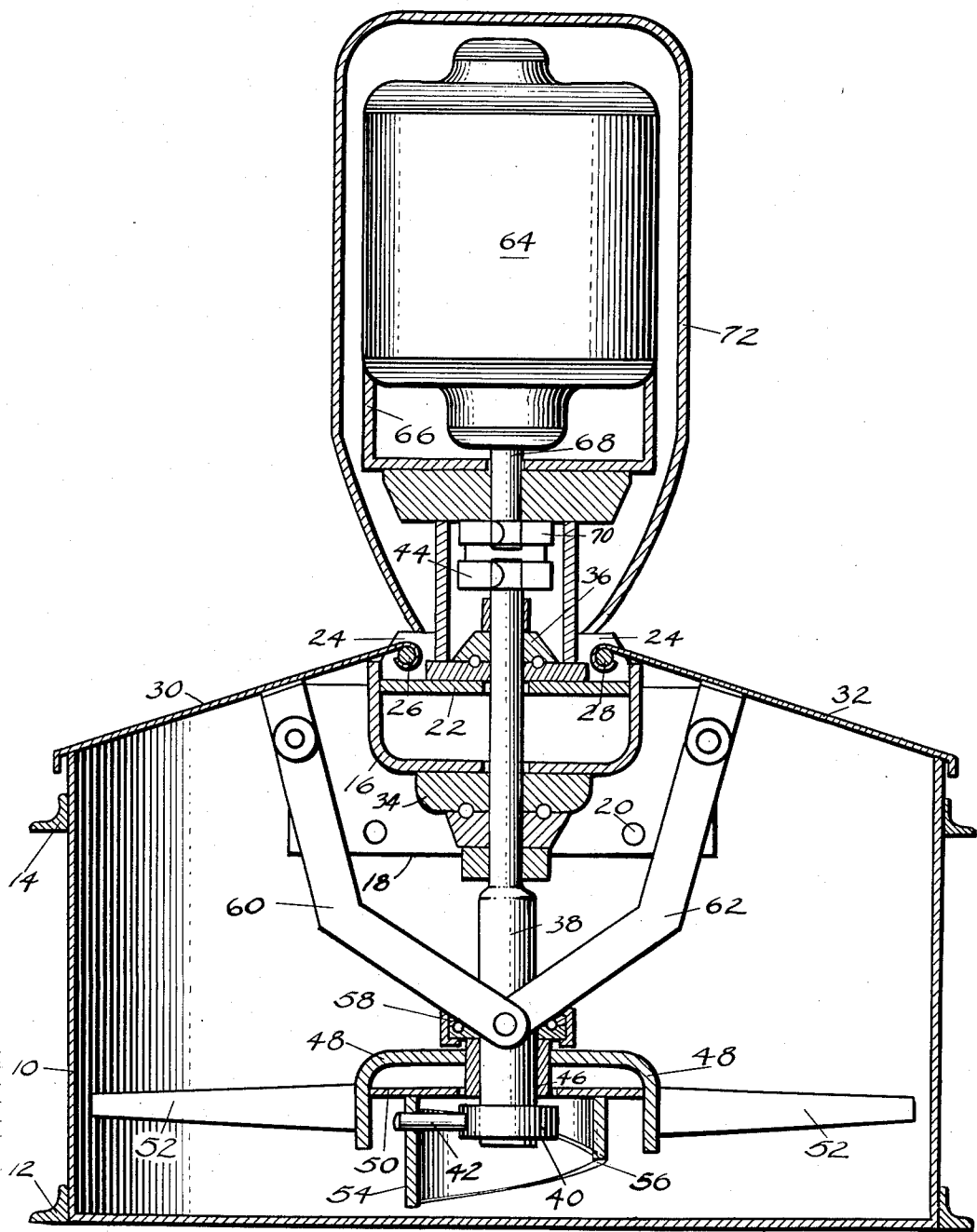


Fig. 1

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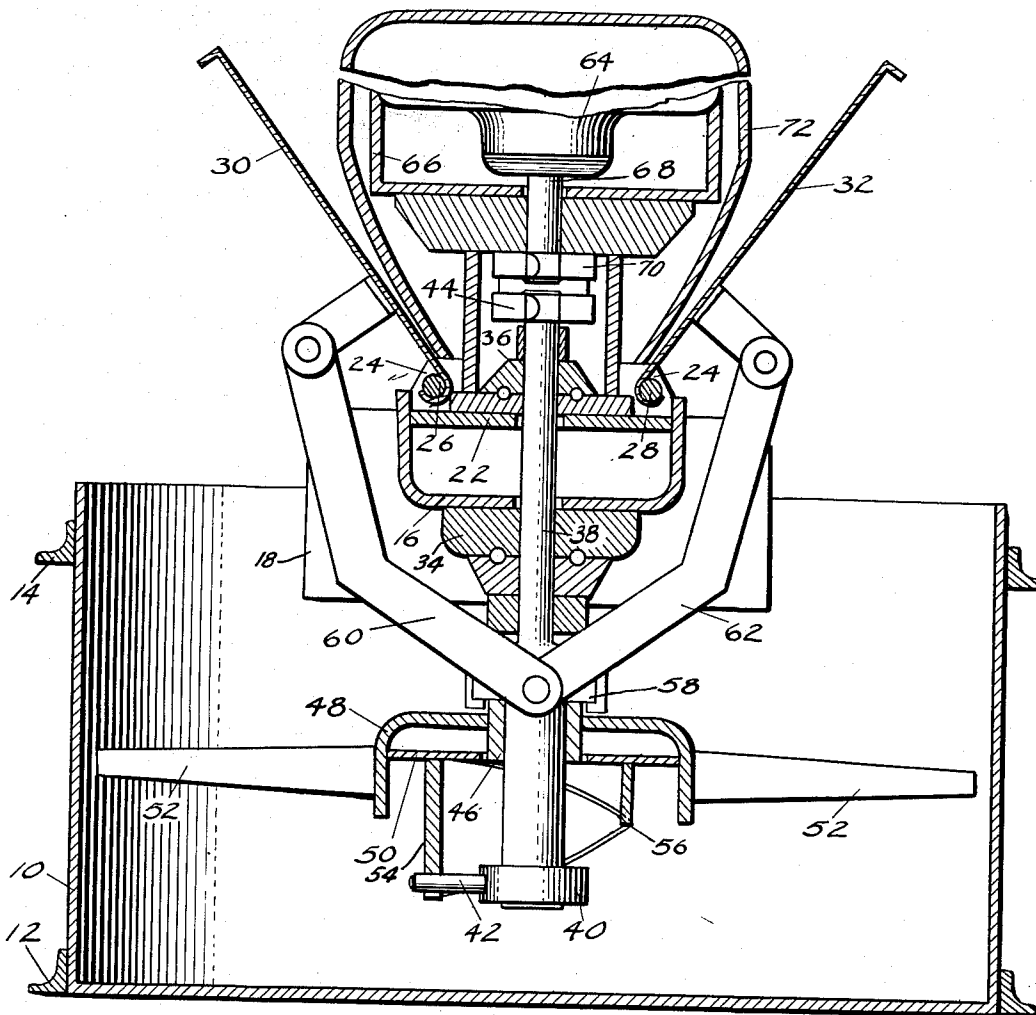
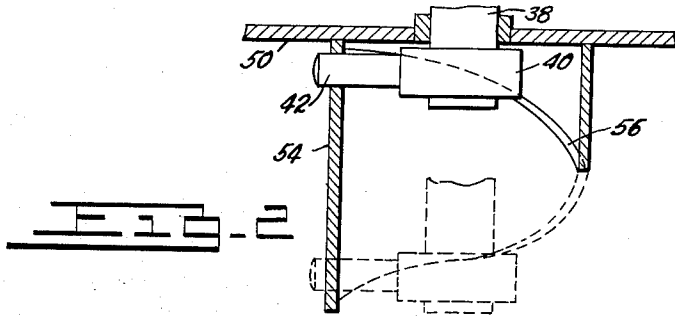


FIG. 3

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8 Claims. (Cl. 230—114)

This invention relates to ventilators and more particularly, to ventilators of the evacuator type.

The invention comprehends a ventilator of the evacuator type for compartments and/or buildings. The ventilator includes a cowl having closure plates and motor driven means for automatically raising the closure plates dispelling air and/or fumes from the compartment and lowering the closure plates when it is no longer desired to evacuate the air and/or fumes from the compartment.

An object of the invention is to provide a ventilator including a cowl, a motor driven fan for inducing movement of air through the cowl, closure means for the cowl and means actuated by axial movement of the fan for control of the closure means.

Another object of the invention is to provide an evacuator ventilator including a cowl, a rotatable and axially movable fan therein, a closure for the cowl and means carried by the fan for control of the closure.

Another object of the invention is to provide a ventilator of the evacuator type wherein a driven shaft carries a fan movable axially thereon and with the shaft during its maximum speed of rotation, and a cam carried by the fan and cooperative with an arm carried by the shaft is effective to move the fan axially.

A further object of my invention is to provide a ventilator of the evacuator type which has high efficiency in operation, and yet marked simplicity as a whole and in respect to each of its component parts so that its manufacture may be economically facilitated both as regards to the parts and their assembly.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereafter set forth and claimed, with the understanding that the several necessary elements comprising my invention may be varied in construction and arrangement, without departing from the spirit and scope of the appended claims.

In the drawings forming a part of this specification:

Figure 1 is a vertical sectional view illustrating the ventilator in closed position.

Figure 2 is an enlarged detail view illustrating the sleeve carried by the fan and having thereon a cam surface, and

Figure 3 is a vertical sectional view of the ventilator illustrated in the open position.

Referring to the drawings for more specific details of the invention, 10 indicates a cylindrical housing having spaced reinforcing flanges 12 and 14 which also serve as supports and anchoring means for the housing. A diametrical support 16 arranged within the housing is fixedly secured to plates 18 riveted or otherwise secured to the wall of the housing as indicated at 20. The support 16 is preferably a channel section with its flanges extended upwardly and cross members 22 welded or otherwise secured to the flanges serve to support bearing blocks 24 which in turn support parallel rods 26 and 28 having mounted thereon corresponding cover plates 30 and 32 contoured to fit and close one end of the housing. Spaced corresponding bearings 34 and 36 mounted

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on the support 16 and cross member 22 axially of the housing support for rotation a shaft 38. As shown, the shaft has on one end thereof a collar 40 fixedly secured to the shaft and the collar supports a pin 42 normal to the shaft, and a coupling member 44 is fixedly secured to the other end of the shaft.

A hub 46 mounted for rotation on the shaft 38 has secured thereto a substantial flange 48 reinforced by an annular plate 50. Equi-spaced fan blades 52 are fixedly secured to the flange 48 and a sleeve 54 fixedly secured to and dependent from the annular plate 50 is cut away to provide a cam surface 56 for cooperation with the pin 42 carried by the shaft 38.

A thrust bearing 58 mounted on the hub 46 carrying the fan has pivotally connected thereto corresponding arms 60 and 62 which, in turn are pivotally connected to the corresponding cover plates 30 and 32 so that upon axial movement of the thrust bearing the cover plates may be raised and/or lowered.

A motor 64 suitably supported as indicated at 66 has its armature shaft 68 in axial alignment with the shaft 38, and a coupling member 70 fixedly secured to the armature shaft cooperates with the coupling member 44 to effectively couple the shaft 38 to the armature shaft and a housing 72 suitably supported on the bearing blocks 24 serves to enclose the motor.

In operation upon energization of the motor 64, the shaft 38 coupled to the armature shaft of the motor is set in rotation. The shaft 38 carries a pin 42 normal to the shaft, and the pin 42 engages the cam surface 56 on the sleeve 54 depending from the hub of the fan.

Upon initial rotation of the shaft 38, the pin 42 carried thereby slides over the cam surface 56 on the sleeve 54. This results in elevation of the fan due to a differential in rotation of the shaft 38 and the fan. When the fan is fully elevated to the position where the pin 42 abuts the wall of the sleeve 54, the fan rotates with the shaft at its maximum speed of rotation. As the fan is elevated, the hub thereof abuts the thrust member 58 and slides the thrust member on the shaft and this movement of the thrust member is transmitted through the arms 60 and 62 to the cover plates 30 and 32 resulting in raising the cover plates and uncovering the cowl so that air and/or fumes may be evacuated through the cowl.

Upon cutting out the motor a differential in rotation between the shaft and the fan immediately occurs and due to the weight of the fan, it descends under the force of gravity, and during this movement the pin on the shaft slides on the cam surface to the top of the cam where the fan remains static, and during this movement of the fan, the lids 30 and 32 gradually descend under the force of gravity to close the cowl, and as the lids descend they transmit force through the arms to the thrust member effective to slide the thrust member on the shaft in substantially abutting relation to the hub of the fan.

While the invention has been described in connection with certain specific embodiments, the principle involved is susceptible of numerous other applications that will readily occur to persons skilled in the art. The invention is, therefore, to be limited only as indicated by the scope of the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A ventilator comprising a housing, a closure therefor, a drive shaft in the housing, a pin fixedly secured thereto and extended laterally therefrom, a fan slidable on the shaft, a cam carried by the fan and cooperating with the pin to move the fan relative to the shaft and for locking the fan to the shaft, and means actuated by movement of the cam effective to raise and lower the closure.

2. A ventilator comprising a housing, a closure there-

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for, a drive shaft in the housing, a pin extended radially from the shaft, a fan slidable on and rotatable with the shaft, a cam depending from the fan and cooperating with the pin and effective to slide the fan on the shaft, and linkage connected between the fan and the closure effective to raise and lower the closure.

3. A ventilator comprising a housing, a closure therefor, a drive shaft in the housing, a pin carried by the shaft, a fan slidable on and rotatable with the shaft, a member carried by the fan and cooperating with the pin for sliding the fan on the shaft and for locking the fan to the shaft for rotation therewith, a thrust member slidable on the shaft for cooperation with the fan and linkage connecting the thrust member to the closure.

4. A ventilator comprising a housing, a closure therefor, a shaft rotatable in the housing, a pin carried by the shaft, a fan slidable on and rotatable with the shaft, a cam depending from the fan and cooperating with the pin for shifting the fan on the shaft and for locking the fan to the shaft, a thrust member on the shaft cooperating with the fan and linkage connecting the thrust member to the closure.

5. A ventilator comprising a housing, closures therefor, a shaft rotatable in the housing, a pin extended radially from the shaft, a fan slidable on and rotatable with the shaft, a sleeve depended from the fan, a cam on the free end of the sleeve cooperating with the pin for moving the fan on the shaft and for locking the fan to the shaft and means connected between the fan and the closures effective to open and shut the closures.

6. A ventilator comprising a housing, cover plates therefor, a drive shaft in the housing, a pin extended radially

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from the shaft, a hub slidable on the shaft and rotatable therewith, a fan on the hub, a cam depended from the fan cooperating with the pin on the shaft, a thrust block slidable on the shaft in abutting relation to the hub, and arms pivotally connecting the thrust block to the cover plates.

7. A ventilator comprising a housing, cover plates therefor, a shaft rotatable in the housing, a pin supported radially on the shaft, a fan slidable on the shaft and rotatable therewith, a cam depending from the fan, and cooperating with the pin for sliding the fan on the shaft and for locking the fan to the shaft, and means connected between the fan and the cover plates for raising and lowering the plates.

8. A ventilator comprising a housing, cover plates therefor, a drive shaft in the housing, a pin supported on the shaft and extended radially therefrom, a fan on the shaft, a sleeve carried by the fan, a cam surface on the sleeve, cooperating with the pin on the shaft for raising and lowering the fan and for locking the fan to the shaft, a thrust block slidable on the shaft cooperating with the fan and arms pivotally connecting the thrust block to the cover plates for raising and lowering the cover plates.

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