Jan. 18, 1944. A. G. SUTCLIFFE ET AL 2,339,363

VENTILATING DEVICE

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Fig. 1

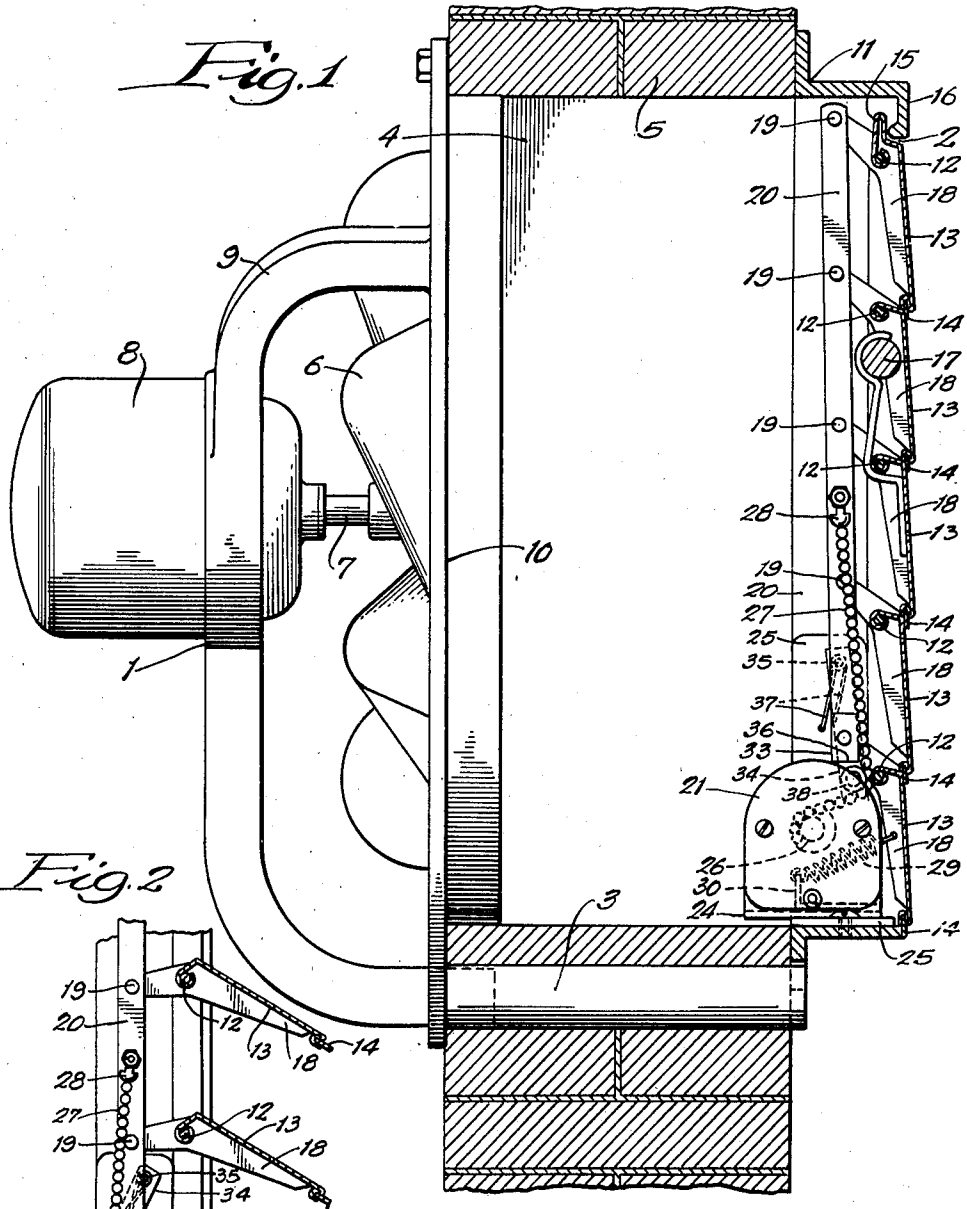
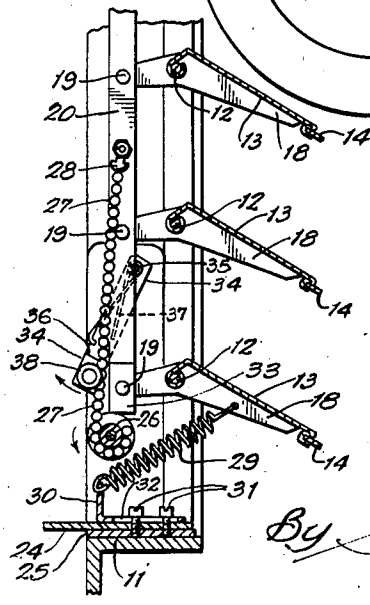


Fig. 2



Inventors:
Arthur G. Sutcliffe, and
Lewis C. Seaver,
By Soans, Ford & Anderson.
Attorneys.

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Fig. 3

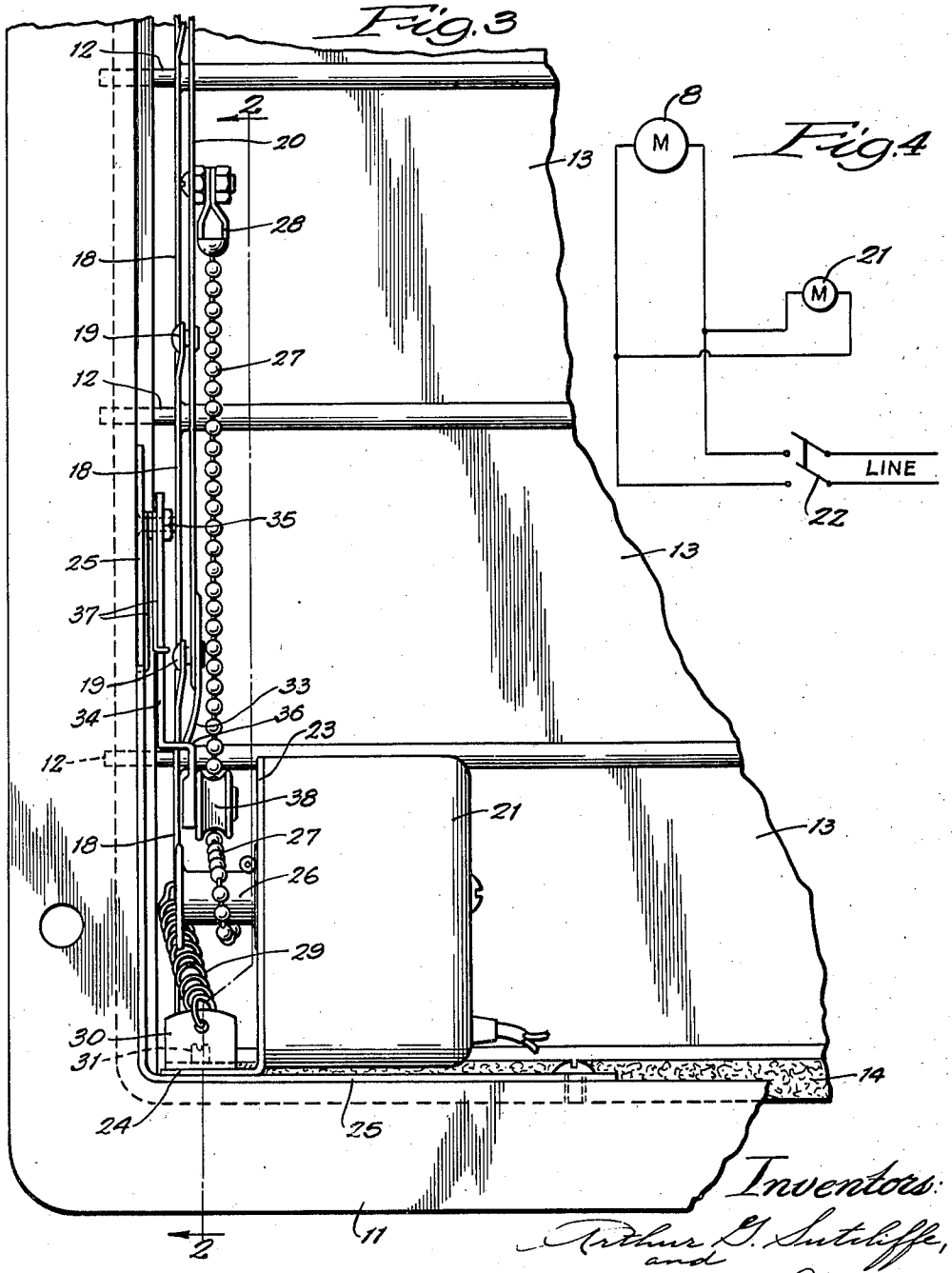


Fig. 4

Inventors:
Arthur G. Sutcliffe,
and
Lewis C. Leaver,
By Soans, Ford & Anderson,
Attorneys.

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UNITED STATES PATENT OFFICE

2,339,363

VENTILATING DEVICE

Arthur G. Sutcliffe, Park Ridge, and Lewis C. Weaver, Chicago, Ill., assignors to Ilg Electric Ventilating Co., Chicago, Ill., a corporation of Delaware

Application June 8, 1942, Serial No. 446,164

7 Claims. (Cl. 98—116)

This invention relates to ventilating devices of the type adapted for use in discharging gases and foul air through an opening in the external wall of a building. Ventilating devices of this general type are illustrated in the following Letters Patent of the United States issued to Ilg Electric Ventilating Co., No. 1,482,398, dated February 5, 1924; No. 1,525,649, dated February 10, 1925; No. 1,917,340, dated July 11, 1933; and No. 2,272,928, dated February 10, 1942.

Such ventilating devices usually include an electrically driven fan mounted on the inner face of the wall adjacent the vent and a pivoted shutter or plurality of pivoted shutter vanes mounted on the outer side of the vent for closing the latter against the ingress of rain, snow, or cold air when the fan is idle.

In some ventilating devices, the shutter vanes are positively opened and closed by electrical or other actuating means, and in others the vanes are opened by the blast of the fan, and closed by gravity when the fan is idle.

Due to external wind or differential in the external and internal pressures, shutter vanes of the gravity closing type have a tendency to rattle when the fan is idle.

The main objects of this invention are to provide improved shutter locking means for positively securing the shutter vanes in closed position when the fan is idle; and to provide an improved form of release controlled by the electric circuit of the fan motor for unlocking the shutter vanes while said circuit is closed.

An illustrative embodiment of this invention is shown in the accompanying drawings, wherein:

Figure 1 is a vertical section of a building wall on which is supported a ventilating device embodying our improved shutter locking means; the shutter vanes being shown in closed position.

Fig. 2 is a fragmentary vertical section of the shutter and locking means, showing the shutter vanes in open position, the view being taken on the line 2—2 of Figure 3 but with the latch released.

Fig. 3 is an enlarged fragmentary rear elevation of the shutter, showing the improved locking means and release.

Fig. 4 is a diagram of the electric circuit which controls the fan motor and the shutter release.

In the form shown, the ventilating apparatus comprises a fan assembly 1 and shutter 2 disposed on respectively opposite sides of a vent 4 formed in an external wall 5. The fan assembly 1 and shutter 2 may be connected together by suitable bolts extending through the wall, or each unit may be independently attached to the wall by individual bolts. In the form shown, a vent pipe 3 extends through the external wall between the two units.

The fan assembly includes a fan 6 mounted on the shaft 7 of an electric motor 8 which is supported on the arms 9 of a frame 10 which is secured to the building wall and to the shutter.

The shutter assembly comprises the usual rectangular frame 11 on which are pivoted the hinge pins 12 of a plurality of horizontally disposed vanes 13 which are movable between the vertical closed position shown in Figs. 1 and 3 and the open position shown in Fig. 2.

Mounted on the lower edge of each vane is a felt facing strip 14 which is adapted to overlap the upper edge of the next lower vane. The felt strip of the lowermost vane abuts the lower edge of the shutter frame 11, as shown in Fig. 1. The upper edge of the upper vane is offset, as shown in Fig. 1, to form a ridge 15 which extends upwardly behind a depending flange 16 of the frame 11 in order to prevent the entry of snow, rain or air at this point.

A counterbalance 17 may be attached to the inner face of one of the vanes as is well understood.

Secured to the end of the hinge pins 12, are bell-cranks 18. The forward arms of the bell-cranks are attached to the vanes 13 and the rear arms thereof are pivoted at 19 to a pair of vertically shiftable bars 20 for causing the vanes to move as a unit. The vertically shiftable bar 20 at one side of the shutter (not shown) has no function other than that of connecting the vanes together for movement as a unit. At the opposite side of the shutter, the bar 20 also serves as part of the improved latch which locks the shutter vanes in closed position while the fan motor is idle, as hereinafter described.

The shutter vanes are automatically opened by means of a stalling motor 21 which is connected to the electric circuit of the fan motor 8 as shown in Fig. 4. This circuit is controlled by the usual switch 22.

The stalling motor 21 is mounted on an end plate 23 having a flange 24 secured to an angle bracket 25 which is rigidly mounted in one of the lower corners of the shutter frame 11. The shaft of the stalling motor projects through the plate 23 and carries a drum 26 to which is secured one end of a flexible cable 27. The other end of the cable 27 is secured to the locking bar 20 by a clip 28. With this improved construction, when the fan motor circuit is closed for operating the fan, the stalling motor drum 26 is rotated thereby pulling downwardly on the cable 27 and rods 20 for swinging the vanes 13 outwardly to open position.

Upon opening the electric circuit, the stalling motor permits the cable 27 to unwind itself, and the vanes are then closed by means of a helical spring 29. The forward end of this spring is attached to one of the bell-cranks 18 of the lower vane 13 and the rear end of the spring is attached

to a clip 30 secured to the flange 24 of the plate 23 by screws 31 which extend through a slot 32 in the clip to permit adjustment for varying the tension of the spring.

The improved latch for securing the shutter vanes in closed position comprises a finger 33 and a keeper 34. The finger 33 is secured to the lower end of one of the vertically movable bars 20. The keeper 34 is pivoted to the bracket 25 by a pin 35 and has an offset portion 36 providing a shoulder adapted to be shifted into the path of the finger 33 to secure the bar 20 against downward movement thereby preventing opening of the shutter vanes. The keeper 34 is yieldingly retained in the operative position shown in Fig. 1 by means of a U-shaped spring 37 which is wrapped around the pivot pin 35. One end of the spring 37 is secured to the bracket 25 and the other end thereof is hooked around the rear edge of the keeper so as to normally urge the keeper into the path of the finger 33.

Mounted on the lower end of the keeper 34, is a roller 38 which engages the cable 27 so that, when the cable is wound on the drum 26 by the stalling motor 21, the keeper is retracted against the action of the spring 37, thereby permitting the finger 33 and its bar 20 to drop.

In operation, when the switch 22 is open, both motors 18 and 21 are idle and the shutter vanes 13 are held in closed position by the spring 29 which acts upon the lower vane 13 and one of its bell-cranks 18 for holding the bars 20 on their uppermost position. In this position, the spring 37 holds the keeper 34 so as to position the stop shoulder 36 directly below the finger 33 thereby locking the bars 20 against downward movement so as to secure the vanes 18 against any pivotal movement.

When the switch 22 is closed for starting the fan motor 8, the stalling motor 21 is simultaneously operated thereby winding the lower portion of the cable 27 around the drum 26. As the cable 27 becomes taut, it acts upon the roller 38 and rocks the keeper 34 rearwardly to disengage the stop shoulder 36 from the finger 33 thereby permitting the cable 27 to pull its attached bar 20 downwardly for opening the vanes. While the electric circuit is closed, the stalling motor 21 acts as a brake upon its pulley 26 for holding the cable 27 taut.

When the switch 22 is again opened, the drum 26 is released so as to permit slackening of the cable 27 whereupon the spring 29 closes the shutter vanes 13 thereby raising the bars 20 so as to permit the spring 37 to again urge the keeper 34 into operative position.

Although but one specific embodiment of this invention has been herein shown and described it will be understood that details of the construction shown may be altered without departing from the spirit of the invention as defined by the following claims:

We claim:

1. In a ventilating device, the combination with a fan and a movable shutter, of a latch normally locking said shutter in closed position, an electric circuit, a switch controlling said circuit, a pair of motors in said circuit, one of said motors being connected to said fan, and means actuated by the other of said motors for releasing said latch and opening said shutter.

2. In a ventilating device, the combination with a fan and a movable shutter, of a latch normally locking said shutter in closed position, an electric circuit, a switch controlling said circuit, a pair of motors in said circuit, one of said motors being connected to said fan, the other of said motors being of the stalling type, and means actuated by said other motor for releasing said latch and opening said shutter.

3. In a ventilating device, the combination with a fan and a movable shutter, of a latch normally locking said shutter in closed position, an electric circuit, a switch controlling said circuit, a pair of motors in said circuit, one of said motors being connected to said fan, and means actuated by the other of said motors for first releasing said latch and then opening said shutter upon the closing of said circuit.

4. A ventilating device comprising a frame having a vent therein, a movable shutter mounted on said frame for controlling the passage of air through said vent, a fan for causing air to flow through said vent, an electric circuit, a switch for controlling said circuit, a motor in said circuit for driving said fan, a latch normally locking said shutter in closed position, a second motor in said circuit, and means actuated by said second motor for serially releasing said latch and opening said shutter.

5. A ventilating device comprising a frame having a vent therein, a movable shutter mounted on said frame for controlling the passage of air through said vent, a fan for causing air to flow through said vent, an electric circuit, a switch for controlling said circuit, a motor in said circuit for driving said fan, means normally closing said shutter, a latch finger movable with said shutter, a latch keeper normally cooperating with said latch finger for locking said shutter in closed position, a second motor in said circuit, and a connection between said second motor and said shutter for opening said shutter, said connection being operative to release said latch keeper from said finger prior to the opening of said shutter.

6. A ventilating device comprising a frame having a vent therein, a movable shutter mounted on said frame for controlling the passage of air through said vent, a fan for causing air to flow through said vent, an electric circuit, a switch for controlling said circuit, a motor in said circuit for driving said fan, a latch finger movable with said shutter, a keeper pivotally mounted on said frame and normally cooperating with said finger for locking said shutter in closed position, a second motor in said circuit, and a connection between said second motor and said shutter for first retracting said keeper from said finger and then opening said shutter.

7. A ventilating device comprising a frame having a vent therein, a movable shutter mounted on said frame for controlling the passage of air through said vent, a fan for causing air to flow through said vent, an electric circuit, a switch for controlling said circuit, a motor in said circuit for driving said fan, a spring normally closing said shutter, a latch finger on said shutter, a latch keeper pivoted on said frame and normally cooperating with said latch finger for locking said shutter in closed position, a second motor in said circuit, and a flexible cable connecting said second motor and said latch finger for opening said shutter, said cable being operative to retract said keeper prior to the opening of said shutter.

ARTHUR G. SUTCLIFFE.
LEWIS C. WEAVER.