

June 22, 1937.

H. C. HUEGLIN

2,084,807

VENTILATOR

Filed July 10, 1936

3 Sheets-Sheet 1

Fig. 1.

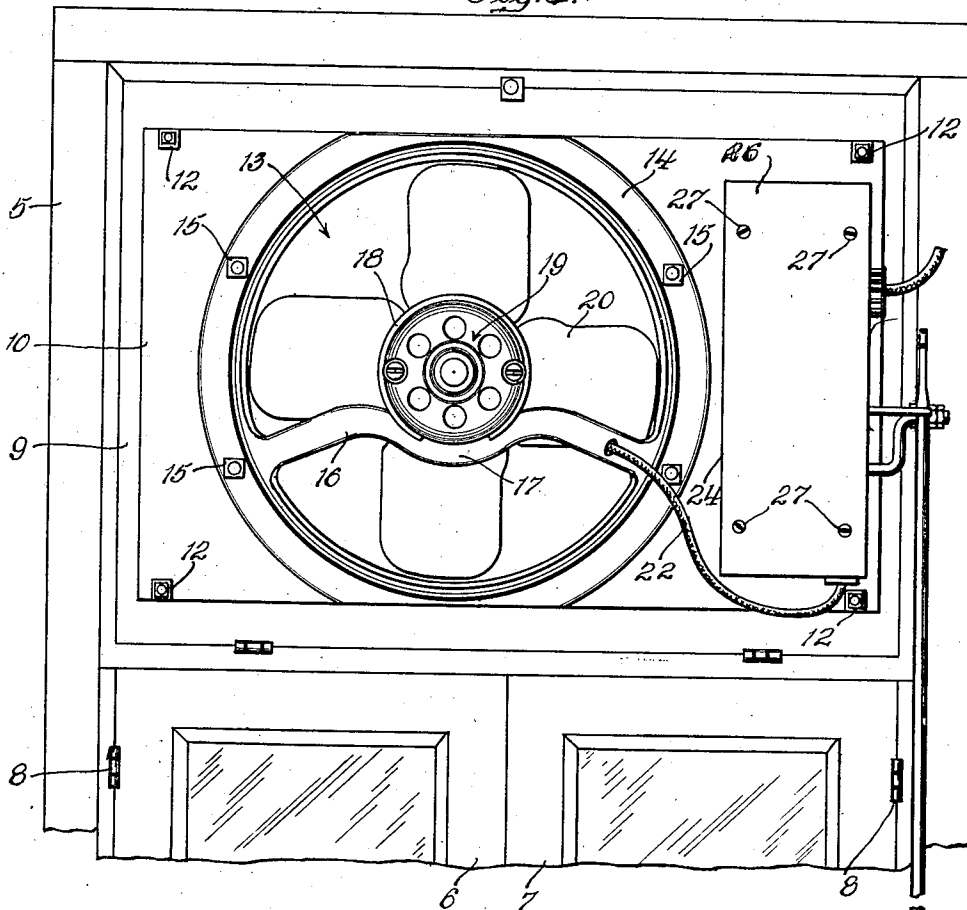
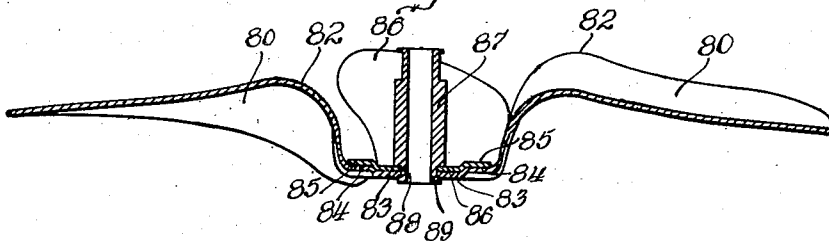


Fig. 5.



Inventor:
Herman C. Hueglin
By *Mowfackson Bortcher-Kimmer*
Att'y.

June 22, 1937.

H. C. HUEGLIN

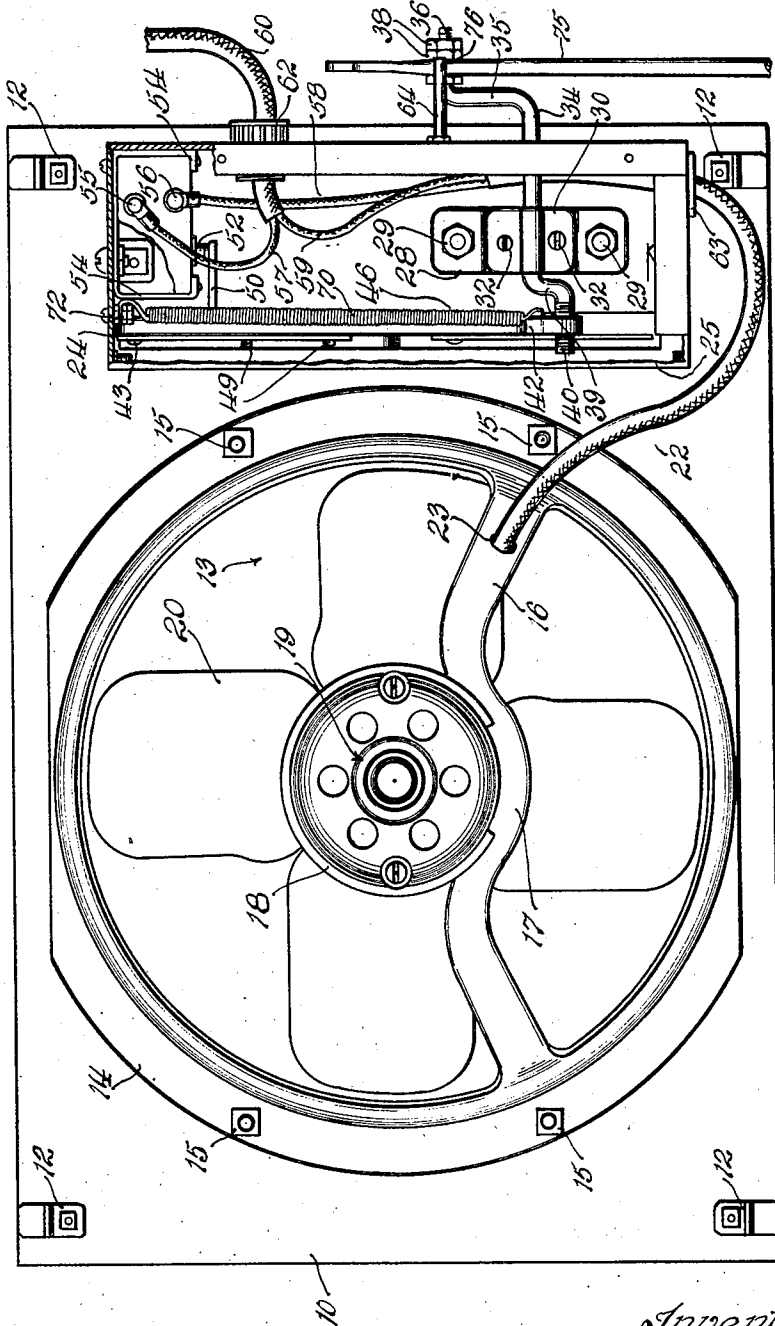
2,084,807

VENTILATOR

Filed July 10, 1936

3 Sheets-Sheet 2

Fig. 2.



Inventor:

Herman C. Hueglin

By *Monroe Jackson Bottcher, Reiner*

Attys.

June 22, 1937.

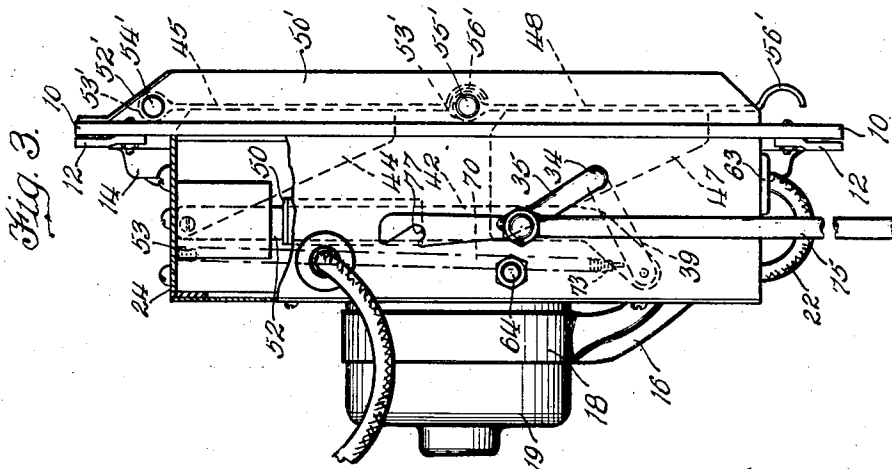
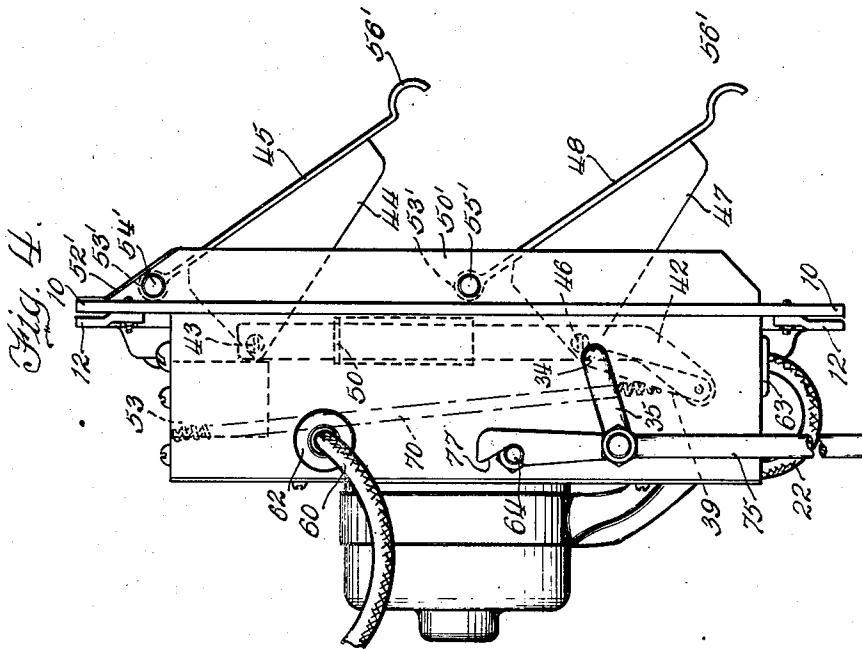
H. C. HUEGLIN

2,084,807

VENTILATOR

Filed July 10, 1936

3 Sheets-Sheet 3



Inventor:
Herman C. Hueglin
By *Proffaction Brothers & Co.*
Attys.

UNITED STATES PATENT OFFICE

2,084,807

VENTILATOR

Herman C. Hueglin, Chicago, Ill., assignor to
Airmaster Corporation, Chicago, Ill., a corpo-
ration of Illinois

Application July 10, 1936, Serial No. 89,901

5 Claims. (Cl. 98—43)

This invention relates to ventilators, and more particularly is directed to ventilators for window openings and the like.

Ventilator devices of this general type usually comprise a fan and driving motor, and have been provided with a mounting bracket for supporting the motor and fan in a panel, which panel is adapted for mounting in or over a window, transom, or equivalent type of opening.

It is customary, in such devices, to have a grill or screen over the outlet opening to prevent entrance of insects or the like, and in some instances to deflect or control the direction of the air from the outlet.

The present invention contemplates an improved type of ventilator having means for particularly adapting it for mounting in window openings, especially in casement or so-called "French" windows, and where the window frame is metallic, although it is readily capable of use in other types of ventilating openings.

One feature of the present invention is the provision of a panel structure adapted for mounting in a suitable opening and having hinged ventilating louvres connected together for conjoint opening and closing movement, the actuating means for operating the louvres simultaneously controlling operation of the fan.

Another advantage possessed by the present invention is the provision of an enclosed control housing containing the switch mechanism for the fan motor and also the operating linkage for the louvres, the housing being disposed on the inside face of the panel adjacent the motor mounting bracket.

Still another object of the present invention is to provide a construction wherein the fan motor control switch and the louvres are normally urged toward inoperative position, and the means for actuating the switch and louvres must be maintained in operative position at all times that operation is desired. Thus if the actuating means is accidentally displaced, the motor switch will automatically be deenergized and the louvres will simultaneously close.

The present invention also provides means whereby the panel may be readily mounted in position in an opening and dismounted therefrom, without any special tools or any special fittings in the opening.

Still another object of the present invention is the provision of a fan construction of simple and economical design, capable of formation from sheet metal stampings, and adapted to be assembled in proper manner with facility.

Other objects and advantages of the invention, such as its simplified construction and assembly, will be more apparent from the following detailed description which, taken in conjunction with the accompanying drawings will disclose to those skilled in the art the particular construction and operation of a preferred form of the present invention.

In the drawings:

Figure 1 is a rear elevational view of a window frame with the ventilator mounted in operative position;

Figure 2 is an enlarged view of the ventilator panel, with the switch housing cover removed;

Figure 3 is a side elevational view with portions broken away, of the ventilator panel;

Figure 4 is a corresponding view with the louvres in open position; and

Figure 5 is a sectional view through the ventilator fan.

Referring now in detail to the drawings, in Figure 1 I have disclosed a window frame indicated generally at 5, having the vertically hinged window portions 6 and 7, which may be of the door or casement type, hinged at their opposite vertical edges as indicated at 8. Disposed above the top of the windows 6 and 7 is a ventilator opening comprising the frame 9, to which is secured the panel 10 carrying the ventilating equipment. The panel 10 may be formed of steel, or of any other equivalent material, and preferably is provided with a plurality of attaching lugs 12 having laterally offset clamping portions, mounted at the corners thereof, and having extending offset clamping portions adapted to form with the panel clamping grooves for receiving the defining edges of the frame 9 for securing the panel in fixed position within the frame.

The panel 10 is provided with a circular opening indicated at 13, about which is mounted a supporting bracket having the ring shaped flange 14 secured by any suitable securing means such as the bolts 15 to the rear base of the panel. Formed integral with the bracket 14 is a rearwardly extending arm portion 16, which is provided with an intermediate arcuate portion 17 adapted to receive and support the frame 18 of a motor indicated generally at 19. The motor 19 is of any desired type of electrical motor, and has secured to the shaft thereof the fan 20, the fan being of a diameter such as to have free rotation within the opening 13. The fan itself is preferably disposed in the plane of the ring shaped portion 14 of the bracket, while the motor

is disposed rearwardly thereof upon the arm 16. The current supply for the motor is lead thereto through the cable 22, which extends through a suitable opening 23 in the arm 16 of the bracket, and thence is lead to the terminal connections of the motor.

Mounted at one side of the bracket 14 is a control housing 24, which housing encloses the actuating means for the motor and also for the louvres. This housing may be of light weight sheet metal construction, with suitably formed defining walls carrying flanges which may be folded together in any suitable manner to form an enclosing substantially dust proof housing. Preferably the side walls are provided with inturned flange portions 25, which form suitable supporting surfaces to which a cover plate 26, as shown in Figure 1, may be secured by the screws 27.

Within the housing 24 there is provided a journal member 28, which is bolted by means of the bolts 29 to the rear face of the housing parallel to the plane of the panel 10. Cooperating with the journal member 28 is a second journaling member 30, secured thereto by means of the screws 32, which forms a substantially cylindrical journal receiving the intermediate portion of a crank arm 34 which has one end portion projecting outwardly through a side wall of the housing and having a normally extending crank portion 35 terminating in a threaded stud portion 36 which is adapted to receive the operating rod 75 secured thereto by means of the nuts 38. The opposite end of the arm 34 is provided with a second crank portion 39 which extends in an angularly offset position with respect to the crank portion 35, and which has a normally extending terminal portion 40 adapted to receive the member 42 which extends substantially vertically within the housing 24, and which at its upper end is provided with securing means 43 securing a normally extending flange 44 of the upper louvre 45 thereto, as indicated clearly in Figure 4, while intermediate its end it is provided with a second securing means 46 for securing the inturned flange 47 of the second louvre 48 thereto. Intermediate the securing means 43 and 46 the member 42 has clamped thereto by means of the bolts 49, a switch actuating arm 50 having a normally extending portion adapted to engage a switch control plunger 52 of a switch mounted within the switch housing 53 disposed at the upper end of the housing 24 and secured thereto by means of the brackets 54 carried by the housing.

The switch plunger 52 is normally urged to a position projecting outwardly of the housing 53, and in its outermost projecting position effects closure of the switch controlling the operation of the motor 19. When the member 42 is in the position shown in Figures 2 and 3, the arm 50 holds the plunger 52 in retracted position, maintaining the circuit through the switch open and resulting in no energization of the motor 19. Suitable terminals 55 and 56 on the face of the switch housing 53 have connection through respective conductors 57 and 58, the conductor 58 leading through the cable 22 to one terminal of the motor 19, the other terminal of the motor 19 being connected through the conductor 59 and through the power supply cable 60 to a suitable source of current supply. The conductor 57 constitutes the second conductor of the power supply line extending through the cable 60, and is connected to the terminal 56. When the switch is closed, contact is effected between the terminals

55 and 56, to complete the circuit through the fan motor 19.

The housing 24 is provided with a suitable bushing 62 in the side wall thereof, which forms a suitable inlet for the supply cable 60, and at its lower end is provided with a second bushing 63 providing a suitable inlet for the cable carrying the current supply to the motor 19. Also, the side wall carries a projecting pin 64 rigidly secured thereto, and disposed substantially in horizontal alignment with the portion 36 of the crank arm 34 when the arm is in inoperative position, as shown in Figures 2 and 3.

Considering now in detail the mounting of the louvres 45 and 48, each of these louvres extends substantially across the panel 10, the panel being provided with outwardly extending side flanges 50', and provided at its top with a downwardly slanting flange 52' which closes the top of the opening in which the louvres are disposed. The louvres are each provided with rolled portions 53' at their upper end, these portions being rolled about horizontally extending shafts 54' and 55', respectively, journaled in the side flanges 50'. Each of the louvres is provided along its lower edge with an arcuate outwardly curved portion 56', the upper louvre 45 being of a vertical extent such that the portion 56' encloses the lower portion 53' and the shaft 55' of the lower louvre 48 when the louvres are in closed position, as shown in Figure 3. The rearwardly extending wings 44 and 47 of the louvres can be formed integral therewith, or may comprise separate flanges welded or otherwise suitably secured to the surface of these louvres.

In order to insure positive closing of the louvres when the crank arm 34 is released, I have provided a spring member 70, which at one end is secured by means of a bracket 72 to the top wall of the housing 24, and at its lower end is secured as indicated at 73 to the lower outwardly curved end of the member 42, the member 42 being pivoted in any suitable manner to the extending end 40 of the arm 39 of the crank 34.

In the operation of the construction thus far disclosed, a suitable operating rod 75, having an opening adjacent one end thereof, indicated at 76 in Figure 2, is secured to the portion 36 of the arm 35, and is pivotally mounted thereon. Extending upwardly from the opening which receives the portion 36 of the arm 35 the actuating rod 75 is provided with a slotted portion 77, shown in Figures 3 and 4, so that when the rod 75 is pulled downwardly to rotate the crank arm 35 in a counterclockwise direction, the radius of this arm in turn serves to move the rod outwardly away from the panel. The notched portion 77 is moved downwardly into a position such that it engages the pin 64, thereby holding the arm 35 in its actuated position. Rotation of the crank 35 results in corresponding rotation of the opposite crank portion 39 of the arm 34, resulting in downward movement of the member 42. This results in a corresponding downward thrust on the flanges 47 and 44 of the louvres, pivoting the louvres about their corresponding shafts 54' and 55', to open the same to the position shown in Figure 4. At the same time, the switch controlling arm 50 is moved away from the plunger 52, allowing the plunger to move outwardly to actuate the switch within the housing 53. Thus, downward movement of the actuating rod 75 simultaneously opens the louvres 45 and 48, and results in energization of the switch to energize the fan motor 19.

As long as the rod 75 is retained in its operative locking position and retains its notched portion 77 engaged with the pin 64, the louvres remain open and the fan operates. However, upon dis-
 5 location of the rod 75 from its abutting engagement with the pin 64, the weight of the louvres 45 and 48, together with the effect of the spring 70, result in upward movement of the arm 35 in a clockwise direction, producing corresponding
 10 clockwise movement of the louvres 45 and 48, and corresponding upward movement of the member 42 whereby the arm 50 engages the plunger 52 for opening the switch, consequently deenergizing the fan motor. It is therefore ap-
 15 parent that the opening of the louvres and energization of the fan motor are simultaneously accomplished by the movement of the actuating rod 75, and that this rod also controls the con-
 20 tinued operation of the ventilator only as long as the rod is retained in actuated position by en-
 gagement of the notch 77 with the pin 64.

Considering the particular fan employed in this invention in detail, the fan comprises a pair of
 25 crossed fan blades 80 and 86, as shown in Figure 5. Each of these blades is of substantially uniform pitch and curvature adjacent the outer extremities thereof, and merges into bucket-
 30 shaped portions 82 adjacent its central portion. These bucket-shaped portions are connected to-
 35 gether by a substantially planar central portion 83, having upstruck ridges 84 formed therein, the ridges 84 being seated in corresponding ridges 85 formed in the other of the fan blades 86. A hub or collar 87 is provided, which is adapted to
 40 be secured to the shaft of the motor 19, and which is provided with a reduced portion 88 extending through the central portions of the blades 80 and 86. The outer end of the reduced por-
 45 tion 88 is then crimped or spun over, as indicated at 89, to secure the members 86 and 80 in fixed
 50 crossed position on the collar 87. The collar may be nonrotatably secured to the shaft of the motor in any desired manner, as by a set screw or the like.

With this particular type of fan construction, the fan blades can be made of metal stampings, and can be readily and economically formed. By reason of the particular aligning grooves, whereby the corresponding portions of the blades
 50 can be fixed in the proper alignment, a positive fixed assembly can be provided at a minimum of cost, and with a minimum amount of detailed assembly work.

It is therefore believed that I have provided a
 55 ventilator construction having certain improved features of design and operation which render the same capable of producing improved oper-
 60 ating characteristics. The provision of a ventila-
 65 tor of this type in which the panel can be se-
 cured directly in a transom opening or the like, and in which the actuation of the motor and the control of the ventilating louvres is conjointly accomplished by a single operating member, is believed of distinct importance. Also, the par-
 70 ticular fan construction is believed to be advan-
 tageous for use with a simplified ventilator construction of this type.

I am aware that various changes in the con-
 70 struction and design of the constituent parts of the present invention are possible, and I there-
 fore intend to be limited only as defined by the scope and spirit of the appended claims.

I claim:

1. In combination, a supporting panel having an opening therethrough, a fan mounted substan-
 5 tially centrally in said opening and having a fixed support on said panel, a plurality of louvres
 10 hinged at corresponding edges to said panel and connected together for conjoint swinging move-
 15 ment, and means for simultaneously swinging said louvres outwardly of said panel and ener-
 20 gizing said fan, comprising a pivoted crank on
 25 said panel, a spring normally holding said crank in louvre closed position, a lever pivoted inter-
 30 mediate its ends on said crank and movable lon-
 35 gitudinally for opening said louvres, and stop means on said panel engaged by one end of said
 40 lever in louvre-open position for holding the crank in actuated position against the action of
 45 said spring, said lever being rotatable about said crank for disengagement from said stop means.

2. Control means for a ventilator having a fan motor and a plurality of hinged louvres, com-
 45 prising a motor switch, a control member hav-
 50 ing means connecting said louvres for conjoint movement and having means for controlling oper-
 55 ation of said switch, a crank arm pivotally con-
 60 nected to one end of said control member, a lever pivotally mounted on one end of said crank
 65 and movable longitudinally for rotating said crank arm to open said louvres and simultaneously pro-
 70 duce closing of said switch, a projecting pin en-
 75 gaged by one end of said lever for locking said lever in actuated position, said lever being dis-
 80 engaged from said pin by rotation about said crank arm, and spring means for restoring said
 85 crank arm to louvre-closed position upon disen-
 90 gagement of said lever.

3. In combination with a ventilator having a fan motor and a plurality of louvres normally closing the outlet of the fan controlled by said
 40 motor, control means for simultaneously ener-
 45 gizing said motor and opening said louvres, a lever movable longitudinally for actuating said control means, stop means engageable by one end
 50 of said lever for retaining said lever in actuating position, and means for restoring said control
 55 means to inoperative position upon rotation of said lever about said control means out of en-
 60 gagement with said stop means.

4. In combination with a ventilator having a fan motor, a switch therefor, and a plurality of
 50 overlapping hinged louvres normally closing the outlet of the fan controlled by said motor, of a link connecting said louvres for conjoint swing-
 55 ing movement and including switch operating means, a pivoted crank having annularly offset
 60 oppositely extending arms, said link being pivoted to one of said arms, an operating lever pivoted
 65 intermediate its ends to the other of said arms and movable longitudinally to rotate said crank
 70 for opening said louvres and simultaneously actu-
 75 ating said fan motor switch, and a projecting stop member engageable by one end of said lever for
 80 holding the same in actuated position, said lever being disengaged from said stop means by rota-
 85 tion thereof about said crank arm pivot.

5. The combination set forth in claim 4 char-
 70 acterized further by spring means engaging said link for restoring said link to louvre-closed po-
 75 sition upon disengagement of said lever from said stop means.

HERMAN C. HUEGLIN.