

Nov. 27, 1962

E. GRASWICH ET AL

3,065,687

FIRE DOOR

Original Filed Aug. 11, 1958

2 Sheets-Sheet 1

FIG_1

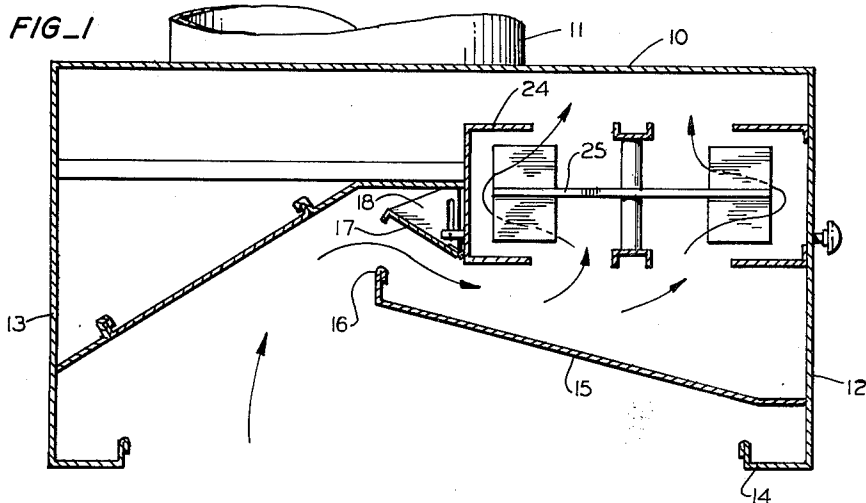


FIG_3

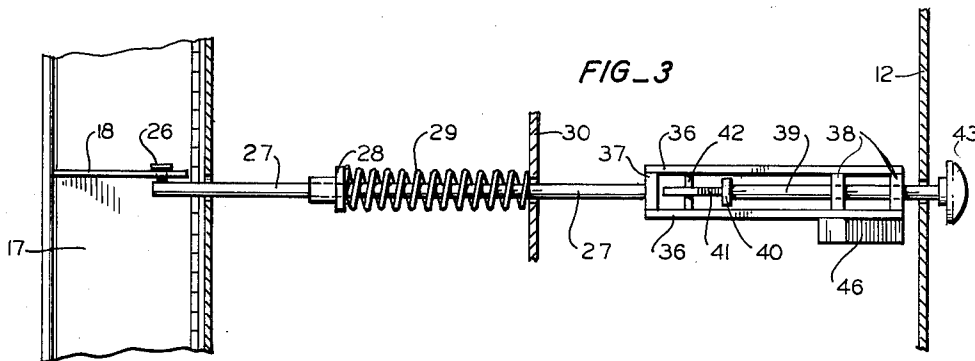
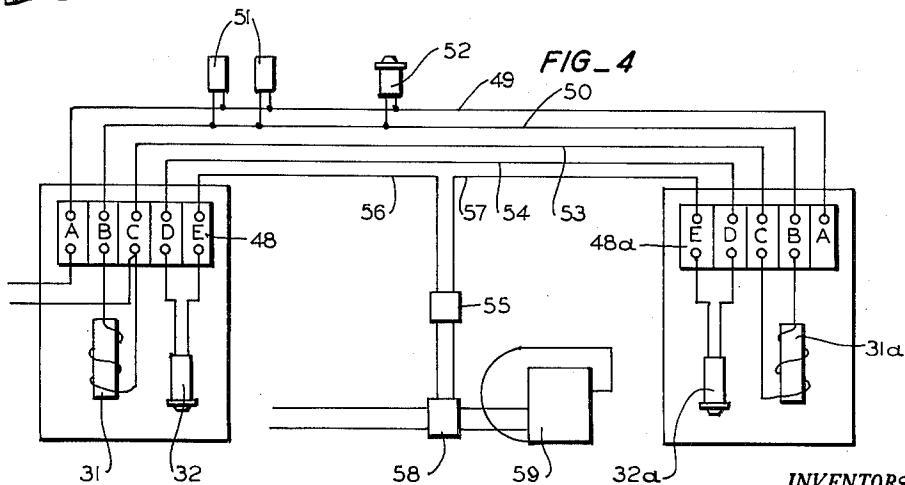


FIG_4



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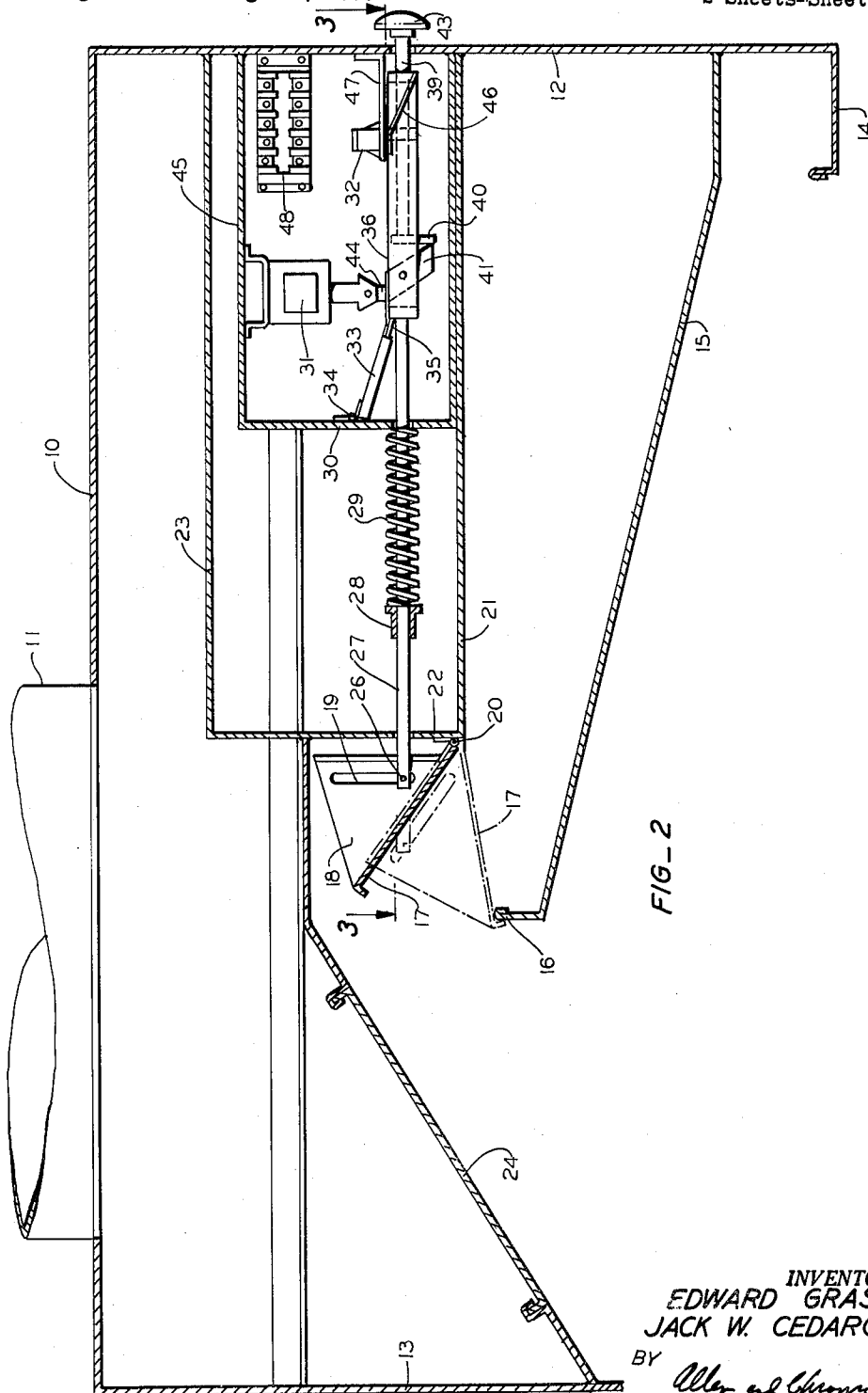
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FIRE DOOR

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3,065,687

FIRE DOOR

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Original application Aug. 11, 1958, Ser. No. 754,374. Divided and this application Nov. 28, 1960, Ser. No. 72,035

3 Claims. (Cl. 98—115)

This invention relates to ventilator apparatus for exhausting cooking gases from cooking surfaces in general. More particularly, this invention relates to ventilator apparatus in which a manually or automatically controlled fire door operating mechanism is provided for substantially eliminating or preventing the burning of grease and cooking gases in the ventilator passage.

This application is a division of our application Serial No. 754,374, filed August 11, 1958, now Patent No. 2,971,452.

An object of this invention is to provide an improved ventilator structure for use with cooking ranges, said ventilator having means to reduce hazards from fires igniting the gases being exhausted.

Still another object of this invention is to provide an improved ventilator structure for use with cooking ranges, said structure having a fire door positioned in the lower part thereof so that the entire ventilating stack interior is closed at the bottom vent thereof whereby no grease-collecting parts thereof are exposed in case of fire.

A further object of this invention is to provide an improved fire door arrangement to the bottom portion of the ventilator passage, said door being provided with both manually and automatically actuated closing means for closing the bottom vent of the ventilating structure in case of fire.

Still a further object of this invention is to provide an improved leverage which may be either manually or electrically controlled for closing fire doors provided to ventilator ducts for exhausting cooking gases.

Other and further objects of this invention will be apparent to those skilled in the art to which it relates from the following specification, claims and drawings.

In accordance with this invention there is provided an improved ventilator structure which is adapted to be used for exhausting gases from cooking ranges, and which is provided with an improved fire door control. The fire door of this ventilator structure is positioned on the lower end of the ventilator passage so that the entire passage is closed when the door is closed whereby the entire passage may be sealed and no grease-covered surfaces of the passage are exposed in case of fire therein. The fire door is provided with a spring-loaded operating leverage that may be controlled or tripped either manually or electrically to close the fire door and the same operating leverage is employed for manually opening the door.

The fire door control is also provided with an electrical switch actuating member that controls the electrical circuit to the ventilator blower whereby this circuit is interrupted when the fire door is closed. Where only manual control of the door is provided, the same switch actuating member is used for automatically controlling the circuit of the blower motor when the door operating leverage is tripped.

Further details of this invention will be set forth in the following specification, claims and drawing in which, briefly:

FIG. 1 is a sectional view taken through the hood or canopy over the cooking ranges and showing the fire door in open position so that the cooking gases are exhausted as shown by the arrows;

FIG. 2 is a sectional view similar to FIG. 1 except

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that it shows the fire door operating leverage which is positioned behind the rotatable baffle shown in FIG. 1;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2; and

FIG. 4 is a wiring diagram of the electrical controls employed in accordance with this invention.

Referring to the drawing in detail there is shown in FIGS. 1 and 2 detail views of the door control employed in the broiler hood. The top wall structure 10 of the hood is connected to and opens into the stack 11 in which a suitable exhaust blower and motor (not shown) are positioned. This hood is provided with a front wall 12 and a back wall 13. The front wall terminates in a trough 14 and slightly above this trough there is provided an inclined wall 15 which terminates in a vertical section that defines one of the lips 16 of the opening that is adapted to be closed by the door 17 which is provided with a slotted vertical member 18 of triangular shape. The door 17 is supported by the hinge 20 on the corner of the horizontal wall 21 and vertical wall 22 shown in FIG. 2. The horizontal wall 21 extends from the door 17 to the front wall 12.

The door operating mechanism which will be described in detail hereinafter, is positioned between the horizontal walls 22 and 23 which extend between the front wall 12 and the wall 22. While the walls 21 and 23 are shown joined to these walls 12 and 22, they may be provided with wall extensions positioned behind the front wall 12 and in front of wall 22 to form the front and back of the rotor housing 24 that is positioned just behind this door operating mechanism, and in such cases the bottom and top of this housing are extensions of the walls 21 and 23 respectively.

The rotatable vane structure 25 shown in FIG. 1 is of the type disclosed in Patent No. 2,793,712. This structure is adapted to be positioned in a housing having a bottom wall and a top wall which may be extensions of the walls 21 and 23, although they may be separate. Two or more rotatable vane structures may be employed in one ventilator if desired, and these may be located one on each side of the door operating mechanism so that this mechanism is located between a pair of the rotatable vanes.

The member 18 that is attached to the door 17 is provided with an elongated slot 19 in which the pin 26 carried by the actuating rod 27 is positioned. The rod 27 is provided with a collar 28 which is fixedly attached thereto and engages one end of the compression spring 29. The spring 29 is positioned between this collar and the wall 30 through which the rod 27 extends so that this spring is compressed when the door 17 is open. The walls 22 and 30 are provided with holes through which the rod 27 extends and which provide bearings for this rod. The wall 30 defines a compartment in which are positioned the door latching and trip mechanisms, including the relay 31 and the blower cut-out switch 32.

The latch 33 is supported on the wall 30 by a spring hinge 34 and this latch carries a member 35 that is adapted to engage the forward end member 37 attached to the members 36. The forward end member 37 is also fixedly attached to the rod 27. The members 36 comprise a pair of elongated members that are held together by the end member 37 and by bearing members 38 in which the rod 39 is slidably supported so that this rod is adapted to slide in and out between said elongated members. The rod 39 is provided with a trip member 40 which is fixedly attached to said rod and is adapted to engage the forward portion of the trip lever 41 that is pivotally attached to the members 36 by the pin 42. The rod 39 is also provided with an actuating handle 43 that is positioned on the outside of the wall 12.

The latch 33 is provided with an extension to which

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the upstanding member 44 is attached and this member is pivotally attached to the armature of the relay 31 which is supported by a suitable bracket attached to the top wall portion 45 of the compartment. One of the elongated members 36 is provided with a switch actuating member 46 shown in FIGS. 2 and 3 which is shaped with a horizontal portion and an inclined portion for the purpose of actuating the switch 32 when the members 36 are shifted laterally. The switch 32 is supported on the bracket 47 that is attached to the wall 12.

The inclined wall 15 is positioned below the rotatable vane structure and as a result grease will collect on this wall. In order to facilitate removal of the grease collected, this wall may be made removable. It may also be provided with an angular extension extending down into the trough 14 to hold it in place. On the other hand the wall 15 may be provided with a door similar to the door 48 in the inclined opposite wall. The door 48 is provided with edge flanges that are frictionally held in a groove formed around the door opening.

The door 17 may be opened by pulling the rod 39 outward by gripping the handle 43 and when this is done the pin 26 carried by the rod 27 slidably engages the member 18 in the slot 19. Thus when the door 17 is closed this pin is in the upper end of the slot 19 as shown by the broken lines, and when the door is open it is in the lower end of this slot, as shown in FIGS. 1 and 2. The door is opened by pulling forward on the handle 43 so that the trip member 40 engages the inner member 38 and then pulls the members 36 and 27 forward. The spring 29 that is positioned on the rod 27 between the collar 23 and the wall 30 is then compressed. The door is held open and the spring 29 is held compressed by the latching member 33 which engages the end member 37 of the members 36 and thus prevents the spring 29 from closing the door 17 until this latch member is released. Releasing the latch member may be accomplished manually by pressing the handle 43 and causing the rod 39 to press the trip member 40 against the pivoted lever 41 thereby lifting the latch member 33 clear of the ends of the members 36. Also, releasing the latch member may be accomplished by energizing the relay 31, thereby causing this relay to lift its armature and the latch member 33.

Releasing the latch member permits the spring 29 to close the door 17 and at the same time the members 36 are shifted to left, whereupon the switch controlling member 46 is also moved to the left, thereby permitting the switch 32 to be opened to cut off the blower motor (not shown) that is positioned in the ventilator stack.

In the wiring diagram there are illustrated two electromagnetic devices 31 and 31a and a pair of switches 32 and 32a which are connected to individual terminal boards 48 and 48a, and this arrangement may be employed for controlling a pair of door operating mechanisms that may be provided to a single ventilator structure and blower arrangement.

The wiring diagram illustrates a pair of terminal blocks 48 and 48a, each having five terminal positions A, B, C, D and E, and each of these terminal positions includes an upper terminal and a lower terminal. Each of these terminal blocks may be positioned in a housing with the relay 31 and switch 32, as shown in FIG. 2, that are connected to selected lower terminals thereof. The lower terminals A and C of the block 48 are connected to a suitable source of current supply such as the conventional 115 v. supply. One side of the relay 31 is also connected to the lower terminal C and the other side of this device is connected to the lower terminal B. The lower terminals D and E are connected to the blower cut-out switch 32. In the case of the terminal block 48a, the lower terminals B and C are connected to the electromagnetic device 31a and the lower terminals D and E are connected to the switch 32a. The upper terminals A and B of each of the blocks 48 and 48a are connected together by the conductors 49 and 50 and the thermostats 51 are

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bridged across these conductors as shown. The manual switch 52 is also bridged across these conductors. Accordingly, when either of the thermostatic switches 51 or the manual switch 52 are closed, the circuits between the 115 v. current supply and the windings of the devices 48 and 48a are closed.

The upper terminal C of the blocks 48 and 48a are connected together by the conductor 53, and also the upper terminals D are connected together by the conductor 54. The upper terminals E of the blocks 48 and 48a are connected to the respective upper terminals of the blower control switch 55 by the conductors 56 and 57, respectively. The lower terminals of this switch 55 are connected to the magnetic switch 58 which is connected to the 110 v., 220 v. source of supply, and to the blower motor 59. The blower motor 59 and the blower associated therewith are positioned to provide a forced draft through the passage of the ventilator structure, and for this purpose they may be located at any desirable point along the stack 11 forming this passage.

The thermostats 51 are located on the lower parts of the hood or canopy where they would be most likely affected by ignited cooking gases so that they can function immediately to energize the door closing mechanism which is instrumental in turning off the blower motor and in closing the draught through the stack. Furthermore, the operator can, by closing the manual switch 52, cause the electro-magnetic device 31 to unlatch the door closing mechanism or he can accomplish this by pressing on the handle 43 which also unlatches the door closing mechanism.

While we have shown and described a preferred manner of carrying out our invention, and a preferred apparatus for the same purpose, the invention is obviously capable of modification and variation from the form shown, so that the scope thereof should be limited only by the scope of the claims appended hereto.

What I claim is:

1. In a ventilator structure adapted to be used for exhausting gases from cooking ranges, the combination of a wall structure forming a ventilating passage for exhausting cooking gas, said passage having an opening near the bottom thereof for admitting said cooking gases, a door for closing said opening, means comprising a hinge for pivotally attaching said door to said wall structure, a plate member having an elongated slot, means for attaching said member to the top of said door so that said slot extends substantially in the direction in which said door is opened, operating means for opening and closing said door, said operating means comprising a rod having means at one end slidable in the slot of said plate member, a pair of elongated telescoping members comprising a forward member and a rearward member, bearing means attached to one of said telescoping members for slidably mounting the other of said members, means for connecting said rearward member to the other end of said rod, a hand grip connected to the free end of said forward member, additional wall structure for slidably supporting said forward member on said wall structure so that said hand grip extends out in front of said additional wall structure, stop means on the inner end of said forward member for engaging means on said rearward member to limit the outward extension of said forward member from said rearward member when said hand grip is pulled forward and said door is lifted open, holding means for holding said door in lifted open position comprising a latch member pivotally mounted on said additional wall structure above said rod so that the free end of said latch member is adapted to engage said rearward member for holding said door in open position, and means mounted on said rearward member adapted to be engaged by said stop means of said forward member for lifting said latch member to disengage it from said rearward member so that said door is released from its lifted open position.

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2. In a ventilator structure adapted to be used for exhausting gases from cooking ranges, the combination of wall structure forming a ventilating passage for exhausting cooking gas, said passage having an opening near the bottom thereof for admitting said cooking gases, a door for closing said opening, means comprising a hinge for pivotally attaching said door to said wall structure, a plate member having an elongated slot, means for attaching said plate member to one side of said door so that said slot extends substantially in the direction in which said door is opened, operating means for opening and closing said door, said operating means comprising a rod having means at one end slidable in the slot of said plate member, a pair of elongated telescoping members comprising a forward member and a rearward member, bearing means attached to one of said telescoping members for slidably mounting the other of said members, means for connecting said rearward member to the other end of said rod, a hand grip connected to the free end of said forward member, additional wall structure for slidably supporting said forward member and said rod on said wall structure so that said hand grip extends out in front of said additional wall structure, stop means on the inner end of said forward member for engaging means on said rearward member to limit the outward extension of said forward member from said rearward member when said hand grip is being pulled forward and said door is being opened, a spring mounted on said rod, means on said rod for engaging one end of said spring and pressing the other end against said additional wall structure when said door is open, holding means comprising a latch member pivotally mounted on said additional wall structure, one end of said latch member being adapted to engage said rearward member for holding said door in open position, and means mounted on said rearward member adapted to be engaged by said stop means of said forward member for moving said latch member to disengage it from said rearward member so that said spring is released to move said door into its closed position.

3. In a ventilator structure adapted to be used for exhausting gases from cooking ranges, the combination of wall structure forming a ventilating passage for exhaust-

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ing cooking gas, said passage having an opening near the bottom thereof for admitting said cooking gases, a door for closing said opening, means comprising a hinge for pivotally attaching said door to said wall structure, a plate member having an elongated slot, means for attaching said plate member to the top of said door so that said slot extends substantially in the direction in which said door is opened, operating means for opening and closing said door, said operating means comprising a rod having means at the rear end thereof slidable in the slot of said member, a pair of elongated telescoping members comprising a forward member and a rearward member, said rearward member comprising a pair of parallel strip members and spacing means attached to the end portions of said strip members for holding them in parallel spaced relation, bearing means attached to said rearward member for slidably mounting said forward member between said parallel strip members, means for connecting said rearward member to the forward end of said rod, a hand grip connected to the free end of said forward member, additional wall structure for slidably supporting said forward member on said wall structure so that said hand grip extends out in front of said additional wall structure, stop means on the inner end of said forward member for engaging one of the spacing means of said rearward member to limit the outward extension of said forward member from said rearward member when said hand grip is pulled forward and said door is lifted open, holding means for holding said door in lifted open position comprising a latch member pivotally mounted on said additional wall structure above said rod so that the free end of said latch member is adapted to engage said rearward member for holding said door in open position, and means mounted on said rearward member adapted to be engaged by said stop means of said forward member for lifting said latch member to disengage it from said rearward member so that said door is released from its lifted open position.

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