May 26, 1953 C. J. MAJAUSKAS 2,639,440

VENTILATOR FOR WATER CLOSETS

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Fig. 1

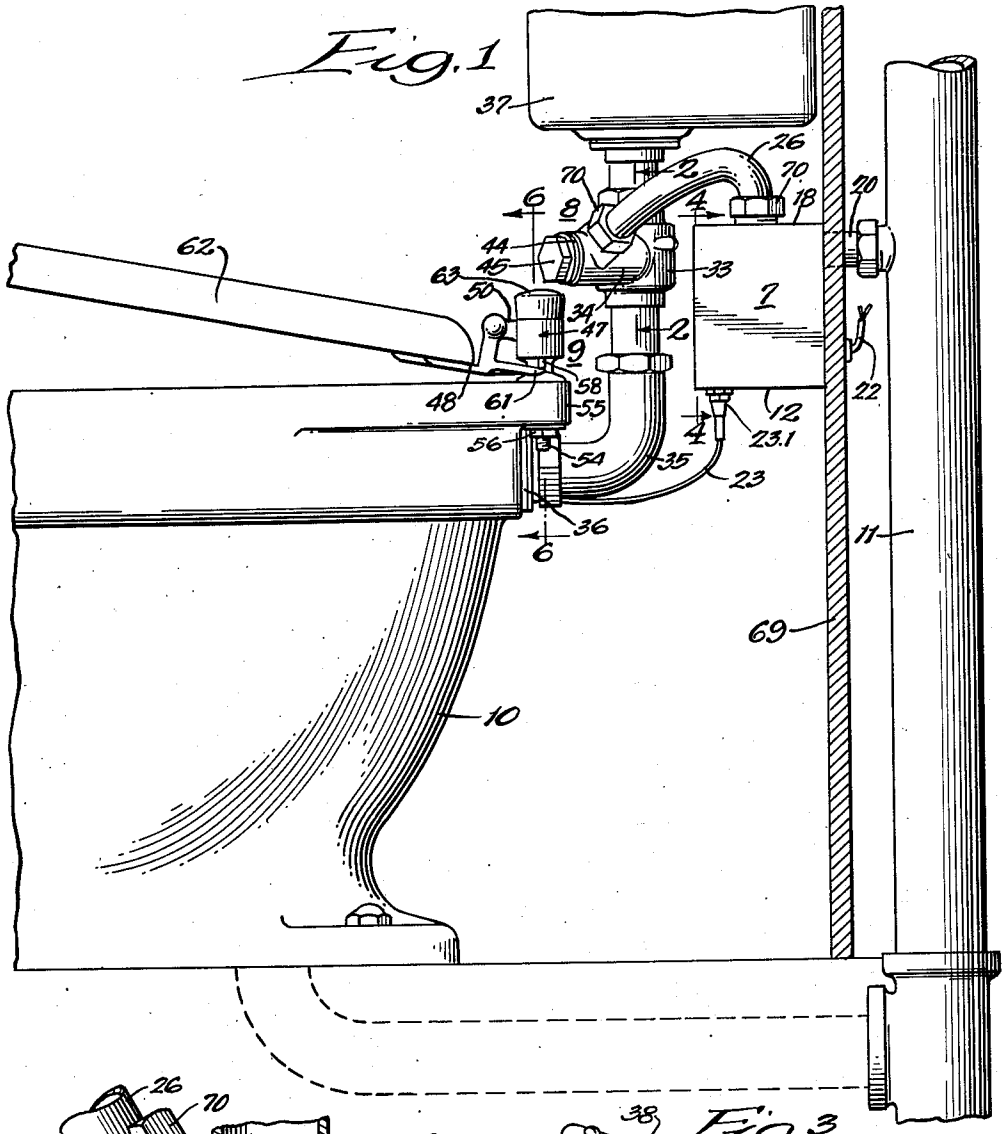


Fig. 2

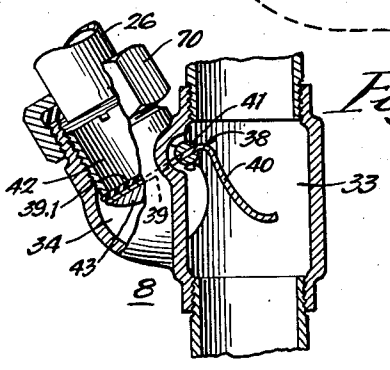
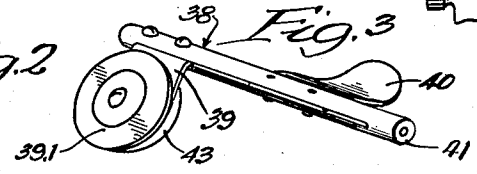


Fig. 3



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Fig. 5

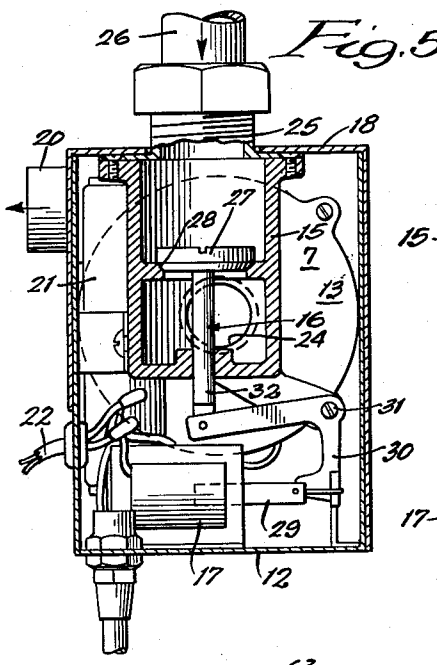


Fig. 4

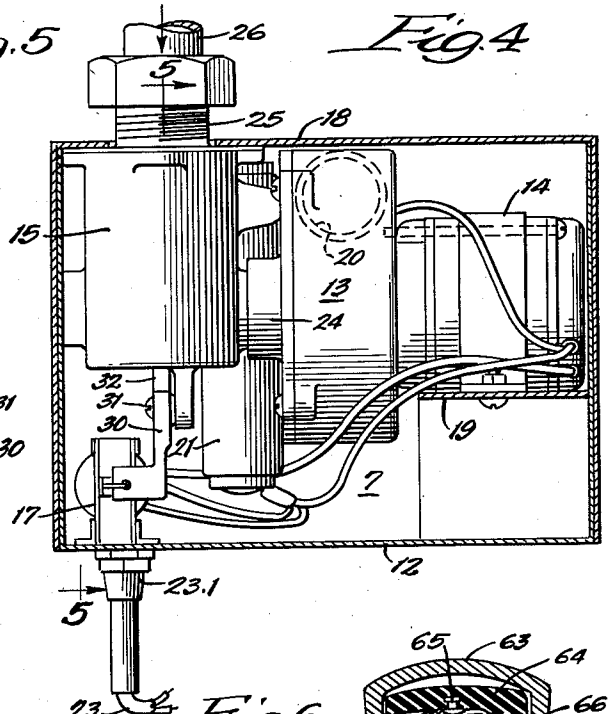
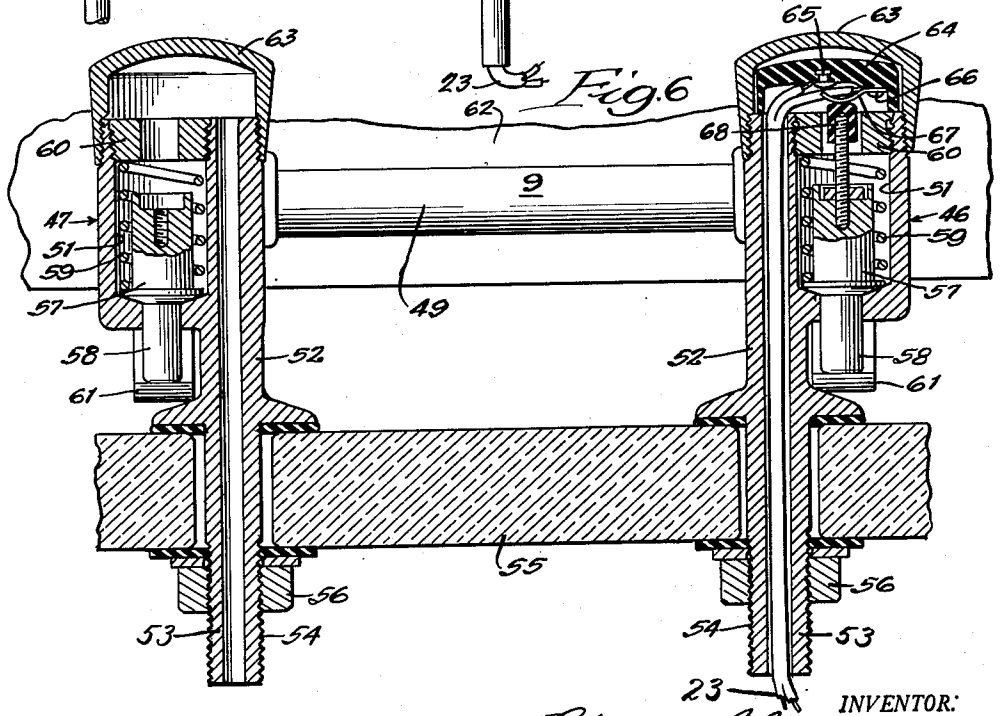


Fig. 6



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VENTILATOR FOR WATER CLOSETS

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4 Claims. (Cl. 4—213)

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This invention relates to ventilators for water closets.

The dissipation of odors from a water closet directly at the time of its use has obvious advantages. Various forms of equipment have been devised heretofore for this purpose. However, they generally have been cumbersome in construction, rather unattractive in appearance and not too effective in function.

The main objects of this invention, therefore, are to provide an improved ventilator for water closets, the functioning of which is initiated at the time the closet is put in use; to provide a ventilator of this kind having an improved compact arrangement of a motor-driven blower and a normally closed vent valve in a casing adapted to be conveniently located apart from, yet as adjacent as required to, a closet bowl to permit direct connection to the flushing water pipe and the conventional vent stack; to provide an improved attractive form of arrangement of a seat mounting for housing a switch for controlling the operation of the motor-driven blower and the shifting of the vent valve; to provide an improved ventilator of this kind having a safety valve for preventing a surge of flushing water from reaching the blower; and to provide an improved ventilator of this kind which is simple and compact in construction, hence economical to manufacture, easy to install, and effective in functioning.

In the particular embodiment of this invention, shown in the accompanying drawings:

Figure 1 is a side elevation of this improved water closet ventilator shown mounted on a wall adjacent and connected to a water closet bowl and flush tank;

Figure 2 is an enlarged cross-sectional detail of the safety valve fitting adapted for interposition in the flush water pipe and which prevents a surge of the flushing water from reaching to the blower;

Figure 3 is a perspective view of the valve member for the same removed from the fitting;

Figure 4 is a section through the ventilator housing taken on the plane of the line 4—4 of Fig. 1, showing in elevation the motor-driven blower and the solenoid operated vent valve;

Figure 5 is a transverse sectional elevation of the same, taken on the line 5—5 of Fig. 4; and

Figure 6 is an enlarged cross-sectional elevation of the seat hinge mounting, as viewed from the plane of the line 6—6 of Fig. 1.

An improved water closet ventilator constructed in accordance with this invention comprises the ventilator unit 7, a safety valve fitting 8, and a seat-operated switch means 9, designed for attachment and operation to effect the ventilation of a water closet bowl 10 to the conventional vent stack 11 at the time the closet is put into use.

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The ventilator unit 7 comprises a housing 12 wherein is mounted a blower 13, driven by a motor 14, and a vent valve fitting 15, the valve 16 of which is actuated by a solenoid 17.

The housing 12, as herein shown, is of rectangular form. Its open top permits the insertion and appropriate location of the parts just described. A hood 18 telescopes with the vertical walls of the main part of the housing 12 to form a closure for the open top thereof. The housing is provided with suitably placed apertures through which fastening means may be inserted for attaching the unit to a wall 69.

The blower 13, preferably of the impeller type, is directly mounted on the motor 14, which is supported on a base spaced above the bottom of the housing 12. The blower 13 has its exhaust 20 extending exteriorly of the housing 12 for connection with the vent stack 11.

The motor 14 is a conventional, fractional horsepower motor adapted for small units of this kind. It has associated therewith a condenser 21 interposed between the wires 22 to a source of electrical power and the wires 23 to the switch mechanism 9. The wires 23 enter the housing 12 through a section of conduit secured to the housing 12 by a fastening means 23.1

The vent valve fitting 15 is directly connected to the intake 24 of the blower 13 and has a nipple 25 extending exteriorly of the housing 12 which is connected to the safety valve fitting 8 by a pipe 26. The valve 16 is arranged for vertical movement in the fitting 15 so that gravity normally urges the valve head 27 to rest on the seat 28 thereby closing communication between the bowl 10 and the vent stack 11 when the motor 14 is idle.

The solenoid 17 is located in the housing 12 below the valve fitting 15, and is energized concurrently with the blower motor 14 to open valve 16. Its armature 29 is connected to a bell crank lever 30 pivoted at 31 and attached to a stem 32 of the valve 16.

The safety valve fitting 8 is of a construction substantially such as shown in Patent No. 2,449,134. This fitting is approximately T-shaped with a main part 33 and a stem part 34. The main part 33 is threaded so that it may be conveniently inserted in the flush water pipe 35 which leads from a source of water to the flush water inlet 36 for the closet bowl 10. This source of flush water may be either a tank 37 such as shown in Figure 1, or it may be a valve-controlled water

pressure source, such as is commonly used for water closets, particularly in large buildings and institutions.

The valve 38 comprises a disk-shaped cap part 39 and a lever 40 secured in axially spaced relationship on opposite sides of a hinge pin 41. The hinge pin 41 mounts the valve 38 so that the cap part 39 is disposed to close the end of the port 42 in the fitting stem port 34 and locates the lever 40 in the main part 33. A suitable gasket 39.1 is secured to the cap 39 to seal the port 42. A weight 43 on the back of the cap part 39 normally holds the valve 38 with the cap part 39 retracted from the port 42, whereby communication is normally open from the closet bowl 10 through the port 42, the connecting pipe 26 and the vent valve fitting 15. The lever 40 is so shaped and dimensioned that when the closet is flushed the surge of water through the fitting 33 will cause the lever 40 to shift the cap 39 to close the port 42, preventing any back-flow of water up through the pipe 26 into the fitting 15 from whence the water might reach the mechanism in the housing 12. The stem part 34 of the fitting 8 has an inspection port 44 in which is secured a threaded plug 45 (see Fig. 1).

The seat-operated switch means 9 comprises a pair of posts 46 and 47, and a pair of seat hinge brackets 48 connected at the ends of a shaft 49, supported in bearings 50 offset from the respective posts 46 and 47.

The posts 46 and 47, are identical, except that one is right-hand and the other is left-hand, as most clearly shown in Fig. 6. Each is provided with a chambered hub part 51 offset from a channelled stem 52. The stems 52 have a downward extending portion 53 with threads 54 whereby the posts may be secured on the rim 55 of the bowl 10 by nuts 56.

A plunger 57 having an integral pin 58 is mounted in each of the chambered hub parts of posts 46 and 47, with plunger pin 58 extending exteriorly parallel to the post stem 52. A spring 59 is compressed against each plunger 57 by a threaded plug 60 so that the plunger pin 58 is normally depressed. The seat brackets 48 are attached to the rear underside of a seat 62. Tongues 61 on these brackets normally contact the plunger pins 58 so as to dispose the seat 62 at a slight angle to the top of the bowl 10. The construction can, of course, be such as to allow tongue 61 to break contact with plunger 58 and permit the seat 62 to be raised to a vertical position.

Each of the posts 46 and 47 is closed at its upper end by a threaded cap 63. Within one of these caps, which as herein shown is for post 46, is an insulating block 64 mounting a pair of electrical contacts 65 and 66 which are adapted to be closed by a switch arm 67 actuated by a switch pin 68 adjustably supported on the plunger 57. The wire 23 leads up through the channelled stem 52 of the post 46 to the contacts 65 and 66.

This improved ventilator unit 7 may be conveniently secured at any suitable point on the wall 69, more or less out of the way from a water closet bowl 10, flushing water for which is supplied from a tank 37, as herein shown, or from a valve-controlled water pressure line. Or, on occasion, the ventilating unit could be associated with an overhead flushing water tank. Mounting the housing on the wall 69, of course, will necessitate cutting a hole through the wall 69 to permit the exhaust 20 of the blower 13 to be connected to the usual vent stack 11. Also, it will require the cutting of a hole sufficient to provide for the wires 22 leading to a source of electricity.

The safety valve fitting 8 would be interposed in the flush water pipe 35 and connected to the nipple 25 of the valve fitting 15 by the pipe 26. The pipe 26 preferably would be of brass or copper so that it could be bent to the desired shape, to span these connections. Each end would be connected to these respective parts by the usual slip nut.

It will be seen from the foregoing description that the operation is as follows. Seat 62 is depressed causing tongue 61 of bracket 48 to raise plunger pin 58 against the action of spring 59. Switch pin 68 will force up switch arm 67 closing electrical contacts 65 and 66 energizing solenoid 17 and motor 14 of blower 13.

Upon energizing solenoid 17, armature 29 will actuate lever 30 opening valve 16. Valve 38, between the flush water pipe 35 and ventilating unit 7, will be opened due to gravity acting on weight 43 and the lack of flushing water in the flush water pipe 35. This completes an open circuit for evacuating gases from water closet bowl 10 into vent pipe 11 through the flush water pipe 35, through valve 38, through pipe 26, through valve 16, through blower 13, into vent pipe 11.

When the flushing water enters pipe 35, valve 38 will be closed due to the action of the flushing water on lever 40, thus cutting off the open circuit and preventing water from entering the ventilating unit. When seat 62 is released, spring 59 opens the electrical contacts 65 and 66 by retracting switch pin 68 and raises seat 62 at an angle by causing plunger pin 58 to bear on tongue 61.

Variations and modifications in the details of the structure and arrangement of the parts may be resorted to within the spirit and coverage of the appended claims.

I claim:

1. A ventilator for a water closet bowl including a motor driven blower having an intake and an exhaust communicating with the closet bowl and with a vent stack respectively, the combination therewith of a vertically disposed pair of posts mounted on said bowl and having chambered hub parts offset from channeled stems extending through a rim portion of said bowl, plungers within said hubs having pins extending downwardly below said hubs, seat hinges pivotally secured to said posts, tongues on said hinges normally contacting the lower ends of said pins, springs disposed within said hubs and urging said pins downwardly to partially raise the bowl seat, an insulating block mounting a pair of spaced electrical contacts and disposed within the upper part of the hub of one of said posts, wires extending through the channeled stem of said one post connected to said contacts and connected to the motor, and an insulating member carried by said plunger in said one post and adapted to close said contacts when said seat is depressed against the action of said springs.

2. A ventilator for a water closet bowl including a housing adapted to be mounted on a building wall adjacent to a vent stack, a vent valve fitting disposed within said housing and having an inlet and outlet, a motor disposed within said housing, a blower driven by said motor and having inlet and outlet ports, means to connect the

inlet and outlet of said valve fitting to said bowl and inlet port of said blower respectively, means to connect the outlet of said blower to said vent stack, a valve within said valve fitting biased to close communication between said bowl and blower, an actuating arm on said valve extending through said valve fitting, a solenoid within said housing having its armature connected to said actuating arm and adapted to move the valve to open position when the solenoid is energized, and an electrical switch operable to energize said motor and solenoid and thereby drive said blower and move said valve to an open position.

3. In a ventilator for a water closet bowl including a housing adapted to be mounted on a building wall adjacent to a vent stack, a vent valve fitting disposed within said housing and having an inlet and outlet, a motor disposed within said housing, a blower driven by said motor and having inlet and outlet ports, means to connect the inlet and outlet of said valve fitting to said bowl and inlet port of said blower respectively, means to connect the outlet of said blower to said vent stack, a valve within said valve fitting biased to close communication between said bowl and blower, an actuating arm on said valve extending through said valve fitting, a solenoid within said housing having its armature connected to said actuating arm, a vertically disposed pair of posts mounted on said bowl and having chambered hub parts offset from channeled stems extending through a rim portion of said bowl, plungers within said hubs having pins extending below said hubs, seat hinges pivotally secured to said posts, tongues on said hinges normally contacting the lower ends of said pins, springs disposed within said hubs and urging said pins downwardly to partially

raise the bowl seat, an insulating block mounting a pair of spaced electrical contacts and disposed within the upper part of the hub of one of said posts, wires extending through the channeled stem of said one post connected to said contacts and connected to the motor and solenoid in said housing, and an insulating member carried by said plunger in said one post and adapted to close said contacts when said seat is depressed against the action of said springs to energize said motor and solenoid and thereby drive said blower and open said valve.

4. The combination as set forth in claim 3, in which the communication between the vent valve and the bowl includes a conduit supplying flushing water to said bowl, and in which a safety valve is interposed between the blower and the bowl, said safety valve including an actuator located in said stream of flushing water and adapted to close said communication whenever flushing water is flowing.

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