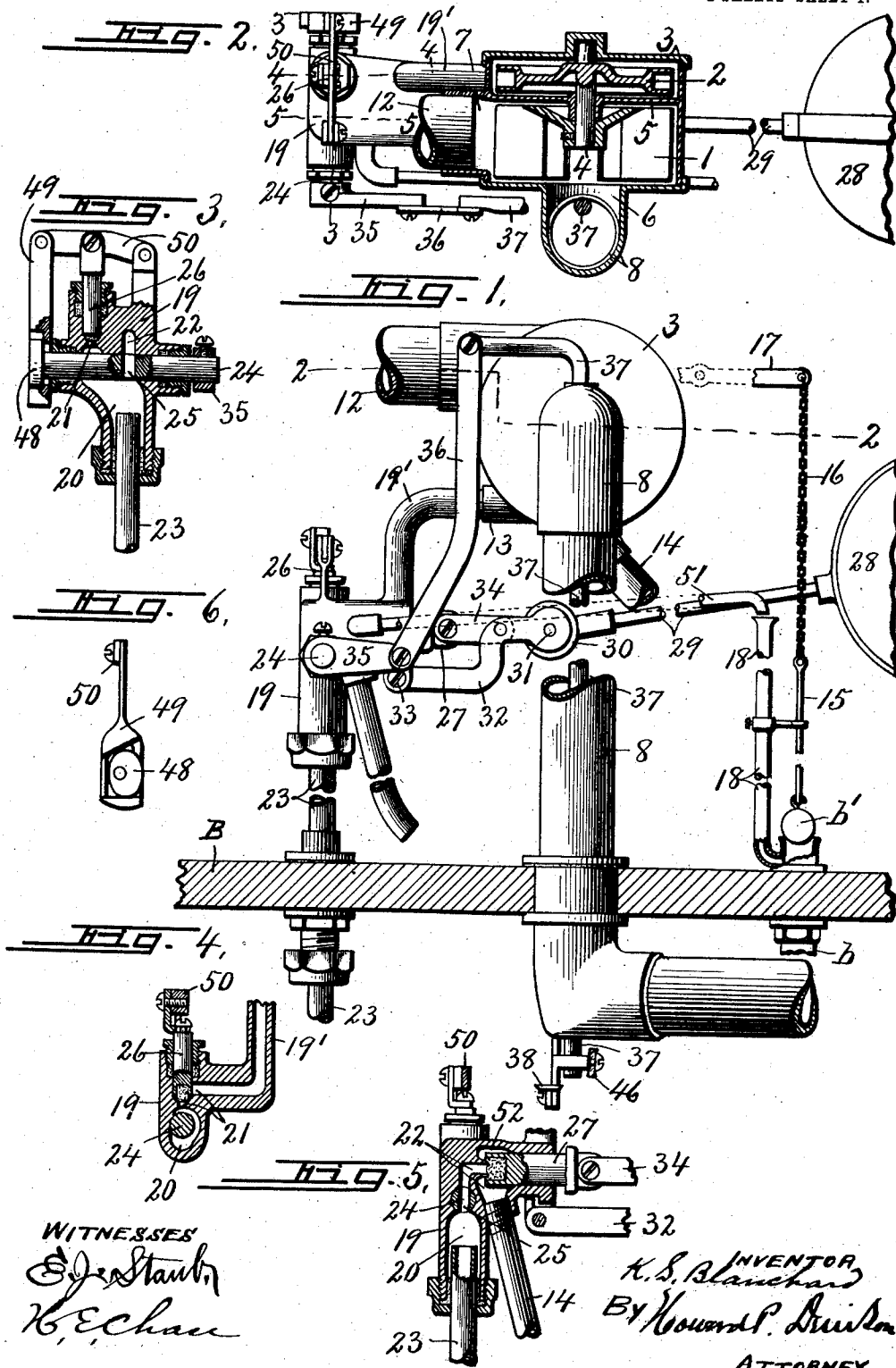


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VENTILATOR FOR WATER CLOSETS.
APPLICATION FILED AUG. 15, 1911.

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2 SHEETS—SHEET 1.

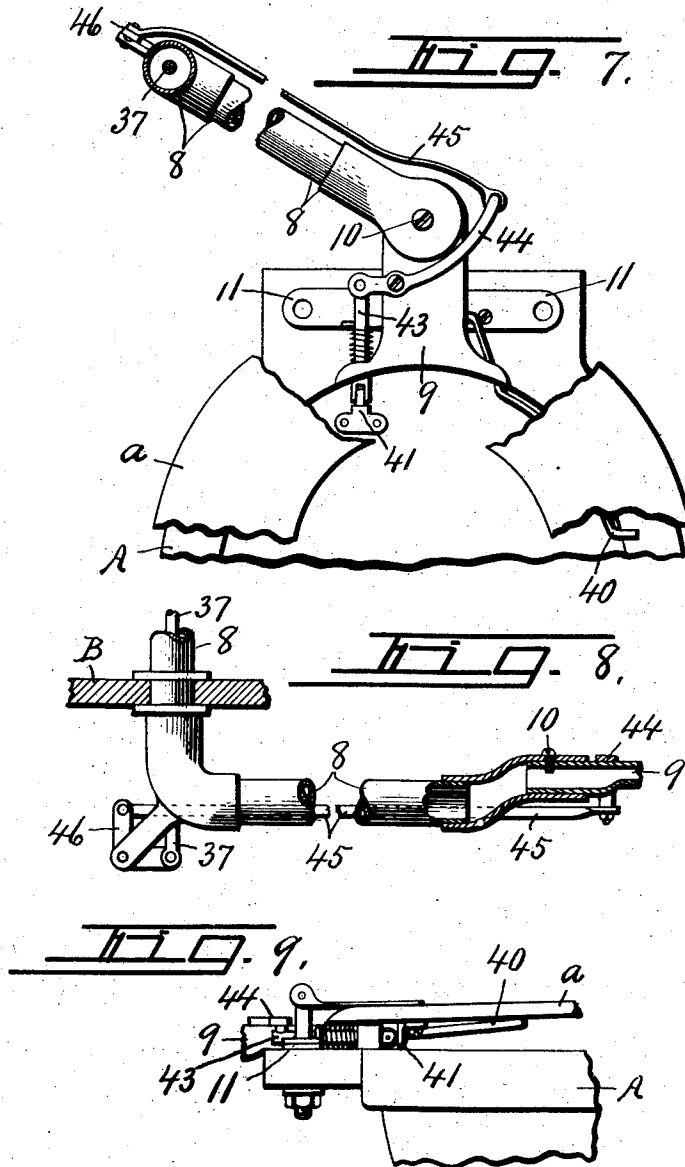


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2 SHEETS-SHEET 2.



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KIRK S. BLANCHARD, OF BROOKLYN, NEW YORK.

VENTILATOR FOR WATER-CLOSETS.

1,025,364.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed August 15, 1911. Serial No. 644,133.

To all whom it may concern:

Be it known that I, KIRK S. BLANCHARD, of Brooklyn, in the county of Kings, in the State of New York, have invented new and useful Improvements in Ventilators for Water-Closets, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in ventilators for water closets of the class set forth in my Patent #996,906 issued July 4, 1911, in which a suitable suction device connected to the interior of the bowl is driven by a water motor discharging into the tank and to which the water under pressure is supplied through one branch of a water supply pipe having another branch passage leading directly into the tank with separate valves for controlling the passage of water through both passages, the valve for the direct passage being controlled by a float in the tank. These several mechanisms are preferably located within the tank and owing to the fact that the available space within the interior of the tank is relatively small it has become necessary to devise some means for reducing the number of units and still carry out the main object of setting the ventilating device in motion automatically or voluntarily by the depression of the seat so that the ventilating action will continue as long as the seat is occupied and at the same time will cause the delivery of extra amount of water into the tank for light flushing of the bowl during such action independently of the ball cock, flush valve and their operating mechanisms.

One of the objects, therefore, of my invention is to simplify the construction and operation of the entire ventilating mechanism and to bring all of the elements into a more compact space by arranging all of the valves exclusive of the flush valve within a single valve case in close permanent connection with the motor and fan case.

Another object is to render the motor controlling valve dependent upon the action of the valve which controls the supply of water to the ball cock so that when the main valve is in its normal open position, the motor valve will be closed and when the main valve is closed the motor valve will be opened, both of these actions being inde-

pendent on the ball cock which is controlled by the rise and fall of the water in the tank through the medium of the float.

A still further object is to provide means for normally holding the seat in a slightly elevated position.

Other objects and uses relating to specific parts of the apparatus will be brought out in the following description:

In the drawings—Figure 1 is an elevation partly broken away of the greater portion of my improved ventilating apparatus showing a portion of the bottom of a flush tank within which the motor, suction fan and valve case together with portions of the suction pipe are mounted, portions of the flush valve and its operating mechanism and also the refill pipe being illustrated in the same figure. Fig. 2 is a horizontal sectional view through the motor and fan taken on line 2—2 Fig. 1 showing the valve case and valve operating mechanism in top plan. Figs. 3, 4 and 5 are sectional views through the valve case and valves therein taken respectively on lines 3—3, 4—4 and 5—5 Fig. 2. Fig. 6 is an end elevation of the detached cam and link operated thereby for imparting motion from the main controlling valve to the motor valve. Fig. 7 is a top plan of a portion of a closet and seat showing the ventilating pipes, seat elevating spring and mechanism for transmitting motion from the seat to the main controlling valve. Fig. 8 is a side elevation partly in section of the ventilating pipes shown in Fig. 7 together with adjacent portions of the lever and link and connections for transmitting motion from the seat to the main valve. Fig. 9 is a side elevation of a portion of a bowl and seat together with the seat lifting spring and plunger actuated by the depression of said seat.

In order that my invention may be clearly understood, I have shown portions of a bowl A and flush tank B, the bowl A being provided with a suitable seat —a— which may be mounted in any well known manner upon the bowl for vertical rocking movement relatively thereto, leaving sufficient intervening clearance between the rear portions of the bowl and seat for the reception of a laterally flaring section of a suction pipe hereinafter described.

The ventilating apparatus forming the subject matter of this invention is mounted within or upon the flush tank —B— and comprises among other elements a rotary suction fan —1— and a coaxial water motor —2— both of which are mounted within a suitable inclosing case —3— and upon a shaft —4— journaled therein, the fan chamber and motor chamber being separated from each other by a partition —5— as best seen in Fig. 2.

The fan case or chamber —1— is preferably circular and provided in its outer side with a central inlet —6— and is also provided with a tangential outlet —7— in its peripheral wall, the inlet —6— being connected to a suction pipe —8— which extends downwardly through the bottom of the tank B and is provided at its lower end with a laterally swinging section —9— which is comparatively thin vertically and flared laterally to easily fit in the opening between the rear sides of the seat and bowl as previously mentioned. The section —9— is preferably pivoted at —10— to the adjacent end of the section —8— so as to be easily adjustable to conform to the position of the bowl relatively to the suction pipe and if necessary may be fastened to the bowl or to the supporting frame (not shown) for the seat for which purpose it is provided with laterally projecting apertured lugs —11—. Leading from the outlet —7— is a suitable pipe —12— which may extend to the exterior of the building or to any other ventilating pipe or flue not necessary to herein illustrate or describe.

The motor chamber is provided with a substantially tangential inlet —13— in its peripheral wall and an outlet pipe —14— extending downwardly therefrom and discharging into the interior of the tank —B— which is provided with the usual flush pipe —b— having its upper end projecting a short distance above the bottom of the tank and forming a seat for a flush valve —b'— the latter being connected by a rod —15— and chain —16— to a suitable hand-operated lever —17—. An overflow pipe —18— is connected to the inner end of the flush pipe —b— directly beneath the valve seat to provide for overflow in excess of a predetermined quantity of water in the tank, thereby determining the normal level of such water. A valve case —19— is located within the tank —B— and connected by a pipe —19'— to the inlet —13— of the motor chamber of the casing —1— for conducting the motor fluid thereto. This valve case is provided with an inlet —20— and separate outlets —21— and —22—, the inlet —20— being connected to a supply pipe —23— for the motive fluid such as water under pressure and is in permanent communication with the outlet port —21—.

Communication between the inlet —20— and outlet —22— is controlled by a main valve —24— consisting of a rock shaft having an opening —25— therethrough movable into and out of registration with the outlet —22— as best seen in Figs. 3 and 5. The outlet —21— is provided with a motor controlling valve —26— as shown in Figs. 3 and 4 while the outlet —22— is provided with a float controlled valve —27— as shown in Fig. 5.

When the tank B is filled to a predetermined level with water and the motor and fan are at rest, the valves —26— and —27— are closed and the main valve —24— is open so that the water pressure is normally on both of the valves —26— and —27—. The action of the valve —26— is dependent upon the operation of the valve —24— as will be hereinafter more fully described, while the action of the valve —27— is controlled by the rise and fall of water in the tank through the medium of a float —28— and suitable connections with the valve —27—.

As shown in Fig. 1 the float —28— is connected by a rod —29— to a clamping head —30— which is clamped by a pivotal bolt —31— to one end of a lever —32— having its other end pivoted by a screw —33— to suitable lugs on the valve casing —18—, the intermediate portion of said lever —32— being pivotally connected by a link —34— to the outer end of the valve —27— so that when the float is raised by the rising level of the water in the tank, the valve —27— will be closed, said valve being opened by the fall of the float when the water in the tank recedes by the opening of the flush valve —b'—. This action of the float valve is therefore entirely independent of the main valve —24— or motor controlling valve —26—.

The valve —24— extends laterally through suitable glands in opposite sides of the valve case and is provided at one end with a crank arm —35— which is connected by a link —36— to the upper offset end of an operating rod —37—. This rod —37— is preferably movable vertically within and through the opposite ends of the suction pipe —8— and as shown in Fig. 4 is connected to a suitable hand piece —38— by which it may be operated to open and close the valve —24—.

In practice, however, I prefer to operate the valve —24— automatically by suitable connections between the rod —37— and seat —a— and for this purpose I have shown the seat as normally and yieldingly held in a slightly elevated position by means of a spring —40— having one end secured to the section —9— of the suction pipe and its other end extending some distance forwardly and upwardly and adapted to bear

against the underside of the seat for holding the front edge of the latter some distance above the rim of the bowl.

Secured to the underside of the seat is a pendant projection —41— bearing against a suitable roller on the front end of a plunger rod —43— which is slidably mounted upon the section —9— as best seen in Fig. 9. The rear end of this plunger rod is pivotally connected to the short arm of a lever —44— which in turn is pivoted to the top of the section —9— and has its other longer arm connected by a link —45— to one arm of a bell crank lever —46—. This bell crank lever is pivoted to suitable lugs on the lower end of the suction pipe —8— and has its other arm connected to the operating rod —37— for the valve —24— so that as the seat is depressed against the action of the spring —40— by the occupant, the pendant shoulder —41— will force the plunger —43— rearwardly and thereby operate the lever —44— and its connection —45— with the operating rod —37— to draw the latter downwardly and thus close the valve —24—. The end of the valve —24— opposite that to which the crank arm —35— is secured is provided with a cam or eccentric —48—, the lower and upper sides of which are engaged by a yoke —49— having its upper end connected by a link —50— to suitable lugs on the valve casing —18—, the valve —26— being connected to the intermediate portion of the link —50—. The cam or eccentric —48— is adjusted so as to close and open the motor controlling valve —26— as the main valve —24— is opened and closed respectively. That is, when the main valve —24— is turned from its normal open position to its closed position by the depression of the seat —a— and connections between said seat and valve, the cam or eccentric —48— is similarly rocked to open the motor controlling valve —26— through the medium of the yoke —49—, and link —50—, thereby allowing the motor fluid as water to pass to the motor for operating said motor and fan.

It is now evident that this motor and fan will continue to operate as long as the seat —a— remains in its depressed position for the purpose of drawing the vitiated air from the bowl and that immediately upon the release of such pressure the seat will be elevated by the spring —43— and thereby cause the opening of the main valve —24— and consequent closing of the motor controlling valve —26—.

When desired the lever —17— may be operated to open the flush valve —b'— and allow the water to pass from the tank to the bowl which causes a depression of the float —28— and consequent opening of the valve —27— to admit a new supply of water to said tank through the outlet —22— and

downwardly extending pipe —14— leading therefrom. As the tank continues to fill to a predetermined level, the float —28— will be correspondingly elevated to close the valve —27— ready for repetition of the operation previously described.

After the bowl has been properly flushed it is desirable to supply additional water thereto and for this purpose I have provided what is commonly known as a refill pipe —51— having one end connected to a chamber —52— in the valve casing —18— surrounding the inner end of the float controlling valve —24—.

The operation of my invention will now be readily understood with reference to the foregoing description and the accompanying drawings, and while I have shown a cam or eccentric on the end of the main valve and suitable connections for operating the motor controlling valve, it is evident that other forms of connections may be employed without departing from the spirit of my invention.

What I claim is:

1. Ventilating apparatus for water closets in combination with a bowl and flush tank, a suction device, a water motor for said device, a valve casing having an inlet and separate outlets, one of said outlets leading to the motor, separate valves for said outlets, float operated means for controlling one of the valves, a main valve controlling communication between the inlet and the outlet in which said float controlled valve is located, means actuated by the main valve for controlling the operation of the other valve, and means for operating the main valve.

2. Ventilating apparatus for water closets in combination with a bowl and a flush tank, a suction device communicating with the bowl, a water motor for said device, a water supply pipe, a valve casing having an inlet connected to said water supply pipe and provided with separate outlets, one of said outlets discharging directly into the tank and the other outlet discharging into the motor, a normally open valve controlling communication between the inlet and one of said outlets, means actuated by said valve for closing and opening the other outlet as the valve is opened and closed respectively, a float operated valve for controlling the discharge of water through the outlet leading directly into the tank, and means for operating the first named valve.

3. The combination with a closet bowl having a vertically movable seat spring pressed upwardly from the bowl and depressible against the action of the spring, and a flush tank, of a ventilating apparatus comprising a suction device having a suction pipe connected to the bowl, a water motor for the suction device, a water supply

pipe, a valve casing having an inlet connected to the supply pipe and provided with separate outlets, one of said outlets discharging directly into the tank and the
5 other outlet discharging into the motor, a normally open valve controlling communication between the inlet and the outlet which discharges into the tank, means actuated by the seat when depressed for closing said
10 valve, an additional valve controlling com-

munication between the inlet and motor, and means actuated by the first named valve for opening the additional valve when the first named valve is closed.

In witness whereof I have hereunto set
my hand on this first day of August 1911.

KIRK S. BLANCHARD.

Witnesses:

GEORGE F. SEWARD,

GEORGE R. STURBERG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."