

E. E. LAUPHEAR.
VENTILATING AND FLUSHING APPARATUS FOR CLOSETS.
APPLICATION FILED MAY 25, 1909.

955,518.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

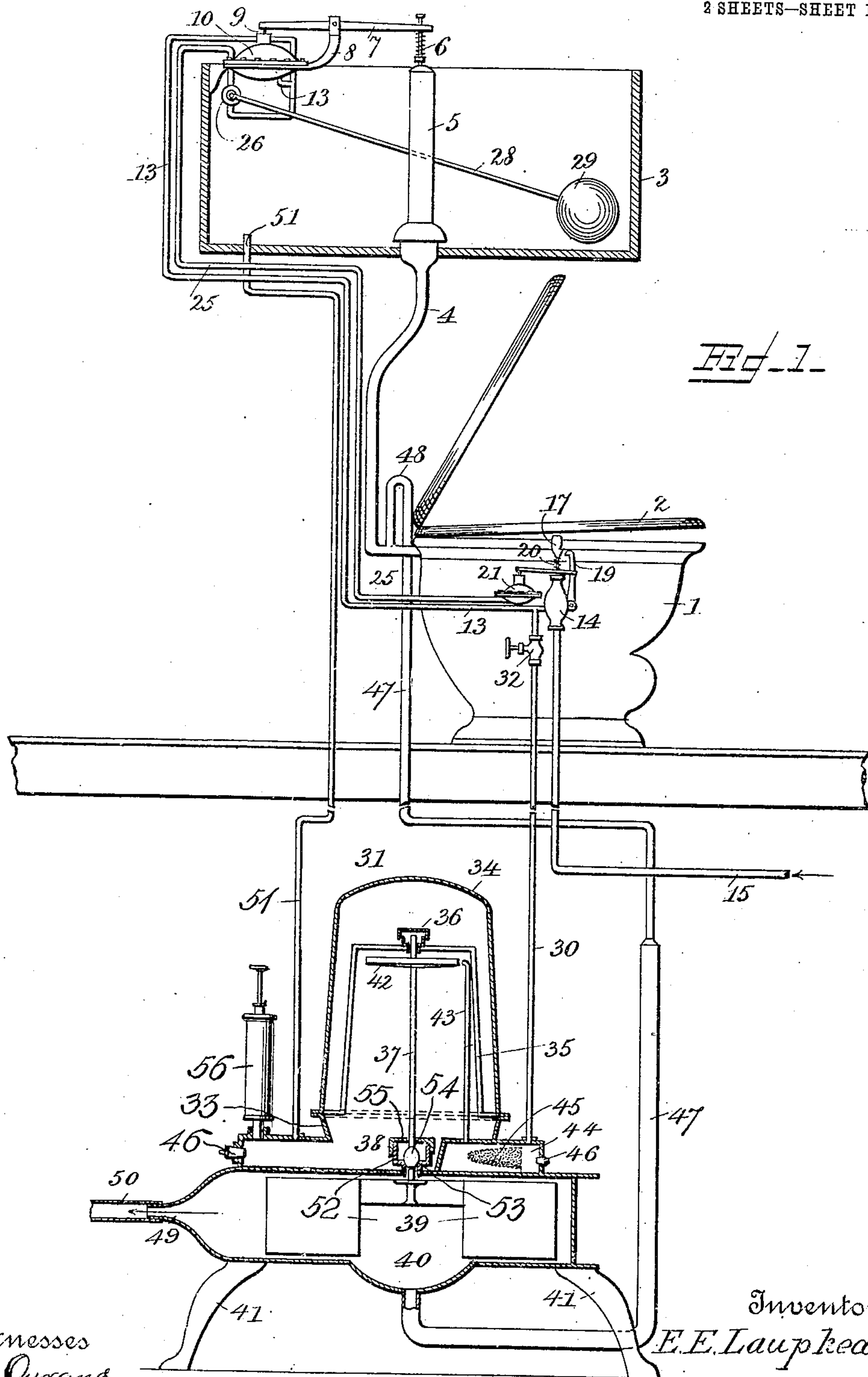


Fig. 1.

Witnesses
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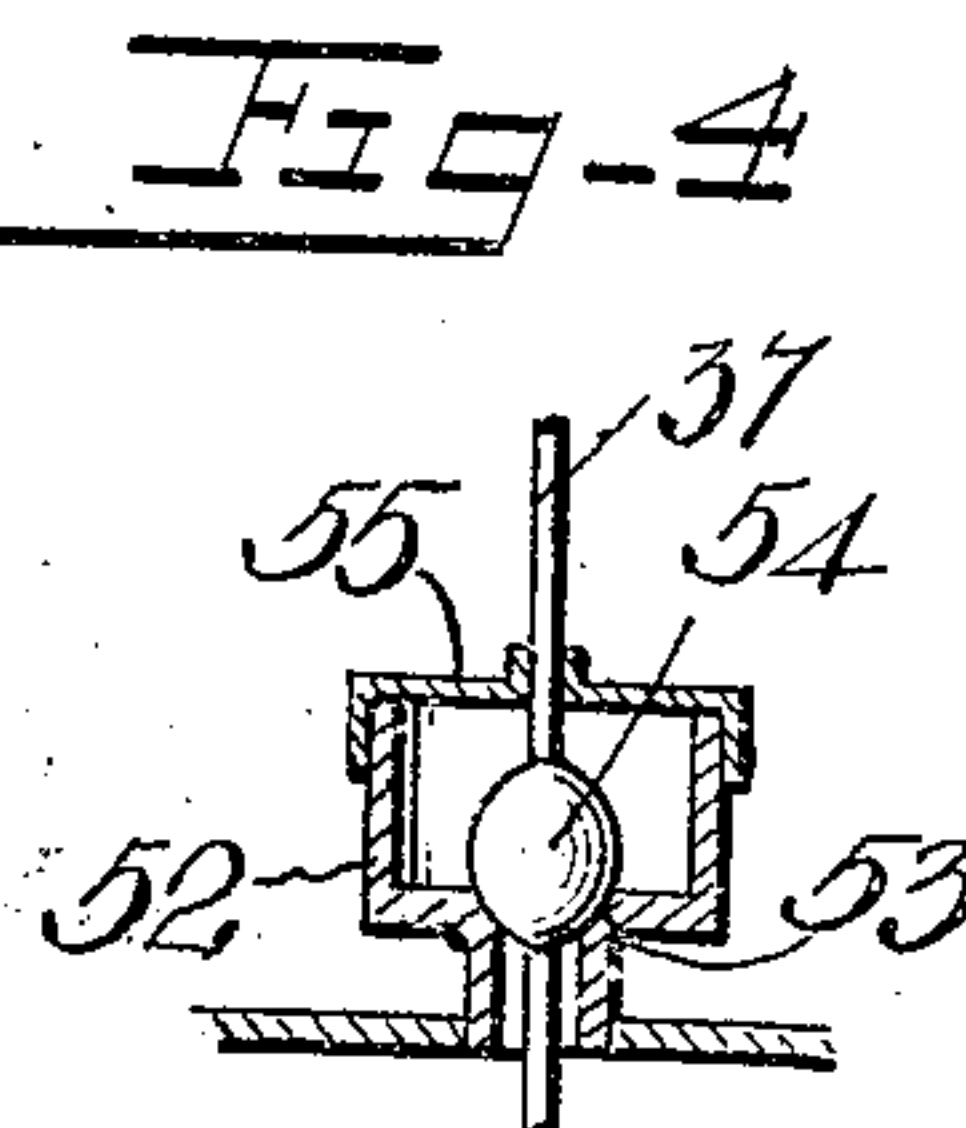
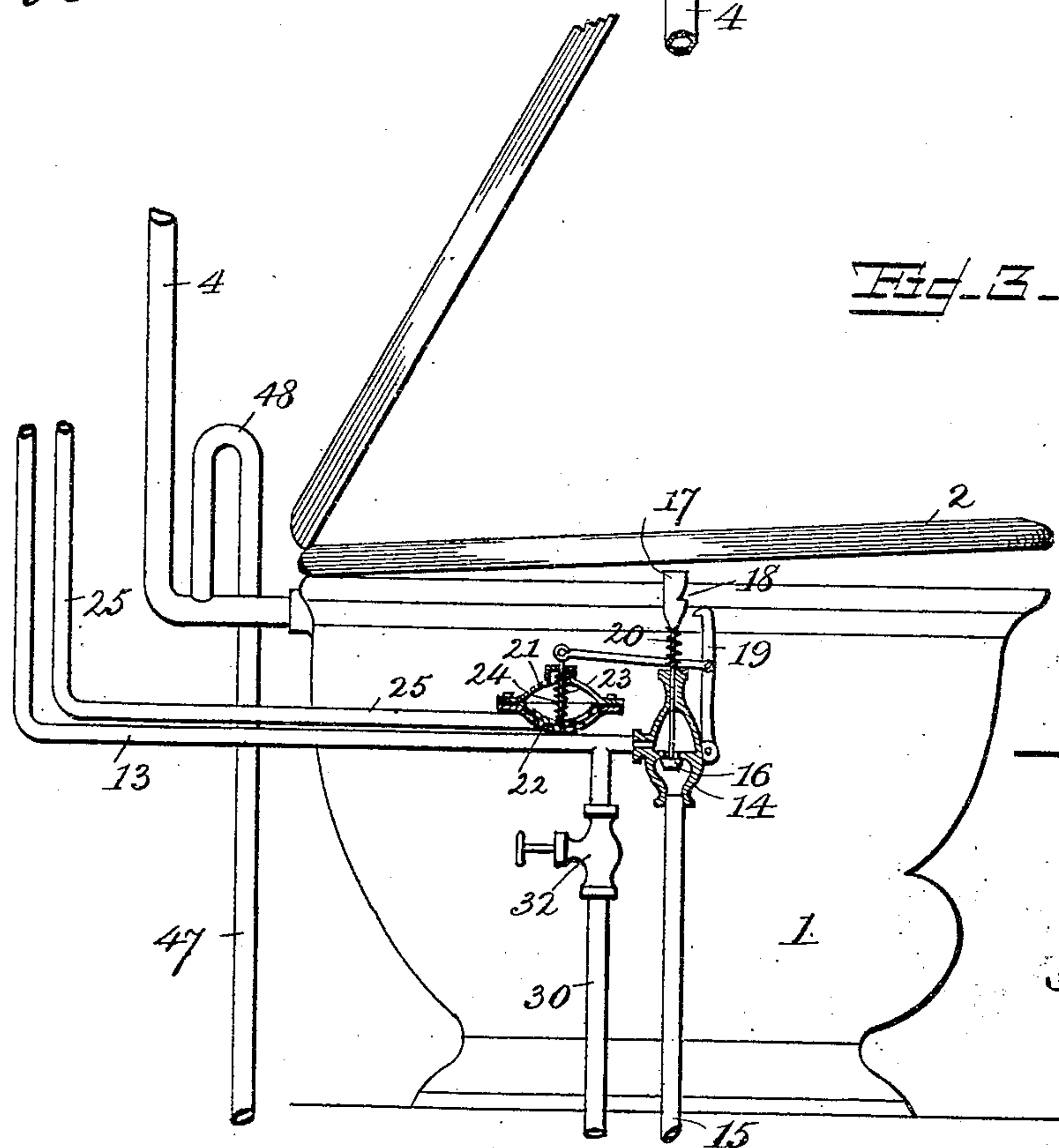
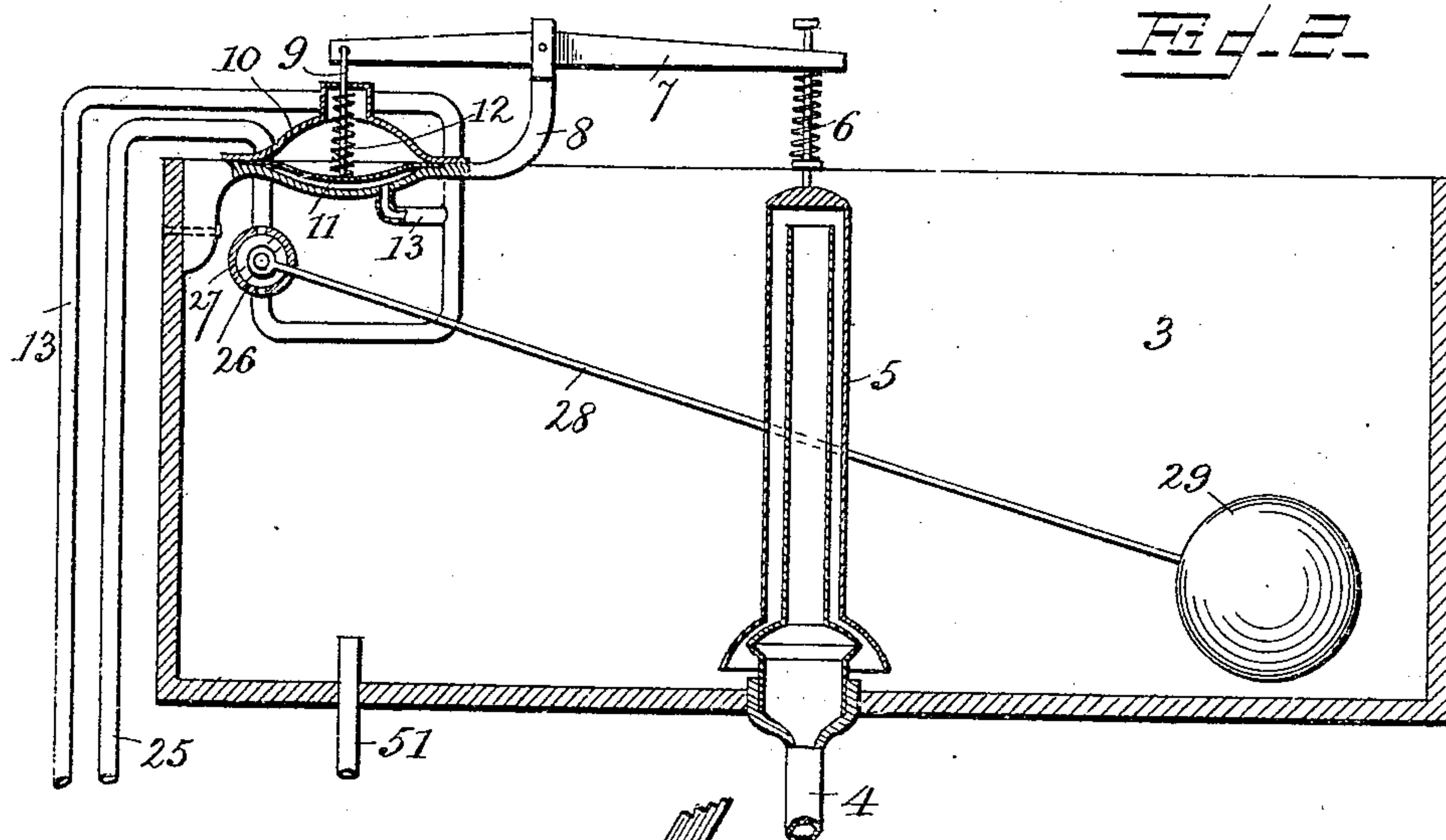
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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VENTILATING AND FLUSHING APPARATUS FOR CLOSETS.

955,518.

Specification of Letters Patent.

Patented Apr. 19, 1910.

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To all whom it may concern:

Be it known that I, ELMER E. LAUPHEAR, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Ventilating and Flushing Apparatus for Closets; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable other skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in combined flushing and ventilating apparatus for closet bowls.

The object of the invention is to provide a device of this character having a ventilating mechanism operated by the water used for flushing and having means controlled by the pressure of water to automatically operate the flushing mechanism.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a part side and part sectional elevation of a flushing and ventilating apparatus constructed in accordance with the invention; Fig. 2 is an enlarged sectional view through the flushing tank, with the flushing valve and the valve operating mechanism arranged therein; Fig. 3 is an enlarged side view of the bowl, showing the water supply pipe and valve and the valve operating device in section. Fig. 4 is an enlarged sectional view of the combined shaft bearing and oil cup for the motor and fan shaft.

Referring more particularly to the drawings, 1 denotes the closet bowl, 2 denotes the seat, 3 denotes the flushing tank which is connected to the bowl by a flushing pipe 4. In the tank 3 and connected to the upper end of the flushing pipe 4 is a flushing valve 5 of any suitable construction. The stem 6 of the valve 5 is connected to one end of an operating lever 7, which is pivoted on a suitable bracket 8 secured to the inner side of the tank, as shown.

The opposite end of the lever 7 is connected to the stem 9 of an automatic valve controlling device comprising a hollow body portion 10 having arranged therein a flexi-

ble or elastic diaphragm 11 to which the inner end of the stem 9 is connected. Between the diaphragm and the upper wall of the hollow body 10 is arranged a coil spring 12, the pressure of which is exerted to open the flush valve 5 and to normally hold the same in an open position. Connected with the body portion 10 of the valve controlling device on the opposite side of the diaphragm from the spring 12 is a water conducting pipe 13, the lower end of which is connected with a controlling valve casing 14 to which is also connected a water supply pipe 15, which may be connected with the city or any other water supply.

In the valve casing 14 is arranged a valve 16, the stem of which projects upwardly and has arranged thereon a head 17 adapted to be engaged by the seat 2 of the bowl. In the head 17 is formed a notch 18 which is adapted to be engaged by a locking pawl 19, whereby when the valve stem is depressed to open the valve, said pawl will automatically engage the notch 18 in the head 17 of the valve stem and thereby hold said valve in an open position. The valve stem 14 is also provided with a coil closing spring 20, whereby when pressure is removed from the head 17 and the pawl 19 disengaged from the notch 18, the valve will be closed and the supply of water thus cut off.

The pawl 19 is automatically released or disengaged from the notch 18 by means of a controlling device 21, comprising a hollow casing having arranged therein a flexible diaphragm 22 to which is connected the inner end of an operating stem 23, which projects through one side of the casing and is connected at its outer end with the pawl 19, whereby said pawl when the flexible diaphragm is actuated in the proper direction will be disengaged from the notch 18 to permit the valve 16 to close as hereinbefore described. In the hollow body portion or casing 21 and around the stem 23 is arranged a coil spring 24, the pressure of which is normally exerted to hold the pawl in position to engage the notch 18 of the head 17 when the latter is depressed by the seat to open the valve.

To the casing or hollow body portion of the controlling device 21 below or on the opposite side of the diaphragm from the spring 24 is connected a water conducting

pipe 25, the opposite end of which is connected with a valve casing 26 arranged in the tank 3. With said valve casing 26 is also connected the end of the water conducting pipe 13, with which the controlling device 10 is connected. Within the valve casing 26 is arranged a plug valve 27 to the stem of which is connected the lever 28 of a valve operating float 29 arranged in the tank 3 and adapted to be actuated by the rising and falling of the water in the tank.

To the water conducting pipe 13 is connected the upper end of a water supply pipe 30, which extends to and connects with a suitable water motor 31, which may be arranged in the cellar or other out of the way place in the building. The supply pipe 30 is preferably provided with a cut off valve 32, whereby the supply of water may be cut off from the motor when desired. The motor 31 preferably consists of a hollow casing 33 having an air dome 34. In the dome 34 is arranged a bearing frame 35 in which is secured a combined oil cup and shaft bearing 36, in which is revolubly mounted the upper end of a motor shaft 37, the lower end of which is revolubly mounted in a combined oil cup and bearing 38 arranged in the bottom of the motor casing as shown. The lower end of the shaft 37 projects through the motor casing and has secured thereto a ventilating fan 39, which is arranged in a fan casing 40 beneath the motor casing as shown. The fan and motor casings are preferably supported upon suitable feet 41.

On the motor shaft 37 is fixedly mounted a water wheel 42 which is operated by a stream or jet discharged from the upper end of a pipe 43 the lower end of which is connected with a water inlet chamber 44 arranged in the base of the motor casing and to which is connected the lower end of the water supply pipe 30. The water from the supply pipe 30 before entering the chamber 44 passes through a filtering screen 45 arranged in said chamber as shown. The chamber 44 and the motor casing are preferably provided with drain ports which are normally closed by plugs 46 or other suitable closing devices. The water when discharged from the pipe 43 strikes the blades of the water wheel 42 of the motor, thereby rapidly revolving said wheel and its shaft, thus driving the fan 39, which will create suction through a ventilating pipe 47, which extends upward and is connected at its upper end with the lower end of the flush pipe 4 by a return bend 48, thereby ventilating the bowl and drawing the impure air from the bowl into the fan casing from which it is discharged through an outlet port or passage 49 into a vent pipe 50, which may be extended above the roof of the building or to any other place of discharge. The water from the discharge pipe 43, after operating the water

wheel of the motor, falls to the bottom of the motor casing and is forced therefrom through a pipe 51 to the flushing tank 3 whereby said tank is filled with the same water used for operating the motor and fan. 70

In Fig. 4 of the drawings, is shown an enlarged detail view of the combined oil cup and ball bearing 38 for the motor and fan shaft. The bearing 38 consists of an oil or grease cup 52 having in its bottom a ground seat 53 to receive a bearing ball 54 on the motor shaft. The cup 52 also has a tight fitting cover 55. A bearing constructed in this manner has been found to be efficient in preventing the water from the dome from entering the fan casing and does not interfere with the operation of the motor and fan shaft. This form of oil cup also keeps the parts well lubricated and permits the use of hard grease which does not rise to the surface of the water in the dome. 75 80 85

In the operation of the apparatus, the flush tank 3 is normally empty and the water inlet valve 16 is normally in a closed position. As soon as pressure is applied to the seat, the valve 16 will be opened and will permit the water to flow through the pipe 13 and into the valve controlling device 10, thereby actuating the diaphragm therein, causing the same to close the flush valve 5. The water passing through the valve 16 will also enter the water supply pipe 30 and flow through the same and the pipe 43 to the motor, thereby operating the same and driving the fan as hereinbefore described. The water after operating the motor falls to the bottom of the motor casing from whence it is forced through the pipe 51 to the tank by the pressure of the air in the dome. 90 95 100 105

The air in the dome is compressed by the accumulation of the water in the lower part of the dome after operating the motor. In the course of time, this air will gradually work out of the dome, allowing the same to fill with water and when this occurs, it is necessary to remove the water from the dome. The removal of the water from the dome is preferably accomplished by forcing more air into the tank by means of an air pump 56 connected to the dome in any suitable manner preferably as shown in Fig. 1 of the drawing. The water when thus driven out by the air forced into the dome, passes up through the pipe 51 to the tank 3. 110 115 120

The water in filling the tank will raise the float 29 thus causing the same to open the valve 27, which will permit the water in the pipe 13 to pass on into the pipe 25 and through the latter to the pawl controlling device 21 thus actuating the diaphragm therein and causing the same to release the pawl 19 which has previously engaged the locking notch 18 in the head 17 of the valve 130

stem. The tank by this time will have become filled with water so that when pressure is removed from the seat, the spring 20 will immediately close the water supply valve 16 and thus relieve the pressure in the pipe 13, which connects with the controlling device 10, thereby permitting the spring 12 in said device to actuate the lever 7 and open the flush valve 5, thus permitting the water in the tank to run into the bowl and flush the same. As the water flows out of the tank 3, the float 29 will again lower and thus close the valve 27, and the spring 24 in the controlling device 21 will move the pawl 19 in position to again engage the notch 18 in the head 17 on the stem of the water controlling valve 16, when the latter is opened by pressure on the seat. If the controlling valve 16 should be held open by pressure on the seat, after the tank has become filled, the water flowing into the tank through the pipe 51 will overflow through the upper portion of the flush valve 5 which is open as usual for this purpose and run into the bowl until pressure is removed from the seat and the valve 16 closed in the manner hereinbefore described.

It will be noted that in the arrangement of the motor as herein shown and described, that the same runs in an air chamber in which the water which operates the motor collects and is forced out by the pressure of air therein. It is also desired to call particular attention to the construction of the ground joint or bearing for the motor and fan shaft. This joint, it will be noted, operates in a closed grease cup inside the air dome and positively prevents leakage of the water from the air dome to the fan casing below at the same time permits of the free rotary movement of the shaft.

From the foregoing description, taken in connection with the accompanying drawings the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the

invention, as defined in the appended claims.

Having thus described my invention, what I claim is:

1. In a combined flushing and ventilating apparatus, for closets, the combination of a bowl having a normally raised seat, a motor operated ventilating mechanism connected with said bowl, a water supply pipe connected with said motor, a flushing tank, means whereby the tank is filled by the water from said motor, a closing valve arranged in said supply pipe, a stem connected to said valve, and engaged with the seat of the bowl, whereby when pressure is applied thereto, the valve is opened, means to hold the valve in open position when pressure is removed from the seat, means controlled by water pressure to release said valve locking mechanism, a spring to close the valve after said locking mechanism is released, a flushing valve arranged in said flushing tank, a flushing pipe to connect said valve with said bowl, water pressure controlled means for closing said flushing valve while the tank is being filled, a float operated pressure releasing valve whereby pressure is relieved from said valve closing mechanism, and means to open said flushing valve when said closing mechanism is released.

2. In a combined flushing and ventilating apparatus for closets, the combination with a fan casing, an air dome arranged thereon, a combined fan and motor shaft in said dome and fan casing, a ground joint or bearing in said dome, a bearing ball on said shaft adapted to engage said bearing, a grease cup surrounding said joint to form a water-tight bearing, a motor arranged on said shaft and in said dome, whereby said shaft is driven, and a fan on said shaft in said fan casing.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ELMER E. LAUPHEAR.

Witnesses:

ISAAC JOHNSON,
CHESTER GREENE.