(No Model.)

R. GIBSON.

FLUSH TANK AND WATER CLOSET.

No. 442,177. Patented Dec. 9, 1890.

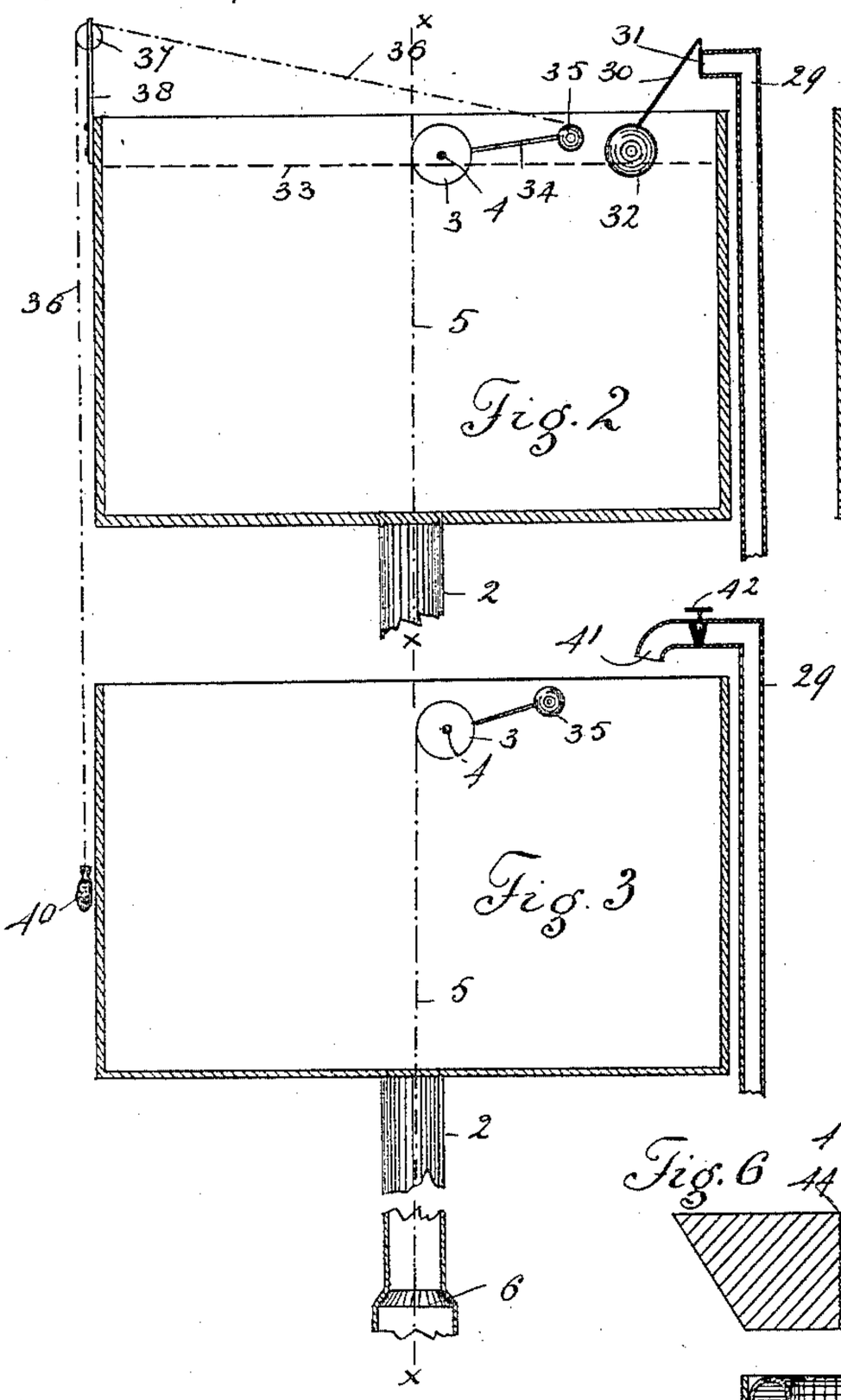


Fig. 2

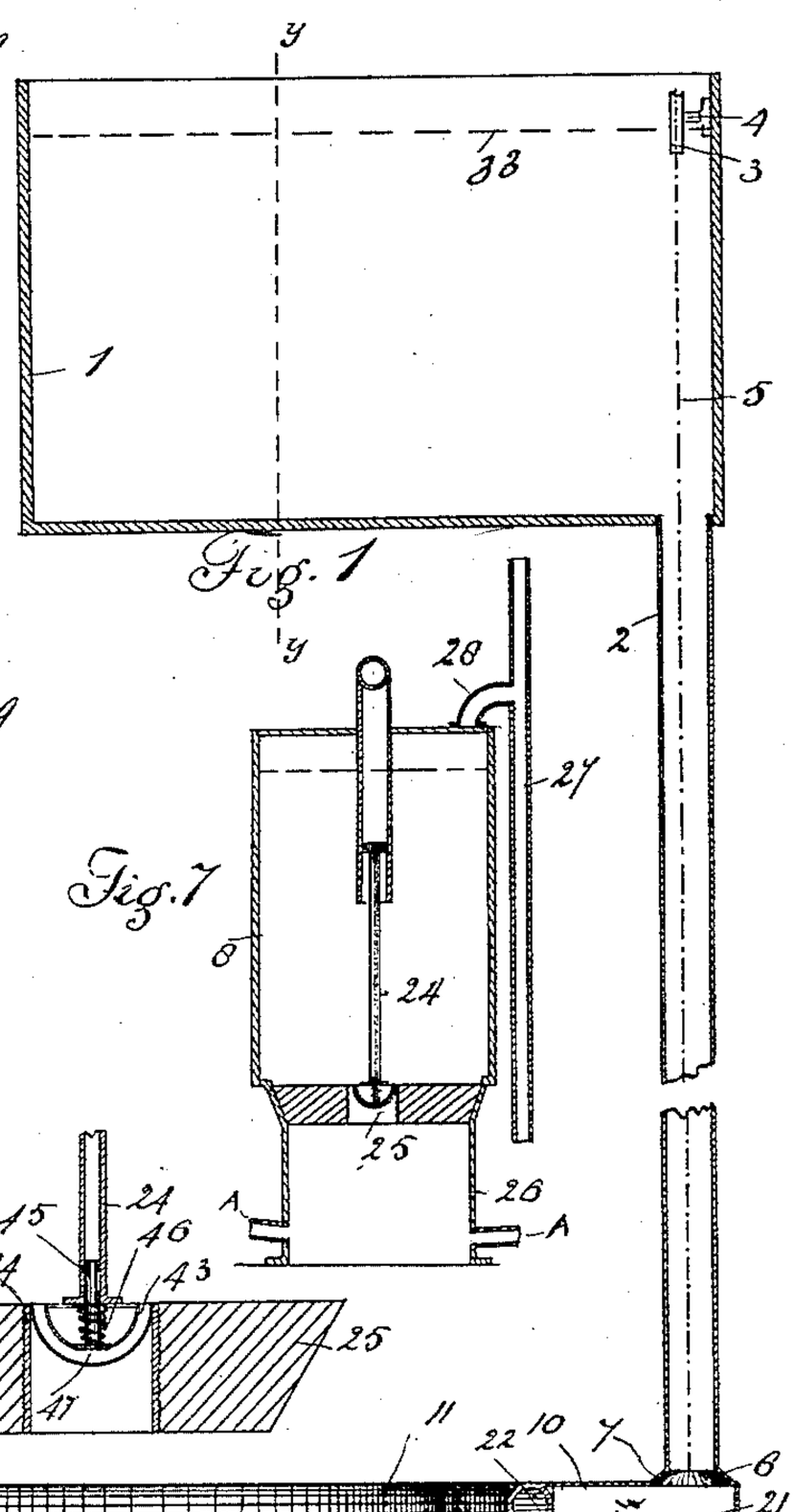


Fig. 1

Fig. 3

Fig. 7

Fig. 6

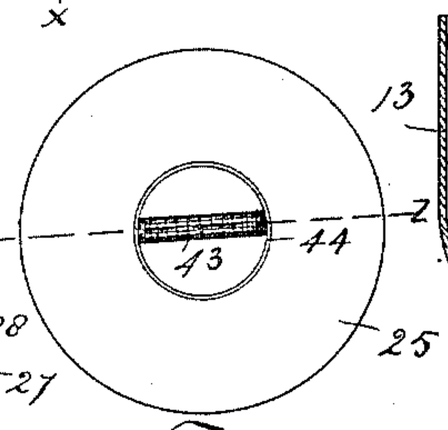


Fig. 5

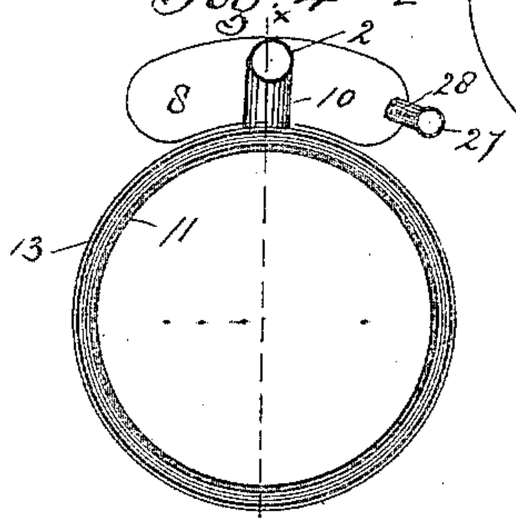
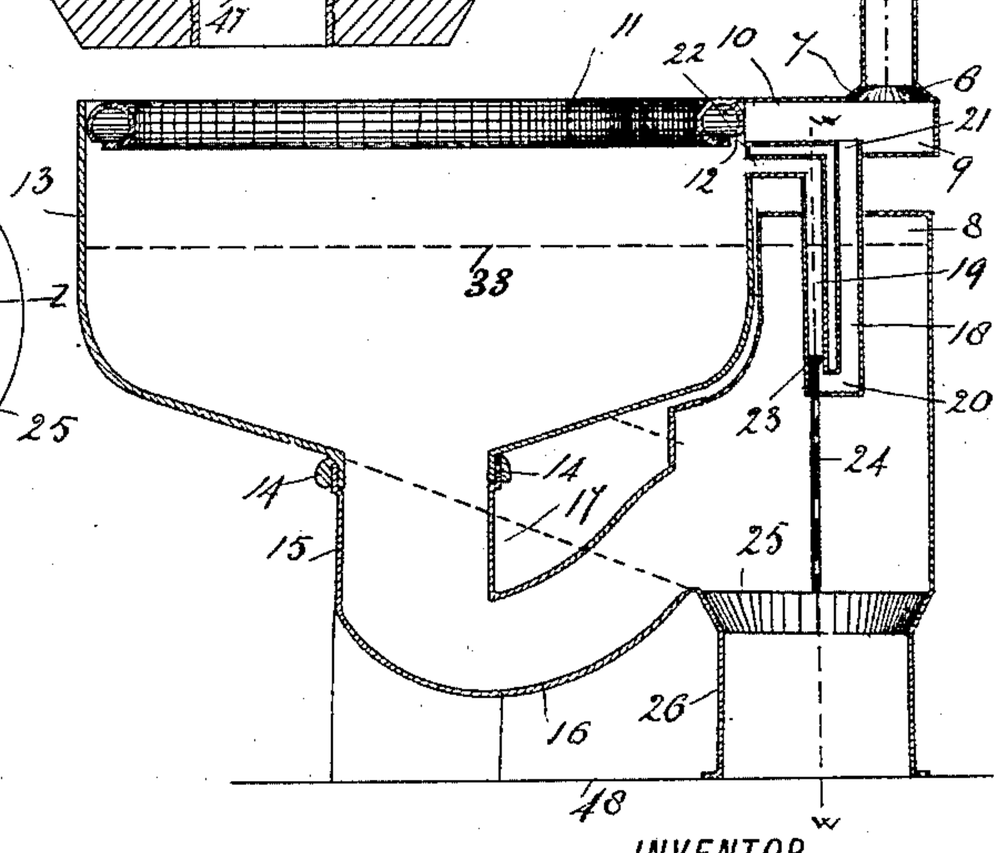


Fig. 4



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ROBERT GIBSON, OF DENVER, COLORADO.

FLUSH-TANK AND WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 442,177, dated December 9, 1890.

Application filed March 24, 1890. Serial No. 345,147. (No model.)

To all whom it may concern:

Be it known that I, ROBERT GIBSON, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Flush-Tanks and Water-Closets; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in water-closets and flush-tanks therefor; and the object of my invention is to provide a combined flush-tank and water-closet of simple and economical construction, easily operated, reliable in action, and durable and efficient in use.

To these ends my invention consists of the features, arrangements, and combinations hereinafter described and claimed.

In the drawings is illustrated an embodiment of my invention, in which drawings Figure 1 is a vertical section taken through the flush-tank and closet on the line *x x*, Figs. 2, 3, and 4. Fig. 2 is a vertical section of the flush-tank, taken on the line *y y*, Fig. 1. Fig. 3 is a similar section taken on the same line of a modified form of tank. Fig. 4 is a top or plan view of the closet. Fig. 5 is an underneath view of the plunger in detail. Fig. 6 is a vertical section taken on the line *z z*, Fig. 5. Fig. 7 is a vertical section taken on the line *w w*, Fig. 1, looking from the rear.

In the views, let the reference-numeral 1 designate a tank or reservoir suitably elevated and containing the supply of water for flushing the closet.

The numeral 29 designates the supply-pipe through which the water passes to the tank. The discharge of water from this pipe into the tank is controlled by a valve 31, operated by a float 32, which rises and shuts off the discharge of water from the supply-pipe after it has reached the proper level of the tank, this level being indicated by the line 33, or the water may run continuously from pipe 29 into the tank, a stop-cock 42 being placed at the discharge extremity of the pipe to regulate the discharge therefrom to correspond with the demands on the closet which the tank is designed to flush. Fig. 3 illustrates the mechanism used when the tank operates automatically in flushing the closet, as hereinafter described.

The numeral 2 designates a vertical pipe leading from the bottom of the flush-tank to the basin of the closet. This pipe opens into the tank next to the wall of the room and passes directly to the closet below. This discharge-pipe 2 is provided with a valve 6 located at its lower extremity and opening downward. Secured to the top of this valve is a suitable chain 5, which passes upward through pipe 2 and is secured to the periphery of a small pulley 3 at a suitable point. This pulley is supported by and turns upon a short pin or shaft 4 made fast to the rear of the tank at a central point, so that the periphery of pulley 3 is in a direct line with the vertical center of discharge-pipe 2.

34 is an arm secured at one extremity to the periphery of pulley 3 at a point about diametrically opposite the tangential contact-point of chain 5, said arm occupying preferably a position inclined slightly upward from the plane of the horizontal, as shown in Figs. 2 and 3, in order that the weight hereinafter described may not enter the water in the tank.

The free extremity of arm 34 is provided with a weight 35, of sufficient size to hold valve 6 in a closed position except during the operation of flushing the closet.

The numeral 36 designates a chain or cord secured at one extremity to weight 35, passing thence over a pulley 37, provided with a suitable support 38, and passing downward, so that its lower extremity provided with a suitable knob or hand-piece 40 shall be within easy reach of a person using the closet. The closet is flushed by pulling downward upon cord or chain 36, since the action raises weight 35 and turns pulley 3 in a direction which permits valve 6 to descend by virtue of its connection with chain 5, the valve being then left free to yield to the downward pressure of the column of water, which it supports when held in the closed position by virtue of its connection with weight 35; or

when it is desired that the closet should be flushed automatically by the use of the mechanism shown in Fig. 3, the gravity of weight 35 is so regulated with reference to the weight of the column of water above the valve that when the water-line has reached the desired height in the flush-tank the weight of this column of water will overbalance the gravity of weight 35. Valve 6 then opens automatically and the closet is flushed, the water continuing to flow until it is so low in the tank that the weight 35 again closes valve 6.

The numeral 13 designates the basin of the closet, provided with the interior circumferential conduit 11, which receives the water from chamber 10, located beneath discharge-pipe 2, and guides the same into contact with the inner walls of the basin during the operation of flushing.

The numeral 15 designates the pipe connected directly with the basin 14 and leading to the trap 16, which terminates at the plunger 25. This plunger closes the soil-pipe 26 when the closet is not in use, and effectually prevents the sewer-gas from the soil-pipe from coming in contact with the water in the basin. Hence the trap 16 may be dispensed with and the contents of the basin discharged directly to the soil-pipe, as indicated by the dotted lines 17.

The numeral 24 designates a vertical rod forming the stem of the plunger, to which it is secured at its lower extremity, being provided at its upper extremity with a suitable head 23, which fits nicely, but moves easily and readily within the vertical pipe 19, which opens into the basin at 22 and also forms a continuation of a similar pipe 18, which opens into chamber 10 at 21, and is joined to pipe 19 by the short horizontal connection 20.

The numeral 8 designates a chamber in the rear of the basin, surrounding pipes 18 and 19, and suitably inclosed, as shown.

The closet is flushed by opening valve 6, as before stated, when the water enters into chamber 10 beneath and passes thence into basin 13 and also down pipe 18 and up into pipe 19, engaging the head of piston 23, forcing the same upward and opening the plunger to allow the discharge of the contents of the basin into the soil-pipe, the water continuing to flow from the basin until it is so low in tank 1 that it will no longer maintain the plunger in the upraised position. The plunger now closes, the water continuing to flow into the basin until the force with which it passes through pipe 2 is not sufficient to prevent valve 6 from closing in opposition to the tendency of weight 35 to effect this result. I make provision for the overflow from the basin by means of the mechanism illustrated in Figs. 5 and 6, the construction and operation of which will now be described. The plunger is provided with a central threaded opening, by means of which it is screwed upon a short pipe 44, open at the bottom and closed at the top, except that the extremities of the curved tube 43 open within the area of its top. Tube 43 curves downward within pipe 44, which is hollow below its top. Tube 43 at the lowest part of its curve is provided with a valve 47, adapted to open upwardly and normally held in the closed position by a coiled spring 46, surrounding its stem 45 and located between the valve 47 and the closed top of pipe 44. Stem 24 of the plunger is tubular and receives the stem 45 of valve 47. This valve 47 with its spring is so regulated with reference to the water that may accumulate in the basin 13 that as soon as the water rises higher in said basin than is desired the pressure of the water in the tube 43 will open valve 46 and permit the surplus to escape through the opening closed by said valve into tube 44, and thence to the soil-pipe by virtue of the construction heretofore described.

The tube 27 designates a ventilating-pipe connected with chamber 8 at 28. This pipe is open at both extremities and is designed to carry off from the room where the closet is located all disagreeable odors common to apartments of this class. The ventilation is accomplished during the flushing of the closet and by reason of the partial vacuum formed in chamber 8 by the siphonage from the basin through the soil-pipe.

It will be observed that my combined flush tank and closet as described has a number of advantages over those in common use, some of which may be mentioned. For instance, the valve 6, being located at the lower extremity of discharge-pipe 2, renders the operation of flushing comparatively noiseless and prevents the entrance or accumulation of disagreeable odors or vapors within the pipe leading from the flush-tank, which when in this pipe are always driven out into the room by the passing of the water through said pipe.

By the use of plunger 25 in closing the soil-pipe the foul air from this pipe is prevented from coming in contact with the water in the basin, which water, therefore, never becomes foul or stagnant. The closing of the soil-pipe by the plunger also prevents, without the use of any additional appliances, the removal of the water from the closet-basin by the siphonage or partial vacuum provided by the entrance of water to the soil-pipe from branch pipes attached below the closet-basin. My improved construction also permits the location of the plunger far enough above the floor 48 to allow connection of other pipes, as shown at A A, Fig. 7, such as those from the bath-tub and wash-basin to the soil-pipe between the plunger and the floor, thereby obviating the necessity of cutting the floor to form this connection, as is generally necessary because of the location of the trap in the ordinary closet so low that there is no room to connect other pipes with the soil-pipe without making said connections underneath the floor.

Many other advantages in favor of my im-

provements may be noted; but further elaboration is not deemed necessary or advisable for the purpose of a specification.

Having thus described my invention, what I claim is—

1. The combination, with a water-closet, of a flush-tank having a discharge-pipe 2, provided with a valve 6, located at the lower extremity of the pipe, a chain or cord 5, secured to valve 6 and extending upward therefrom, a pulley 3, to the periphery of which chain 5 is secured, said pulley being suitably pivoted to the flush-tank and provided with an arm 34, secured at one extremity to the pulley and provided at its opposite extremity with a weight 35, said weight having a tendency to hold valve 6 in the closed position, and suitable means of raising weight 35 and permitting valve 6 to open for the purpose of flushing the closet, substantially as described.

2. In a water-closet, a valve or plunger 25, normally closing the soil-pipe and provided with a stem or rod 24, secured to the plunger at its lower extremity and provided with a cap or piston 23 at its upper extremity, a pipe composed of parts 18, 19, and 20, said pipe being open at both extremities and having the piston 23 fitting in arm 19 thereof, and a suitable flush-tank from which water passes to arm 18 of the pipe and thence to arm 19, raising piston 23 and opening plunger 25, substantially as described.

3. In a water-closet, an overflow device consisting of a plunger 25, normally closing the soil-pipe, said plunger being provided with a tubular stem 24, the plunger having an aperture in its center through which passes a pipe 44, closed at the top and open underneath, a tube 43, curved downwardly into said pipe, the extremities of tube 43 being open, a valve 47, located in tube 43, said valve being provided with a stem 45, which enters tubular stem 24, and a coiled spring 46, surrounding stem 45 and located between valve 47 and the top of tube 44, said mechanism permitting the water to enter tube 43 and open valve 47 for the purpose of discharging the surplus water in the closet-basin, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT GIBSON.

Witnesses:
FRED. W. FELDWISCH,
WM. MCCONNELL.