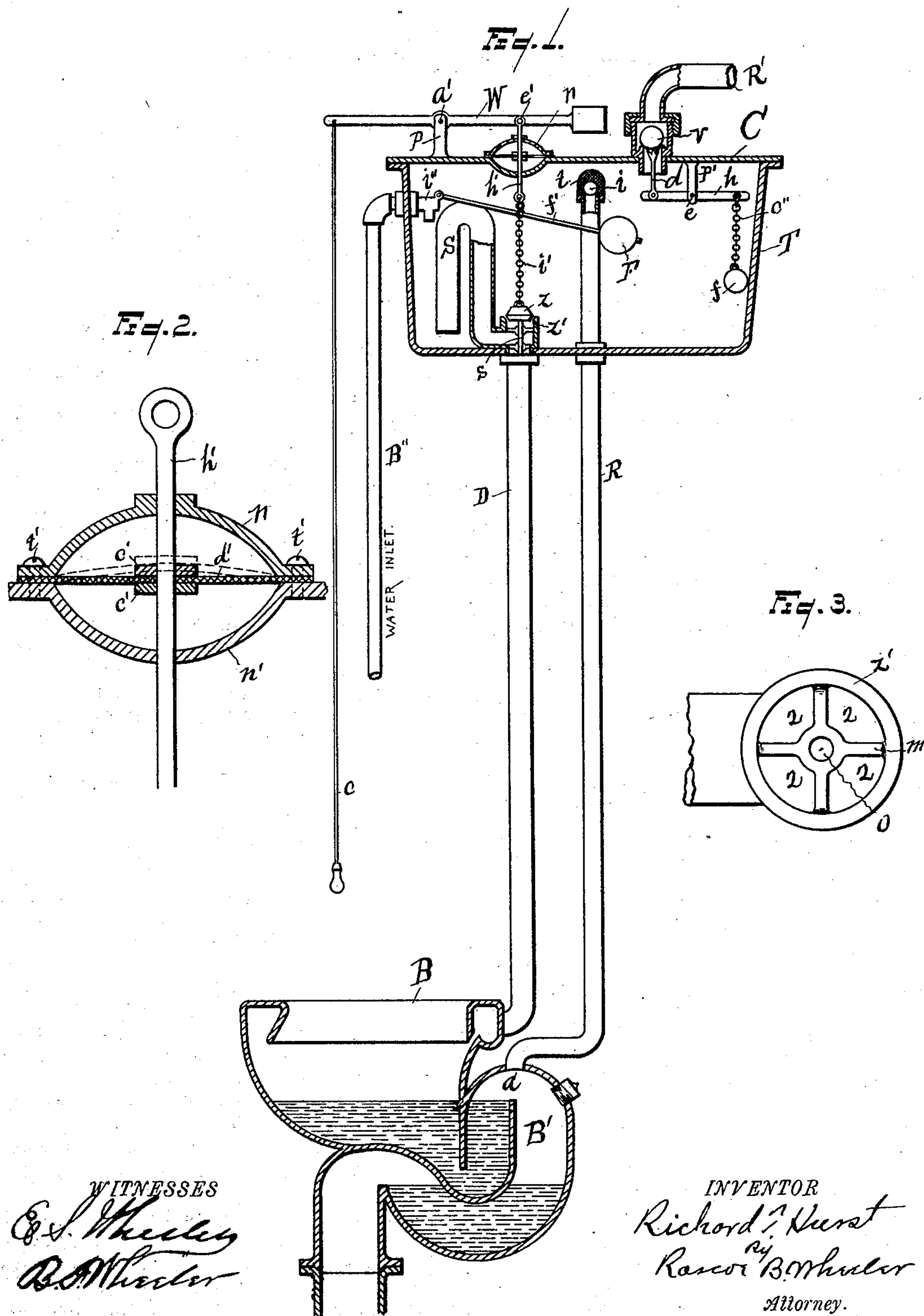


(No Model.)

R. T. HURST.
TANK FOR WATER CLOSETS.

No. 422,417.

Patented Mar. 4, 1890.



UNITED STATES PATENT OFFICE.

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JOHN H. HAMILTON, OF SAME PLACE.

TANK FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 422,417, dated March 4, 1890.

Application filed May 18, 1889. Serial No. 311,327. (No model.)

To all whom it may concern:

Be it known that I, RICHARD T. HURST, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Tanks for 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.

This invention relates to water-tanks for flushing the bowl of water-closets; and it consists of the combination and arrangement of parts coupled to an air-tight or close-covered water tank or cistern, as will be fully herein-
after set forth.

The object of the invention is to provide means for flushing or cleansing the bowl, having also mechanism whereby the foul air in the chamber of the closet is drawn into the tank, and from said tank discharged into a ventilating-pipe, all of which will be fully explained, and indicated particularly in the claim.

In the accompanying drawings, forming a part of the specification, Figure 1 is a view, partly in section, of a water-closet bowl and water-tank, showing my arrangement of mechanism coupled thereto. Fig. 2 is an enlarged detail in section of the diaphragm and its couplings located in the top of the tank. Fig. 3 is an enlarged detail to be referred to.

As indicated in the drawings, B represents the bowl; B', the air-chamber between the traps of the bowl; T, the water-tank; D, the flushing-pipe; R and R', the foul-air-discharge pipes, and B'' the water-supply pipe.

The water-closet bowl and double-trap arrangement thereof is such as is in common use, and will therefore require no special mention.

The tank T is provided with the closed top or cover C, and said tank is made air-tight by securely bolting or riveting the top C to the upper edge of the tank. The lower end

of the pipe R communicates at *a* with the air-chamber B' of the bowl and passes upward through the bottom of the tank T. The upper end of said pipe terminates above the water-line within said tank, and is provided with a wire-gauze valve-cage *t*, which confines the light ball-valve *i* to the upper end of said pipe. The lower end of the flushing-pipe D discharges into the bowl B. The upper end of said pipe passes through the bottom of the tank T and communicates with the siphon S therein. Located over the upper end of the pipe D, within the tank, is a valve-seat *z'*, the diverging arms *m* of said valve-seat supporting a center head, which is provided with the hole or opening *o*. (See Fig. 3.) The spaces 2 2 between said arms indicate the water-discharge ports.

The part *n'* of the top C of the tank is depressed or made saucer-shaped, as shown in Figs. 1 and 2. The upper part *n* is in the shape of an inverted saucer and fits over the part *n'*. The flexible diaphragm *d'* is of leather and is suspended across the chamber formed by the parts *n n'*, and is held in place by the bolts or screws *t'*, which secure said parts. The rod *h'* passes loosely through the parts *n n'*, but is firmly secured to the collars *c'* on each side of the diaphragm. The lower end of the rod *h'* is attached to the chain *i'*, which connects said rod to the valve *z*, which closes the port in the valve-seat *z'*. The stem *s* of said valve, traveling in the hole *o* in said valve-seat, serves to guide the valve to its seat. The upper end of the rod *h'* is pivoted at *e'* to the weighted lever W, said lever being pivoted at *a'* to the support *p* on the top of the tank. To the outer end of the lever W is attached the pull-cord *c*.

The water-inlet pipe B'' passes through the end of the tank near the top, having on its inner end the water-supply cock *i''*, said supply-cock being actuated by the float F and lever-arm *f'*.

The float-ball *f* is attached by means of the chain *c''* to one end of the lever *h*, said lever being pivoted at *e* to the depending support *p'*. To the other end of said lever is pivoted the lower end of the arm *d*, the upper end of

said arm resting against the ball-valve *v*, which closes the opening from the tank into the ventilating-pipe *R'*.

The operation of the device is as follows:

5 A downward pull on the cord *c* will tilt the lever *W*, drawing upward on the rod *h'* and springing the diaphragm, as shown by dotted lines in Fig. 2, when the valve *z* will be lifted, causing a flow of water down the flushing-
 10 pipe *D*, which will start the water through the siphon *S*. The cord *c* being released, the valve *z* will return to its valve-seat *z'*, and the flow of water will continue through the siphon, down the pipe *D*, and discharge into
 15 the bowl *B*. As the water is drawn from the tank a vacuum is formed therein. To supply said vacuum the foul air in the chamber *B'* will pass up through the pipe *R*, lifting the valve *i*, and discharge into the tank. As the
 20 water lowers in the tank the float *f* will drop, actuating the lever *h* and raising the valve *v* from its seat, when the foul air that is drawn into the tank may discharge out the ventilation-pipe *R'*. When the water in the tank
 25 reaches the lower end of the siphon *S*, the flow of water through said siphon will stop, the float *F* having then fallen sufficiently to open the supply-cock *i''*. When the inflowing water refills the tank, the water, rising in
 30 the tank, will compress the air therein, closing the ball-valve *i* over the pipe *R* and lifting the valve *v*. The foul air rapidly escapes through the air-pipe *R'*, which may pass out of a building at any convenient point. When
 35 the tank has sufficiently filled, the float *F*, rising, closes the inflow of water. The device is then ready for another operation.

The object of the diaphragm *d'* is to allow the rod *h'* to work up and down through the
 40 tank in starting the siphon and to have no

air-passage around the rod, and also to avoid packing around the rod, as would be required if passed through the tank in the common way.

It will be observed from the foregoing description that the foul air standing in the 45 chamber *B'* is completely and effectually gotten rid of, obviating the disagreeable odor arising therefrom incident to water-closet apparatus in common use.

Having thus fully set forth my invention, 50 what I claim as new, and desire to secure by Letters Patent, is—

The water-closet tank having a closed top, in combination with the water-supply cock, the float-arm and float coupled to said water- 55 supply cock, the siphon in said tank, the flushing-pipe coupled to the siphon and leading to the rim of the water-closet bowl, the valve-seat and valve at the base of the siphon, the rod passing through the tank-cover, the chain 60 coupling said rod to the valve at the base of the siphon, the weighted lever coupled to said rod and to a suitable support, the pull-cord on the free end of said lever, the foul-air pipe extending into the tank above the water-line, 65 its opposite end communicating with the air-chamber of the closet-bowl, the wire cage over the upper end of said pipe, the ball-valve in said cage, the air-outlet pipe passing into the tank above the water-line, a valve in said 70 pipe, a stem pressing said valve, said stem coupled to a pivoted lever in the tank, and float coupled to the opposite end of said lever, substantially as and for the purposes specified.

In testimony whereof I affix my signature in 75 presence of two witnesses.

RICHARD T. HURST.

Witnesses:

R. B. WHEELER,
 E. S. WHEELER.