

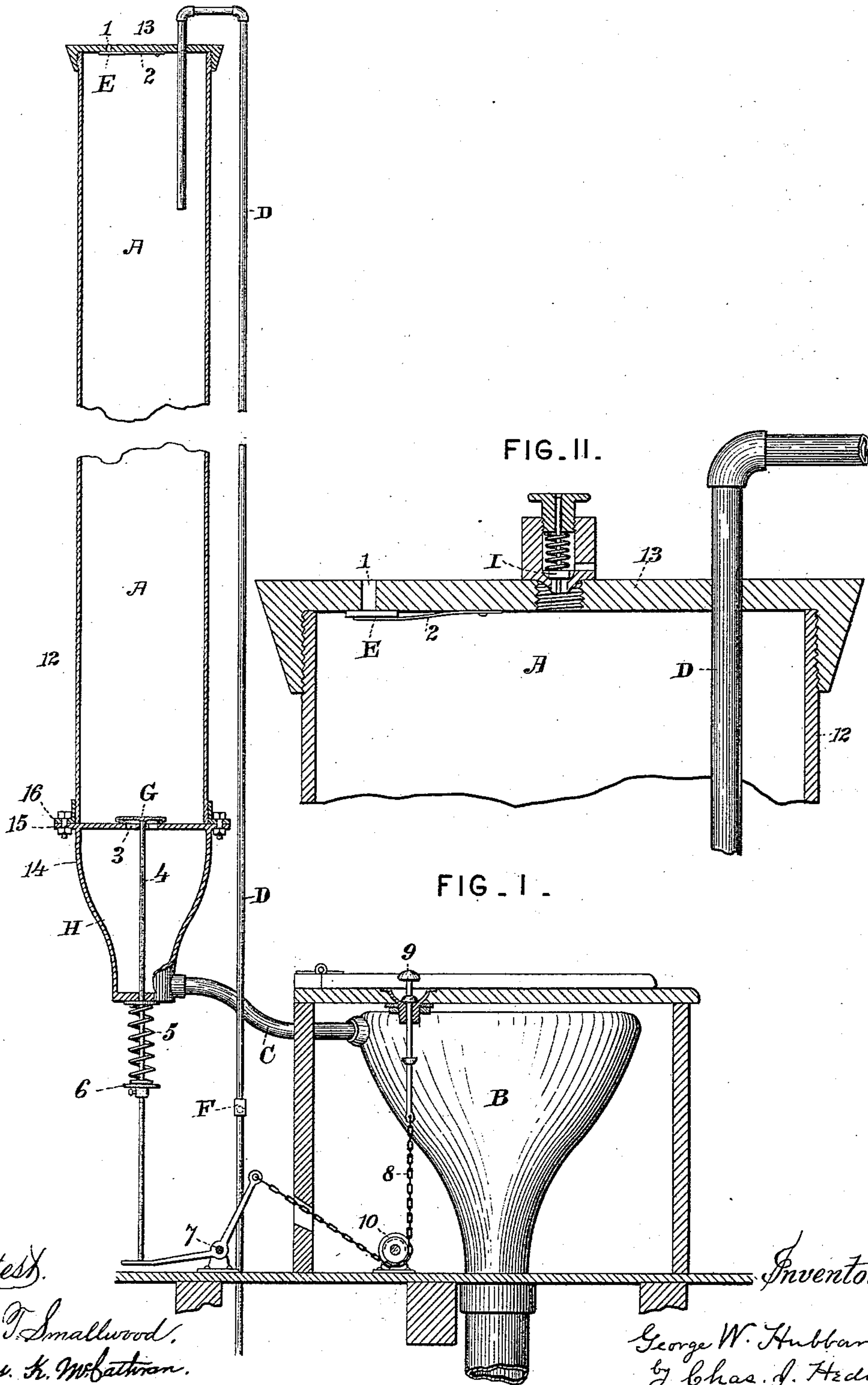
(No Model.)

G. W. HUBBARD.

RESERVOIR OR TANK APPARATUS FOR WATER CLOSETS.

No. 379,310.

Patented Mar. 13, 1888.



Attest.
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UNITED STATES PATENT OFFICE.

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RESERVOIR OR TANK APPARATUS FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 379,310, dated March 13, 1888.

Application filed June 20, 1887. Serial No. 241,900. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. HUBBARD, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Reservoir or Tank Apparatus for Water-Closets, of which the following specification is a full, clear, and exact description.

This invention is designed to dispense with the unsightly elevated open tanks now ordinarily employed, and at the same time to secure simplicity, economy, efficiency and durability in the apparatus.

In accordance with the said invention the apparatus illustrated in Figure I is employed, said figure being a view in vertical section of said apparatus. An addition to said apparatus, which may be used and which is included in the invention, is represented in Fig. II, which figure is a view in vertical section of the upper part of the reservoir or tank provided with said addition.

Referring to Fig. I, the tank or reservoir A, in the form of a tube or pipe of suitably-large diameter closed at top and bottom, is supported in an upright position by any ordinary or suitable means, and is connected at the bottom with the hopper or bowl B, of any ordinary or suitable form, through the discharge-pipe C, and at or near the top with the water-inlet pipe D. It is provided at the top with an air-inlet, I, and an inwardly-opening check-valve, E, for admitting the air when the pressure inside the tank falls slightly below that of the outside atmosphere. A clappet-valve comprising a light leaf-spring, 2, which tends to hold it closed, is shown; but a valve of other known or suitable form for permitting the ingress but checking the egress of air could be used. The water-inlet pipe D is provided with a check-valve, F, which may be of ordinary construction. It is relied upon to prevent the loss of pressure in the closed reservoir or tank A by escape of air through the pipe D when water is drawn in other parts of the house. Without this valve F, or in case it being used should leak, the reservoir would remain practically full of water, owing to the communication with the said pipe D being at or near the top of the tank.

At the bottom of the tank A there is a dis-

charge-opening, 3, and a self-closing valve, G, which is or may be similar to those commonly employed with open tanks, or it may be of other suitable form. It admits the water into the supplementary chamber H, whence it passes through the discharge-pipe C into the hopper or bowl B. This supplementary chamber H is not essential. The valve is provided with a stem, 4, for operating it, and a spiral compression-spring, 5, is or may be interposed between the bottom of the chamber H and a collar, 6, on said stem for drawing the valve more quickly to its seat. The valve is lifted, when desired, by turning the two-armed rock-shaft 7, one arm of which extends under the stem, while the other arm is connected by the chain 8 with the pull or handle 9, the chain running over a pulley, 10, so that when the pull or handle 9 is drawn up the shaft 7 is turned in the direction to open the valve. When the pull or handle 9 is released, the valve returns to its seat. The water in the chamber H continues to run until it is empty.

The operation of the apparatus is as follows: The reservoir or tank A being empty and the valve G closed, the water flows in by the pipe D and collects in the tank, compressing the air in the upper part thereof until the pressure of the confined air balances that of the water-works. The inflow then ceases. This pressure is maintained by the check-valves E and F until it is desired to flush the hopper or bowl. On opening the valve G the water rushes out under the pressure due to its column and also to the compression of the confined air. Should the pressure in the tank A at any time fall below that of the atmosphere, the valve E opens and allows air to enter, so that if the pressure of the confined air be reduced by the leakage of the valve F or otherwise the water will still have the pressure of its own column to force it out.

Sometimes it may be desired to increase the water capacity of the tank by permitting the escape of some of the confined air, so that the inflow is not stopped as soon as it otherwise would be. In that case a pressure-valve, I, is or may be provided, which is set to open outwardly when the air is compressed by the full pressure, or nearly so, of the water-works, and the end of the inlet-pipe D is placed a suitable distance below the top of the tank A, so that

the water may rise above the end thereof until it forms a column which balances the pressure in the pipe D to such an extent as to permit the valve I to close. The operation of the rest of the apparatus is the same as before.

In the foregoing description the tank or reservoir has been described as an upright tube or pipe, and a tank or reservoir of that description is specially intended by the reference to the tank or reservoir in the combinations hereinafter pointed out. Nevertheless a closed tank or reservoir of any ordinary or suitable form arranged in any suitable position may be employed in the said combinations, and the reference is not, therefore, restricted to the upright tubular tank or stand-pipe, but includes a closed tank or closed reservoir in general.

By a closed tank or reservoir is to be understood one which is closed against egress of air when full, and not one which is necessarily closed at all times.

Any suitable arrangement of mechanism for operating the discharge-valve may be used.

A water-inlet pipe communicating with the upper part of the closed tank or reservoir, or at a suitable distance above the bottom, forms a special feature of invention in combination the other elements hereinafter pointed out: but the invention is not wholly restricted thereto, since if the connection were otherwise made—as, for example, at or near the bottom of the tank—a part of the advantages of the invention would be thereby secured. By having the communication at the upper part of the tank the supply of water, at least to the capacity of the tank below the end of the water-inlet pipe, is, as already explained, independent of the tightness of the check-valve F in said pipe.

In explaining the apparatus shown the tank A has been heretofore described as an upright pipe with a supplemental chamber below, the said chamber being not essential. Such a reservoir could be made in various ways, and its combination generally with other elements hereinafter pointed out is included in the invention.

As shown, the body or cylindrical portion 12

of the tank is made of large-size lap-welded pipe and the ends are formed by castings 13 and 14, connected with the cylindrical portion by screw-joints. The lower casting on which the supplemental chamber H is formed is provided with flanges 15, which are bolted to a flange-ring, 16, screwed to the cylinder 12.

Modifications may be made in detail without departing from the spirit of the invention, and parts of the invention may be used separately.

I claim as my invention or discovery—

1. The combination, with the bowl or hopper, the discharge-pipe, the discharge-valve, and the closed tank, of an air-check valve which permits the ingress of air into the upper part of said tank whenever the pressure therein falls slightly below that outside, but prevents the egress of air therefrom, and a separate water-inlet pipe which terminates in the upper part of said tank at a considerable distance below the top thereof, so that a tank nearly full of water with a substantial body of air above it will be insured, notwithstanding any withdrawal of air or water through said water-inlet pipe, substantially as described.

2. The combination, with the closed tank or reservoir, its discharge-valve, the discharge-pipe, and the hopper or bowl, of the water-inlet pipe having its end below the top of said tank or reservoir, and a pressure-valve loaded to a little below the pressure of the water-service at the said end, so that said valve permits the escape from the tank of air compressed by the full head of the water, and consequently allows the water to enter until it rises above said end, but prevents egress of air when the water-service pressure is partially counterbalanced by the accumulation of water in the tank above said end, substantially as described.

In testimony whereof I have signed this specification in the presence of two witnesses.

GEORGE W. HUBBARD.

Witnesses:

W. R. BOOTH,
H. S. SAVAGE.