(No Model.)

G. B. MOORE.

VALVE.

No. 482,187. Patented Sept. 6, 1892.

Fig. 1.

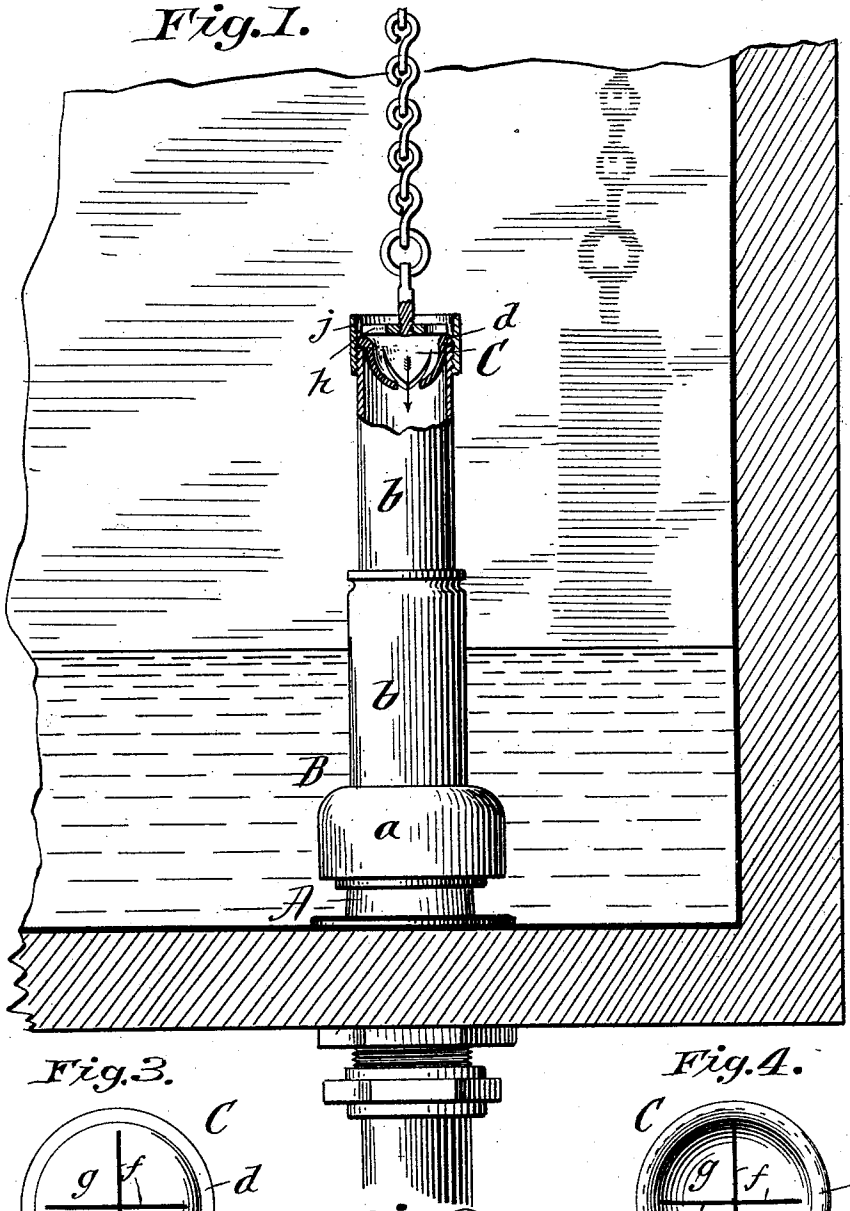

Fig. 3.

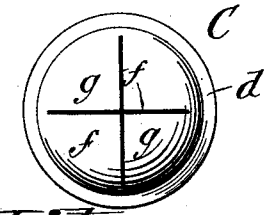

Fig. 2.

Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE B. MOORE, OF SPRINGFIELD, MASSACHUSETTS.

VALVE.

SPECIFICATION forming part of Letters Patent No. 482,187, dated September 6, 1892.

Application filed November 7, 1891. Serial No. 411,189. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. MOORE, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Valves, of which the following is a specification.

The object of this invention is to improve water-closet-tank valves, which comprise a valve-seat opening and egress-passage, the lift-valve for closing said egress, and in addition to said parts an upwardly-extended and upwardly-opening tubular member, that is arranged and adapted for communication for the suitable air-supply and overflow with the said egress-opening, whereby the valve will be rendered more nearly noiseless at and after the time of its closing than have been heretofore valves of the class indicated.

Reference is to be had to the accompanying drawings, in which the improved device, constructed under the present invention is illustrated, in which—

Figure 1 is a sectional elevation of valve shown as applied in a water-closet tank and provided with the present novel device. Fig. 2 is a perspective view of the improved valve appliance. Figs. 3 and 4 are respectively bottom and top plan views of the said appliance.

It is a well-known fact that in the operation of valves having characteristics substantially as above set forth, at and also more especially after the time the valve is lifted from the valve-seat, the outflow of water through the valve-seat and egress-conduit under the valve and tube occasion a suction of air through the overflow-tube and consequent noise or reverberation therein, which it is desired shall be avoided; and to this end the invention consists in the combination of a diaphragm or muffle with the upwardly-extended and upwardly-opening tubular member of the valve, which diaphragm is constructed to prevent such tubular member from becoming air-bound, and also to form practically no impediment to the overflow of an overplus of water in the tank therethrough, and yet to constitute in the ordinary workings of the valves such a practical impediment to the entrance of air into the valve-tube that only such an amount of air will enter the said tube as will relieve any vacuum therein and permit the most advantageous working of the valve, so far as the same is dependent upon the entrance of air therewithin, substantially as will hereinafter appear.

In the drawings, A represents the valve-seat and egress-conduit for the tank, and B the valve which comprises the weighted valve proper *a* and the tube *b*, which, as usual, is open from end to end, and when the valve is closed is in communication with the said egress-conduit.

C represents the diaphragm or muffle, the same consisting of a cup-shaped shell of flexible rubber or other analogous material, with a surrounding outwardly-extended flange or bead *d*, the concavo-convex portion within said bead being slitted or severed radially from the center, as at *f f*, forming several segments *g g*, with their edges converged to said center. The diaphragm is supported by the bead *d* at the upper end of the tube *b* as an inverted dome, and is retained by the spider *h* or other suitable internal bearing portion of a ring *j*, which being internally screw-threaded engages the outwardly-formed threads in the upper extremity of the tube *b*. The resilient properties of the material from which the muffle-diaphragm is formed tends to retain the edges of the segments *g g* substantially in contact; but it will be apparent that on occasion the usual weight of any water above the diaphragm will cause a downward and outward spreading of the segments, leaving a free overflow-passage. The air-pressures, however, which during the working of the valve may be brought upon the segments will not cause any very marked movement thereof, but merely such slight separating deflections thereof as the most efficient working of the valve demands. These actions and results will be the better understood on taking into consideration that after the valve has been lifted from its seat and egress-opening A to permit the outflow of a quantity of water through such seat and egress-opening the water passing downwardly through the pipe therebelow to the bowl causes a suction in such pipe, and in the upwardly-projected overflow pipe or extension with which the pipe to the bowl is then in communication. These said conduit and overflow sections constitute

a sounding-chamber by reason of the unobstructed entrance-orifice at the top and the consequent freedom of reverberation therein; but by the provision of a diaphragm, constructed and applied substantially as described the freedom of the air entrance from above is properly retarded, (only so much air entering as is requisite to relieve the vacuum below the diaphragm,) and consequently there is a muffling or avoidance of the reverberations within the tubular chamber, which in valves of the class indicated is a result much to be desired.

What I claim is—

The combination, with a tank-valve having the upwardly-extended and upwardly-opening tubular member adapted for communication with the valve-seat opening, of a muffle or diaphragm composed of resilient material, as rubber, having slits within its borders leaving members at either side which have their edges normally together, whereby said passage will be usually practically closed, but whereby downward air-suctions or overflowage of water passing through said passage from its top will insure a suitably-corresponding opening of the passage, substantially as described.

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Witnesses:
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