(No Model.)

C. D. MOODY.

TANK VALVE.

No. 455,257. Patented June 30, 1891.

Fig. 1.

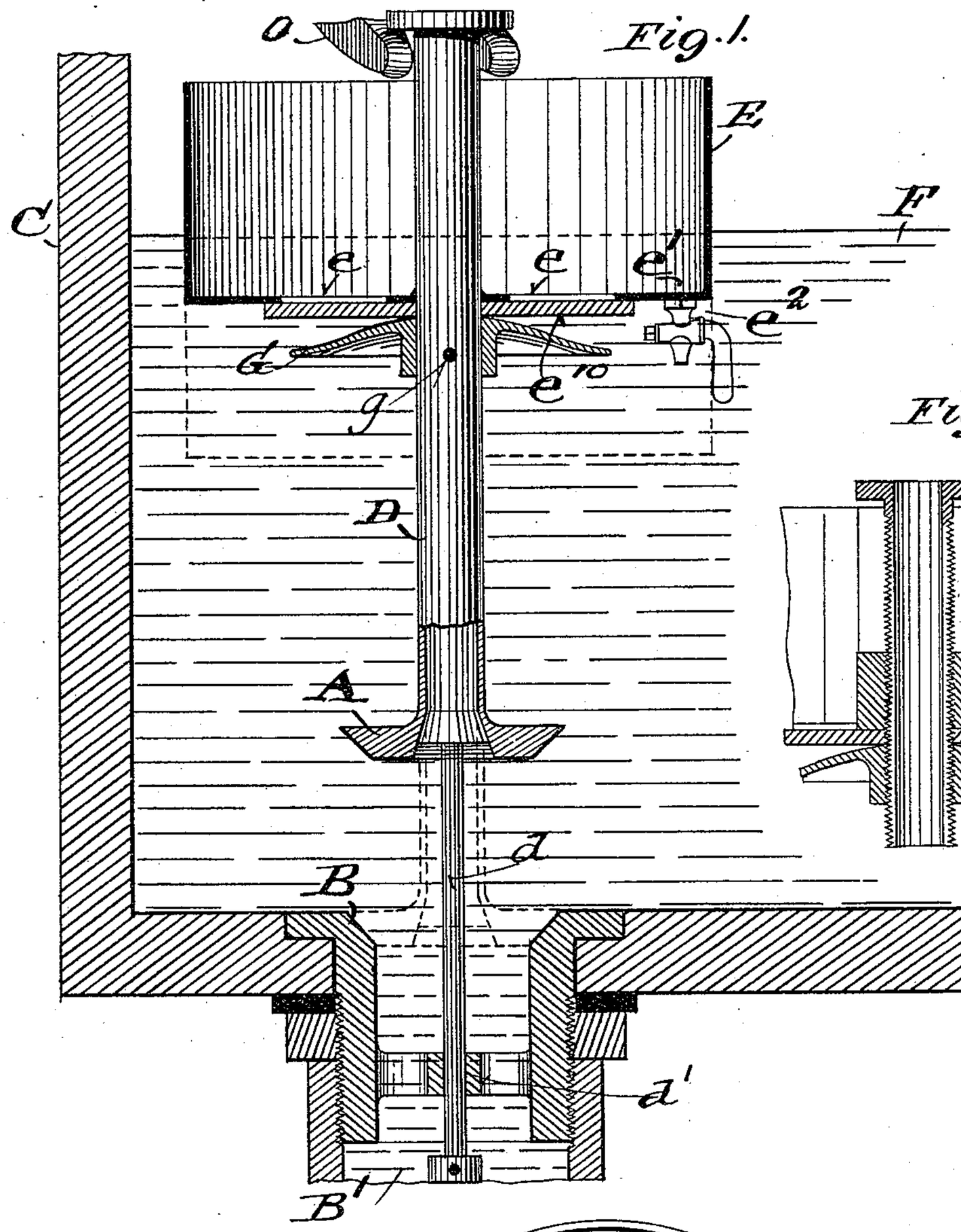


Fig. 3.

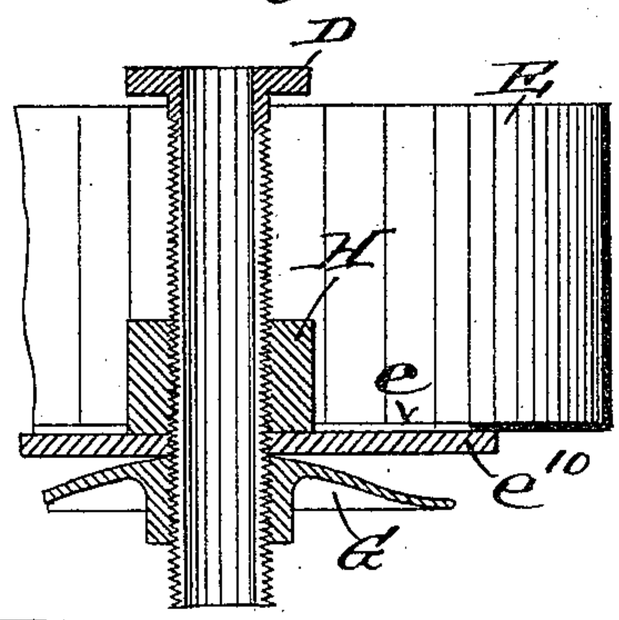
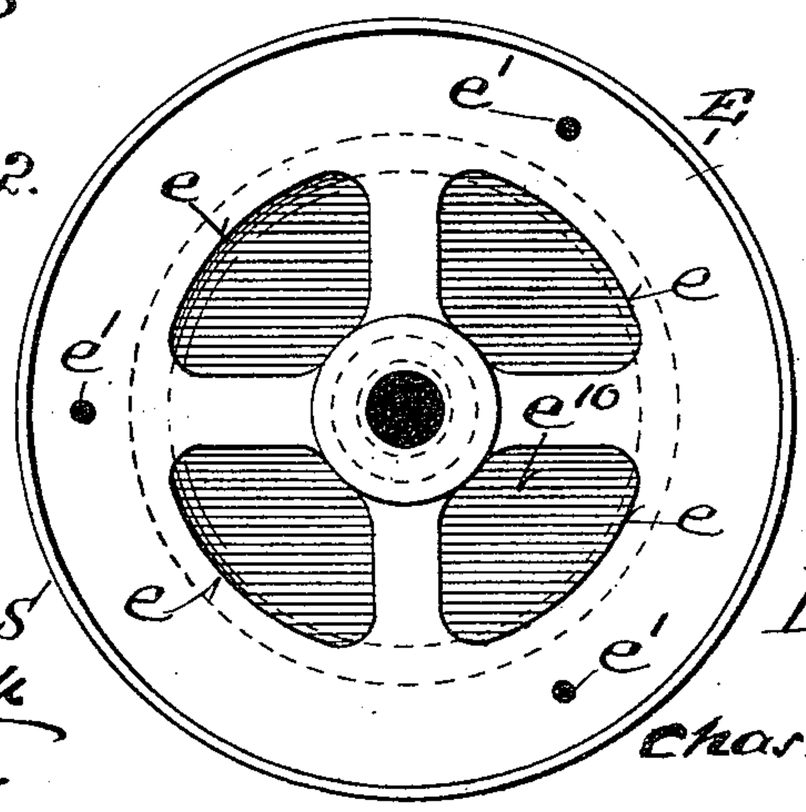


Fig. 2.



WITNESSES
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CHARLES D. MOODY, OF WEBSTER GROVES, MISSOURI.

TANK-VALVE.

SPECIFICATION forming part of Letters Patent No. 455,257, dated June 30, 1891.

Application filed November 1, 1890. Serial No. 370,076. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. MOODY, of Webster Groves, Missouri, have invented a new and useful Improvement in Tank-Valves, of which the following is a full, clear, and exact description.

The present valve is adaptable to tanks of various descriptions, wherein it is desirable to prolong the discharge of the contents of the tank after the valve has been released by the operator. It is especially adapted to water-closet tanks, and it is illustrated in connection with such a tank.

The improvement relates, mainly, to the means for controlling the closing of the valve, substantially as is hereinafter described and claimed, aided by the annexed drawings, making part of this specification, in which—

Figure 1 is a vertical section of the improved valve in position. Only that portion of the construction is exhibited which is needed for an understanding of the improvement, and the valve is represented as opened; Fig. 2, a plan of the chamber of the valve; and Fig. 3, a vertical section similar to that of Fig. 1, but showing the chamber which is attached to the valve-stem vertically adjustable thereon.

The same letters of reference denote the same parts.

Only that portion of the tank which is immediately associated with the discharge-valve in question is shown, the tank inlet-valve, and parts therewith directly connected not appearing, and only the end of the lever for lifting the valve being shown. For the purpose under consideration various mechanisms have heretofore been employed, among which, notably, are what are termed "float-valves"—such, for instance, as shown in Robertson's patent, No. 245,318, dated August 9, 1881—and which seat by falling evenly with the water as it lowers in the tank. Another form has for its leading feature a hollow valve, from which, when seated, the water is drained into the tank discharge-pipe, and which is provided with an air-exit, through which the air escapes slowly from the valve, and thereby permits the water of the tank to enter the valve gradually, and thus cause its seating to be effected gradually. A well-known form of this last-named class of valves is shown in Scott's patent, Reissue, No. 10,653, dated October 20, 1885, in which form the air escapes from a hollow valve to a point outside the water of the tank, and another form is shown in White's patent, No. 354,285, dated December 14, 1886, in which construction the air within the hollow valve is discharged into the water of the tank. The present valve differs substantially from those referred to.

The valve A is not a float-valve, but merely an ordinary solid one, substantially as shown—that is, it is not at all essential in carrying out the improvement that the main valve A be a hollow one, and it is preferably a solid one, as shown. The valve-seat B is also of the usual form, and B′ represents the customary tank discharge-pipe of the tank C, which is such as is generally used.

D represents the stem of the main valve A. It is preferably tubular to adapt it for an overflow-passage in a manner similar to that of overflow-tubes hitherto in use.

E represents a chamber attached to the valve-stem. It can be fixed upon the stem or it can be vertically adjustable thereon, as indicated in Fig. 3. Its function is to effect the described retardation of the seating of the valve. To this end it is contrived to offer as little resistance as is practicable to the unseating of the valve and so that the water within it shall be discharged from it as the valve is unseated, and, on the other hand, so that the water of the tank shall be admitted gradually into it when it is desired to seat the valve, and thus cause the seating of the valve to be retarded, as described. To this end, as a desirable construction, the chamber E is open at its top to the air, and in its bottom are openings *e*, adapted to be closed by a valve e^{10}, which opens when the main valve A is unseated and which closes when the main valve moves in the direction of its seat B, and it (the chamber) is also provided with one or more water-inlets *e′*.

The water-discharge valve e^{10} is made as large as is practicable to enable the water within the chamber to be discharged therefrom as rapidly and as easily as is possible when the main valve A and its stem and the chamber E are raised, and the water-inlets *e′* are made sufficiently small to prevent the water from entering the chamber any faster

than is necessary to effect the described gradual seating of the valve, and to better control the closing of the main valve A means can be provided for enlarging and contracting the inlets e'. This last-named feature in the present construction takes the form of a small petcock e^2, substantially as shown. Any other means for this purpose may be adopted. The chamber E is constructed and arranged upon the valve-stem, so that when the main valve A is unseated it shall come above the water F of the tank, and it is better for the chamber to be of such size and so arranged that a portion only of it needs to be submerged to uphold the main valve from seating—that is, the chamber is best formed and located when it, with its water-inlets e' closed and its discharge-valve e^{10} also closed, serves to uphold the main valve when a portion of the chamber is beneath the surface of the water, substantially as indicated in the drawings.

The operation is as follows: The valve is unseated by any ordinary means, such as the lever O, and the valve-lifting means may be such as to effect what is termed a "single action," or such as to effect what is termed a "double action"—that is, to produce both a fore and after wash. As the main valve is lifted, the downwardly-opening valve e^{10} of the chamber E opens and the water which has been previously received into the chamber flows outward therefrom past said valve e^{10}. The lift of the main valve may be sufficient to take the chamber E entirely out of the water of the tank. When the valve-stem is released in the ordinary manner, the main valve, valve-stem, and chamber settle downward in the water of the tank. The chamber discharge-valve e^{10} now closes, and the only passage by which the water of the tank can now enter the chamber are the contracted inlets e'. These last-named passages being opened suitably, the water of the tank enters slowly through them into the chamber, which thereby becomes less and less buoyant, and the main valve in consequence seats in advance of the fall of water in the tank, but at the same time with a rate of movement sufficiently slow to permit of the desired discharge of the water of the tank after the main valve has been released by the operator. The valve is suitably guided in its movement by means of the stem-extension d, working in the guide d'. The part G may serve as a guard to prevent the valve e^{10}, which may be of rubber or leather or be otherwise suitably constructed for the purpose in question, from dropping too low at its periphery. It is also a means, if desired, for upholding the chamber E, to which end the part G may be secured to the stem D by a pin passing through an opening g in the stem, and the chamber may rest upon the part G, which is in effect a shoulder upon the stem, and the chamber may be held down upon the part G by any suitable means. (Not shown.) In Fig. 3 the stem D is threaded, and the chamber is secured thereon by means of the guard G and nut H, which are adapted to engage with said threaded stem, as shown.

I desire not to be restricted to the particular means herein shown for producing a larger water-passage at the lower part of the chamber E for the outflow therefrom of the water and a smaller water-passage for the admission of water into the chamber. Said larger and smaller passages may be united. Nor do I wish to be limited to any special form of chamber E.

I claim—

1. A tank-valve having a chamber at its upper part open to the air and at its lower part having water-passages—namely, a larger passage or passages, which are more or less perfectly closed by a valve as the tank-valve moves toward its seat and opened to discharge the water freely from the chamber as the tank-valve is lifted from its seat, and a smaller passage or passages admitting the water gradually into the chamber as the tank-valve moves toward its seat, for the purpose set forth.

2. The chamber E, having the opening to the air at its upper end and at its lower end having the larger and the smaller passages, and the valve for closing said larger passages, in combination with the stem D, said chamber being vertically adjustable on said stem, substantially as described.

3. In a tank as described, the chamber E, open at its upper end to the air and at its lower end having the larger passage or passages, with a valve for closing them, and a smaller passage or passages, with means for graduating them, in combination with the tank-valve and its stem, substantially as described.

Witness my hand this 30th day of October, 1890.

CHARLES D. MOODY.

Witnesses:
A. BONVILLE,
W. H. HERNSTEIN,
EDWARD W. FURRELL.