

UNITED STATES PATENT OFFICE.

DAVID CRAIG, OF MELROSE, ASSIGNOR OF ONE-HALF TO HENRY CONLEY,
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TANK-VALVE.

SPECIFICATION forming part of Letters Patent No. 543,570, dated July 30, 1895.

Application filed November 24, 1894. Serial No. 529,832. (No model.)

To all whom it may concern:

Be it known that I, DAVID CRAIG, of Melrose, county of Middlesex, State of Massachusetts, have invented an Improvement in Tank-Valves, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to tank-valves or flushing devices for water-closets of the "slow-acting" kind, and has for its object to improve and simplify the same in many particulars; and the invention consists in details of construction of the parts, as will be hereinafter more particularly set forth.

Figure 1 shows in longitudinal vertical section a tank-valve embodying this invention; Fig. 2, a plan view of the parts shown in Fig. 1, and Figs. 3, 4, and 5 sectional details to be referred to.

The tank *a* may be of any suitable shape and size, provided with an inlet (not shown) and with an outlet pipe *b*. A fitting (herein represented as a T *c*) is permanently connected with an inner tube *b'*, arranged within the outlet-pipe *b*, and is secured to said outlet *b* and a bayonet or other joint, and to the upper end of said T-fitting a collar *c'* is connected, the upper end of which is concealed or recessed to form a seat for a ball *d*. The ball *d* is contained within a cylindrical pipe *d'*, the internal diameter of which is substantially the same as the diameter of the ball *d*, so that said ball can move from end to end of said pipe slowly, bearing frictionally against the interior of the pipe. A strap or collar *d''* embraces said pipe *d'* near one end, the lower part of said strap or collar being pivotally connected to a stud *d'''*, preferably made vertically adjustable in an arm *d''''*, secured to the collar *c*—as, for instance, it may embrace said collar.

The pipe *d'* containing the ball is normally inclined, and at its lower end, or that end opposite its pivotal connection, is cut away at its lower side, presenting a hole through which the ball *d* normally projects, the hole being of circular shape to correspond to the ball. This lower or ball receiving end of the pipe extends over the collar *c*, so that the projecting ball *d* may be seated in the upper end of

the collar. A yoke *e* is loosely placed upon and so as to partially embrace the pipe *d'* near the lower end thereof, the arms of said yoke projecting downward and engaging the projecting portion of the ball, as best shown in Fig. 3. This yoke is prevented from lateral movement on the pipe by suitable ribs 20 or otherwise. A cord 2 is attached to said yoke, passing up over a pulley *c*, thence over a pulley 4, and then down within convenient reach of the user, and by pulling said cord the yoke *e* is first raised independent of the pipe *d'*, its arms lifting the ball *d* away from its seat, and then said arms engage the pipe and raise it on its pivotal connection, so that the ball *d* is free to pass to the other end of the pipe by gravity.

The tank is supposed to be filled with water to the point above the pipe *d'* even when said pipe is raised by the action of the cord. Each end of the pipe *d'* is open and provided with a clack-valve *f f'*, the valve *f* being pivoted at *f''* at a point above its center, so that when the pipe *d'* is raised the lower part of the valve turns into the pipe, and the valve *f'* being pivoted at *f'''* at its top and provided also at the top with an inturned arm or offset *f''''*, provided with an adjusting-screw *f'''''*, which, by striking the top of the pipe *d'*, limits the distance the valve *f'* can open. The lower end of the valve *f'* has an adjusting-screw *f''''''*, by which the closing of the valve can be regulated, said screw striking against the end of the pipe *d'*. By pulling the cord 2 the pipe *d'* is raised, and the ball *d*, passing along the opposite end of the pipe, bears upon or against the valve *f'*. At such time the water passes through the outlet-pipe of the tank, flushing the closet. By releasing the tension upon the cord 2 the pipe *d'* immediately resumes its normal position, bearing upon the collar *c*; but the water continues to pass through the opening in said pipe through which the ball projects until the ball returns, closing said opening and becoming seated in the collar.

The ball in returning to its normal position at the lower end of the pipe *d'* moves frictionally along the pipe against the pressure of the water in front of it, and owing to the adjustment of the valve *f'* the water enters at that end of the pipe slowly, so that the ball

consumes a predetermined amount of time in returning to its normal position, which time may be regulated by the adjusting-screw f^6 of the valve f' , (see detail Fig. 5,) which determines the entrance of the water. Thus the ball returns slowly.

In many instances the bowls are so constructed that as soon as the tank-valve is closed there is not enough water left to properly fill the bowl, and hence I have provided supplementary means for filling the bowl, which I desire to be understood is only used in cases of necessity, owing to the additional expense of providing it. This supplementary filling device consists of a pipe g , connected with the T-fitting below the collar c , the outer end of said pipe being upturned and formed with a seat at the end for a ball g' similar to the ball d , and a cylindrical pipe g^2 is provided, which contains said ball, it having a strap or collar g^3 (see dotted line, Fig. 1) embracing it near its opposite end, which is pivotally connected to an adjustable stand g^4 on the pipe g , or it may be otherwise supported. This pipe g^2 is constructed substantially the same as the pipe d' , having clack-valves at each end, one of which is adjustable to regulate the inflow of water, and as a means of raising the pipe to cause the ball to leave its seat and pass to the other end of the pipe, and thereby expose the open end of the pipe g , I have herein provided the pipe d' with a lateral projection n , having a latch or dog n' , which, as the pipe d' is raised, passes by a projecting arm n^2 on the pipe g^2 ; but as the pipe d' is returned to its normal position said dog n' engages said arm n^2 , raising the pipe g^2 . The arm n^2 is made of suitable length, so that while it may be engaged by the latch or dog n' during the return movement of the pipe d' it permits said latch or dog to slip off just as said pipe d' resumes its normal position, thereby permitting the pipe g^2 to thereafter resume its normal position. The ball g' of said supplementary pipe resumes its normal position just after the ball d resumes its seat, so that the results desired may be effectually carried out.

The tank herein shown is also provided with an overflow-pipe which, in itself, I believe, possesses elements or features of novelty. It consists in an overflow-pipe m , the lower end of which is connected with the T-fitting and the upper end of which projects above the ordinary water-level. This pipe is bent at substantially right angles, as shown in Fig. 1, and at the bend is contracted, as at m' , and provided with a seat for a ball m^2 , which is contained in a short branch pipe or other form of receptacle m^3 , leading from the pipe opposite the valve-seat therein. The ball m^2 normally effectually closes the overflow-pipe, so that there is no opportunity for the air to enter and cause a rattling or whistling noise when flushing the bowl or at other times; but in case the water in the tank rises above the upper end of said overflow-pipe it passes down said pipe, moving the ball m^2 out into

its branch or receptacle m^3 , and thereby escaping. A suitable air-vent pipe m^4 is provided for said branch or receptacle m^3 .

I claim—

1. In a tank valve, the combination of an outlet pipe, a ball valve controlling the passage therethrough, a cylindrical pipe containing the ball, which latter snugly fits its interior, said pipe being pivoted at one end, and provided at its lower side at the opposite end with an opening through which the ball projects while closing the outlet pipe, a valve controlling the passage through said pipe, which when open permits the ball to move quickly, and when closed or partially closed, causes it to move slowly, and a cord connected with said pipe, substantially as described.

2. In a tank valve, the combination of the outlet pipe and ball seated at its upper end, a cylindrical pipe containing said ball, which latter snugly fits its interior, said pipe being pivoted at one end, and having an opening at its lower side at the opposite end, through which the ball normally projects, the adjustable valve f' , and cord 2, substantially as described.

3. In a tank valve, the combination of the outlet pipe and ball seated at its upper end, a cylindrical pipe containing said ball, which latter snugly fits its interior, said pipe being pivoted at one end, and having an opening at its lower side at the opposite end, through which the ball normally projects, the adjustable valve f' , a loose yoke e , and cord 2, substantially as described.

4. In a tank valve, the combination of the outlet pipe and ball seated at its upper end, a cylindrical pipe containing said ball, which latter snugly fits its interior, said pipe being pivoted at one end, and having an opening at its lower side at the opposite end, through which the ball normally projects, the adjustable valve f' , and the valve f , and cord 2, substantially as described.

5. In a tank valve, the combination of the outlet pipe and ball seated at its upper end, a cylindrical pipe containing said ball, which latter snugly fits its interior, said pipe being pivoted at one end by an adjustable pivotal connection, and having an opening at its lower side at the opposite end, through which the ball normally projects, the adjustable valve f' , and cord 2, substantially as described.

6. In a tank valve, the combination of the outlet pipe and ball seated at its upper end, a cylindrical pipe containing said ball, which latter snugly fits its interior, said pipe being pivoted at one end, and having an opening at its lower side at the opposite end, through which the ball normally projects, a clack valve f' having a limiting stop f^5 , and a regulating stop f^6 , a cord 2 connected with the pipe, substantially as described.

7. In a tank valve, the outlet pipe, and flushing valve, combined with a supplementary bowl-filling device, consisting of a ball seated at the upper end of the pipe g , a cylindrical

pipe g^2 , which it snugly fits, pivoted at one end and having at its lower side, near its opposite end, an opening 4, through which the ball normally projects, and end valves for said pipe, substantially as described.

8. The tank a , flushing valve contained therein, and the over-flow pipe m , having a contracted portion m' , formed with a valve seat, a ball m^2 and vented receptacle therefor, into which the ball is moved by the pressure of the water, substantially as described.

9. In a tank valve, a pivoted cylindrical pipe having an opening at the end opposite its pivotal connection, and containing a ball which normally projects through said open-

ing, and closes on a seat to stop the outlet of the tank, but which is movable to the other end of the pipe when the pipe is turned up, and means for retarding the progress of the ball on its return, consisting of a gravitating valve controlling the passage through the pipe; substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID CRAIG.

Witnesses:

B. J. NOYES,

FLORENCE H. DAVIS.