No. 637,499. Patented Nov. 21, 1899.

H. T. BUSH.

FLUSHING VALVE OR APPARATUS.

(Application filed Mar. 5, 1898.)

(No Model.)

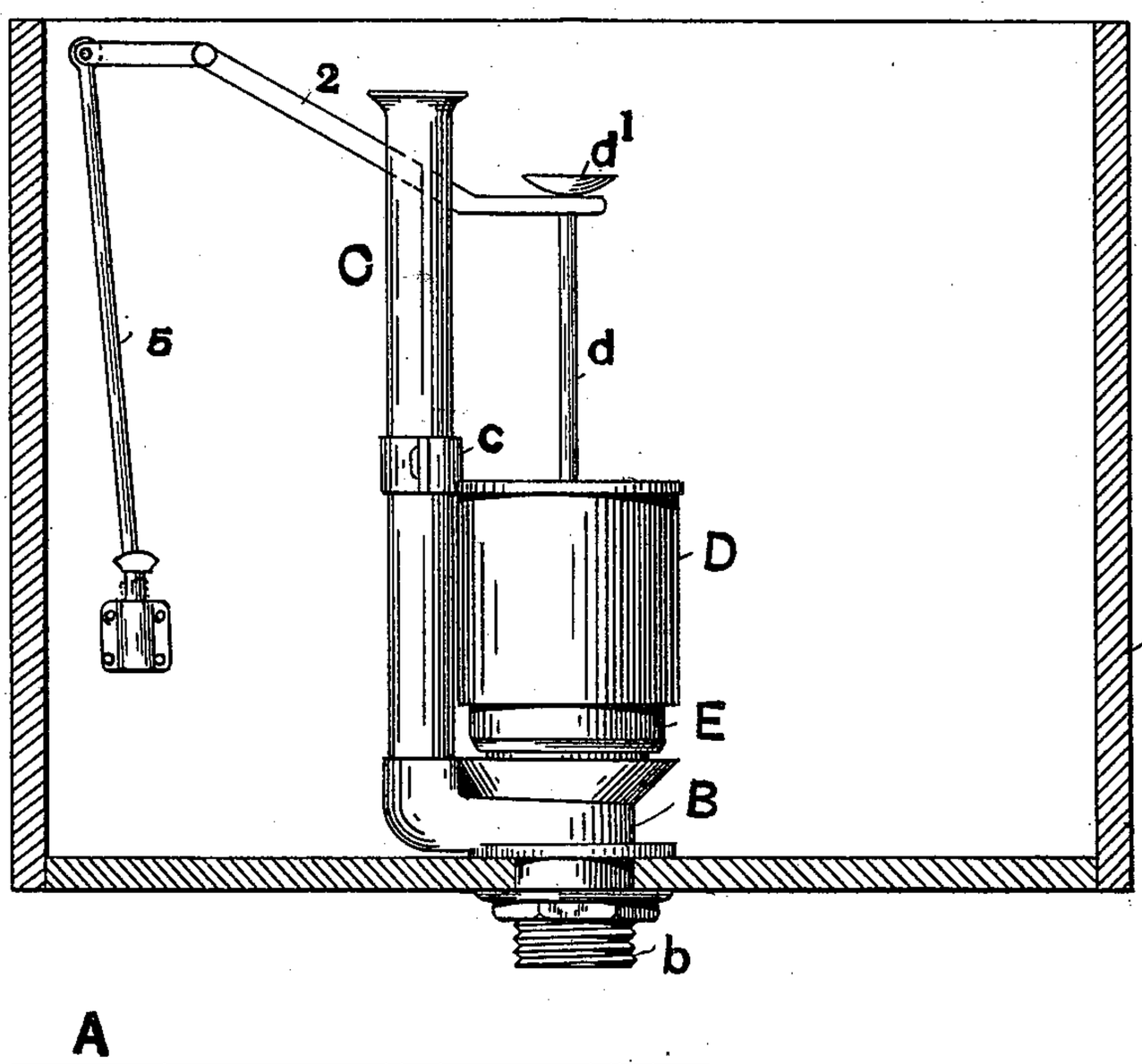

Fig. 1.

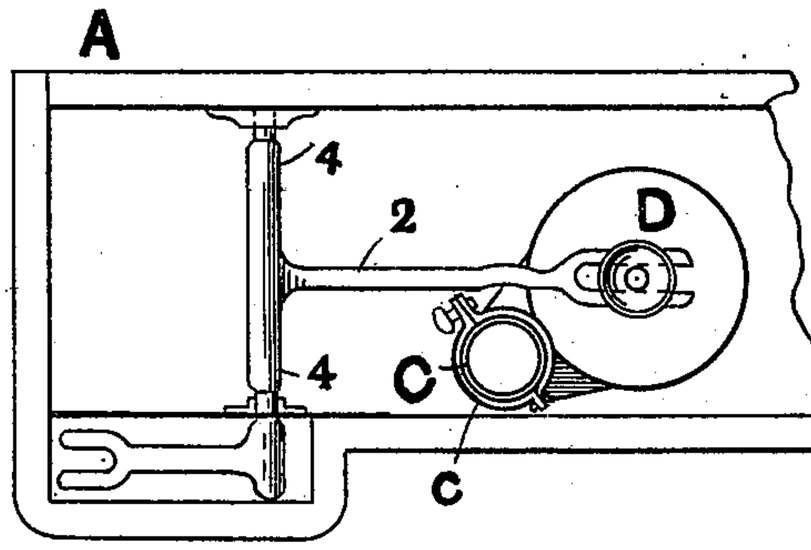

Fig. 3.

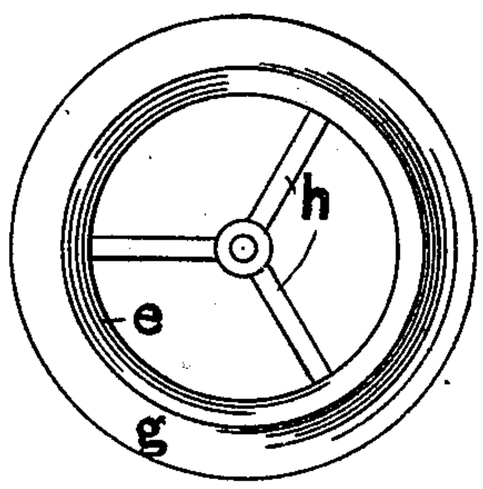

Fig. 4.

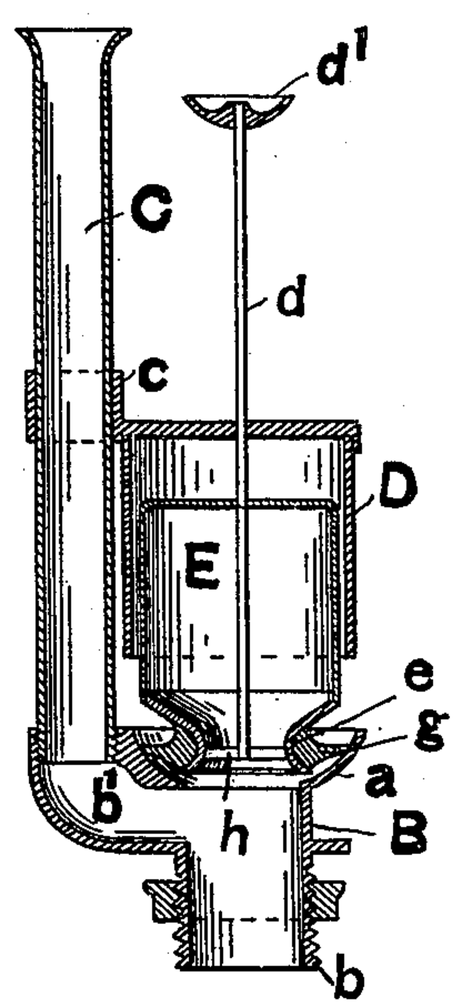

Fig. 2.

WITNESSES

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FLUSHING VALVE OR APPARATUS.

SPECIFICATION forming part of Letters Patent No. 637,499, dated November 21, 1899.

Application filed March 5, 1898. Serial No. 672,628. (No model.)

To all whom it may concern:

Be it known that I, HIRAM T. BUSH, a citizen of the United States, residing at the city of Detroit, county of Wayne, and State of Michigan, have invented a certain new and useful Improvement in Flushing-Valves or Flushing Apparatus; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to valves for flush-tanks, and has for its object an improved valve adapted to open quickly, to remain open during a period in which the tank is emptying, and to close quickly when the tank is emptied. It is arranged to be readily adjusted, and that part of it which takes the place of the ordinary float-valve and which may be called a "float-valve" is arranged to be held up by the body of water in the tank after it has been once lifted, but to drop gradually when the water has escaped and no longer supports it and to remain seated, with the valve part of it on the valve-seat, while the tank is again filling.

In the drawings, Figure 1 shows the valve in elevation. Fig. 2 shows it in sectional elevation. Fig. 3 is a plan view of the valve and its connections. Fig. 4 is a bottom view of the float part of the valve.

A indicates the walls of the tank, through the bottom of which projects the fitting B, terminating on its lower end with a coupling-screw *b* and provided on the upper end, within the tank, with a valve-seat *a*, below which there is an inlet *b'*, adapted to receive the lower end of the overflow-pipe C. The overflow-pipe is open at its upper end and communicates freely at its lower end with the fitting B below the valve-seat *a*.

The overflow-pipe C is utilized as a support for a guiding-shell D, which is held to the overflow-pipe C by a clamping-ring *c*. The guiding-shell D is a short cylinder open at its lower end and closed at its upper end, except for the small hole through which the stem of the valve projects.

Within the guiding-shell D is a bell or cylindrical cup E, the lower or mouth end of which is contracted somewhat and is provided with an annular groove *e*, of a shape proper to hold a packing-ring *g*. There is also across the mouth of the bell E a spider, (shown in Fig. 4,) by means of which the rod or stem *d* is secured to the bell E. The rod extends axially through the bell E and projects upward through the upper surface-plate of the guiding-shell D and terminates at its upper end with a button or enlargement *d'* to engage the end of the forked lifting-lever 2. The lifting-lever is fulcrumed by trunnions 4 and is provided with a pull-rod 5, which is outside of the water-containing part of the tank. It may be and preferably is inclosed within the wooden casing, except at the extreme lower end, where it is bent, and the bent portion projects out through a slot in the wooden casing and terminates with an upturned button, arranged to be pushed by the hand.

The packing-ring *g* is a ring of rubber, made to conform on its inner surface to the groove *e* at the lower end of the bell E.

A projecting flange or web of thin rubber engages against the surface of the conical seat *a* at the upper end of the fitting B. When the bell is dropped, so that the rubber packing engages the seat *a*, the extreme outer edge bends upward somewhat and forms a packing similar to the well-known Brahmah packing, and the weight of the water acts in conjunction with the weight of the bell to hold the valve securely to its seat. The lower end of the bell being open the interior of it fills with air, and it has now no quality of flotation. As soon, however, as the bell is lifted by means of the pull the air within it, being held from escape by the water which is now flowing under it, gives to the bell qualities of flotation, and it will not sink in the water, but rises immediately until it reaches the surface of the water or until its upward motion is stopped by the guide D, and remains floating, as it were, on the water until the water-level sinks to the upper edge of the fitting B. As soon as the water has sunk to this point there is no longer support offered by it to the bell, and the bell sinks back to its seat, and a fresh supply of water coming in through the inlet-valve fills the tank again.

The height to which the valve is to be lifted is readily adjusted by means of the guide-shell D and the clamping-ring *c*. The guide D regulates the height to which the bell can be lifted, guides it accurately to its seat, and aids in holding the bell in its lifted position so long as water is flowing out through the outlet B.

The diameter of the bell E is slightly less than the inner diameter of the shell B, so that water can readily pass into and out from the chamber above the bell.

What I claim is—

1. In a valve for flush-tanks, the combination of a guide-shell closed at its top, and adjustable with reference to the valve-seat below it, a hollow open-mouthed valve concentrically within the shell and of less diameter than the inner diameter of the shell, a valve-seat and a Brahmah packing carried by the open-mouthed valve, and adapted to engage the valve-seat, substantially as described.

2. In combination with an overflow-pipe and an outflow fitting for flush-tanks, a valve, cylindrical guide closed at the top and adjustable along said overflow-pipe, a hollow valve adapted to hold a supply of air therein, and to be supported in water by the air contained therein, substantially as described.

3. In combination with a tank, a guide-shell open on its under side, a bell-valve arranged within the shell to admit circulation of water between it and the guide-shell, a seat for the bell-valve and means for lifting the bell from the valve-seat, the parts being arranged so that the bell-valve retains a quantity of air on its interior which is confined therein by the water beneath it when the valve is lifted off its seat to allow the water to flow out, and the air so confined prevents the bell from filling with water, and causes it to rise through the water in the tank, substantially as described.

4. In a flushing apparatus, the combination of a guiding-shell, a bell-shaped valve located within the shell, a valve-stem, and a lever engaging the stem; the shell being larger than the valve and adapted to fill with water whereby the valve, after leaving its seat, floats upward through the water in the guide and automatically drops to its seat when the water flows out from the shell and the tank, substantially as described.

5. In a flushing apparatus, the combination of a float-valve, a guard incasing said float-valve arranged to confine within the guard and outside the valve a quantity of water through which the valve automatically rises and floats so long as water remains within the interior of the guide-shell, substantially as described.

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

HIRAM T. BUSH.

Witnesses:
JOHN H. BISSELL,
ANNA E. WILSON.