

No. 621,388.

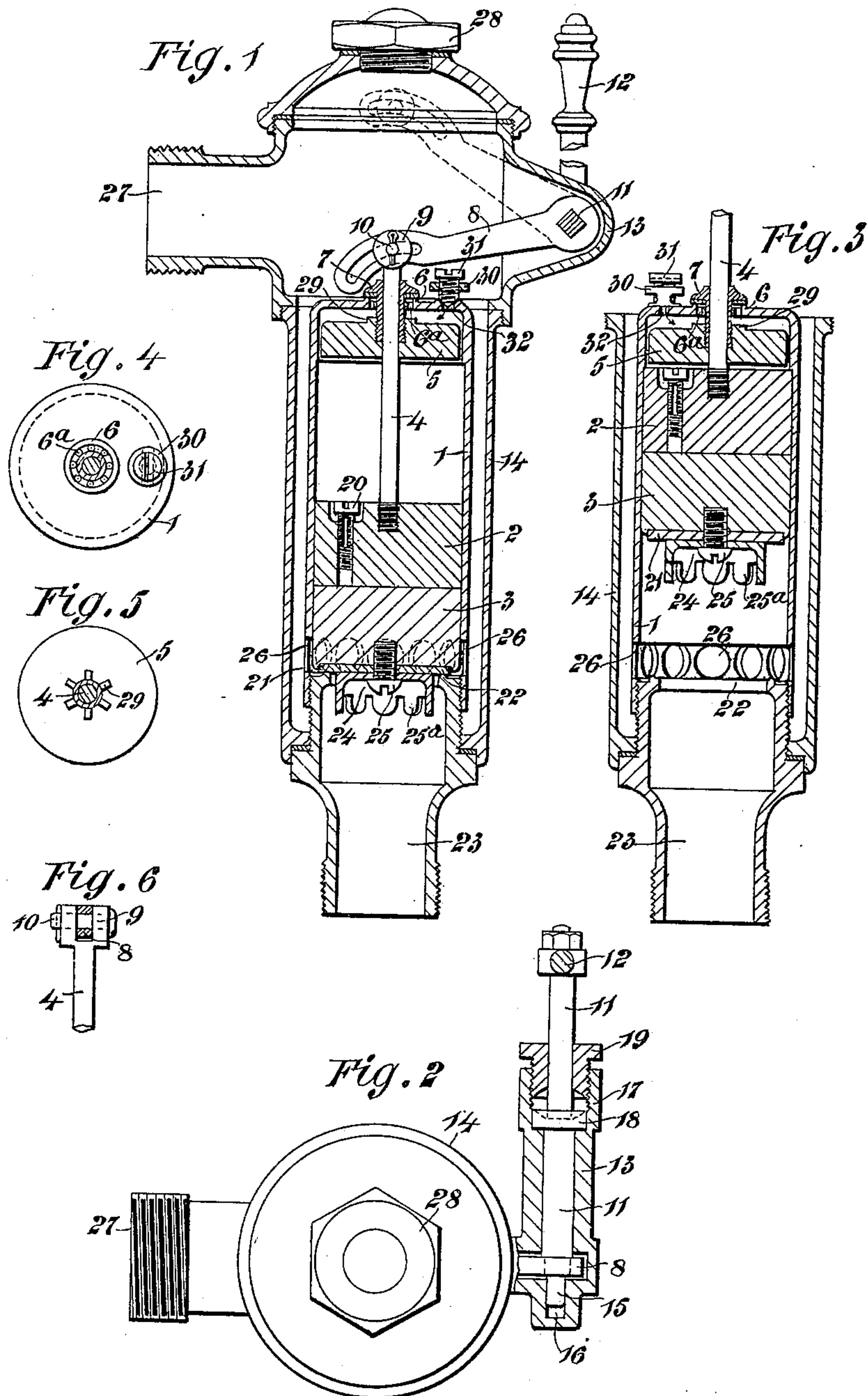
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W. TURNBULL.

APPARATUS FOR DRAWING OFF FIXED QUANTITIES OF LIQUIDS.

(Application filed Oct. 15, 1898.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR DRAWING OFF FIXED QUANTITIES OF LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 621,388, dated March 21, 1899.

Application filed October 15, 1898. Serial No. 693,628. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM TURNBULL, a subject of the Queen of Great Britain, residing at 54 Lambton Quay, Wellington, New Zealand, have invented an Improved Apparatus for Drawing Off Fixed Quantities of Liquids, of which the following is a specification.

This invention relates to apparatus used for drawing off liquids in fixed quantities, and is more especially applicable for use in water-closets, for flushing drains, drawing beer, and like purposes.

The object of the invention is to provide apparatus whereby a fixed maximum of water to be drawn for such purposes as flushing a water-closet cannot be exceeded each time the apparatus is operated.

With the apparatus at present in use it is possible to leave the water running; but such waste is prevented when my apparatus is used, because the water will be shut off after the determined quantity has passed, independently of holding or releasing the handle which sets the apparatus in operation.

With my invention the noise occasioned in water-closets by the siphon is entirely avoided, two or more water-closets may be served from one cistern, and a saving of cost thus effected in a building provided with a number of closets. Escape of gas from the drain cannot take place, as occurs with the present ball-cock when the water is shut off at the main, and since the cistern may be large and is not emptied each time my apparatus is used the closets may be flushed for some time after water has been shut off at the main.

In order that the invention may be readily understood, I will now give a detailed description of the apparatus as applied to flushing a water-closet, from which description a skilled person will be able readily to adapt the apparatus to other purposes.

The drawings are appended and form part of this specification.

Figure 1 is a sectional elevation of the apparatus. Fig. 2 is a plan of the same, partly in section. Fig. 3 is a sectional elevation of part of the apparatus. Fig. 4 is a view of the top of a dome. Fig. 5 is a view of the top of a weight. Fig. 6 is a side view of the top of a piston-rod.

Similar figures of reference indicate corresponding parts throughout the views.

Describing the invention by aid of the drawings, the dome or vessel 1 has a piston 2, a weighted valve 3, and a piston-rod 4, passing through the weight 5, valve-seat 6, and valve 7 to the slotted lever 8, to which it is coupled by means of its jaw 9 and pin 10. The lever 8 is fixed to the spindle 11 and operated by the handle 12. The said spindle 11 is carried in a bracket 13, formed upon the outer casing 14, the pivot 15 fitting into the end 16 of the said bracket, which at its outer end has a stuffing-box 17 to receive the collar 18 of the spindle 11. By means of the gland 19 the spindle may be held in position and leakage of water prevented.

The piston 2 has a vent-screw 20, preferably split, as shown, so that by turning the screw the size of the passage through the vent may be increased or decreased, as desired.

The valve 3 has a face 21, of leather or the like, which in normal conditions rests upon the seating 22, formed upon the base or nozzle 23. The inverted cup 24 is secured to the valve 3 by the screw 25, and preferably has a scalloped edge 25^a.

The dome 1 screws upon the base 23 and is perforated with holes 26. In the top of the dome is a vent 30, which may be made similar to vent 20, or, as shown, comprises a valve-seat with a screw 31 fitted into the upper part of the same. The conical end of the screw may be brought to close the opening 32 in the dome, and by adjusting the said screw the flow of water through the vent may be regulated as required. The vent is shown in section in Fig. 1, in elevation in Fig. 3, and in plan in Fig. 4. The arrows indicate the direction in which the water enters.

The nozzle 27 is connected to the water-main or to a supply-tank and the base 23 to the pan of the closet.

When the lever 8 is raised, the piston 2 will be drawn upward. The water contained in the upper part of the dome 1 lifting the valve 7 and its weight 5 and finding its way around the weight 5 and through the holes 6^a will pass into the outer casing 14. A partial vacuum will be formed between the piston 2 and valve 3, with the result that the valve 3, with its valve-face 21, will follow the piston 2 in its

upward stroke, as shown by Fig. 3, and, uncovering the valve-seat 22, will leave a passage for the water from the outer casing 14 to the base 23 and thence to the pan of the closet.

5 As soon as the movement of the lever 8 is arrested the valve 3 will commence to descend and the valve 7 will close. The speed at which the valve 3 will descend is regulated by adjusting the vents 30 and 20, through
10 which the water is allowed to flow from the outer casing 14 at any desired speed. Thus an unlimited quantity of water cannot pass from the nozzle 27 to the closet by holding the handle 12 after the lever 8 has been raised,
15 but the valve 3 will fall whether the handle is held or released.

In practice the handle 12 will usually be released immediately after it has been operated, and in such cases the piston 2 and valve 3
20 will descend together, and the regulating of the descent of the two parts falling together may be effected by the vent 30 alone.

The apparatus may be adjusted to different pressures by screwing down the dome until the holes 26 are partially covered and the cup 24 is provided to descend through and partially close the passage into the base 23, and thus shut off the water without shock when the valve 3 reaches its seat 22. The
30 scalloped edge 25^a of the cup provides for the still more gentle closing of the valve 3.

I prefer to place the nozzle 27 near the top of the apparatus to prevent air collecting in that part; but I also provide a screw-cap 28,
35 which may be unscrewed to allow air to escape in the event of its accidentally collecting.

The top of weight 5 has ribs 29 to arrest the lift of the said weight and prevent the holes 6^a from being so covered as to impede the
40 passage of water.

By my apparatus the amount of water allowed to flow from the main or from a cistern may be regulated with the greatest exactitude.

45 It is obvious that I may dispense with the lever 8 and handle 12 and carry the piston-rod upward through the cap 28 and operate the same directly by the hand.

Having now particularly described and as-
50 certained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an apparatus for drawing off fixed quantities of liquids, in combination, an outer
55 casing, a dome within the casing having perforations in its lower part and having a restricted opening in its upper part for the admission of fluid, a weighted valve closing an

exit-opening in the top of said dome, a vented piston having a rod extending through the
60 top of the dome with means for operating the same, and a valve below the piston, substantially as described.

2. In an apparatus for drawing off fixed quantities of liquids in combination an outer
65 casing having a nozzle at its upper part and a nozzle at its lower part a removable cap closing an air-escape opening in the upper part of the outer casing a dome within the casing having perforations in its lower part
70 a piston having a vent a weighted valve and a vent in the top of the dome ribs upon the top of said weighted valve a piston-rod carrying the piston a lever and handle for operating the piston and a valve below the piston,
75 substantially as set forth herein.

3. In an apparatus for drawing off fixed quantities of liquids in combination an outer casing a dome within the casing having perforations in its lower part said dome being
80 screw-threaded so that its perforations may be partially closed a piston having a vent a weighted valve and a vent in the top of the dome a piston-rod carrying the piston and passing through the top of the dome means
85 for operating the piston and a valve below the piston, substantially as set forth herein.

4. In an apparatus for drawing off fixed quantities of liquids in combination an outer casing a dome within the casing having per-
90 forations in its lower part a piston having an adjustable vent a weighted valve and a vent in the top of the dome a piston-rod carrying the piston and passing through the top of the dome a lever and handle for operating the
95 piston a bracket having a stuffing-box for carrying the spindle of the said lever and handle and a valve below the piston, substantially as set forth herein.

5. In an apparatus for drawing off fixed
100 quantities of liquids a piston a weighted valve below the piston a dome for containing the said piston and valve means for raising the said piston so that a partial vacuum is formed below the piston to raise the valve vents in
105 the piston and dome to provide for the descent of the valve and a weighted non-return valve in the top of the dome, substantially as set forth herein.

In witness whereof I have hereunto set my
110 hand in the presence of two witnesses.

WILLIAM TURNBULL.

Witnesses:

E. S. BALDWIN,
W. E. HUGHES.