

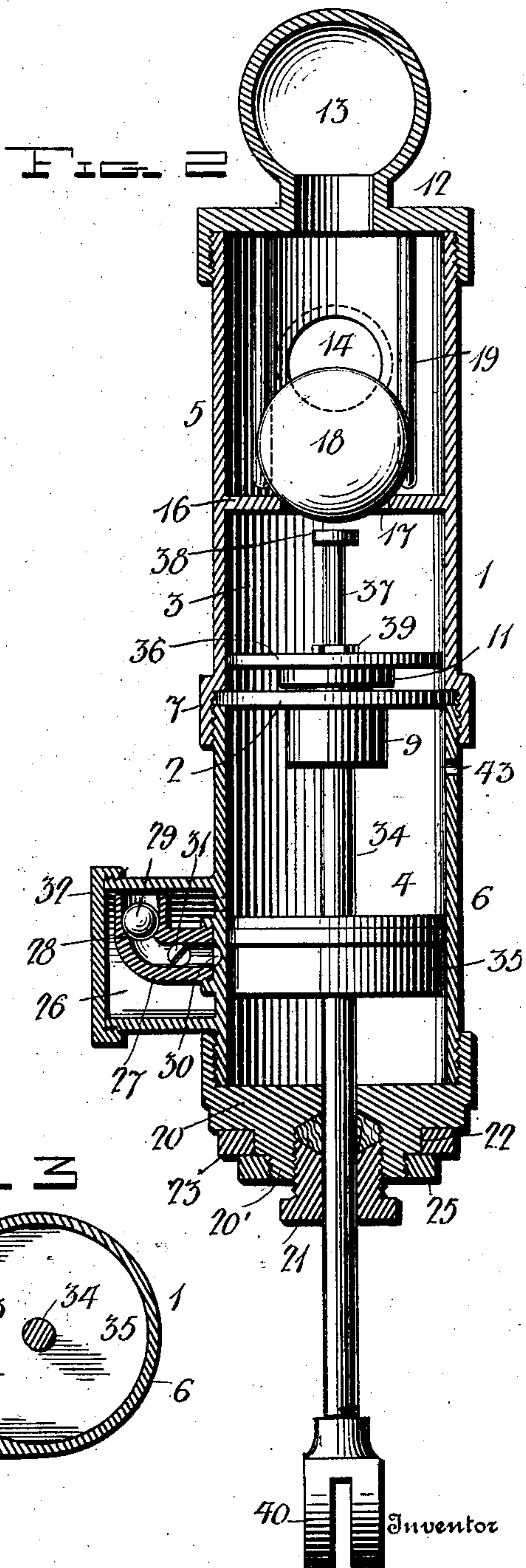
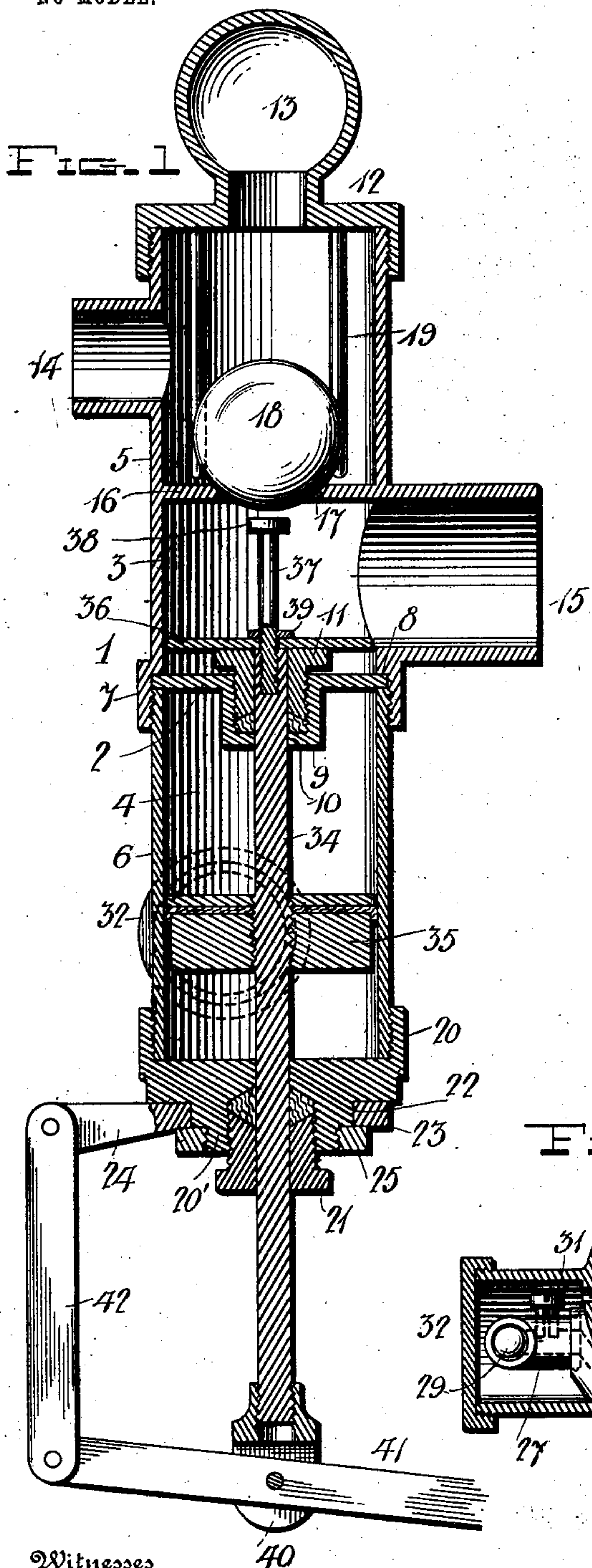
No. 754,573.

PATENTED MAR. 15, 1904.

H. O. KRAKOW.  
WATER CLOSET.

APPLICATION FILED OCT. 19, 1903.

NO MODEL.



Witnesses

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# UNITED STATES PATENT OFFICE.

HENRY O. KRAKOW, OF DUBUQUE, IOWA.

## WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 754,573, dated March 15, 1904.

Application filed October 19, 1903. Serial No. 177,678. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY O. KRAKOW, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Water-Closets; and I do hereby 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 appertains to make and use the same.

This invention relates to water-closet-flushing apparatus of the character described in my United States Letters Patent No. 723,612, dated March 24, 1903, and is designed as an improvement thereon.

One object of the invention is to prevent leakage from what I shall term the "impact-chamber" of the cylinder to the piston-chamber thereof.

A further object of the invention is to render the air-valve of the apparatus readily accessible from the exterior of the cylinder for the purpose of adjustment.

For a full understanding of my invention reference should be made to the drawings, illustrating the preferred form of apparatus embodying the same, together with the detail description, forming this specification, and the claims.

In the accompanying drawings, Figure 1 is a vertical section of an apparatus embodying my invention, taken through the center of the cylinder and its inlet and discharge openings. Fig. 2 is a similar section taken at approximately right angles to that of Fig. 1. Fig. 3 is a horizontal section through the cylinder and air-chamber.

Referring to the drawings, the numeral 1 denotes a cylinder divided at a suitable point interiorly by a diaphragm 2 into an upper or impact chamber 3 and a lower or piston chamber 4.

For convenience and economy of manufacture the cylinder is constructed of an upper section 5 and lower section 6, the diaphragm 2 being rigidly secured at or near the junction of the two sections, a convenient construction being to clamp the rim thereof between the upper and lower sections. As shown, the upper section is provided at its

lower end with an annular offset 7, rabbeted interiorly to provide a shoulder 8, against which the rim of the diaphragm is seated and having a female thread to engage the male thread at the upper end of the lower section 6. The shoulder 8 and upper end of the lower section 6 will be accurately dressed, so that an impervious joint will be made when the diaphragm is clamped tightly between them.

The diaphragm is provided centrally with a circular box 9, interiorly threaded and having in its bottom wall an opening 10, forming a guideway for a piston-rod, to be presently described, and threaded into this box is a gland 11, between the stem of which and the bottom of the box 10 a packing for the piston-rod is compressed, thus preventing leakage from the upper to the lower section at this point.

The upper section 5 of the cylinder is closed at top by a cap or head 12, shaped to form an air-space 13, and is provided near the upper end with a water-inlet 14 and near its lower end with a water-outlet 15, preferably of greater area than the water-inlet for obvious reasons.

Between the water-inlet and water-outlet and conveniently cast integral with the section is a partition 16, having an opening 17, forming a passage or port between the water inlet and outlet and constituting a seat for a gravity-valve, preferably a ball-valve 18, which normally closes the passage between the water inlet and outlet. This valve may be guided in its movement from and to its seat by any preferred means—as, for instance, a number of guide-rods 19, depending from the upper head 12.

The lower section 6 of the cylinder is closed at its lower end by a head 20, screwed thereon, said head being provided with a tubular boss 20', interiorly threaded to receive the gland 21, said boss and gland constituting a stuffing-box for the piston-rod before mentioned. Exteriorly the boss 20 forms a bearing 22 for a circularly-shiftable collar 23, having at one side a projecting ear 24, and is threaded to receive a clamp-nut 25, by means of which said collar 23 is locked in a desired position of adjustment.



An air-chamber 26 is located exterior to the lower section 6 of the cylinder, near its lower end, within which is arranged an automatic air-valve consisting of an elbowed or L-shaped tube 27, the bore of the vertical leg of which is enlarged, thus forming a seat 28 for the gravity-valve 29. The horizontal leg of the tube is screwed into the threaded inner end of an air-passage 30, communicating at its outer end with the atmosphere, and said horizontal leg is tapped to receive an adjustable air-vent consisting of slotted screw 31. The vertical end of the tube 27 opens into the air-chamber 26, which is closed to the atmosphere by a large screw-cap 32, but communicates with the interior of the lower section 6 of the cylinder through an opening 33 in the wall of said section.

Seated slidably in the stuffing-boxes 9 11 and 20 and 21 of the lower section 6 of the cylinder is a piston-rod 34, fitted at a suitable point within said section with a packed piston 35 and at its upper end (which terminates in the normal position of the parts flush with the head of the gland 11) with a disk 36 of a diameter sufficiently smaller than that of the upper section 5 to move freely therein. The upper end of the piston-rod 34 is tapped to receive the lower threaded end of rod 37, the upper end of which terminates in the head 38 in juxtaposition with the lower surface of the valve 18, and as a convenient construction the disk 36 is shown as clamped between the head of the gland 11 and a nut 39 engaging the thread of the rod 37.

The lower end of the piston-rod carries a forked sleeve 40, between the legs of which is pivoted a lever 41, one end of which terminates in a handle (not shown) for manual operation, the other end being fulcrumed in the lower ends of a pair of links 42, and the upper ends of which are pivoted to the ear 24 of the collar 23.

The several parts are shown in the drawings as in their normal position, in which a flow of water from the water-inlet 14 to the outlet 15 will be prevented by the valve 18. To cause a flow of water through the apparatus, the free end of lever 41 is raised, thus causing the rod 37 to lift valve 18 from its seat to permit the water to flow to the outlet 15. The upward movement of the piston, with the rod, tends to create a vacuum beneath it, and this serves to dislodge the valve 29 in the elbow-tube 27, whereby air will be drawn into the piston-chamber from the exterior of the apparatus through air-passages 30, air-chamber 26, and the opening 33 between said chamber and the lower part of the piston-chamber, and thus support the piston-rod and its appurtenances and prevent the immediate cutting off of the flow of water by the restoration of said parts, due to the impact of water on the disk 36, and its continued flow tending to

carry the parts downward. The degree of resistance to this downward movement of the piston-rod and the parts carried thereby is regulated by the adjustment of the slotted screw 31, as downward movement of the piston will force air through the opening 33, thus permitting the valve 29 to be seated and forcing the air confined beneath the piston to find exit through the slot of the screw 31.

The piston-chamber is open to the atmosphere adjacent to the diaphragm 2 through openings 43 in the wall of the cylinder, so that practically no resistance is offered to the movement of the piston in either direction in the space between said piston and the diaphragm.

By terminating the piston-rod 34 flush with the head of the gland 11 and securing the impact-disk thereon by means of the rod 37 and nut 39 I dispense with use of the stop-sleeve (shown in my prior patent) to limit the downward movement of the piston-rod.

My present invention presents the advantages that there can be no leak from the upper part of the cylinder to the piston-chamber, thus avoiding the possible necessity of disconnecting the lower head, operating-lever, &c., to withdraw the water, ready accessibility to the air-valve for adjustment, removing the cap of the air-chamber, and avoidance of unequal wear on the piston due to manipulation of the operating-lever, since the piston-rod is guided by the stuffing-boxes on either side of the piston.

I claim as my invention—

1. A water-closet-flushing apparatus comprising a casing consisting of separately-formed connected sections the upper one of which contains a valve-chamber communicating with a water-inlet and an impact-chamber communicating with said valve-chamber and with a water-outlet, and the lower section having a piston-chamber and an air-chamber exterior to the latter, a separately-formed water-tight diaphragm between the sections at their point of connection having an opening and a gland at said opening, a valve in the valve-chamber, a piston in the piston-chamber, and a rod connected with the piston and extending through the diaphragm-opening and gland and adapted to engage and unseat the valve in its upward movement.

2. A water-closet-flushing apparatus comprising a casing consisting of separately-formed connected sections the upper one of which contains a valve-chamber communicating with a water-inlet and an impact-chamber communicating with said valve-chamber and with a water-outlet, and the lower section having a piston-chamber and an air-chamber exterior to the latter, an air-valve in the air-chamber, a separately-formed water-tight diaphragm between the sections at their point of connection having an opening and a gland at

said opening, a valve in the valve-chamber, a  
piston in the piston-chamber, a rod connected  
with the piston and extending through the  
diaphragm-opening and gland, a valve-engag-  
5 ing rod screwed into the upper end of the  
piston-rod and an impact-disk at the point of  
connection of said rods.

In testimony whereof I affix my signature in  
presence of two witnesses.

HENRY O. KRAKOW.

Witnesses:

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