

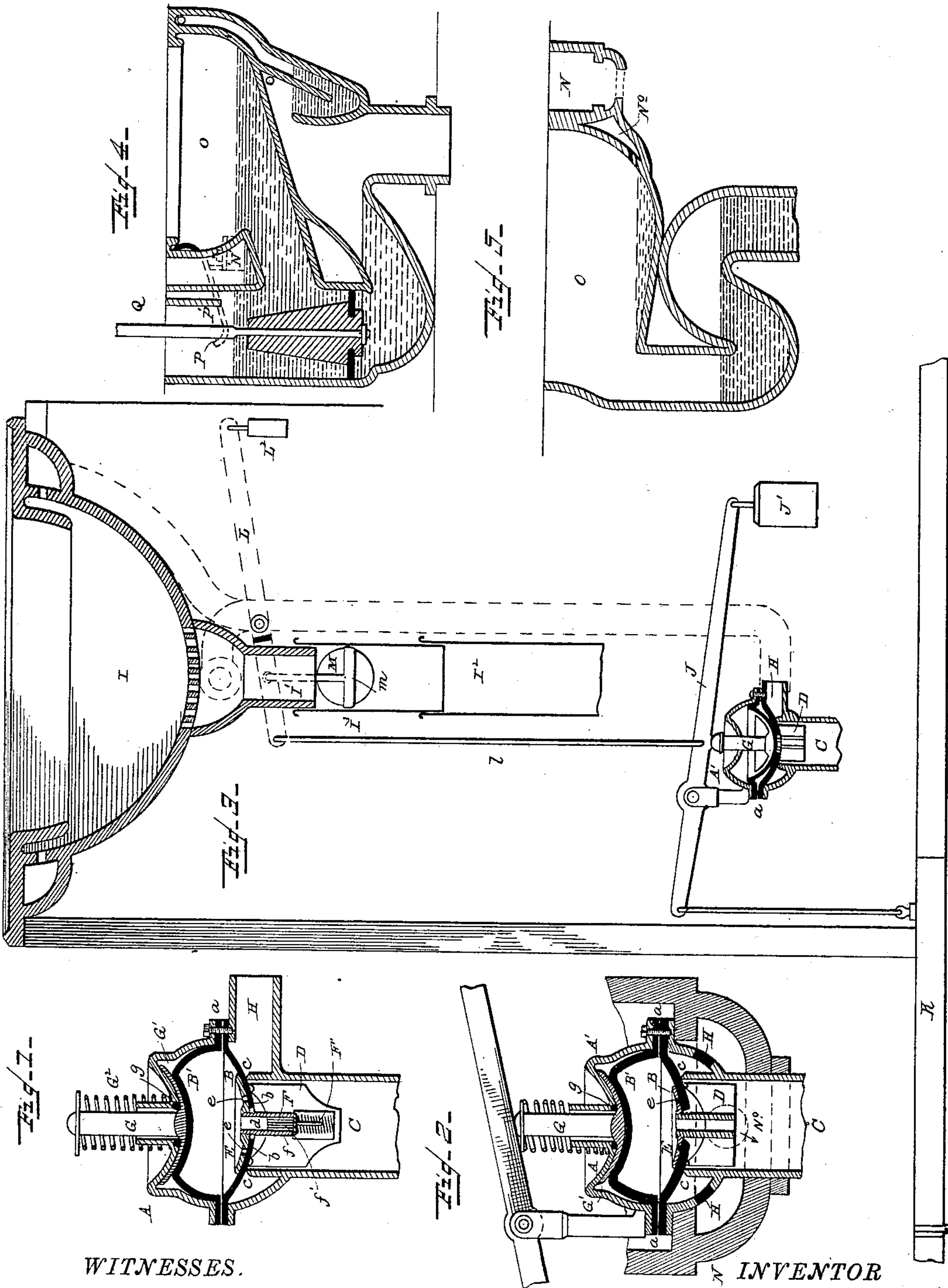
(No Model.)

D. S. KEITH.

WATER SUPPLY APPARATUS FOR WATER CLOSETS, &c.

No. 377,261.

Patented Jan. 31, 1888.



WITNESSES.

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WATER-SUPPLY APPARATUS FOR WATER-CLOSETS, &c.

SPECIFICATION forming part of Letters Patent No. 377,261, dated January 31, 1888.

Application filed June 25, 1886. Serial No. 206,267. (No model.) Patented in Eng'land September 7, 1885, No. 10,571.

To all whom it may concern:

Be it known that I, DAVID SMITH KEITH, a subject of the Queen of Great Britain, and presently a resident of the city of Toronto, Province of Ontario, Canada, have invented certain new and useful Improvements in Water-Supply Apparatus for Wash-Hand Basins, for Water-Closets, and for other Purposes, (for which I have obtained a patent in Great Britain, No. 10,571, bearing date September 7, 1885,) of which the following is a specification.

My invention consists of an improved arrangement or combination of parts of water-supply apparatus for wash-hand basins, baths, and the like, and it also comprises improvements in the construction of the water-supply valve and other details of the combination, which are separately applicable in connection with domestic water-supply.

In the accompanying drawings, which serve to illustrate my invention, Figures 1 and 2 are vertical sections of modifications of my improved water supply valve. Fig. 3 is a vertical section of a wash-hand basin and improved water supply and discharge apparatus adapted thereto, and Figs. 4 and 5 are vertical sections of water-closet basins provided with my improved water-supply valve.

The improved water-supply valve shown in Figs. 1 and 2, which forms an essential element of the combinations hereinafter described in reference to Figs. 3, 4, and 5, is particularly adapted for low pressures or for use in connection with service-cisterns. It consists of a valve-casing, A, in which are two dished diaphragms, B B', of rubber or similar flexible material, which face each other and form a partially-compressed ball, the edges of the diaphragms being secured together by the flanges a, forming the joint between the lower part, A, and the cover A' of the valve-casing. In the lower part of the valve casing the water-inlet pipe C enters and projects inward to form the valve-seat c, upon which the lower diaphragm, B, rests. The lower diaphragm forms both the inlet and discharge valve, and is kept normally closed by the pressure of the water, which is admitted from the inlet-pipe to the space between the diaphragms B B', and acts on the full area of the lower diaphragm to keep it down on its seat c, while the water in the inlet-pipe C only presses on

a part of the diaphragm equal to the area of the pipe. Within the inlet-pipe is fitted a wing-valve, D, which is secured to the diaphragm-valve B by a flange-piece, E, fitted above that diaphragm and screwed to the stem d of the wing-valve, which projects through the diaphragm.

The stem of the wing-valve is tubular, and may either be formed with a small opening, f, as shown in Fig. 2, or be fitted with a smaller valve, F, which opens against the pressure of the inlet water, and is kept normally closed by a spring, F', as shown in Fig. 1, a small orifice or a notch, f', corresponding to the opening f in Fig. 2, being formed in the valve or its seat for the passage through it of the inlet water, which enters the space or chamber between the diaphragms B B', and serves to equalize the pressure of water on both sides of the diaphragm-valve B.

The valve is operated by depressing the upper diaphragm, B', to expel the water from the chamber between the diaphragms, the water escaping partly through the spring-valve F in the example shown in Fig. 1, and in each case between the diaphragm B and the flange E of the wing-valve to the inlet-pipe, the flange E being formed with openings or perforations e, through which the water passes and forces down the inner lip, b, of the diaphragm B.

For the purpose of expelling the water from the space between the diaphragms, a stem or rod, G, is fitted through the cover A' of the valve casing, and is provided with a curved disk, G', which bears the upper diaphragm, B'. Around the stem-rod is fitted a helical spring, G², or to it is connected a weight arranged to act so that after effecting the expulsion of the water from the diaphragm-chamber the stem G rises to its normal position. The lower diaphragm, B, is thereupon raised by the pressure of the water in the inlet-pipe C, the water rushes in between the diaphragm B and its seat c, and flows through the lower valve-casing, A, and through a discharge pipe or orifice, H. While the water continues to flow through the valve-casing the diaphragm-chamber slowly fills through the opening f or the notch or orifice f' in the spring-valve, and as it becomes filled the water-pressure within it closes the diaphragm-valve on its seat c and cuts off the water-sup-

ply. The size of the notch or orifice f' or f thus serves to determine the length of time during which the diaphragm-valve may remain open, and therefore controls or regulates the supply. This feature is, however, common to a number of self-closing valves.

In order to prevent leakage in the event of the upper diaphragm bursting, a small flexible washer, g , is fitted between the disk G' of the stem-rod and the cover A' of the valve-casing, so that if water escapes through the diaphragm B' it will close the disk tightly against the washer around the stem-rod orifice.

In the arrangement of apparatus for supplying water to wash-hand basins shown in Fig. 3 this improved self-closing valve is employed to control the supply of water to the basin, the discharge-pipe H of the valve being fitted to the basin in any convenient way, but being by preference connected to the discharge-pipe I' under the basin I , so that the water for filling the basin flows upward through the outlet I' . The supply-valve B is operated either by a hand push or lifting rod in the usual way, or, as is preferred, by a lever, J , operated by a wire or link, j , connected to a foot-board or platform, K , upon which the user of the basin stands. A weight, J' , at the back end of the lever J , serves to keep the lever normally in a position in which it presses down the stem G of the valve, to keep the upper diaphragm, B' , down; and from the lever J a wire or chain, l , passes up to the end of a weighted lever, L , which is fitted by a joint-pin to a bracket-piece, L' , on the lower side of the basin, or on the discharge-pipe I' . On this lever L is hung a cup-piece, m , carrying a ball, M , which forms a stop-valve closing against the lower end of the discharge-pipe I' to retain the water in the basin. In the normal position of the lever J the weighted end of the upper lever, L , is tilted up, and the ball M is lowered from the discharge-pipe or horn I' and leaves the discharge-orifice open. When the user of the basin stands on and depresses the platform or foot-board K , he tilts the lever J , thereby raising the diaphragm B' and allowing the valve B to open and flush or fill the basin I . The upper lever, L , is at the same time tilted to bring the ball M into close contact with its seat on the discharge-orifice I' of the basin, and it is there maintained by a weight, L^2 , on the end of the lever L . The valve B remains open only for such length of time as will allow of the passage of sufficient water to fill the basin to the required extent, and then it closes automati-

cally, as before described. When the user of the basin steps off the foot-board, the levers J L tilt back to their original positions, the ball-valve M is lowered, and the waste water is discharged from the basin. To give access to the ball M , the discharge-pipe I^2 is fitted with a telescoping piece, I^3 , which may be lowered into the main pipe I^2 . This arrangement of water-supply apparatus may be applied in connection with baths, lavatories, water-closets, and the like.

In applying the improved water-supply apparatus in connection with water-closets I employ either one or two self-closing valves, (which may be of the construction hereinbefore described, and shown in Fig. 2,) in the manner represented in Figs. 4 and 5, Fig. 4 being a plunger closet with two valves, and Fig. 5 being a wash-out closet with one valve. When two valves are used, I fit the valve-casings in pockets N' , formed in the crockery outside of the closet-basin O , as shown in Figs. 2 and 4, and I center the levers P P' on opposite sides of the valves and connect them to the closet handle or pull Q , so that in raising the handle one valve is operated on to supply water to flush the closet, and on lowering the handle the other valve is operated on to supply water for the after flush. The valve-casings are inclosed in the pockets or chambers N , which are formed with discharge-branches N^0 , leading to the "fan" of the closet-basin.

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

1. The combination of a valve-casing, the elastic diaphragms B B' , secured by their edges to said casing to form a chamber, and the diaphragm B having an opening to admit and expel water from said chamber, a water-supply pipe having a seat for the diaphragm B and its discharge-opening opposite to opening in said diaphragm B' , the discharge-pipe, and the compressor acting upon the diaphragm B' , substantially as described.

2. The combination of a valve-casing, the elastic diaphragms B and B' , a water-supply pipe having a seat for the diaphragm B , which is provided with a valved opening, the discharge-pipe, and the compressor acting upon the diaphragm B' , substantially as described.

DAVID SMITH KEITH.

Witnesses:

A. FRASER,
KATE FRASER.