(No Model.)

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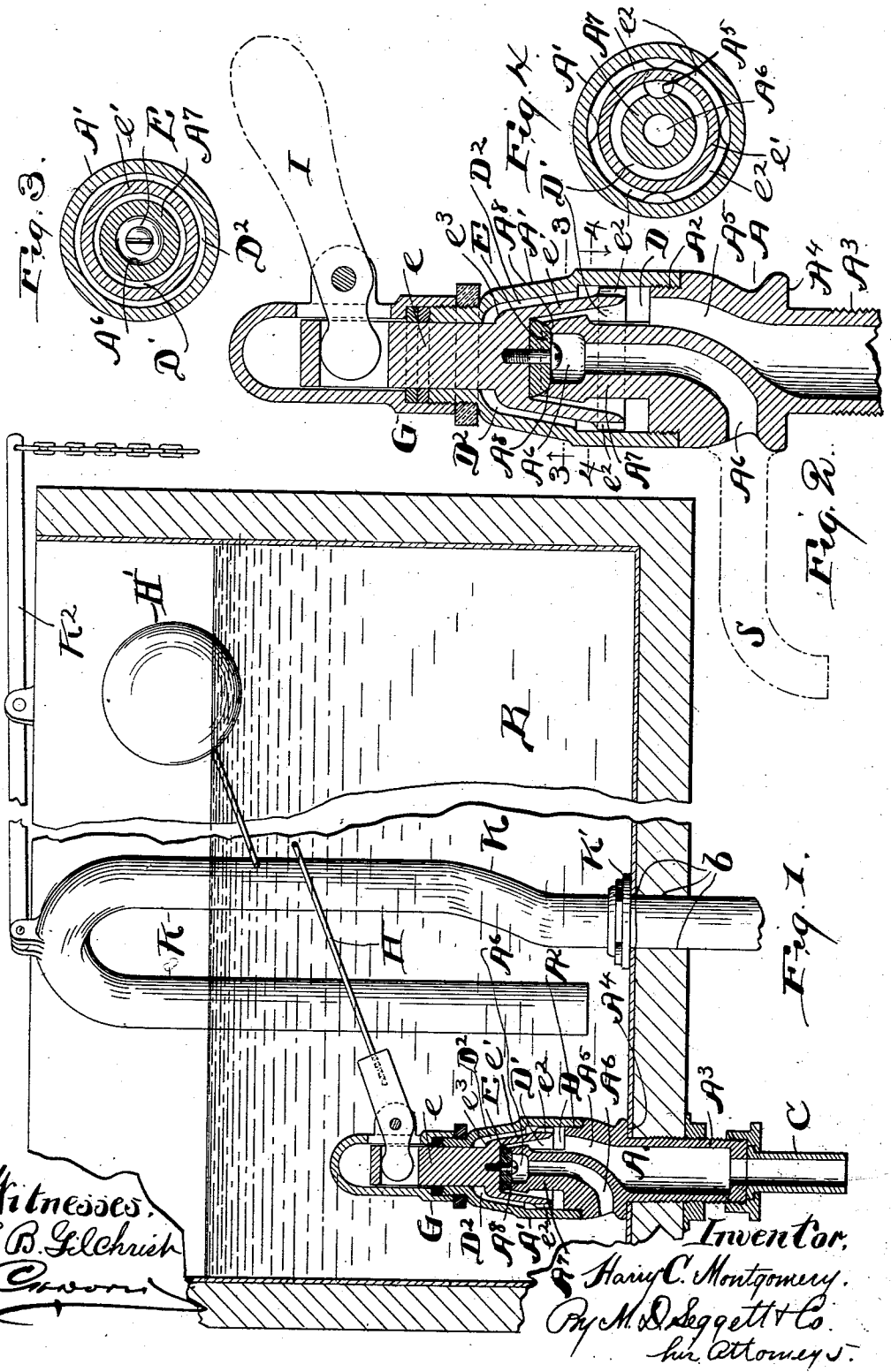
SUPPLY VALVE OR FAUCET.

No. 570,811. Patented Nov. 3, 1896.



UNITED STATES PATENT OFFICE.

HARRY C. MONTGOMERY, OF CLEVELAND, OHIO.

SUPPLY VALVE OR FAUCET.

SPECIFICATION forming part of Letters Patent No. 570,811, dated November 3, 1896.

Application filed August 5, 1895. Serial No. 558,275. (No model.)

To all whom it may concern:

Be it known that I, HARRY C. MONTGOMERY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Supply Valves or Faucets; 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 pertains to make and use the same.

My invention relates to improvements in supply valves or faucets more especially designed for use with washbasins, lavatories, flushing-tanks, &c., the object being to devise a valve or faucet that shall present a surface or surfaces of slightly greater area toward the direction in which the valve opens than the surface or surfaces presented toward the direction in which the valve closes, so that by the pressure of water impinging upon said opposing surfaces within the valve-casing the valve will constantly tend to close or remain seated and will, both in opening and closing, be cushioned in such manner as to have a practically noiseless operation.

With this object in view my invention consists in certain features of construction and novel combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional elevation of a flushing-tank provided with a supply-valve embodying my invention and showing said valve in central vertical section with the valve proper in its closed position. Fig. 2 is an enlarged central vertical section of a valve or faucet embodying my invention and also showing the valve proper as closed. Figs. 3 and 4 are horizontal sections on lines 3 3 and 4 4, respectively, Fig. 2.

Referring to the drawings, A designates the lower portion of the valve-casing, and A′ the upper portion of said casing. The upper casing member A′ is screw-threaded internally at its lower end, as at A^2, and said threaded end engages corresponding threads formed externally upon the lower member A. At its lower end the part A terminates in a tubular shank A^3, that is adapted to extend through the object to which the valve-casing is attached. The supporting object in Fig. 1 is the bottom of the flushing-tank B.

At the upper end of the tubular shank A^3 is an annular shoulder or seat A^4, that is adapted to engage and rest upon the bottom of the flushing-tank or other object to which the valve-casing is attached. The tubular shank A^3 is designed to be connected in any approved manner with the water-supply pipe C, and at its upper end it communicates with an upwardly-extended induction-port A^5, that is suitably formed within and terminates at the top of the lower member A of the valve-casing.

A^6 designates the eduction-port of the valve-casing, which port is suitably formed in a centrally-located tubular part A^7, that is preferably integral with the lower member A of the casing.

It will be seen that the tubular part A^7 projects upwardly from the central portion of the lower member A of the valve-casing and is considerably smaller in external diameter than the internal diameter of the adjacent lower portion of the upper member A′ of the valve-casing, so as to form an annular chamber D between said upward-extended part A^7 and the surrounding adjacent portion of the member A′ of the valve-casing.

The eduction-port A^6 leads from the open upper extremity of the central tubular part A^7 downward and outward to a point on the outer surface of the lower member A of the valve-casing. It will be observed that the upper extremity of the central tubular part or extension A^7 projects within the upper casing member A′ some distance above the discharge or exit end of the induction-port A^5, and that consequently the receiving end of the eduction-port A^6 is located above the induction-port.

At its upper end the eduction-port A^6 is preferably somewhat enlarged in diameter and the tubular extension A^7 is provided around the receiving end of the eduction-port A^6 with an annular seat A^8, adapted to be engaged by a vertically-movable valve E in the closed position of the latter.

The valve E is secured to an upright stem *e*, that is extended upward through the upper member A′ of the valve-casing and into a packing-box G, arranged for preventing leakage between said valve-stem and the valve-casing. At its lower end the valve-

stem e terminates in a thimble, skirt, or inverted cup e', which is extended downward into the annular chamber D and around the tubular extension A^7, in which the receiving end of the eduction-port A^6 is located. This valve-skirt or inverted cup e' is preferably flared downward and outwardly, so that it is gradually enlarged in diameter toward its lower or open end, which terminates a suitable distance above the bottom of the annular chamber D, intermediate the discharge end of the induction-port A^5 and receiving extremity of the eduction-port A^6. At its lower end the skirt or inverted cup e' may be provided with any suitable number of outwardly and laterally projecting wings e^2, that are arranged at proper intervals to permit the passage of water to the outer surface of said skirt or cup and at the same time serve as guides in contact with the walls of the chamber D to steady the valve E and its attached parts in their up-and-down movements.

As shown in the drawings, the valve-skirt or inverted cup e' is larger in internal diameter than the external diameter of the tubular central part A^7, that supports the valve-seat A^8, and it is smaller in external diameter than the internal diameter of the adjacent surrounding portion of the upper member A′ of the valve-casing. It will thus be seen that by means of this valve-skirt e' the upper and central portion of the annular chamber D is divided into annular spaces D′ and D^2, the inner and smaller annular space D′ being formed between the tubular extension or valve-seat bearing A^7 and the interior surface of the said valve-skirt e', while the outer and larger annular space D^2 is located between the external surface of the skirt or inverted cup e' and the internal surface of the chamber D or valve-casing. An external annular shoulder e^3 may be formed on the valve-skirt e' at its junction with the valve-stem to conform somewhat to the shape of the upper portion of the chamber in which the valve operates.

It will be observed that by the described construction of the valve-skirt e' and its arrangement with relation to the annular spaces D′ and D^2 of the chamber D the valve is provided with water-impinged surfaces facing in the direction in which the valve closes and with other water-impinged surfaces facing in the direction in which the valve opens. The valve-surfaces within the inner annular space D′ are somewhat less in area than the valve-surfaces within the outer annular space D^2, and consequently when the valve E is closed down the greater pressure of water on the outside of and above the valve-skirt e' tends to keep the valve closed. At the same time the water-pressure in the inner and smaller annular space D′ tends to unseat the valve and will assist its opening or lifting when the valve-lever is operated in the proper direction. Thus while the valve is practically balanced the excess of water-pressure on one side or on the surfaces facing in the direction in which the valve is to open will be sufficient to hold the valve closed or seated until it is necessary that the valve should be opened, whether automatically or by hand.

The location of the receiving end of the eduction-port A^6 above the discharge end of induction-port A^5 and the extension of the valve-skirt e' to a point intermediate said ports to form the concentric annular spaces D′ and D^2 within the chamber D affords a simple and inexpensive means of providing a thoroughly effective water-cushion on both sides of the valve, and thereby prevents a jumping or rattling of the valve and renders it practically noiseless in operation or during the intervals of opening and closing the valve. It will be seen also that the skirt e' will gradually cut off the flow of water before the valve E reaches its seat. This construction also affords the desired pressure-surfaces without objectionably enlarging the diameter of the valve-casing.

If the valve is to be employed for automatically controlling the supply of water to a flushing-tank or the like, as represented in Fig. 1, the upward-projecting valve-stem e will be operatively connected with a lever H, to which a float H′ is attached.

As a faucet for lavatories and elsewhere the valve-stem e is operatively connected in any approved manner with a vertically-tilting hand-lever I, as shown by dotted lines in Fig. 2, and the eduction-port A^6 of the valve-casing will be provided at its discharge extremity with a spout S, Fig. 2, also shown in dotted lines.

In Fig. 1, K designates the siphon usually employed in draining flushing-tanks and which is provided with valve K′ and actuating-lever K^2 as ordinarily employed.

When the siphon-valve is operated to drain the tank, the consequent lowering of the water-level in said tank and resulting downward movement of the float H′ will of course open the supply-valve E and cause it to remain open until the normal level of water in the tank is restored, and meanwhile the cushioning of the valve by the pressure of water on all sides will obviate the usual objectionable noises.

What I claim as my invention is—

1. A supply valve or faucet comprising a valve-casing provided with an induction-port and an eduction-port, a valve-seat at the receiving end of the said eduction-port, and a valve provided with a skirt extended around the eduction-port to a point intermediate the discharge end of the induction-port and receiving end of the eduction-port and having water-impinged surfaces facing in the direction in which the valve closes and other like surfaces of greater area facing in the direction in which the valve opens, substantially as and for the purposes described.

2. A supply valve or faucet comprising a

valve-casing provided with an induction-port and with a centrally-located tubular extension having an eduction-port therein and surrounded by an annular chamber, the receiving end of said eduction-port being provided with a valve-seat and located above the discharge extremity of the induction-port, a valve having a gradually-flaring skirt extended into said annular chamber to a point intermediate the discharge end of the induction-port, and receiving end of the eduction-port and dividing said chamber into two concentric annular spaces communicating with the induction-port, whereby both the inner and outer surfaces of said valve-skirt are subjected to water-pressure within the valve-casing, the outer surfaces of said valve-skirt being of greater area than the inner surfaces, and means for actuating the valve, substantially as described.

3. In a supply valve or faucet, the combination with a valve-casing comprising a lower member having an induction-port and provided with a centrally-located tubular extension having therein an eduction-port leading downward from the upper end of said extension to a point on the lower outer surface of the valve-casing, the receiving end of said eduction-port being provided with a valve-seat above the discharge extremity of the induction-port, and an upper casing member having an annular chamber surrounding said tubular extension of the lower casing member, of a valve having a skirt surrounding the eduction-port and extended into said annular chamber to a point intermediate the discharge extremity of the induction-port and receiving end of the eduction-port and forming concentric annular spaces within the said annular chamber, whereby the said valve-skirt is provided both on its outside and inside with surfaces exposed to fluid-pressure from the induction-port, substantially as and for the purposes described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 27th day of July, 1895.

HARRY C. MONTGOMERY.

Witnesses:
C. H. DORER,
L. WARD HOOVER.