(No Model.) 2 Sheets—Sheet 1.

A. P. HOWES.

FAUCET.

No. 453,785. Patented June 9, 1891.

Fig. 1

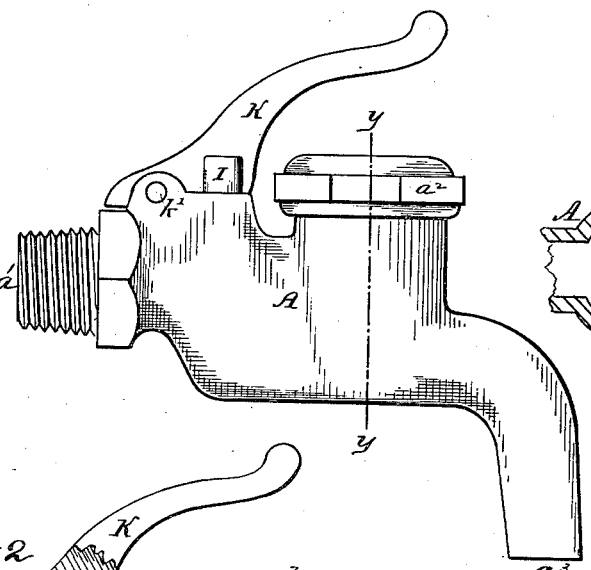


Fig. 7

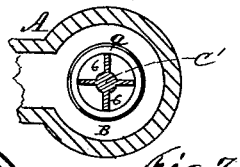


Fig. 8

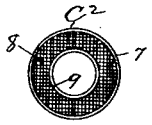


Fig. 2

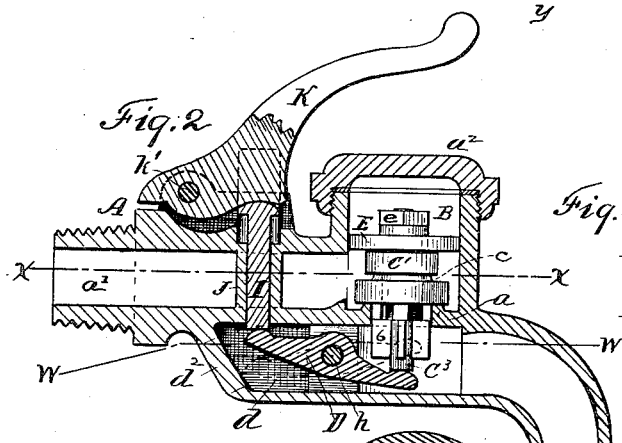


Fig. 5

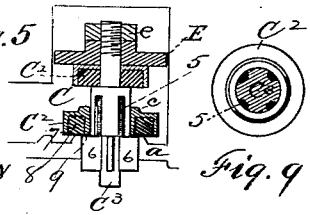


Fig. 9

Fig. 3

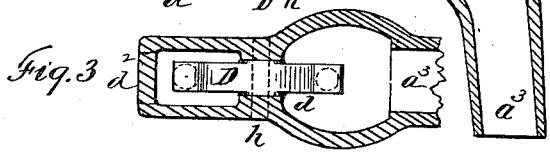


Fig. 4

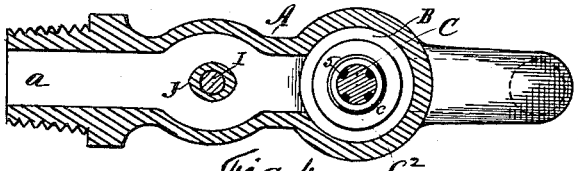
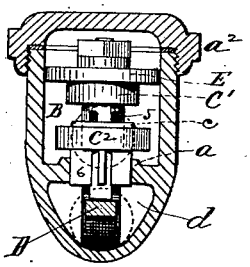


Fig. 6



Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

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FAUCET.

No. 453,785. Patented June 9, 1891.

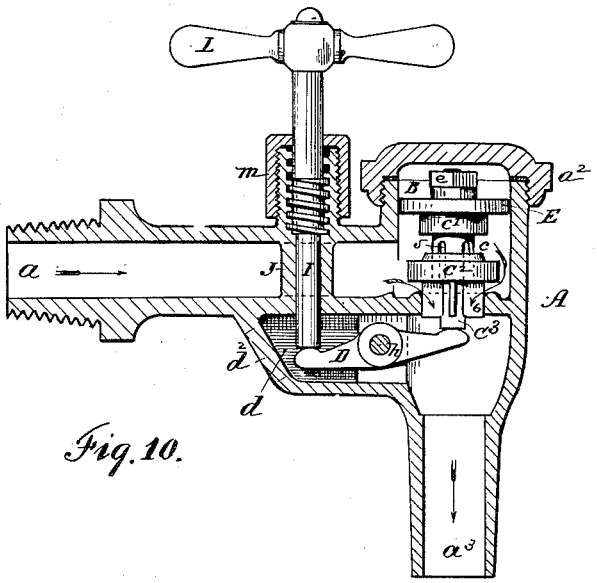

Fig. 10.

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UNITED STATES PATENT OFFICE.

ALBERT P. HOWES, OF WORCESTER, MASSACHUSETTS.

FAUCET.

SPECIFICATION forming part of Letters Patent No. 453,785, dated June 9, 1891.

Application filed August 11, 1890. Serial No. 361,632. (No model.)

To all whom it may concern:

Be it known that I, ALBERT P. HOWES, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Faucet, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to that class of faucets wherein the valve or puppet opens in opposition to the direction of the discharge flow, and is closed by the pressure of the water or liquid behind the valve; and the object of my present invention is to provide a durable, efficient, and desirable faucet for household water-service and similar purposes having means, such as hereinafter explained, for effecting a retarded closure of the exit-passage when the valve-lifter is released; also, to afford a faucet capable of satisfactory and proper action under extremes of heavy or light pressures, as well as under ordinary conditions and pressures. These objects I attain by a faucet constructed and organized for operation substantially as illustrated, and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a side view of my improved faucet. Fig. 2 is a longitudinal vertical section; Fig. 3, a horizontal section at line *w w;* Fig. 4, a horizontal section at line *x x;* Fig. 5, a vertical section of the duplex valve-puppet; Fig. 6, a vertical transverse section at line *y y;* Fig. 7, a plan of the valve-seat and section at the lower part of the valve-stem; Fig. 8, a bottom view of the lower valve; Fig. 9, a top view of the lower valve and section of the valve-stem. Fig. 10 is a longitudinal vertical section showing a modification in the form of the body or shell and the manner in which the operating devices can be arranged for a non-self-closing faucet.

Referring to parts, A denotes the body or shell of the faucet, having a suitable attaching-boss and provided with the inlet-passage a', the chamber B for containing the valve devices, the screw-threaded cap a^2 at the top, and the valve-seat a at the bottom thereof, and the bib or nose with the discharge-passage a^3 therethrough. Said body is also provided with a chamber d beneath the inlet and valve-chamber and in connection with the outlet passage, wherein is arranged a tilting-lever or valve-lifter D.

The valve-puppet C is constructed in duplex form, as shown. It is composed of a stem C^3, having its central portion, which is preferably of larger diameter than the ends, provided with smaller water-ways 5, its lower end provided with guiding-wings 6, and its upper end screw-threaded. On the upper end of the stem is arranged a fixed valve C′ and a circular disk E, which latter fits closely but not tightly within the chamber B. A nut e is screw-threaded to the end of the stem for holding the disk E and valve C′ firmly in place upon the stem. The valve C′ fits against a flange or shoulder formed on the stem, as indicated.

Upon the central portion of the stem C^3 and surrounding the water-ways 5 is arranged a movable valve C^2, that matches the valve-seat a in the faucet-body, which valve is itself provided with a valve-seat c, onto which the upper valve C′ closes when the puppet is fully depressed. The valve C′ is preferably made of a thin sheet-metal shell filled with vulcanized packing material, such as is commonly used for faucet-valves. The lower valve C^2 is best made with an outer shell 7, an annular body of packing 8, and an inner lining or cylindrical bushing 9, (see Figs. 5 and 8,) which surrounds the valve-stem, serves as a guide for the valve, and prevents wear, said lining fitting sufficiently close, but not so close but that the valve-stem can move freely up and down within the said lower valve.

The valve-puppet is supported and guided in a manner to have free movement up and down within the chamber of the body by means of the disk E at its upper part, and the flanges 6 at the lower end of the stem, fitting within the passage through the valve-seat.

Beneath the valve-puppet and inclosed within the chamber d in the shell is arranged the tilting lever or lifter D, which is supported on a fulcrum-pin or axis h, that passes laterally through the parts. One end of said lifter is disposed beneath the end of the valve-stem,

and its other end beneath the operating-pin I, which latter is arranged vertically through the neck of the faucet, the same being provided within a guideway within a column J, that extends down through the inlet-passage a', as illustrated in Figs. 2 and 4. Resting upon the top end of said operating-pin is an actuating-lever K, that is fulcrumed at its rear end on a pin k', which passes through upwardly-projecting ears formed on the faucet-body, while the forward end of said lever projects forward over the cap a^2 in convenient position to be depressed by the hand. The form of this hand-lever may be modified, as desired, to suit different styles of finish or design, and a knob, ring, or other shaped handle can be arranged on the end thereof to suit the taste or convenience of users,

When constructing the faucet, the lifter D is introduced through an opening formed in the rear end of the chamber d, which opening is afterward solidly plugged up with a disk or plug of metal d^2, which is externally finished off smooth and flush with the outside of the shell.

In the operation, depression of the hand-lever K forces downward the operating-pin I and depresses the rear end of the lever D, thereby throwing upward the forward end of said lever, which raises the valve-stem C^3, lifting the upper valve C′ from its seat c upon the lower valve C^2, which action opens the water-ways 5 and allows the water or liquid to pass through said water-ways between the valve C^2 and the valve-stem, starting the flow by a small stream before the valve C^2 is opened. Further depression of the hand-lever effects a further lifting of the valve-stem, and when the wings or flanges 6 come into contact with the lower valve C^2 they raise said valve from the seat a for opening the passage to its full extent. When the valve-puppet is raised, the disk E at the top of the valve-stem displaces some of the liquid in the upper part of the valve-chamber B. Then when the hand-lever is released and the pressure of liquid flowing out through the passage causes the lower valve C^2 to drop onto its seat d, the upper valve C′ is retained elevated for a time by reason of the downward movement of the disk E as a piston in its chamber, being retarded until the liquid or water can leak past its periphery into the upper part of the chamber B, during which time the water flows out in gradually-decreasing quantity through the water-ways 5 in the side of the valve-stem. By thus effecting the slow and retarded closure of the passage the shutting off of the flow is so gradual that it will not cause a strain or hammering on the pipes when under great pressure or head of water.

This faucet is self-closing, and automatically acts by pressure on the valves for shutting off the flow by gradual retardation as soon as the actuating-lever K is released, and will operate successfully under light, medium, or heavy pressures without strain or injury to the mechanism or packing-faces. The pressure for closing the valve also effects the elevation of the hand-lever, so that it is in position to be again operated.

In Fig. 10 I have shown a manner whereby the faucet may be made for operating as a non-self-closing faucet. In this instance the operating-pin I is screw-threaded and fitted to a screw-thread in the frame, also extended upward and provided with a handle L, whereby it can be conveniently rotated. The valve-lifter or tilting lever D is actuated for moving the valves by running the pin I up and down by its thread instead of the depressing-lever. A cap m is screwed onto the boss that surrounds the operating-pin, which cap serves as a stop to prevent the screw-thread being run completely out or released when turned backward, but which permits removal of the operating-pin by first removing said cap from the boss. The valve parts of this faucet are made in the same way, as above described, and the discharge-nose is extended straight downward from the valve instead of being turned outward as a curved bib. Either form can be employed, as preferred.

By constructing and combining the parts of the faucet in the manner illustrated and described I produce a very efficient, convenient, and desirable faucet, one which, while opening against the flow, operates with ease, and which closes without shock or strain, and which is practically and successfully operative under light or heavy pressures, and especially successful when used under very heavy pressures of, say, from seventy-five to two hundred pounds per square inch. The degree of rapidity with which the upper valve C′ closes may be varied to meet different circumstances, according to the degree of closeness with which the disk E fits the chamber in the head of the faucet. If fitting very free, the disk will of course be drawn down by the pressure on the valve C′ more rapidly than will be the case where the disk fits comparatively tight. In any case, however, there should be sufficient looseness to permit the disk to move easily, and to allow the water to pass by the edge of the disk to avoid a vacuum in the upper part of the chamber.

I claim as my invention herein to be secured by Letters Patent—

1. The within-described faucet, consisting of the body A, formed with its passages a' a^3, valve-chamber B, and valve-seat a disposed as shown, and having the backwardly-extended chamber d beneath the supply-passage, the downwardly-closing puppet-valve having the two valves C′ and C^2, its stem provided with guide-flanges 6 below the valves, and a disk E at its upper end that fits within the chamber B in the top of the faucet-body for retarding the closing movement of the valves, the tilting lever D, arranged within the chamber d, the depressing-pin arranged through a guideway in the neck of the faucet,

and the handle at the top for operating the same, all constructed and combined substantially as set forth.

2. In a faucet having its body provided with a valve-seat for receiving a valve that closes in the direction of the flow, the body fitted with the cylindrical chamber B above said seat, and the backwardly-extended chamber *d* in the lower part of said body, with the stopper d^2 therein, a loose valve-poppet, the stem of which is provided with a disk that acts as a piston within the chamber B, and with flanges 6, that guide within the valve-seat opening, in combination with the tilting lever D, disposed and fulcrumed, as at *h*, within said backwardly-extended chamber, with one of its ends in conjunction with the valve-stem, the operating-pin I, engaging the opposite arm of said lever, and the actuating-lever K, having its rear end pivoted by the pin *k'* between ears formed on the body, and its lower edge fitted to rest upon the head of pin I for actuating the same, all substantially as shown and described.

Witness my hand this 6th day of August, A. D. 1890.

ALBERT P. HOWES.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.