

(No Model.)

A. J. KNIGHT.
SELF CLOSING NOZZLE.

No. 565,211.

Patented Aug. 4, 1896.

Fig. 1.

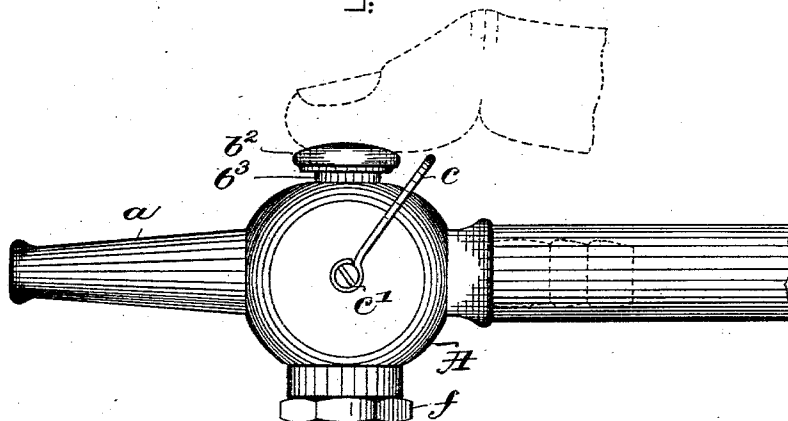
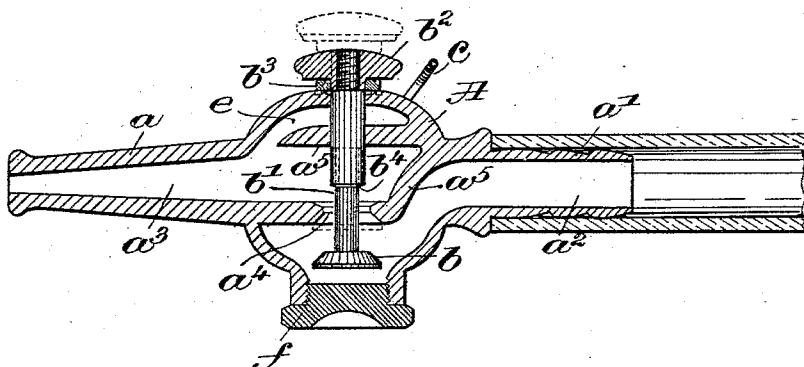


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

ALFRED J. KNIGHT, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JESSE B. THOMAS, OF SAME PLACE.

SELF-CLOSING NOZZLE.

SPECIFICATION forming part of Letters Patent No. 565,211, dated August 4, 1896.

Application filed February 11, 1895. Serial No. 537,843. (No model.)

To all whom it may concern:

Be it known that I, ALFRED J. KNIGHT, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Self-Closing Nozzles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a novel self-closing delivery-nozzle particularly adapted for the delivery-pipes of fire-extinguishers, or for lawn-hose or the like, the object of my invention being to provide a nozzle the valve of which shall be automatically seated and closed by the pressure of the fluid tending to flow through the nozzle, the valve being removed from its seat to permit the discharge of the fluid through the nozzle by suitable manually-controlled devices.

My invention comprehends certain other features of construction to be hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a nozzle embodying my invention, and Fig. 2 a vertical longitudinal section of the same with the valve shown open in full lines and closed in dotted lines.

Referring to the drawings, preferably to Fig. 2 thereof, in the embodiment of the invention there shown, A is the body, provided at one side with a delivery-nozzle a and at its opposite side with a neck a' , suitably formed to receive and hold the end of a flexible hose or a conductor. The inlet-passage a^2 and the outlet-passage a^3 for the nozzle are shown as placed in communication by means of and through the valve-opening a^4 in the central division or partition a^5 .

The valve proper, b , shown as tapering to fit the preferably-tapering valve-seat, is mounted upon the end of a valve-stem b' , extended upwardly through the body A, and outside the latter is provided with a suitable finger-piece b^2 , shown as provided at its under side with a preferably rubber or other soft packing-ring b^3 , adapted to seat upon the body A and assist in preventing leakage.

In the preferred construction the upper portion of the valve-stem b' is made larger in diameter than the lower portion adjacent to

the valve to form a shoulder b^4 , to be described.

The operation of the valve is as follows, viz: When fluid under pressure is admitted to the inlet-passage a^2 , it at once closes or seats the valve upon its seat a^4 , there being an excess of area at the under side of the valve b over that at the upper side equivalent to the area of the valve-stem. To open the valve and permit discharge of the fluid there-through, the operator depresses the finger-piece b^2 from its dotted to its full line position, thereby dropping the valve from its seat and permitting communication through the inlet and outlet passages, the valve remaining open only so long as the finger is maintained upon the finger-piece, it automatically closing at once upon removal of the finger. To retain the valve in its open position without requiring it to be held by the finger, I have herein provided a bail c , pivoted at c' , at opposite sides of the body A and adapted to be swung over and to hold the finger-piece in its depressed position, enabling the nozzle to be left open for any desired period of time.

It will be noticed that there is no packing where the valve-stem passes through the body of the nozzle. This would ordinarily permit leakage, notwithstanding the rubber packing b^3 , under the usual pressure at which fire-extinguishing fluids are discharged; but in the present instance I have obviated this by providing what I call a "leakage-chamber" e , surrounding the valve-stem between the inner wall of the body and the outer wall thereof, said leakage-chamber opening into the outlet-passage a^3 .

The passage of the fluid under pressure out through the exit-passage a^3 acts like an ejector to draw from the leakage-chamber e any fluid which may leak thereinto, the suction being so strong as to prevent any leakage passing through the chamber to the outside of the body around the valve-stem, such leakage being instantly drawn into the exit-passage.

I have provided a screw-plug f in line with the valve and at the under side of the nozzle, which, when removed, gives free access to the valve.

To remove the valve, the plug is removed and the valve held against rotation in suitable manner, while the finger-piece b^2 is unscrewed, thereby permitting the valve and its stem to be drawn downwardly through the opening left by the removal of the plug f .

The shoulder b^4 on the valve-stem is important as assisting in the closing of the valve, for, assuming the valve to be in its full-line open position, the fluid flowing through the nozzle under pressure acts constantly against this shoulder, and the moment the finger is removed from the finger-piece impact of the fluid against the shoulder acts, in addition to the pressure of the fluid at the inner side of the valve, to quickly close the valve.

My invention is not limited to the particular shape or construction herein shown, for it is evident the same may be varied without departing from the spirit and scope of the invention, and while I have herein shown and described my invention in connection with a hose-nozzle, yet it is adapted for use in connection with any nozzle or equivalent tip for discharging fluid under pressure.

I claim—

1. A self-closing delivery-nozzle containing inlet and outlet passages; a valve-opening between the same; a valve at one side of and controlling said valve-opening, the stem rigidly connected with said valve and having a sliding movement through an opening in the wall of said nozzle, said sliding stem made less in diameter within and adjacent said valve-opening than where it passes into the wall of said nozzle to leave a shoulder or en-

largement, immediately adjacent the said valve-opening when the valve is opened, against which the moving fluid may impinge and tend to close or seat said valve, and a finger-piece on the outer end of said valve-stem whereby said valve may be opened by a finger of the hand holding the nozzle and automatically closed by the fluid-pressure within the nozzle, substantially as described.

2. A self-closing delivery-nozzle containing inlet and outlet passages, a partition-wall between said inlet and outlet passages, centrally perforated to provide a valve-seat on the inlet side thereof, a valve-stem operating through said perforation and through one side wall of said nozzle and terminating on its inner end in a valve carried thereby, said valve being free when not acted upon by the water-pressure to hang suspended in disengagement with its valve-seat, said valve-stem having a sliding longitudinal movement and made of less diameter within and adjacent said valve-opening than where it passes into the wall of said nozzle to leave a shoulder or enlargement immediately adjacent the said valve-opening, when the valve is opened, against which the moving liquid may freely impinge and thereby tend to close or seat said valve, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED J. KNIGHT.

Witnesses:

FREDERICK L. EMERY,
JOHN C. EDWARDS.