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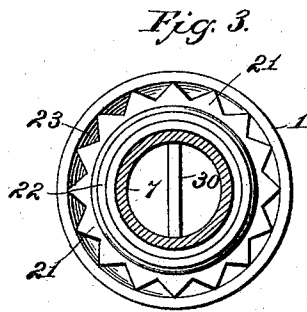
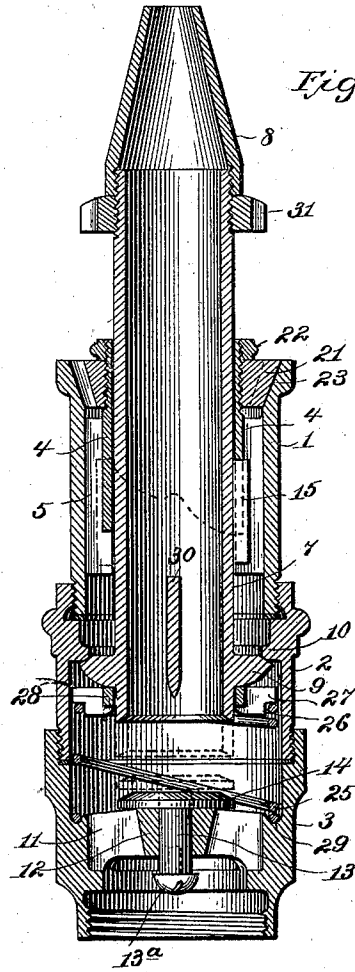
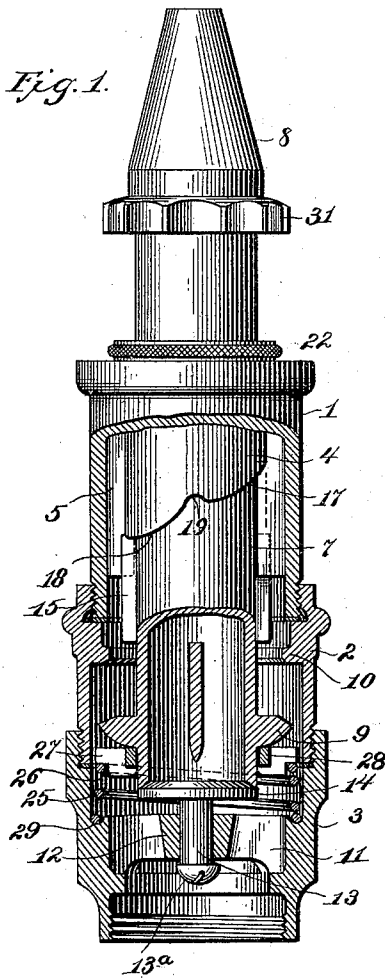
Patented May 30, 1899.

J. BUSHA.
HOSE NOZZLE.

(Application filed Jan. 27, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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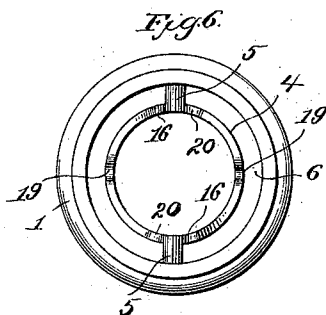
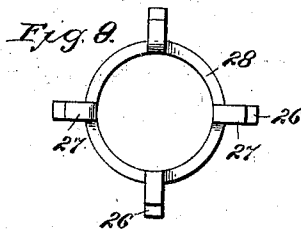
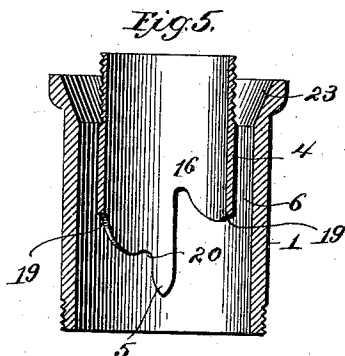
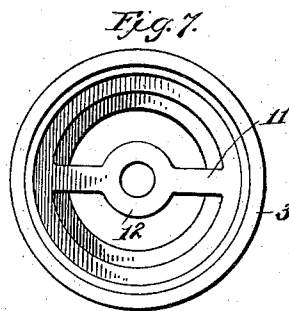
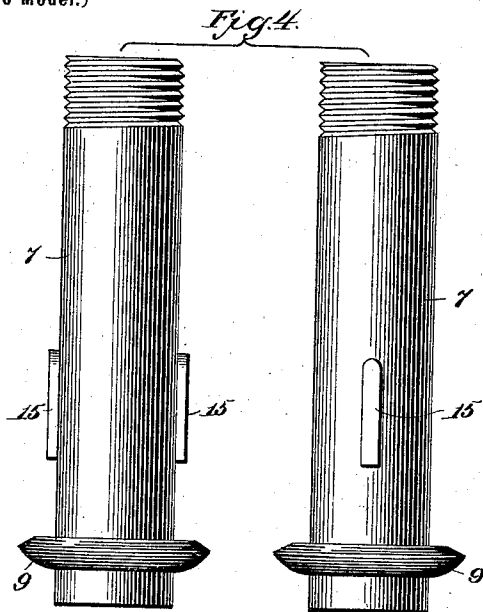
Patented May 30, 1899.

J. BUSH.
HOSE NOZZLE.

(Application filed Jan. 27, 1898.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOSEPH BUSHA, OF PITTSBURG, PENNSYLVANIA.

HOSE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 625,871, dated May 30, 1899.

Application filed January 27, 1898. Serial No. 668,178. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BUSHA, a citizen of the United States of America, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hose-
Nozzles, of which the following is a specification.

This invention has particular reference to that class of hose-nozzles for firemen's use constructed to throw both spray and solid streams; and it consists in certain peculiarities in the construction of the elements and in certain novel combinations of parts, substantially as hereinafter described, and particularly pointed out in the subjoined claims.

The main object of the invention is to provide a simple and practical nozzle capable of throwing a solid stream, a spray, or both a solid stream and spray at once, at the will of the operator. This object and others hereinafter appearing are accomplished by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a side view, partly in section, showing the parts in position to throw a spray alone. Fig. 2 is a longitudinal section showing in dotted lines the parts adjusted to throw both a spray and solid stream and in full lines the parts adjusted to throw a solid stream alone. Fig. 3 is a plan view of the forward end of the nozzle with the tube through which the solid stream flows shown in section. Fig. 4 is a detail representation of said tube from two points of view. Fig. 5 is a detail sectional view of the forward section of the nozzle-shell. Fig. 6 is a rear end view of said shell-section. Fig. 7 is a detail view of the rear shell-section, looking at the forward end thereof. Figs. 8, 9, and 10 are detail views of parts of the device.

The same reference characters are used to designate the same parts in the several views.

The shell of the nozzle is composed of three sections 1, 2, and 3, threaded together. Within the forward section 1 is a sleeve 4, which is connected with the inner wall thereof by ribs 5 and is so arranged within said section as to leave a water-chamber 6 between the two, through which chamber the water to be
sprayed flows. Extending through and be-

yond said sleeve and guided thereby is a longitudinally-movable tube 7, to the upper end of which is secured the tip 8 and the lower end of which is provided with a circumferential flange 9, forming a valve which when the tube is in its foremost position is seated against an offset 10, projecting inward from the intermediate section 2, and thus closes communication to the chamber 6 and causes all the water to flow through the tube 7 and issue from the tip in a solid stream. Extending toward each other across the rear shell-section 3 are arms 11, at the junction of which is a sleeve 12, through which extends the stem 13 of a freely-movable valve 14, which is forced forward away from the forward surface of said sleeve 12 by the pressure of the inflowing water. Said stem has at its rear end a head or enlargement 13^a, which engages the rear end of said sleeve 12, so as to confine the forward movement of said valve to within certain predetermined limits.

In the operation of the device when the parts are in the position shown in full lines in Fig. 2 the water will issue from the nozzle in a solid stream only. If now it is desired to cause the water to issue in both a solid stream and spray, the tube 7 is forced inward a portion only of its whole extent of longitudinal movement, thus forcing the valve 9 away from its seat 10 and opening the inlet to the water-chamber 6 (which has a spraying device, hereinafter described, at its forward end) without closing the inlet to the tube 7, so that the stream of inflowing water will be divided, one portion flowing through the chamber 6 and the other portion flowing through the tube 7. When it is desired to cause the water to issue in a spray alone, said tube 7 is moved rearward its full extent, thus bringing its rear end into engagement with the valve 14, and thereby closing the inlet to said tube 7.

The means preferred by me for causing the longitudinal movement above described of the tube 7 consists of pins or ribs 15, projecting laterally from the lower end of said tube and received within openings 16, formed at diametrically opposite sides of the inner end of said sleeve 4, each of said openings having a curved wall formed to provide two successively-arranged cam-surfaces 17 and 18, with

a depression or seat 19 between the same and with depressions or seats 20 at each end of the same. The construction is such, therefore, that when the tube 7 is turned in one direction the cams engaged with the pins thereof will cause it to move rearward and when turned in the opposite direction the tube will similarly be caused to move forward. The seats 19 at the junctions of the two cams of the respective pairs of cams 17 and 18 are so located as to hold the tube 7 in its intermediate position when engaged with the ribs or projections 15, and they allow said ribs or projections to be freely released therefrom and the tube to be forced forward or rearward of its said intermediate position when said tube is turned in one or the other direction, as the case may be.

The spraying device hereinbefore referred to is located at the forward end of the shell-section 1 and comprises a stationary ring 21, having an inwardly-beveled outer wall threaded upon the forward end of the sleeve 4 and preferably locked thereon by the threaded ring 22. The mouth 23 of the shell-section 1 is correspondingly beveled, and the bevels of the ring and mouth are preferably relatively such as to cause the water to issue from the chamber 6 in almost a solid stream and spread gradually into a widely-spread spray after it leaves said chamber, thus enabling the nozzle to be used in spraying through a small opening without wetting the firemen who are directing the stream.

In Fig. 10 I have shown a spraying-ring 21^a having a plain beveled wall, which when this construction is used will be at a slight distance from the beveled mouth of the shell to provide an outlet-opening between the two; but the form of spraying-ring shown detached in Fig. 9 and in place in Figs. 1 and 2 is greatly preferred by me, as with it the objects in view are better attained. In said construction the beveled outer edge of the ring 21 is preferably in contact with the beveled mouth of the shell and is serrated to provide alternating V-shaped openings and V-shaped teeth. This serrated ring is preferred to the plain one for the reason that the flow of the water through it will be in greater volume and have greater force. It will be observed that the V-shaped teeth and openings cause the water to consolidate at the points of the teeth and issue in an annular jet. It has also been found in practice that the jet-openings in the serrated construction of ring are not so liable to become clogged with dirt as is the spray-opening provided by the plain ring.

A spring has heretofore been employed in a similar type of nozzle for preventing accidental longitudinal movement of the tube 7 by the jolting to which the nozzle has been subjected in drawing it from place to place or when turned upon its rear end. The forward end of this spring, however, was engaged directly with the rear end of said tube

and its said forward end was of less diameter than its rear end, whereby it sometimes became more or less compressed under the influence of the pressure of the inflowing water and also frequently turned on its seat while the tube was being turned. To overcome these disadvantages, the spring 25 in the present structure is of the same diameter at each end and its forward end is set in depressions 26, formed in lugs 27, projecting laterally from a ring 28, (shown in detail in Fig. 8,) which latter loosely encircles the rear end of said tube 7. The rear end of said spring is seated on an offset 29 within the shell-section 3.

Owing to the great pressure of water necessarily used in extinguishing fires and to the fact that the inlet end of the nozzle is of considerably greater diameter than the tube 7, the water is liable to enter the latter, particularly when the spraying-chamber 6 is closed, in a very "wild" condition, and unless this is corrected the nozzle will be very difficult to hold and control. To overcome this disadvantage, a partition 30 is placed in the inlet end of the tube 7, which partition extends across the tube from wall to wall thereof and serves to "straighten" the stream within said tube.

The forward end of the tube 7 is preferably provided with a nut 31, threaded thereon for convenience in turning it.

It will be observed that the construction of the shell is such as to afford access to the several inner parts of the nozzle and that said inner parts are separable and may be removed and replaced at pleasure. It will also be observed that the construction of the nozzle as a whole is simple, durable, and practical and that it may easily be adjusted to throw either a solid stream or a spray, or both a solid stream and spray, at the will of the operator.

I do not wish to be understood as limiting myself to the precise detail construction herein described, as many of the details may be varied without departing from the spirit of the invention; but

What I believe to be new and desire to secure by Letters Patent, and what I therefore claim, is—

1. In a hose-nozzle, the combination with the shell constructed to provide a spraying-chamber, and the longitudinally-movable tube, of a valve controlled by said tube and arranged to close the inlet to said chamber when the tube is at one extremity of its movement, and a device for closing the inlet to said tube when the latter is at the other extremity of its movement.

2. In a hose-nozzle, the combination with the shell constructed to provide a spraying-chamber, and the longitudinally-movable tube, of a valve controlled by said tube and arranged to close the inlet to said chamber when the tube is at one extremity of its move-

ment, and a valve, moved and held from its seat by the pressure of the inflowing water, for closing the inlet to said tube when the latter is at the other extremity of its movement.

3. In a hose-nozzle, the combination with the shell constructed to provide a spraying-chamber, and the longitudinally-movable tube therein, of a valve controlled by said tube and arranged to close the inlet to said chamber when the tube is at one extremity of its movement, a device for closing the inlet to said tube when the latter is at the other extremity of its movement, whereby the nozzle is adapted to throw either a solid stream or spray, and a means for holding said tube in an intermediate position, substantially as described and for the purposes specified.

4. In a hose-nozzle, the combination with the shell, having an interior sleeve arranged to provide a water-chamber between it and the adjacent wall of the shell, said sleeve being constructed to provide successively-arranged cam-surfaces having a depression between them, and a spraying device at the outlet end of said water-chamber, of a longitudinally-movable tube, extending through said sleeve and having a projection engaging said cam-surfaces, a valve carried by said tube and arranged to close the inlet to said chamber when the tube is at one extremity of its movement, and a device for closing the inlet to said tube when the latter is at the other extremity of its movement.

5. In a hose-nozzle, the combination with the shell, having an interior sleeve arranged to provide a water-chamber between it and the adjacent wall of the shell, said sleeve being constructed to provide successively-arranged cam-surfaces having a depression between them, and a spraying device at the outlet end of said chamber, of a longitudinally-movable tube, extending through said sleeve and having a projection engaging said cam-surfaces, a valve carried by said tube and arranged to close the inlet to said chamber when the tube is at one extremity of its movement, and a forwardly-pressed valve for closing the inlet to said tube when the latter is at the other extremity of its movement.

6. In a hose-nozzle the combination with the shell, of a sprayer in the mouth thereof, said sprayer having its periphery formed with alternating V-shaped teeth and openings, said teeth engaging the wall of said mouth, substantially as described and for the purposes set forth.

7. In a hose-nozzle, the combination with the shell having a beveled mouth, of a relatively-stationary sprayer in said mouth, said sprayer having a beveled wall formed with alternating teeth and openings and said teeth engaging the wall of said mouth, substantially as described.

8. In a hose-nozzle, the combination with the shell, of a non-rotating spraying device

located in the mouth of said shell and having its periphery formed with teeth the walls of each of which converge to a point, to cause the water to consolidate into an annular jet and to permit the flow of a maximum volume of water and with maximum force, substantially as described.

9. In a hose-nozzle, the combination with the shell, the relatively-movable tube extending into the same, said tube serving for the solid stream and so related to the shell as to leave a water-chamber between the same, a valve-seat at the inlet end of said water-chamber, and a valve carried by the tube for closing said inlet when the tube is in one position, of a spraying-ring in the mouth of said shell and at the outlet end of said water-chamber, said ring and mouth being relatively constructed to cause the water to issue from said chamber in almost a solid stream, as and for the purpose specified.

10. In a hose-nozzle, the combination with the shell, having a beveled mouth and an interior sleeve arranged to provide a water-chamber between it and the adjacent wall of the shell, and the tube extending through said mouth and sleeve, of a spraying-ring encircling said tube and threaded upon the forward end of said sleeve, said ring having a beveled periphery engaged with the wall of said mouth and formed with openings, substantially as described.

11. In a hose-nozzle, the combination with the shell constructed to provide a spraying-chamber, the longitudinally-movable tube, and a valve controlled by said tube and arranged to close the inlet to said spraying-chamber when the tube is at one extremity of its movement, of a coiled spring in the shell, and a ring loosely encircling the rear end of said tube and engaged by the forward end of said spring, substantially as described and for the purposes set forth.

12. In a hose-nozzle, the combination with the shell having a beveled mouth and an interior sleeve arranged to provide a water-chamber between it and the adjacent wall of the shell, and the tube extending through said sleeve and movable relatively thereto, of a spraying-ring secured to the forward end of said sleeve and formed with a beveled wall having alternating teeth and openings, substantially as described.

13. In a hose-nozzle, the combination with the shell having a beveled mouth and an interior sleeve arranged to provide a water-chamber between it and the adjacent wall of the shell, a valve-seat at the inlet end of said chamber, and the tube extending through said sleeve and movable longitudinally therein, and a valve, controlled by said tube, to engage said seat, of a spraying-ring arranged in the mouth of said shell and threaded upon said sleeve, said ring having a beveled wall, substantially as described.

14. In a nozzle for throwing both a solid

stream and spray at once, or either a solid stream or spray alone, the combination with the body part formed to provide separate passage-ways for the solid stream and spray, of
5 separate valves for said passage-ways, and an adjustable controlling means common to both of said valves and coacting therewith to open both passage-ways or close one passage-way

according to the extent to which said controlling means is adjusted.

Signed by me, at Pittsburg, Pennsylvania, this 18th day of January, 1898.

JOSEPH BUSHA.

Witnesses:

SIMON MATHUS,
S. A. WILL.