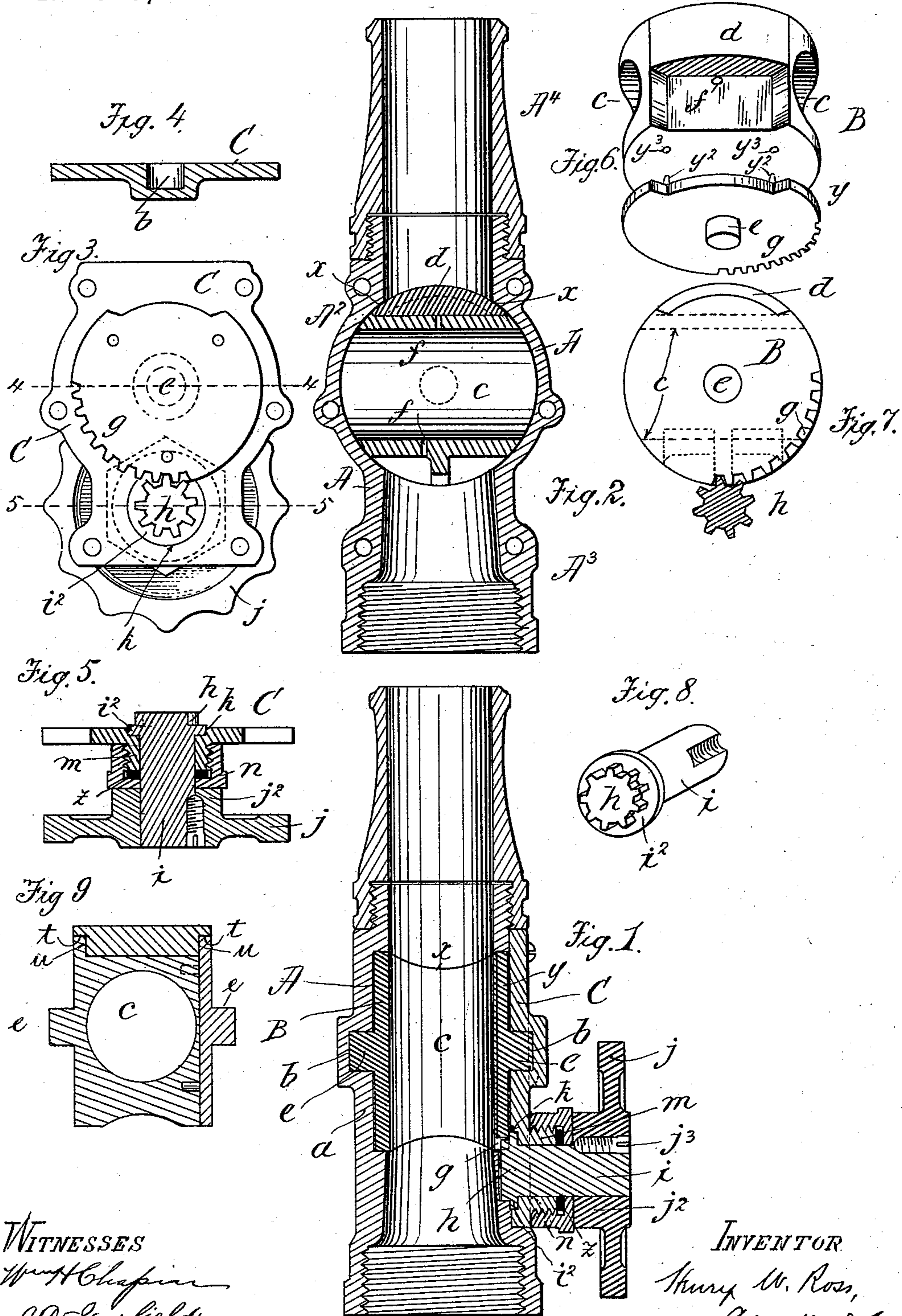


(No Model.)

H. W. ROSS.
VALVED NOZZLE FOR FIRE HOSE.

No. 543,220.

Patented July 23, 1895.



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VALVED NOZZLE FOR FIRE-HOSE.

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To all whom it may concern:

Be it known that I, HENRY W. ROSS, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Valved Nozzles for Fire-Hose Pipes, of which the following is a specification.

This invention relates to improvements in valved nozzles which are more especially designed for fire-hose.

The invention relates to the improved construction in the valved nozzle of the means for mounting the valve whereby friction is avoided, of the means for operating the valve whereby the same may be accomplished to close the nozzle against a high water-pressure with the utmost ease and whereby the valve-operating mechanism is so reinforced and rendered stable as not to be injured by hard usage—such as incidental to the falling and violent contact and blows to which the nozzle is subjected—and all whereby the construction of the nozzle is practicable and comparatively simple and inexpensive.

To these ends the invention consists in the construction and combinations of parts, all substantially as will hereinafter fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the nozzle, taken centrally thereof and intersecting the valve-operating device. In this view the valve is shown open. Fig. 2 is a longitudinal sectional view of the nozzle, taken on a plane at right angles to that of Fig. 1 and showing the valve in its closed position. Fig. 3 is a plan view of the inner side of the removable cap, showing the pinion and hand-wheel for turning it and also showing a segmentally-gearred plate which is formed as a part of or attachment to the valve. Fig. 4 is a cross-section of the cap only as taken on line 4 4, Fig. 3. Fig. 5 is a cross-section of the cap, the valve-operating pinion, and the hand-wheel connected to the shaft of the pinion and the stuffing-box, all as taken on the line 5 5, Fig. 3. Fig. 6 is a perspective view of the valve and of the sector-gearred appliance thereof shown as separated therefrom for purposes of clearness in illustration. In this view

the seating portion of the valve is shown as broken out in section crosswise thereof to more clearly indicate the form thereof and the socket in the valve-body in which it rests. Fig. 7 is in part a sectional view of the pinion and the portion of the valve with which it meshes, the valve being otherwise shown in end plan view. Fig. 8 is a perspective view of the valve-operating pinion and its spindle for receiving the operating hand-wheel. Fig. 9 is a sectional view of the valve.

In the drawings the nozzle has the body A, with the intermediate box-like portion A², herein termed the "valve-box," having the cylindrical opening within it axially at right angles to the length of the butt and forward end portions A³ A⁴ of the nozzle, and the passage through these parts connects with the said intermediate opening in the valve-box except when the communication is closed by the turning of the valve.

One of the flat sides of the valve-box A² is constituted by the integral portion *a* of the casting, and it constitutes the bottom of the chamber within the box, which is substantially filled by the valve B. The opposite side of the said valve-box is constructed open and receives the closing-cap C, which is secured firmly and closely in place by screws, the screw-holes being indicated in Figs. 2 and 3.

The valve is substantially of cylindrical form and is of a size to have a somewhat loose fit within the opening therefor in the valve-box, and it has the transverse water-way *c*. The bottom of the valve-box and the cap therefor have central sockets *b b*, within which the opposite bosses *e e* at the ends of the valve are set. The bosses have a close fit within the sockets, so that the valve-body proper, which is loose within the box, is entirely supported by these boss-and-socket journals and has no peripheral or end-face contact for friction within the box.

The seating portion of the valve is constituted by a supplemental piece *d*, of segmental form, which is provided at the outer side of the valve, parallel with the water-way *c*, and it is capable of a bodily movement away from and against the valve-body proper, in a line at right angles to the axis of the water-way. The valve-body is shown in Fig. 2 as having through it crosswise thereof and in a direction

coincident with the line of movement which the supplemental segment is capable of having the perforations ff , so that when the valve is closed, as seen in Fig. 2, the water-pressure may exert a forwardly-forcing action to carry the convex face of the segment hard and closely against the rear orifice of the forward portion of the nozzle, which constitutes the valve-seat, and which valve-seat is indicated by the letter x .

In practice, by reason of the loose fit which the valve-body B has within the box therefor, there is a slight space around the valve, which may carry the water, so that it may attain an impingement behind and under the segment d of the valve when closed to pry or force it to its seat x , the degree of play being of course very slight, but still sufficient to provide for the absolutely close seating of the valve under the force of the water-pressure and still enable the freedom of rotary movement of the valve-body within the box without frictional contact with the inner surface of the latter. The perforations ff may therefore be omitted.

The valve-body has at its edge portion at one end the sector-gear g , with which meshes the pinion h , which is formed on, or provided to, the inner end of the valve-operating shaft i , which is mounted in and through the cap C and has at its outer end the operating hand-wheel j . The shaft i has next to the valve the annular flange i^2 , which sets in the rabbet k , within the inner face of the cap. The cap has at its outer side the bored externally-threaded boss m , which receives the gland n . The stuffing z is applied between the face of the internal gland-flange and the end of the boss m . The gland is turned with a powerful wrench, so that its end is brought to a very hard and firm contact upon the face of the cap.

The hand-wheel j , which has a rather broad hub j^3 , is placed upon the outer end of the pinion-shaft i , with the end of its hub in bearing against the top face of the gland, and is securely though detachably secured by the screw-key j^3 .

In the construction of the valve for practicability the part of the valve-body which has the gear-teeth g is constituted by a separate disk, as seen at y , Figs. 6 and 7, at the edge of which the gear-teeth may be cut in a gear-cutting machine. This disk has the dowel-studs y^2 firmly set therein and protruding from the inner face thereof, which register with and fit into the sockets y^3 therefor in the end of the valve-body. When the valve-body is thus constructed, the one end journal-stud e therefor is produced upon this disk. The disk having the dowel-stud and socket engagement with the valve-body is also further secured by "sweating" it upon the body. The sector-gear disk, after its teeth have become badly worn, may be readily detached and replaced.

Through the means of the hand-wheel and connections between it and the valve-body the latter may have its quarter rotary movements for being opened and closed at the exertion of but slight manual power.

By reason of the hub of the hand-wheel resting on the outer end of the gland and the base of the gland firmly resting on the face of the cap C there can be no forces incidental to rough usage of the nozzle brought upon the pinion-shaft to bend or twist it whereby it would cramp or bind.

The repacking of the stuffing-box is accomplished not by further compressing the already worn packing, but by inserting additional packing; but of course by dispensing with the advantage of maximum stability mentioned, as derived by having the gland-bottom upon the cap, the gland might be applied without bottoming, the adjustment of the packing being accomplished by screwing down the gland; but the first-mentioned arrangement of the parts is manifestly the one to be preferred in a fire-hose nozzle.

All of the parts of the nozzle are advantageously constructed of brass, except the seating segment d of the valve, which, preferably, is of Babbitt metal.

As seen in Fig. 9, the movable segment d has on its inner side at its ends the rabbet t , with which engage the flanges u provided upon the body of the valve, whereby the segment, while permitted to freely have its slight movement transversely of the axis of the valve, may have no endwise movement.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with the nozzle having the valve-box, comprising the chamber of cylindrical form the opposite walls of which have the sockets, b, b , of the valve-body, of a diameter slightly less than the valve-box-chamber having the transverse water-way, and the endwise extended bosses which closely fit in said sockets, and provided with the supplemental and independently movable seating portion, d , said valve-body receiving its entire support by said journal-bosses whereby it is relieved from frictional contact against the wall of the chamber within which it rotates, and the nozzle being so constructed that when the valve is closed a water passage is formed leading from the pressure to access behind said supplemental independently movable seating portion in the valve, substantially as described.

2. In combination, the nozzle having the valve-box with a cylindrical chamber therein, one side of which is constituted by the removable cap, C, the cylindrical valve-body, having the water way transversely through it rotatably mounted within the box and having gear-teeth, g , at its one end, a pinion adapted to mesh with said gear-teeth of the valve and having its operating shaft sup-

ported by and journaled through said cap, and having its outer end provided with an operating handle, substantially as described.

3. In combination, the nozzle having the 5 valve-box, one side of which is constituted by the removable cap, C, which has the hollow externally threaded boss, m, the valve-body having the water way rotatably mounted within the box and having the gear-teeth, the 10 shaft, i, having the pinion, h, at its inner end, and journaled through said boss, the gland, n, surrounding the pinion-shaft and bottoming against the cap, and the hand-wheel, keyed upon the outer extremity of the shaft 15 and having its hub in bearing against the outer end of the gland, substantially as and for the purposes specified.

4. The combination with the nozzle having the intermediate valve-box comprising the 20 single cylindrical chamber one side of which is constituted by the removable cap, and said cap and the opposite side having the sockets, b, b, of the cylindrical transversely apertured

valve-body loose within the box and having the end bosses closely fitting in the said sock- 25 ets and having the gear teeth at its one end, a shaft, i, supported by and journaled through the cap, having the pinion, h, at its inner end in mesh with said gear-teeth and concealed by the applied cap, and the operating handle 30 at the outer end of the shaft, substantially as described.

5. The combination with the nozzle having the intermediate valve-box, of the cylindri- 35 cal valve-body rotatably mounted within the box and having a portion thereof comprised in a separately constructed disk which is edge-wise gear-toothed and which is attached to the end of the valve-body and the pinion 40 mounted in the nozzle and in mesh with the teeth of said disk, together with means for turning the pinion, substantially as described.

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Witnesses:

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