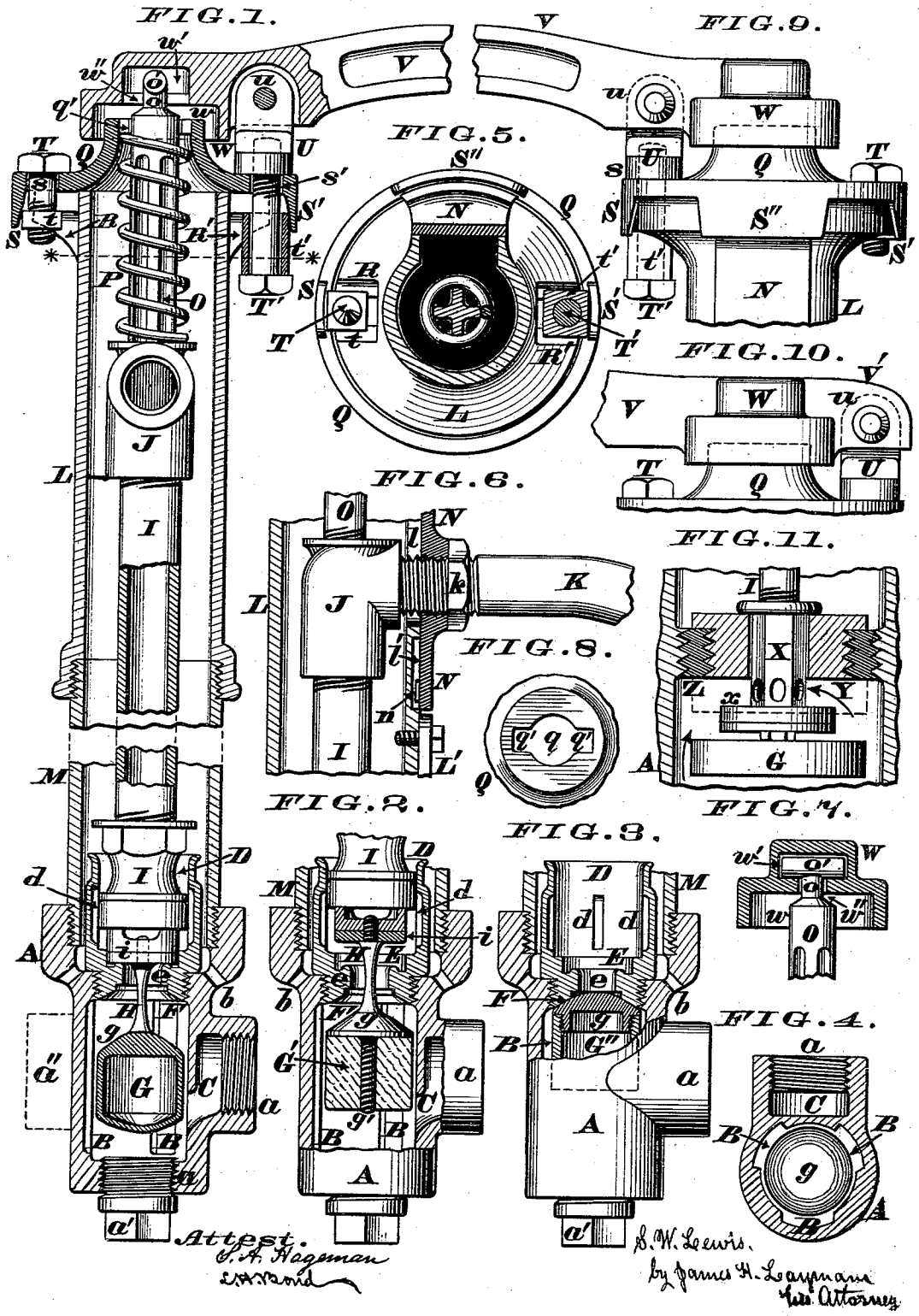
S. W. LEWIS.

HYDRANT.

No. 192,379. Patented June 26, 1877.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HYDRANTS.

Specification forming part of Letters Patent No. **192,379**, dated June 26, 1877; application filed May 15, 1877.

To all whom it may concern:

Be it known that I, SAMUEL W. LEWIS, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Hydrants, of which the following is a specification:

The first part of my invention relates to that class of wasting-hydrants having hollow valve-stems or plungers, which devices are commonly known as "moving water-ways;" and my improvement consists in applying to the base of such wasting-hydrants an auxiliary or duplex valve that closes and shuts off the flow of water from the inlet-pipe the moment the moving water-way is withdrawn, either for inspection or repair.

This auxiliary or duplex valve obviates the necessity of employing a special stop or other device for shutting off the supply, and said valve may be arranged so as to be closed wholly by the ascending current of water, or this closing action may be initiated or completed with the assistance of any suitable appliance or appliances.

Furthermore, this duplex valve may be applied to wasting-hydrants whose moving water-way closes either with or against the pressure in the inlet-pipe.

The second part of my invention consists in making such duplex valves of any suitable buoyant material, the top of said valve being furnished with a ground seat that effectually prevents the passage of water up into the hydrant the moment said valve is free to assume its normal or elevated position.

This second feature of my invention is applicable to all kinds of hydrants, fire-plugs, street-washers, or other devices for controlling the flow of water under pressure, no matter whether such devices are provided with hollow or solid plungers, or whether they are wasting or non-wasting appliances, or whether they close with or against the current of water admitted at the inlet-pipe.

The third part of my invention consists in providing the counter-bored valve-chamber of a hydrant with a raised seat, upon which seat the controlling-valve rests when the supply of water is shut off. This raised seat is applicable to hydrants having either solid or hollow plunger-rods, the object of said seat being to prevent any concussion or jar in case the controlling-valve should be suddenly closed in shutting off the water.

The fourth part of my invention consists in applying the operating handle or lever to a hydrant in such a manner as to be readily attached either to the right or left side of the cap or stock, as may be found convenient.

The fifth part of my invention consists in so constructing this handle as to render it applicable to hydrants closing either with or against the pressure.

The sixth part of my invention consists in coupling the operating-lever and the valve-stem or plunger to the cap of a hydrant in such a manner as to permit the withdrawal of the stem or plunger without disconnecting them either from the handle or cap.

In the annexed drawings, Figure 1 is an axial section, showing my improvements embodied in a hydrant whose moving water-way shuts against the pressure, the controlling-valve being closed and the auxiliary valve depressed. Fig. 2 is a similar section through the hydrant-base, the controlling-valve being shown elevated, so as to permit the current of water to ascend within the moving water-way. Fig. 3 is another axial section of the base, the moving water-way being withdrawn therefrom and the auxiliary valve forced up against its seat. Fig. 4 is a horizontal section through said base. Fig. 5 is a horizontal section of the hydrant-stock at the line *——*. Fig. 6 is a vertical section of the stock at the junction of the nozzle with the hollow plunger. Fig. 7 is a section, showing the method of coupling the moving water-way or valve-stem to the operating lever or handle. Fig. 8 is a plan of the central portion of the cap. Fig. 9 is a front elevation of the hydrant, showing the operating-handle applied to the left side of the cap. Fig. 10 represents a modification of said handle as adapted for use with those hydrants whose plungers close with the pressure; and Fig. 11 represents one method of applying the duplex valve to such hydrants.

The base of the hydrant consists of a cylindrical casting, A, tapped with one, two, or more female threads, *a*, into either of which threads may be engaged the inlet-pipe that

communicates with the street-main, the lower orifice of said base being closed with a suitble plug, a'. When the device is to be used as a hose-plug or street-washer, said base may be provided with yet another female thread, as indicated by dotted lines a'' in Fig. 1. By this arrangement the street-washer may be attached directly to the same line of pipe that supplies the hydrant, the water being thus allowed to flow freely through the two opposite openings of the base A.

This base is provided with vertical channels B, waste-apertures b, and a curtain or partition or other obstruction, C, which barrier C is so located with reference to the inlet a as to deflect the current of water toward plug a', and thereby dislodge any sediment that may have settled at the bottom of the hydrant.

Fitted to this base is a valve-chamber, D, having one or more waste-passages, d, a counter-bore, E, and a raised seat, e, which seat occupies a concentric position within said counter-bore of the valve-chamber.

The extreme lower end of chamber D has a seat, F, for the duplex or auxiliary valve G, whose upper end is ground at g to insure an accurate water-tight joint when said valve comes in contact with seat F. Said duplex valve may be elevated by means of a spring; but I prefer to use a valve that will ascend by its natural buoyancy as soon as it is relieved from the pressure of the plunger or stem.

This buoyancy may be secured by making the valve of a thin metallic shell, as seen in Fig. 1; or the ground disk g may be attached to a piece of cork or other light substance, G', by means of a screw-threaded stem, g', as represented in Fig. 2; or said ground disk g may be screwed to a tube, G'', as seen in Fig. 3, the lower end of said tube being closed, so as to prevent the entrance of water into the shell-valve. The duplex or auxiliary valve is depressed by a rod, H, depending from the moving water-way I, whose construction and operation are essentially the same as the hollow plunger seen in Letters Patent No. 169,738, issued November 9, 1875. The controlling-valve i of said plunger may be secured in position by the act of screwing rod H into the closed lower end of said moving water-way, the upper end of this water-way being coupled to an elbow, J, from which latter projects discharge nozzle or spout K, capable of vertical movement within slot l of the hydrant-stock L. This stock may be attached to the base A with any suitable pipe, M, the junctions between said base, pipe, and stock being effected either with screw-threaded joints or else with flanges and bolts. Nozzle K is screwed into elbow J, and carries a scutcheon-plate, N, that is adapted to conceal the previously-described slot l.

Plate N is secured with nut k, and is guided in a vertical path by a lug or tongue, n, that traverses a groove, l', of the stock L.

Projecting from elbow J is a spindle, O, having a diminished neck, o, and a T-head, o', said spindle being surrounded with a coiled spring, P, that maintains controlling-valve i securely upon raised seat e, as seen in Fig. 1. Q represents the hydrant-cap, whose central and elevated portion is pierced with a circular aperture, q, to admit the spindle O. Communicating with this central aperture are slots q', of such size as to permit the ready passage through the cap of the T-head o'. These slots are in line with the perforated sockets R R' of the hydrant-stock.

Furthermore, this cap is pierced with two diametrically-opposite apertures, s s', and three depending flanges, S S' S'', of which flanges the ones S S' conceal the sockets R R', as seen in Fig. 5. The other flange, S'', acts as a guide to the upper end of plate N, and also prevents any exposition of the slot l when the closure of the hydrant depresses said plate. Passing through aperture s is a bolt, T, whose nut t is housed within socket R S. Aperture s' is traversed with a bolt, T', whose extended washer t' occupies the socket R' S', and said bolt T' engages with a fulcrum-bearing, U, upon whose pivot u the operating handle or lever V vibrates. The short arm of this lever or handle carries a hood, W, which is chambered out at w w', said chambers being provided with a communicating slot, w'', of such size as to readily admit the insertion of T-head o' into the upper division w'.

This slot w'' is in the same plane as the slots q' and handle V, as seen in Fig. 1.

The lower chamber w is of such capacity as to permit free vertical movement of hood W without coming in contact with the central portion of cap Q, while at the same time the extremity of said cap is never exposed when handle V is operated to open valve i.

In Fig. 11 the moving water-way or plunger is shown as adapted for use with a hydrant that closes with the pressure of water, said plunger I being secured either to a hexagonal or octagonal or other non-circular tube, X, having suitable apertures above its valve x to permit the ascent of water through said tube and plunger as soon as this valve is forced away from its seat Y. Valve Y is screwed into a bushing, Z, which latter is screwed into base A. The aperture in seat Y has the same non-circular shape as tube X, in order that the proper rotation of the latter may unscrew said seat from the bushing Z when the hydrant is to be inspected or repaired. Immediately upon the removal of plunger I X x and seat Y the float G will ascend and close the opening in bushing Z, and thus prevent water entering the hydrant-stock. L' is a button or other stop capable of being turned up, so as to maintain the plunger in an elevated position when it is desired to draw off a large quantity of water.

To apply handle V to the right side of the hydrant, as shown in Fig. 1, the fulcrum bearing or stump U is secured in position with bolt T', whose washer t' is seated in the socket R' S'. To apply said handle to the left side

of the cap the bolts T T′ are detached, and lever V is then swung around until the fulcrum-bearing U is in line with aperture *s*, when said bolts are inserted, respectively, in the sockets R R′, the bolt T′ being again engaged with said bearing U, as seen in Fig. 9.

It will thus be seen that the change from a right to a left hand hydrant can be effected in a few minutes, and without calling in a plumber or other artisan. It will also be noticed that, in whichever of these two diametrically-opposite positions handle V may be turned, the T-head *o′* will be disposed transversely of slot *w″*, and, consequently, spindle O cannot become uncoupled from said operating-handle. Owing to the stress of spring P, valve *i* is maintained securely upon the raised seat *e*, and in this closed condition of the hydrant the water in plunger I J K is drained off through the waste-passages *b* and *d*. Furthermore, in this closed condition of the hydrant rod H forces the auxiliary or duplex valve G away from seat F. To open the hydrant the long arm of lever V is depressed, and the cupped packing of plunger I is elevated far enough to cover the upper ends of channels *d*, as seen in Fig. 2, and water then flows through said plunger in the manner described in the patent previously alluded to. In this open condition of the hydrant rod H prevents the float-valve G coming in contact with seat F, and as soon as a sufficient quantity of water has been drawn off, lever V is liberated, and the stress of spring P at once restores the two valves G and *i* to their normal positions. In thus closing the hydrant the valve *i* gradually compresses the water contained in the annular space around raised seat *e*, which body of water then serves as a cushion to prevent any sudden jar or concussion when said valve comes in contact with said seat. For repair or inspection of the apparatus, bolts T T′ are disengaged and cap Q elevated until plunger I and its attachments are withdrawn bodily from the stock L M. The instant plunger I is withdrawn float-valve G *g* is driven against seat F, and thus prevents the ascent of water within the stock L M. This automatic closure of said valve is effected, primarily, by its natural buoyancy, and, secondarily, by the deflection of the current of water under barrier C, and thence up within the base A. The plunger, while withdrawn, will remain coupled to lever V as long as the latter is maintained in line with apertures *s s′*; but by simply swinging said handle around so as to bring slot *w″* in line with T-head *o′*, the latter can at once be disengaged from the hood W *w′*.

Spindle O, however, is still coupled to cap Q; but by rotating the latter far enough the T-head *o′* can be slipped through the slots *q′*, after which act all the component members of the plunger H I *i* J K N can be detached from each other in a few minutes.

To adapt my shiftable handle for use with hydrants closing with the pressure, said lever V W is furnished with a short lug, V′, which lug is pivoted to the fulcrum-stump U, as seen in Fig. 10.

I am aware that it is not new to apply duplex or auxiliary valves to hydrants having solid stems or plungers, and I am also aware that it is not new to use such duplex or auxiliary valves with hydrants having moving water-ways when said valves are arranged to coact with the main valve in starting or stopping the flow of water every time the hydrant is opened and closed. Therefore my claim to the duplex or auxiliary valve is expressly limited to their use in wasting-hydrants with moving water-ways when said duplex valves are so arranged as to be seated only on the bodily withdrawal of the plunger from the stock, while at all other times said auxiliary valve is maintained a suitable distance away from its seat by the rod H, or its equivalent device, or else by its own weight or otherwise.

By this arrangement I dispense with at least three water-tight joints in the stock and a stuffing-box at the upper end of the same, which devices are necessary to confine the discharge of water at the nozzle when the water occupies the entire body of the hydrant, as has heretofore been done.

Furthermore, this arrangement facilitates repairing and reduces very materially the cost of manufacture. It also reduces the quantity of water that is wasted every time the hydrant is closed.

I reserve the right of operating the plunger I K with a screw or eccentric, or any substitute for the lever V. I reserve also the right of applying any or all of these improvements to fire-plugs or street-washers, or any other apparatus for controlling the flow of water under pressure.

Finally, I may in some cases dispense with the buoyant or float valve G, and couple the latter to the moving water-way in such a manner as to be elevated by the same with a positive movement, the coupling being so arranged as to disconnect the valve from the water-way when said water-way is removed bodily from the hydrant.

I claim as my invention—

1. A wasting-hydrant consisting of a moving water-way closing either with or against the pressure, and a duplex or auxiliary valve, which latter is seated only when the main or upper valve is withdrawn bodily, for the purpose described.

2. An improved wasting-hydrant, consisting, essentially, of a suitable valve-chamber, a moving water-way, and an auxiliary or duplex valve, which latter closes automatically and shuts off the supply only when said water-way is withdrawn, substantially as herein described and set forth.

3. In combination with a hydrant-base, a buoyant or floating duplex valve whose up-

per end is furnished with a ground seat, substantially as herein described, and for the purpose set forth.

4. The combination of valve-chamber D F, buoyant duplex valve G, operating-rod H, and plunger I, the upper end of said valve being provided with a ground joint, substantially as herein described and set forth.

5. In combination with valve-chamber D of a hydrant, the counter-bore E and raised seat *e*, for reception of the controlling-valve *i*, substantially as herein described.

6. A hydrant-lever capable of being secured to the cap or stock in either one of two diametrically-opposite positions by the shiftable fulcrum-bearing T′ U, so as to locate said handle either to the right or left, substantially as herein described.

7. The combination of hydrant-cap Q *s s′*, sockets R R′, retaining devices T *t* T′ *t′*, and shiftable fulcrum-bearing U of handle V, substantially as herein described.

8. The combination of spindle O, neck *o*, T-head *o′*, and chambered hood W *w w′ w″* of handle V, substantially as herein described.

9. The combination of spindle O, neck *o*, T-head *o′*, hood W *w w′ w″*, handle V, and cap Q *q q′*, substantially as herein described.

10. The barrier C for deflecting the inflowing current of water toward the bottom of hydrant-base A, substantially as herein described.

11. In combination with the shiftable fulcrum-bearing U and hydrant-handle V, the extension V′, pivoted to said bearing, substantially as herein described.

In testimony of which invention I hereunto set my hand.

SAMUEL W. LEWIS.

Witnesses:
JAMES H. LAYMAN,
D. P. KENNEDY.