J. A. STACY & S. W. LEWIS.

HYDRANT.

No. 169,738. Patented Nov. 9, 1875.

FIG. 1.

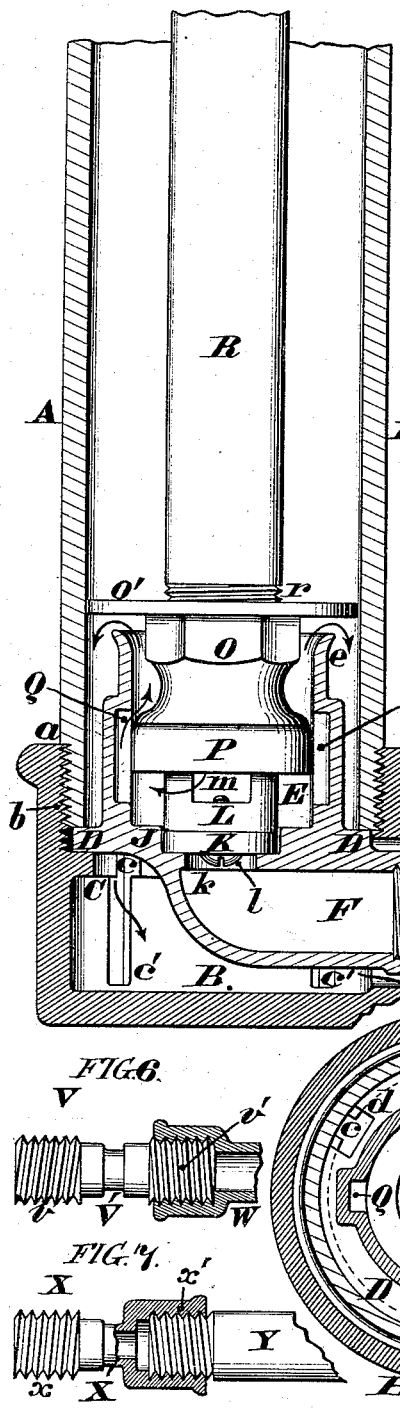

FIG. 2.

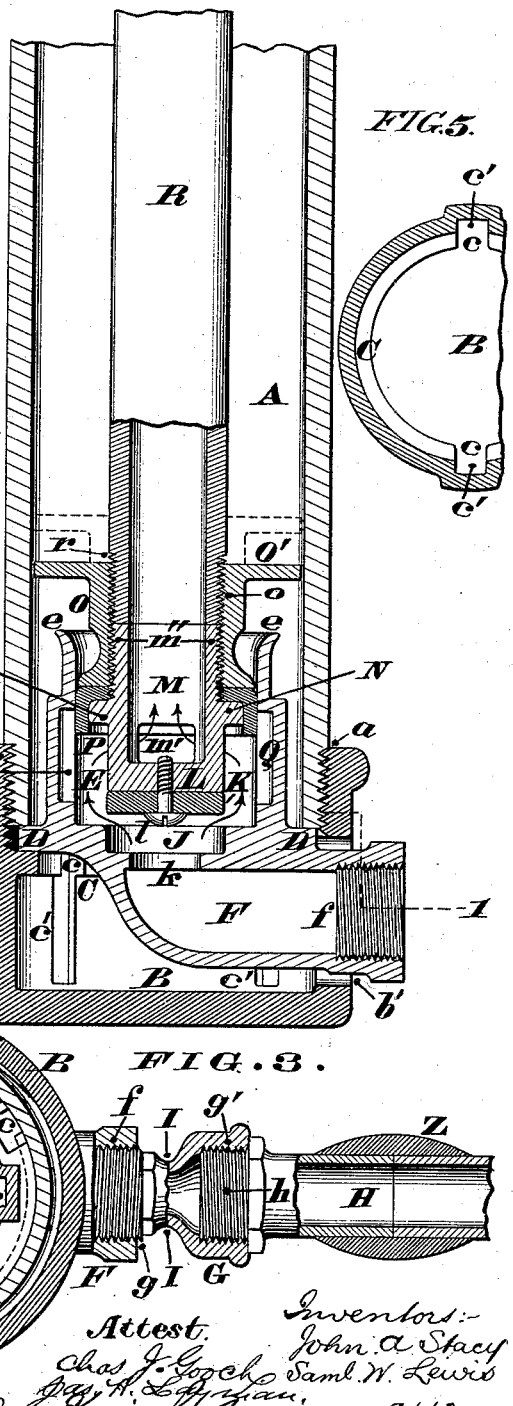

FIG. 4.

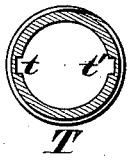

FIG. 5.

FIG. 6.

FIG. 7.

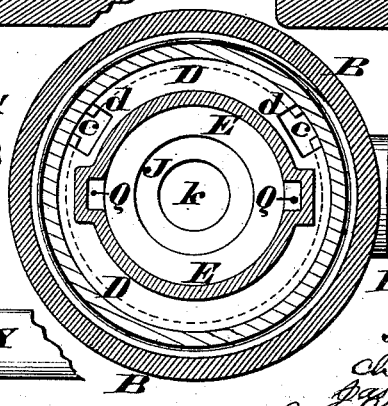

FIG. 3.

Attest.
Chas. J. Gooch
Jay A. Lehman.

Inventors:-
John A. Stacy
Saml. W. Lewis

By Knight Bros. Att'ys.

UNITED STATES PATENT OFFICE.

JOHN A. STACY AND SAMUEL W. LEWIS, OF CINCINNATI, OHIO.

IMPROVEMENT IN HYDRANTS.

Specification forming part of Letters Patent No. **169,738**, dated November 9, 1875; application filed August 28, 1875.

To all whom it may concern:

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

This invention relates to that class of hydrants which have a hollow or tubular vertically-moving water-way or plunger, within which the fluid ascends when the controlling-valve is opened; and our improvement comprises an arrangement of inlet-valve, countersunk seat, side or waste channel or channels, down-turned cupped leather plunger, and a containing-chamber, which devices, by their peculiar construction and location with reference to each other, effectually prevent any discharge through the wasteway while the hydrant is open, the elevation of the plunger operating to close said waste before opening of the hydrant, and the depression of the plunger operating to close the hydrant before opening of the wasteway, as hereinafter more fully explained. Our improvement further comprises a provision for guiding the valve and plunger into the chamber after removal for inspection, repair, or other purpose, and for protecting the chamber from the entrance of sand and other gritty or clogging substances.

In addition to the above-described improvements our hydrant is constructed in such a manner that the act of coupling the wrought-iron stock to the cast-iron base or foot serves to secure the valve-chamber immovably in position.

In the accompanying drawing, Figure 1 is an axial section of our improved hydrant, the valve being shown seated, its counter-bore and the wasteway opened. Fig. 2 is a similar section, but showing the inlet-valve slightly elevated and the wasteway closed. Fig. 3 is a horizontal section of the hydrant at the line 1 1, the plunger being removed; and Fig. 4 represents, by side elevation and an enlarged transverse section, the method of uniting the discharge nozzle or spout of the hydrant to the moving water-way.

The stock A, which may be either a wrought or cast iron pipe, is screw-threaded, *a*, at its lower end, so as to engage with the female screw *b* of the cast-iron shoe or base B, which supports the hydrant. This cast-iron base is provided on one side with a suitable opening, *b'*, to receive the inlet-pipe of the valve-chamber, and said base is furnished with an inwardly-projecting annular ledge, C, that is pierced at *c*, so as to allow the waste-water that overflows from the valve-chamber to escape down the channels *c'* in said base, as indicated by arrows in Fig. 2. The outer walls of these channels may project somewhat beyond the sides of the base, as shown in diagram 5, thereby affording a secure grasp of the wrench or vise in fitting up the hydrant. Seated upon this annular ledge C is the collar D of the valve-chamber E, which chamber is composed of brass or other non-corrosive metal, and said collar is provided with apertures *d*, that are in line with the openings *c* and channels *c'* when the hydrant is properly adjusted, as represented in Fig. 3. F is the inlet-pipe of valve-chamber E, said pipe being passed through the side opening *b'* of the base, and having a right-hand female thread, *f*, for the reception of the left-hand screw *g* of a coupling, G, whose other end is furnished with a female thread, *g'*. Engaging with this female thread *g'* is the male screw *h*, that has a pitch to the right. This screw *h* is cut upon the branch pipe H, that communicates with the street-main, in the usual manner. The coupling G has a contracted waist, I, the object of such contraction being to render this portion of said coupling the weakest part of the hydrant. Consequently, whenever the hydrant is elevated by the action of frost or other unavoidable causes, the coupling will break off at the thin and contracted waist, and thereby prevent the valve-chamber or its accessories being injured. The chamber E is cylindrical interiorly, and has a slightly-flaring trumpet or bell mouth, *e*, for the ready reception of the plunger or moving water-way, while the lower end of said chamber is provided with a counter-bore or depressed seat, J, for the controlling-valve K. The aforesaid countersunk seat communicates with the inlet F by means of a port, *k*, the counter-bore and port both occupying a central position with reference to the chamber E. The controlling-valve K, which fits snugly within the

countersunk seat J, is composed of leather, india-rubber, or other suitable material, and is attached to the head L of the moving water-way with a screw or bolt, *l*. This head L of the plunger is chambered out at M, and is furnished with one or more ports, *m m'*, which communicate with said tubular portion M. Furthermore, this head L is provided with an annular flange or collar, N, between which and the nut O is clamped a down-turned cupped leather packing, P, which latter fits so snugly within the chamber E as to effectually prevent the escape of water, the expansion of said cupped packing being caused by the pressure of water in the main. The tubular portion M of the plunger is screw-threaded externally at *m''*, to engage with the female thread *o* of nut O.

R is the hollow vertically-moving water-way, which pipe or tube may be elevated and depressed with a screw or lever, or with an eccentric or other actuating device applied to the upper end of said plunger. The pipe constituting this water-way is screw-threaded at *r*, to engage with the female coupling *o* of nut O, which latter holds the cupped packing in position. Cast with the nut O is a circular flange, O', which acts as a guide to confine the plunger to its proper path when inserted in the chamber E, and said flange serves also as a guard or fender to prevent the entrance of sand or other foreign and injurious substances into the mouth of said chamber. This guard, however, may be a separate member, and ride upon the nut O, or it may be secured to the latter when the pipe R is screwed home.

Located at either side of chamber E are one or more channels, Q, that constitute the wasteway proper of the hydrant. The waste-channel should be of such length as to insure its upper end being uncovered by the packing P when the valve K is seated, as shown in Fig. 1, while at the same time this end of the channel is covered with the packing the instant valve K is withdrawn from the counter-bore J. (See Fig. 2.) The lower end of this channel is at all times in communication with the lower portion of chamber E, as it is the opening and closing of the upper end of said channel that causes the hydrant to waste, or else prevents such an escape of water.

Whether one or more channels are employed, they are preferably formed by chill-cores, for the purpose of securing perfect smoothness, hardness, and durability, with a saving of expense in manufacturing the hydrant.

Secured to the upper end of moving water-way R is an elbow, S, into whose horizontal limb a screw-threaded tube, T, is engaged, the outer end of said tube having the discharge spout or nozzle U screwed to it.

It is preferred to make the tube T of some non-corrosive metal, so as to enable the ready detachment of the spout whenever the hydrant is taken apart. The aforesaid tube is provided with two internal and longitudinal grooves, *t t'*, for the reception of a key or wrench when said tube is to be detached from the elbow S.

In diagram 6 the coupling V is shown as having a left-hand thread, *v*, a waist or circumferential groove, V', and a right-hand screw, *v'*, which latter is an external one, and engages with a suitable internal thread of the branch pipe W.

In diagram 7 the coupling X is shown as adapted to receive a wrought-iron pipe, Y, thereby dispensing with the solder-joint, as shown at Z in Fig. 3. The coupling X has a left-hand thread, *x*, a waist, X', and an interior thread, *x'*.

The operation of our hydrant is as follows: In fitting up the apparatus the inlet-pipe F is passed through the side opening *b'* of base B, and the collar D is seated upon the annular ledge C, after which the stock A is screwed home. This act clamps the collar D firmly down upon the aforesaid ledge, and thereby secures the valve-chamber E immovably in its proper position.

In applying the plunger L M to the moving water-way R the packing P is first arranged upon the head L in such a manner as to insure the uncovering of the upper end or outlet of channel Q, when the valve K is completely seated at the bottom of the counter-bore, and not before. When thus arranged it is evident that the valve K prevents any entrance of water through the central port *k*, while at the same time any water that may be contained in pipe R descends and flows out through openings *m m'* into the lower portion of chamber E. The waste-water then ascends through the side channels Q, and escapes over the mouth *e* of chamber E, and enters the annular space between said chamber and the interior of stock A. The waste-water escapes from this annular space through the apertures *c d* and channels *c'*, and thence out at the opening *b'* in the base, as indicated by arrows in Fig. 2, and it is evident that the flow will continue until the water in pipe R falls to a level with the mouth of chamber E, when the current will stop. The valve-chamber is thus kept constantly full of water, and the plunger, being at all times submerged, never becomes dry and stiff, but is always pliable and ready to expand the moment the hydrant is turned on. To accomplish this act it is only necessary to properly manipulate the screw or eccentric so as to elevate the moving water-way R and its attachments, thereby lifting the valve K from off its seat.

The flow of water, however, does not begin the moment said valve is raised, but takes place only as soon as it is fairly withdrawn from counter-bore J; but before this occurs, the packing P has been sufficiently elevated to close the upper end of channel Q, and thus prevent the escape of water through said wasteway. The inflowing current then passes through counter-bore J, ports *m m'*, ascends

within the moving water-way R, and is finally discharged from the hydrant at the nozzle U. During the time the plunger is maintained in this elevated position the pressure of water acts outwardly against the packing P, and causes it to hug the interior of chamber E so snugly as to effectually prevent any waste over the mouth *e* of said chamber. The descent of the plunger acts to promptly but gently close the hydrant, and the various operative parts assume their normal positions, (shown in Fig. 1,) and the waste at once commences through the side channel or channels Q.

When only a limited quantity of water is to be drawn from the hydrant, the valve need not be raised any higher than shown in Fig. 2; but to insure a more copious discharge, the plunger may be elevated higher, as indicated by dotted lines in said illustration.

One great advantage peculiar to our hydrant is, that the wasteway is always fairly closed before the valve is withdrawn from its countersunk seat, and, consequently, no escape of fresh water can ever take place through said wasteway, no matter how small a quantity is drawn.

In the customary abruptly opening and closing hydrants, the least elevation of the plunger being sufficient to pass water, a portion is liable to escape through the wasteway, and whenever the hydrant is but slightly opened for a limited supply, the wasteway remains open during the entire delivery. This defect we wholly obviate.

It is designed to furnish the coupling G *g g'* I to the trade, and in setting up a hydrant the short pipe H *h* is first to be soldered to the branch main at Z, and then said coupling is made effective to unite the hydrant to said branch, the reverse threads *g g'* enabling a tight joint to be made.

This method of putting in a hydrant prevents the communicating of any heat from the solder-joint to the chamber E, and, consequently, there is no danger whatever of the packing P being burned, which almost invariably occurs in the old method of soldering directly to the inlet-pipe.

We claim as our invention—

1. The valve-plunger K L P, countersunk inlet-seat J, and wasteway Q, so arranged and combined as to insure complete closure of the wasteway before opening of the inlet-passage, and complete closure of the inlet-passage before opening of the wasteway, substantially as set forth.

2. The provision, on the plunger of waterway pipe, of the flanged nut or collar O O', of greater diameter than the mouth of the inlet-valve chamber, to guide the said plunger or pipe into the said chamber, and to keep out sand and other extraneous matters.

3. A coupling tube or pipe having right and left screw-threaded ends, and a middle portion of such relatively reduced diameter as to break before either the valve-chamber or supply-pipe can be injured from the effects of frost-heaving or otherwise, and so as to be easily replaceable without liability to burn the inlet-packing in securing the solder-tail.

In testimony of which invention we hereunto set our hands.

JOHN A. STACY.
SAMUEL W. LEWIS.

Attest:
GEO. H. KNIGHT,
WALTER KNIGHT.