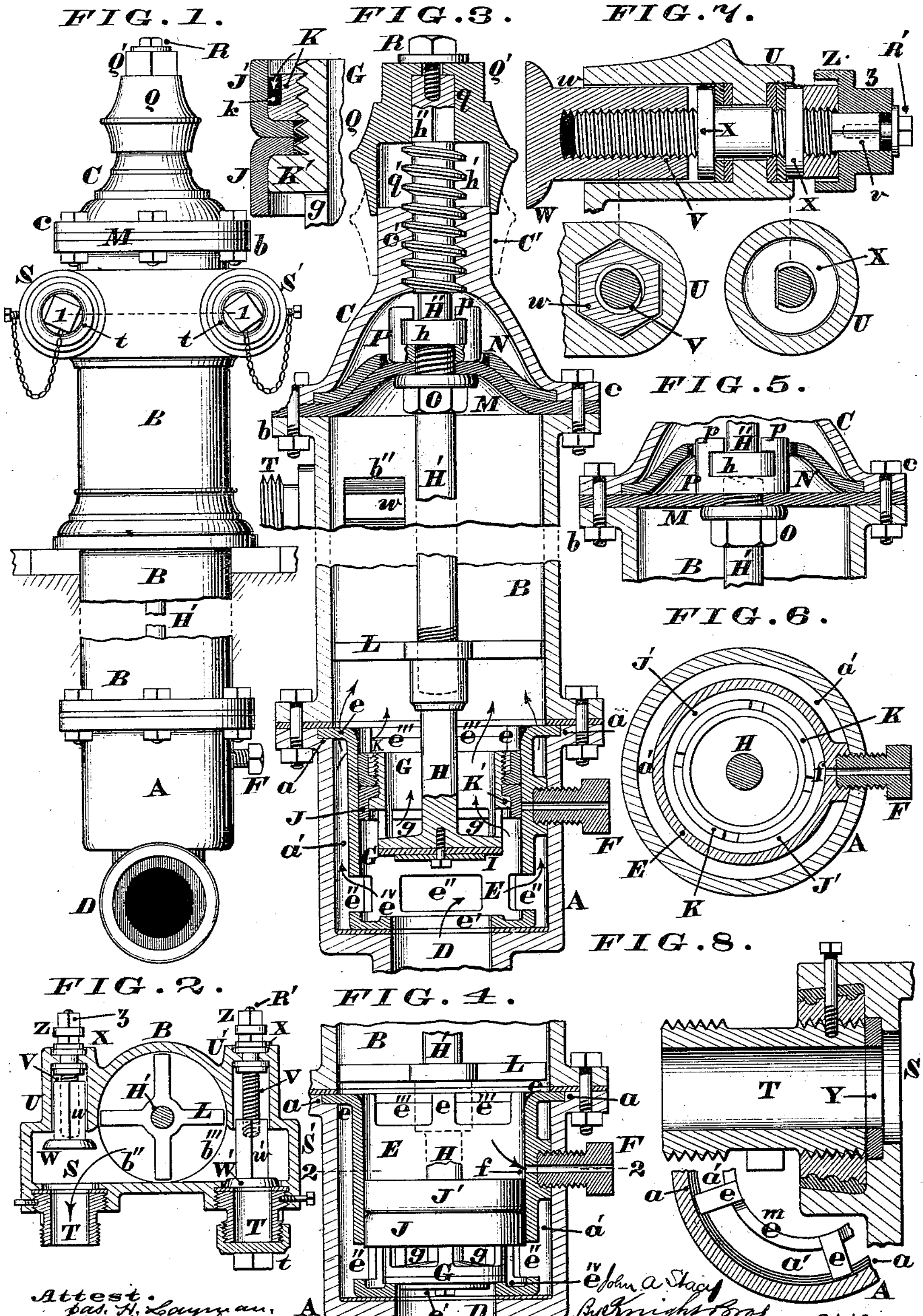
J. A. STACY.

Fire-Plug.

No. 167,582. Patented Sept. 7, 1875.



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UNITED STATES PATENT OFFICE.

JOHN A. STACY, OF CINCINNATI, OHIO.

IMPROVEMENT IN FIRE-PLUGS.

Specification forming part of Letters Patent No. **167,582**, dated September 7, 1875; application filed, July 12, 1875.

To all whom it may concern:

Be it known that I, JOHN A. STACY, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Fire-Plugs, of which the following is a specification:

My fire-plug, or street-washer, in its most complete form, is designed to combine the following advantageous features: Capacity for being made either "wasting" or "non-wasting" at will of the supervisor, so as to guard against freezing in winter and unnecessary waste in summer; a construction of inlet-valve chamber and water-way which permits a free passage of water on opening the valve; a guide-collar near the lower end of the valve-stem, an arrangement of packing diaphragm and shield to the upper part of the valve-stem that permits unrestricted play of the said stem, while preventing the escape of water into the valve-operating-screw chamber; the provision of one, two, or more hose-nozzles independently closable by a separate compression-valve to each nozzle; a provision of protecting-caps to the operating-screws, which caps also serve as arbors for the action of the turning-wrenches.

In the accompanying drawing, Figure 1 is a side elevation of a fire-plug embodying my improvements, a part of the stock or pipe which connects the lower with the upper portions being broken away. Fig. 2 is a section at line 1 1. Fig. 3 is an axial section of such "plug," parts of the middle and of the inlet-passage being broken away, the inlet-valve being shown elevated and the wasteway closed. Fig. 4 is a partial section, showing the inlet closed and the waste open. Fig. 5 is a partial section, showing the position of my diaphragm when the inlet-valve is closed. Fig. 6 is a section at line 2 2. Figs. 7 and 8 are axial sections of one of the discharge-valves, with its operating mechanism, and of a corresponding nozzle.

A is the foot, B the middle portion, and C the cap, of my combined stock and water-way. The foot A has an inlet-passage, D, which communicates with the service-pipe. The said stock A B C D may be of cast-iron. The foot A is counter-bored at *a* to receive and hold the marginal flange *e* of my brass inlet-valve chamber E, of cylindrical form, and perforated below at *e'* to correspond with the opening of the inlet D. The chamber E is of so much smaller diameter than the bore of the foot A as to leave an annular interstice, *a'*, and said chamber has openings *e''* and *e'''* for a purpose explained in the sequel. The floor of the chamber E has a raised margin, e^{iv}, around the opening *e'*, to form a seat for my inlet-valve. A hollow plug or bolt, F, screwed through the side of the foot into that of the chamber E, communicates with an orifice, *f*, in said chamber, to form a wasteway.

My inlet-valve consists of a cylindrical cup, G, having a central stem, H, whose upper end is screw-threaded interiorly to receive the correspondingly screw-threaded lower extremity of a rod, H', which extremity also carries a nut, L, that serves to securely lock the two members H and H'. Said nut has radial spurs or projections L, which, being of slightly less diameter than the bore of stock B, serve, on insertion of the valve after removal, to guide it into place without bruising the leathers against the upper edges of the chamber E. The upper end of rod H' is screwed fast into the screw-threaded stem H'', by which the inlet-valve is operated. One or more disks, I, of india-rubber, leather, or other suitable material, secured to the sole of inlet-valve G, insure the complete closure of the passage D when the valve is depressed. Apertures *g* in the sides of valve G permit the ascent of water therethrough when the valve is elevated. A pair of reversed cup-leathers, J J', secured upon the valve G by means of nut K and collar K', serve to close the wasteway *f* in the elevated condition of said valve. (See Fig. 3.)

A channel, *k*, in nut K enables the superincumbent water to spread the leather J' and to thereby insure its effective action.

The cap C of the stock is made crowning, as shown, to afford room for the play of the rod H' and its accessories, as follows: The parts B and C are flanged and bolted together, as at *b c*, and hold fast between them the margin of a rubber or leather disk or diaphragm, M, and above that of my crowning-shield N of cast-iron. Both diaphragm M

and shield N have central perforations for rod H′. A nut, O, and stirrup P, screwed to the upper end of rod H′, serve to nip between them the central portion of the diaphragm M, so as to compel said portion to rise and fall with said rod, and also to prevent any escape of water into the cap C.

The screw-stem H″ has a head, *h*, which, engaging under the hooks *p* of stirrup P, compels the rod H′ and its attached valve-stem H to rise and fall with said screw-stem, but without taking part in the rotation of the latter.

The thread *h′* of the screw-stem H″ occupies the interiorly screw-threaded portion *c′* of the cap C and terminates with a square or other non-circular projection, *h″*, that fits and occupies a corresponding cavity, *q*, in movable cap Q, whose counter-bore *q′* incloses the cylindrical termination C′ of the cap C, about which it slides and rotates in the act of opening and closing the valve G.

The movable cap Q has a square or other non-circular termination, Q′, to take a suitable wrench or spanner, wherewith the screw-stem is rotated, so as to open and close the valve G. The movable cap Q is fastened to the screw-stem H″ by means of a screw, R, or other means.

The stock B has near its top one, two, or more openings or ports, *b″ b‴*, into side chambers S S′ of as many discharge-nozzles T T′.

Each chamber S S′ has a rear prolongation, U or U′, to receive the operating-screws V V′ and stems *w w′* of discharge-valves W W′. Each valve-stem *w w′* being non-circular exteriorly, as shown, and fitting the corresponding non-circular interior of the prolongation U or U′, and being screw-threaded interiorly to receive the operating-screws, it follows that rotation of the operating-screw V or V′ operates to merely advance or retract the valve W or W′ without rotating the same.

Suitable collars, flanges, nuts, and washers X, while permitting the easy rotation of the screw-stems V V′, prevent any escape of water around said stems.

Washers Y of leather or other suitable material, secured between the nozzles T T′ and the chambers S S′, afford suitable seats for the valves W W′.

Each screw-stem has a square or other non-circular termination, *v*, which occupies a corresponding orifice in cap Z, secured to said stem by means of screw R′.

A square or other non-circular head, *z*, on cap Z, affords means of operating the screw-stem by means of a customary wrench or spanner. *t* represents customary nozzle-caps.

The operation of my improved plug is as follows: I will first suppose all the valves closed—that is to say, the main or inlet valve G, as in Fig. 4, and both discharge-valves, as at W′, Fig. 2. The wasteway *f* is now open, so as to discharge all water left in the plug. This is the permanent condition of the plug whenever not in use during freezing weather. If it be now desired to use the plug, the wrench is applied to the cap Q of the main valve-stem and turned to the right, so as to elevate the valve G. (See Fig. 3.) This having been done, water rushes up from the inlet D, as indicated by arrows in Fig. 3, both inside and outside of chamber E, the numerous passages providing a very free vent, as shown. The cap *t* being now removed from one of the nozzles, the hose is coupled in the usual manner, and the valve belonging to that particular nozzle is opened by a right-hand rotation of its screw-stem, as shown at W, Fig. 2. Meanwhile the other nozzle remains tightly closed until needed, so that there is no difficulty experienced in coupling another hose, even while the first is in full operation, and that without closing the inlet-valve for an instant.

In the operation of the plug the diaphragm M serves the purpose both of a gasket between the parts B and C, and prevents the escape of water into the cap C, and the contact of water with the operating-stem, more effectually than a piston would do it, and with far less friction, while the movable cap Q effectually guards the upper end of the said operating-screw from the deleterious influences of rain and dust from without, the depth of the cavity *q* being such as to allow full play to the valve-rod without exposing the said screw. Furthermore, the operating screw-stem H″, which is preferably of brass, is not brought directly in contact with the wrench, and the cast-iron cap Q may be cheaply renewed as often as may be necessary.

The caps Z afford similar protection to the operating-screws of the discharge-valves.

The shield N serves to sustain and support the diaphragm M against the upward stress of water in the open condition of the plug.

In the full open position of the main valve G the wasteway *f* is closed by the cup-leathers, and, inasmuch as the plug may be kept in this condition without inconvenience in all, except freezing, weather, the great waste of water (amounting to many gallons every time the plug is closed) may be thus saved, except when the severity of the weather is such as to make it necessary, in order to avoid the greater evil of ice in the water-way.

I have selected to illustrate my invention a plug provided with two independent discharge-nozzles, each of which has its own compression-valve; but I may use a greater number of discharge-nozzles on one plug in some cases.

A fire-plug having one or more of my improvements may be used in connection with a single discharge-nozzle, whose axis of issue may either be to one side, as here shown, or be in the plane of the main axis, the operating valve-rod being slotted to straddle the main valve-rod.

I claim as new and of my invention—

1. The compression independent valve-noz-

zle cut-off W, arranged and operating substantially as set forth.

2. In combination with the diaphragm M, the shield N, formed and adapted to operate as set forth.

3. The movable cap Q or Z, so arranged that, whether open or shut, the operating-screw and diaphragm are completely protected from the deleterious contact of moisture, grit, &c.

4. The provision, in a fire-plug, of two or more independently-operated compression nozzle-valves, W W′.

5. The guide-spurs L upon the inlet-valve rod or stem H, the same serving as both lock-nut and guide.

In testimony of which invention I hereunto set my hand.

JOHN A. STACY.

Attest:
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