

P. H. BAERMANN.
Hydrant.

No. 218,418.

Patented Aug. 12, 1879.

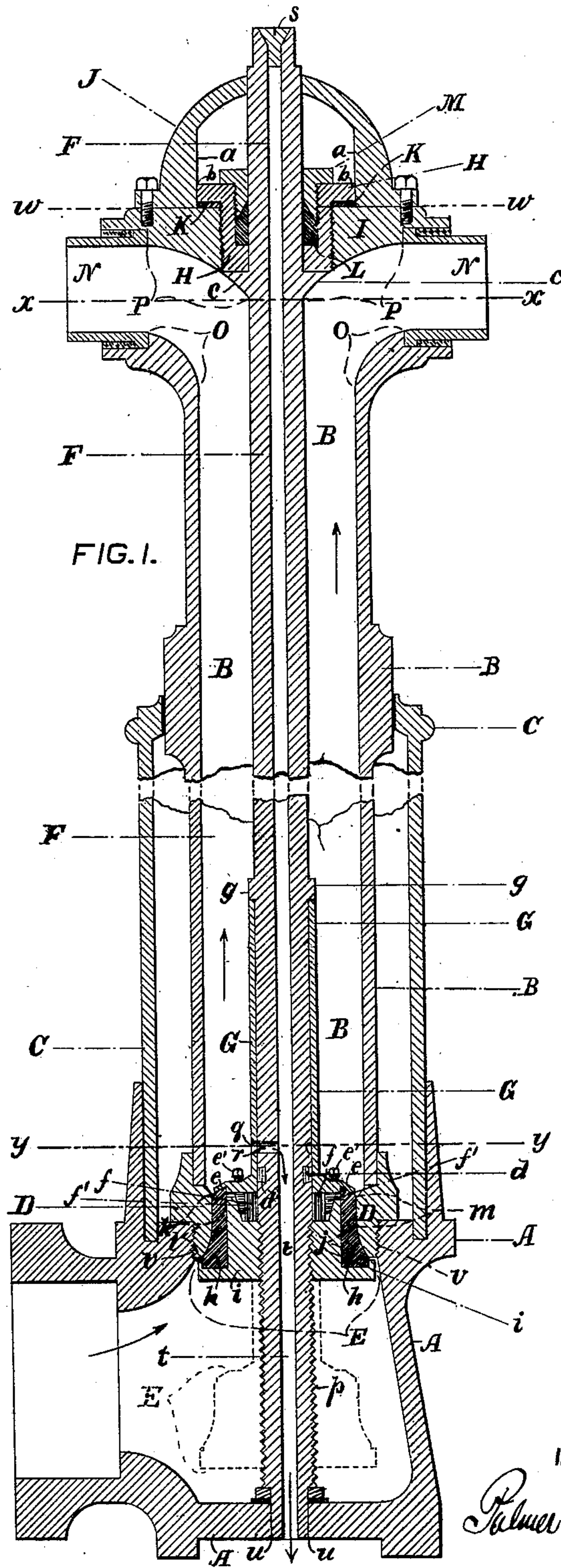


FIG. 1.

WITNESSES:

James H. Glady.
James T. Goodfellow.

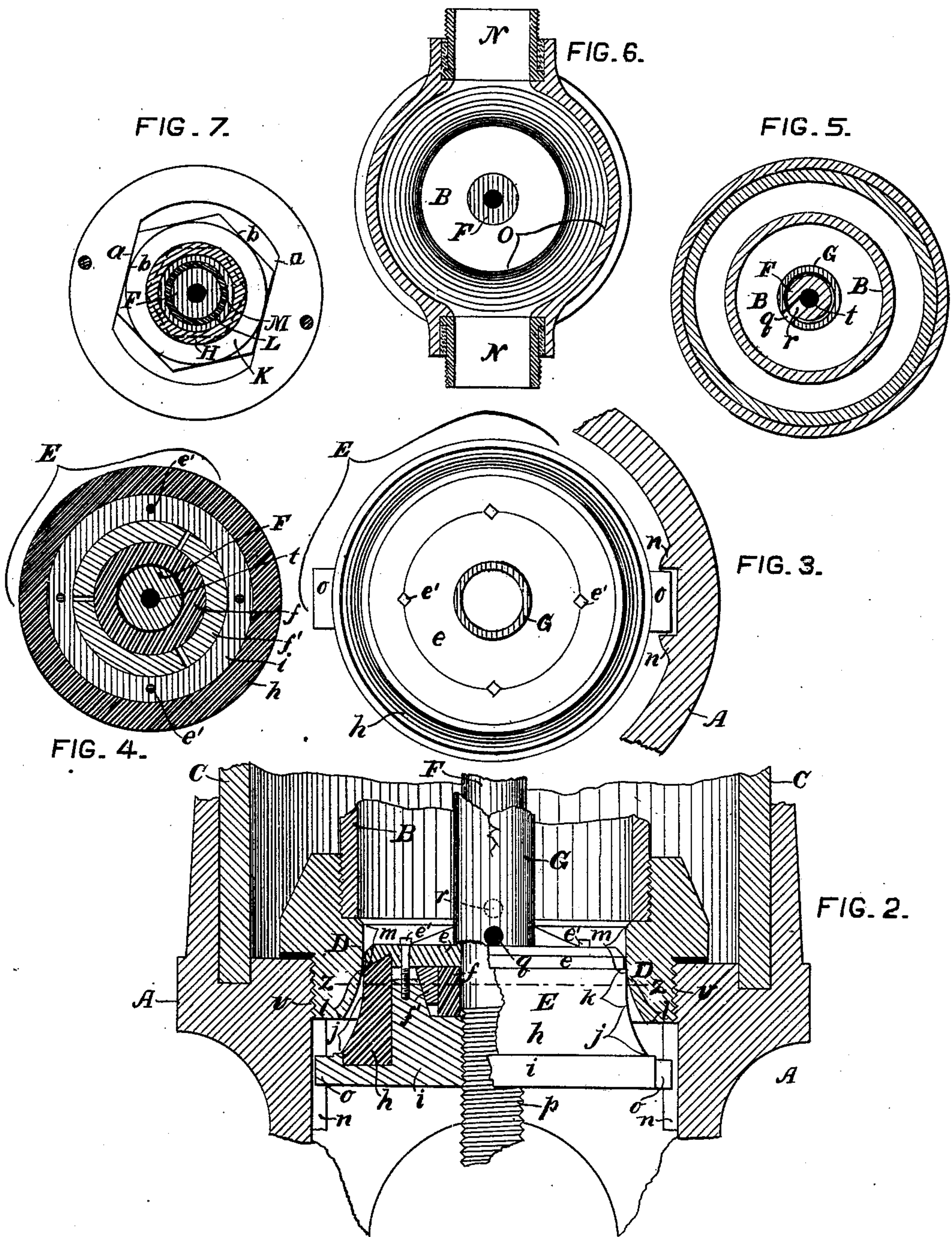
INVENTOR:

Palmer H. Baermann.

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WITNESSES

James H. Slade,
James T. Morfellow.

INVENTOR

Palmer H. Baermann

UNITED STATES PATENT OFFICE.

PALMER H. BAERMANN, OF WEST TROY, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO FRANK E. KERNOCHAN, OF PITTSFIELD, MASS.

IMPROVEMENT IN HYDRANTS.

Specification forming part of Letters Patent No. **218,418**, dated August 12, 1879; application filed July 7, 1879.

To all whom it may concern:

Be it known that I, PALMER H. BAERMANN, of the village of West Troy, in the county of Albany and State of New York, have invented certain new and useful Improvements in Hydrants, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain novel devices and combinations of parts hereinafter set forth, whereby steam, hot water, or a rod can be passed through the tubular valve-stem in the standing water-way from the top and out through the base of the hydrant, and by which the waste water is drawn from the stand-pipe through the same tubular valve-stem, and by which the main valve and waste-valve are connected with and operated by the valve-stem, and by which the valve-stem is closely held without endwise movement while being rotated to and fro in opening and closing the hydrant-valves.

In the aforesaid drawings, in which like parts are marked by like letters, Figure 1 is an elevation of a central vertical section of a hydrant which embodies this invention. Fig. 2 is a partial central vertical section of a portion of a similar hydrant on a larger scale. Fig. 3 is a plan, on the same enlarged scale, of the main valve and a horizontal section of the waste-valve and a part of the casing of the valve-chamber. Fig. 4 is a horizontal section, on the same enlarged scale, of the main valve and valve-stem at the line *z z* in Fig. 2. Fig. 5 is a horizontal section of the hydrant at the line *y y* in Fig. 1; Fig. 6, a like section and partial plan at the line *x x*, and Fig. 7 a horizontal section at and view from below of the parts above the line *w w*.

A is the elbow-like base portion, having therein the main valve-chamber, and B is the main standing discharge-passage or stand-pipe. C is a casing fitting at its top around the stand-pipe and at its bottom to the said base portion. D is the main valve-seat, of annular form, secured to the lower end part of the stand-pipe, and having a screw engaging with a screw, *v*, on the base portion, whereby the stand-pipe with the valve-seat can be together unscrewed from the base portion, drawn

out through the casing C, reinserted therein, and rescrewed fast to the base part while the latter remains in the ground, essentially as in some hydrants heretofore devised.

E is the main valve, and F is the rod or stem by which that valve is operated to open and close the water-way through the main valve-seat.

In order to provide simple means whereby steam, hot water, or a rod can be passed through the water-way and out through the base of the hydrant, to quickly thaw out and clear the same whenever obstructed by ice, whether the main valve shall be in any way closed or open, I make a perforation, *u*, in the hydrant-base and another opposite perforation in the hydrant-top, and make the valve-stem F hollow, with a passage, *t*, therethrough from end to end, and have the upper part of the hollow valve-stem extended through the perforation in the hydrant-top, and the open lower end of the valve-stem fit the said base perforation *u*, so that steam, hot water, or a rod can be introduced into the hollow valve-stem at its top and passed through the latter and out through the base of the hydrant to thaw out and clear the same.

In Fig. 1 the upper end of the tubular valve-stem is shown temporarily closed by a removable plug, *s*.

In order to provide means whereby the waste water, when the main valve is closed, shall be drawn off through the lower portion of the same tubular valve-stem through which steam can be passed from the top through the whole length and out through the base of the hydrant, I make in the said tubular valve-stem F a lateral waste-passage, *r*, which is opposite to the lower part of the stand-pipe B, and open to and in communication therewith, so as to let the waste water run out through the passages *r* and *t* in the valve-stem when the main valve is closed, said lateral passage *r* being closed and separated from the said stand-pipe by suitable means when the main valve is open.

G is a tubular waste-valve or sleeve having a transverse waste-passage, *q*, and fitted to slide endwise upon the hollow valve-stem F, and connected therewith by suitable means,

so as to open the waste-passage *r* in the valve-stem when the main valve is closed, and to close that waste-passage when the main valve is open.

In Figs. 1 and 2 the sleeve *G* is shown secured to the main valve *E*, and the valve-stem *F*, with a screw, *p*, engaging with a corresponding female screw or nut in the main valve, which latter has lugs *o o*, Figs. 2 and 3, that fit guides *n n* on the casing of the valve-chamber, so that by turning the valve-stem to and fro the main valve *E* and the waste-valve *G* will have up-and-down movement on the valve-stem without material rotary motion thereon in closing and opening the main and waste passages of the hydrant.

In order that the main valve *E*, when fully closed, shall accurately fit the valve-seat *D* throughout, and in being closed shall very gradually lessen the water-way and flow of water through that valve-seat, and thereby prevent injuriously straining or bursting the supply-pipe in arresting the momentum of the moving water therein, and in order that the waste-valve, when connected with the main valve, shall be closed before the main valve is opened, and shall not be opened until after the water is shut off by the main valve, and in order that the water-way through the main-valve seat, when the main valve is open, shall approach in form to the natural contraction of the vein of water passing through such opening, I make the upper part, *m*, of the valve-seat *D* in the shape of a hollow cylinder, and its lower portion, *l*, in convexly-flaring form, and combine therewith the main valve *E*, having the waste-valve connected thereto, and the upper portion, *k*, of its outer surface in cylindrical form, and the lower part, *j*, in concavely-flaring shape, and fitting throughout against the corresponding cylindrical and convex parts of the valve-seat *D* when the valve is fully closed against its seat, as represented in full lines in Fig. 1.

By inspecting Figs. 1 and 2 it will be seen that, while the opening and closing of the water-way through the valve-seat *D* by the valve *E* is very gradual, the water-way approaches the *vena contracta* in form, and that in thus opening and closing the water-way the valve *E* is moved a distance equal to the width of its cylindrical part *k*, while the water-way through the seat *D* is loosely closed, and that in opening that water-way the waste-passage *r* is closed by the valve *G* before the cylindrical part *k* of the valve leaves the cylindrical part *m* of the valve-seat, and that in closing that water-way the cylindrical part of the valve enters the cylindrical part of the seat, and thus loosely closes the water-way before the waste-passage *r* begins to be opened, as indicated in Fig. 2.

The main valve *E* is to be of any suitable materials; but I commonly prefer to make it with a metallic body portion, *i*, engaging with the screw *p* on the valve-stem, and a ring-like

outer part, *h*, of india-rubber, leather, or other suitable elastic packing adapted to fit the valve-seat.

In order to secure a tightly-packed joint between the rotary valve-rod *F* and the non-rotary valve *E*, while the latter is closed against the seat *D*, as shown in full lines in Fig. 1, I commonly prefer to form the valve-rod with a lateral projection or collar, *g*, and make the upper part of the main valve with a recess containing a suitable packing, *f f'*, fitting the recess and the valve-rod, and make the sleeve *G* with a base part, *e*, fitting upon the said packing, and a little above the valve-body *i*, and loosely secured to the latter by bolts *e'*, or other suitable means, so that when the main valve is open the packing *f f'* will not be pressed hard against the valve-rod, and that when that valve is being closed against its seat the part *G e* will be first stopped in its upward movement by the projection *g* on the valve-rod, and will then press the packing *f f'* in its recess, and consequently against the valve-rod, as the main valve continues its upward movement a little farther to bear tightly against its seat.

The packing *f f'* is to be of any suitable material and form; but I commonly prefer to have the part *f* in the shape of a short cylinder of leather or rubber packing, and the part *f'* in the form of segments of a tapering metallic ring fitting between the part *f* and the tapering casing of the recess in the valve-body.

I also commonly prefer to have the part *e* extend over and bear upon the upper edge of the outer elastic packing, *h*, of the main valve, so as to force that packing outward against the valve-seat *D* when the follower *G* is pressed against the projection *g* by the closing movement of the main valve.

Sometimes I prefer to have in and around the rotary valve-stem below its lateral waste-passage *r*, Fig. 1, an annular recess filled with a packing, *d*, fitting the inner surface of the non-rotary sleeve *G* to prevent leakage between the valve-rod and sleeve.

The lower part of the valve-stem *F* is shown in Fig. 1 with a shoulder fitting upon a washer, and with a journal extending through the washer and a packing below and into the socket-perforation *u* through the hydrant-base. The upper part of the valve-stem has a shoulder or collar, *c*, fitting against the under side of a perforated screw-plug, *H*, which is screwed into a threaded perforation through the hydrant-top *I*, and is thereby adjustable vertically, so as to insure the tight fitting of the lower end of the valve-stem against the perforated hydrant-base.

By preference the collar or shoulder *c* is smaller in diameter than the screw-plug *H*, so that upon removing the latter the valve-stem can be drawn out for repairs and replaced through the top *I* of the hydrant. The screw-plug *H* has its upper part, Fig. 7, with flat

sides *b*, adapted to fit a wrench; and, in order to prevent all liability of the valve-stem becoming loose or bound too tightly endwise by the unscrewing or screwing down of the plug *H* from adhesion to the valve-stem when the latter is turned to and fro in operating the valves, I make the interior of the removable cap *J* with a flat side or sides, *a*, Fig. 7, adapted to fit against one or more of the sides *b* of the upper part of the screw-plug, and thereby prevent the turning of the latter by the turning of the valve-stem.

K is a packing between the screw-plug *H* and hydrant-top *I*; and *L* is a packing furnished with a screw-follower, *M*, between the valve-stem and screw-plug.

The valve-stem is by preference extended through and above the cap *J*, and formed at its top to fit a hand-wrench, by which the valve-stem can be turned to and fro to operate the valves.

In order to facilitate the passage of water from the cylindrical stand-pipe *B* through two or more lateral nozzles, *N N*, all in one horizontal plane, I make the water-way between the said stand-pipe and nozzles with its lower surface, *O*, in complete annular convex form, and the upper surface, *P*, in corresponding annular concave shape, substantially as shown in the drawings.

A hydrant has been heretofore devised with a hollow valve-stem, through which steam could be passed from the top into the lower part of the standing discharge-passage, but not at the same time out through the base of the hydrant.

Other hydrants have been devised, some with a stationary and others with an endwise-movable tubular stem extending downward from the main valve at the lower part of the stand-pipe, and serving to conduct the waste water from the stand-pipe when the main valve was closed, but not being revolved to and fro to close and open the main and waste valves of the hydrant.

Other hydrants have been heretofore made, some with the main-valve seat in annular convex form, and others with the main-valve seat in the form of a short hollow cylinder, with a cylindrical main valve having an elastic outer packing and adapted to first enter and thereby loosely close the water-way through the main-valve seat, and afterward move farther and expand tightly against the valve-seat while a waste-valve was being automatically opened.

I do not claim any of those devices in hydrants.

What I claim as my invention is—

1. A hydrant having two opposite perforations through its top and base, and the hollow valve-stem extending lengthwise through the water-way of the hydrant and fitting the said opposite perforations, substantially as described, so as to permit steam, hot water, or a rod to be passed through the valve-stem

from the top and out through the base of the hydrant when the main valve is closed and when it is open.

2. A hydrant having two opposite perforations through its top and base, and the tubular valve-stem *F*, fitting the said opposite perforations, and having a lateral waste-passage, *r*, in communication with the lower part of the stand-pipe when the main valve is closed, substantially as described, so that waste-water will run from the stand-pipe through the lower portion of the same tubular valve-stem through which steam can be passed in at the top and out through the base of the hydrant.

3. In a hydrant, the combination of the valve-stem having its lower portion hollow and open at the bottom, and there fitting a perforation in the hydrant-base, and adapted to be rotated to and fro without endwise movement, and having the lateral waste-passage *r*, and the non-rotary sliding tubular waste-valve *G*, fitting upon the said valve-stem, and connected therewith by operating devices, substantially as described.

4. The combination, in a hydrant, of the valve-stem adapted to be rotated to and fro without endwise movement, and having the longitudinal waste-passage *t*, lateral waste-passage *r*, and screw *p*, the non-rotary main valve surrounding and engaging with the screw on the valve-stem, and the waste-valve *G*, surrounding the valve-stem and secured to the main valve, substantially as described.

5. In a hydrant, the combination, substantially as described, of the main valve-seat *D*, having the ring-like cylindrical part *m* and convexly-flaring portion *l*, the main valve *E*, having the cylindrical portion *k* and concavely-flaring part *j*, shaped to fit the valve-seat, the valve-operating stem, and the waste-valve adapted to operate in relation to the main valve, as set forth.

6. In a hydrant, the combination of the rotary non-sliding valve-rod having the screw *p* and lateral projection *g*, the non-rotary main valve engaging with the screw on the valve-rod, the packing *f f'* in the valve and around the valve-rod, and the follower *G e*, fitting upon the said packing, loosely secured to the main valve, and arranged, substantially as described, so as to press and loosen the packing between the valve-rod and main valve by the closing and opening movements of the latter, as set forth.

7. In a hydrant, the combination of the rotary non-sliding valve-rod having the screw *p* and lateral projection *g*, the non-rotary main valve having the body *i* engaged with the screw on the valve-rod and the elastic exterior packing *h*, and the non-rotary follower *G e*, fitting upon the said exterior packing, loosely secured to the main valve, and arranged, substantially as described, to expand and release the said outer packing in closing and opening said valve.

8. In a hydrant, the combination of the top

part I, having the screw-threaded perforation, the rotary non-sliding valve-rod having the collar *c*, the perforated screw-plug H, surrounding the valve-rod, inserted in the said perforation in the top part, and having an angular projecting part, *b*, and the perforated cap J, having the inner side or sides, *a*, fitting the angular part of the screw-plug, as described.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses this 9th day of June, 1879.

PALMER H. BAERMANN.

Witnesses:

JAMES H. SLADE,

JAMES T. GOODFELLOW.