(No Model.)

2 Sheets—Sheet 1.

E. L. ROWE.

HYDRANT.

No. 410,026. Patented Aug. 27, 1889.

Fig. 1.

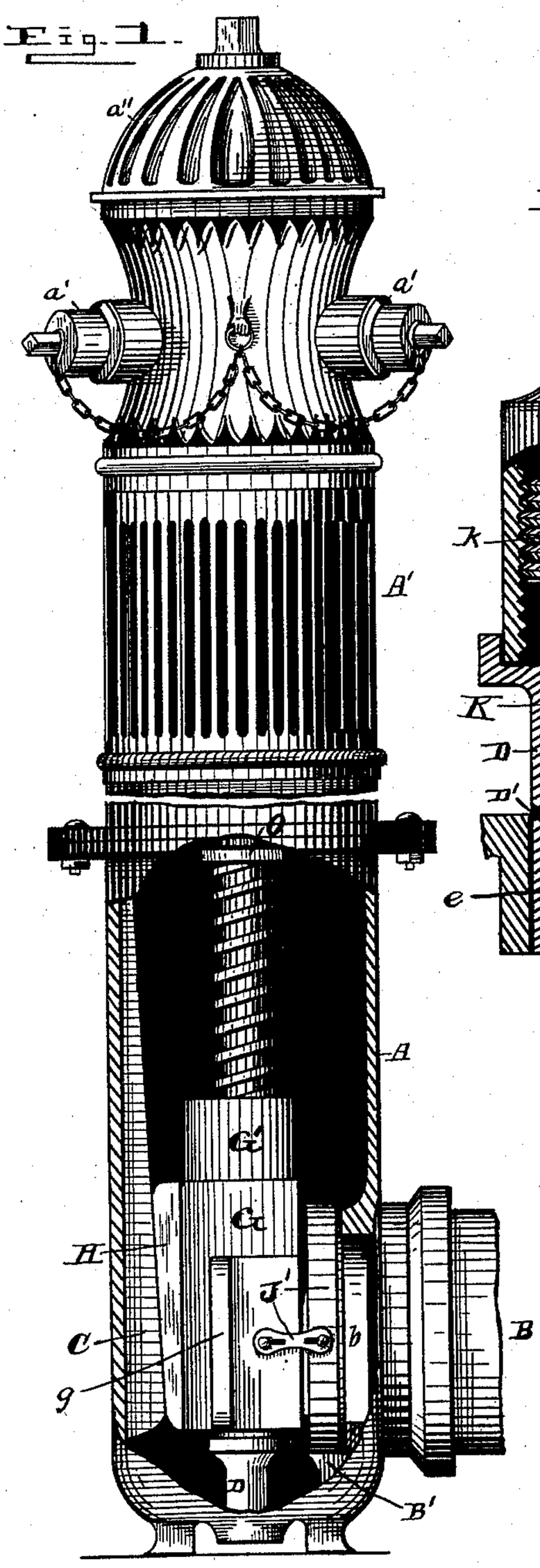


Fig. 4.

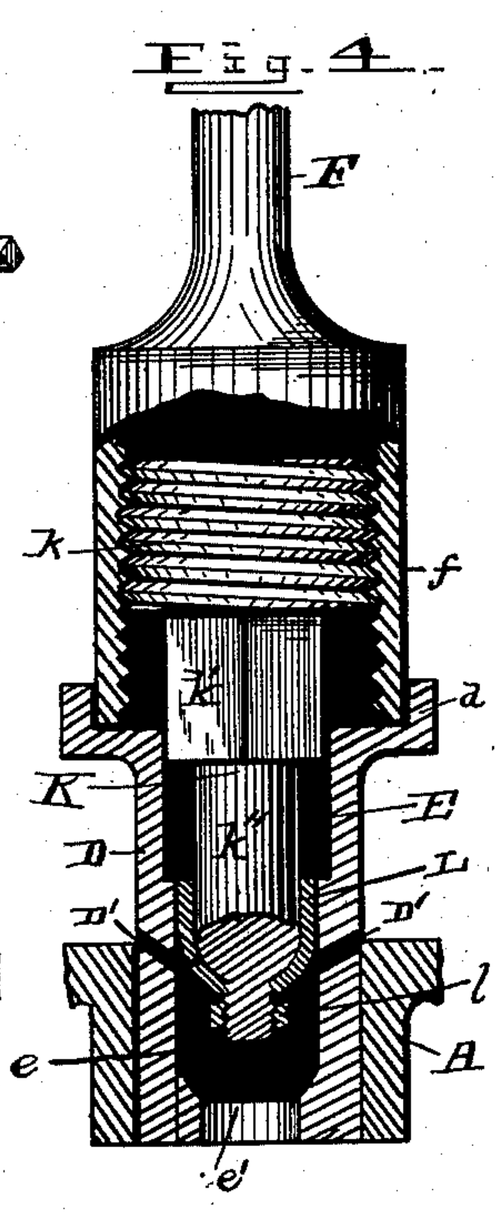
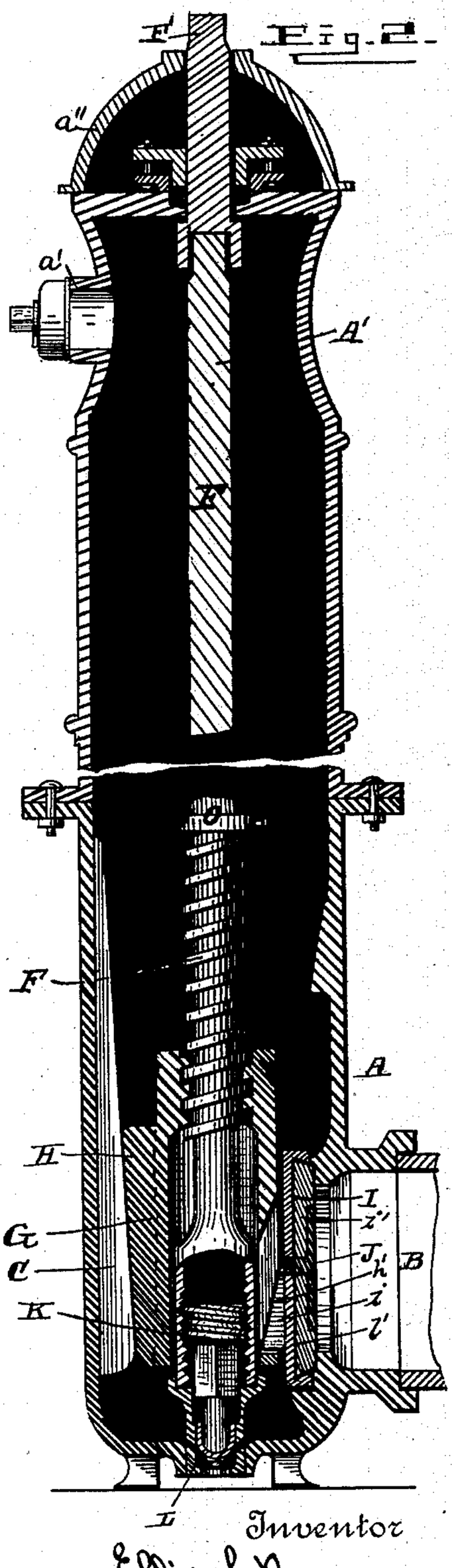


Fig. 2.



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Inventor
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By his Attorney W. Alexander

(No Model.) 2 Sheets—Sheet 2.

E. L. ROWE.

HYDRANT.

No. 410,026. Patented Aug. 27, 1889.

Fig. 3.

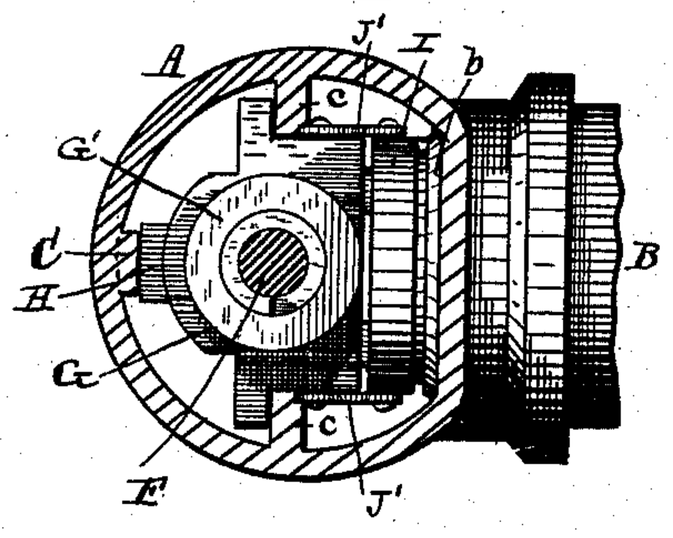


Fig. 5.

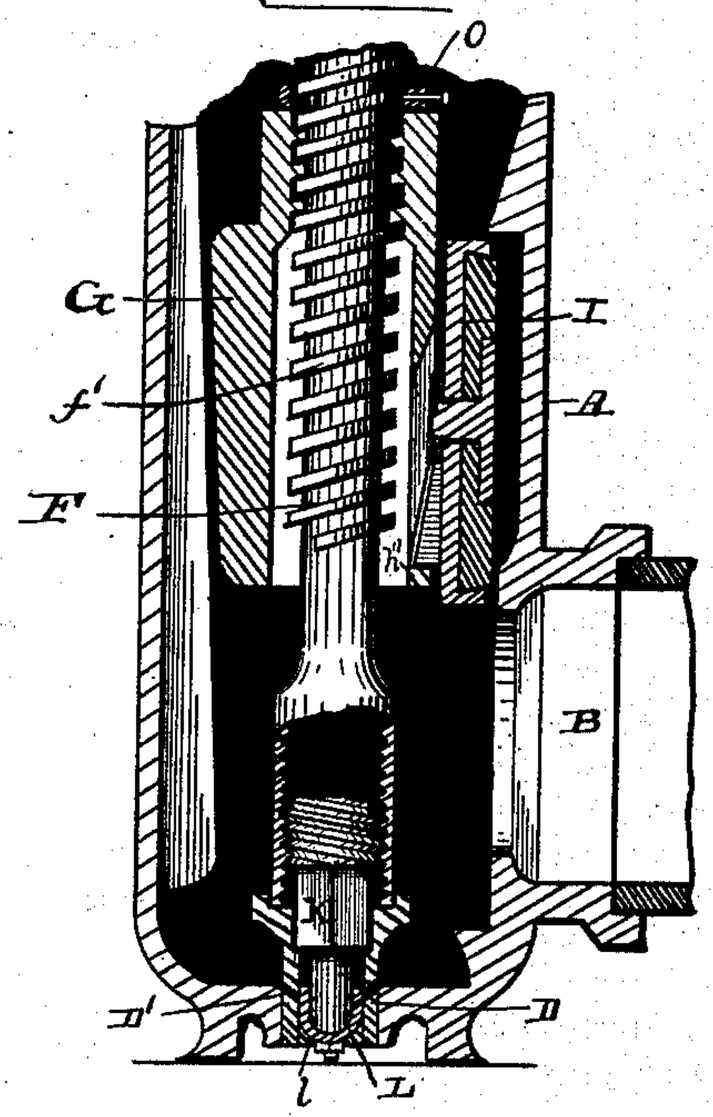


Fig. 6.

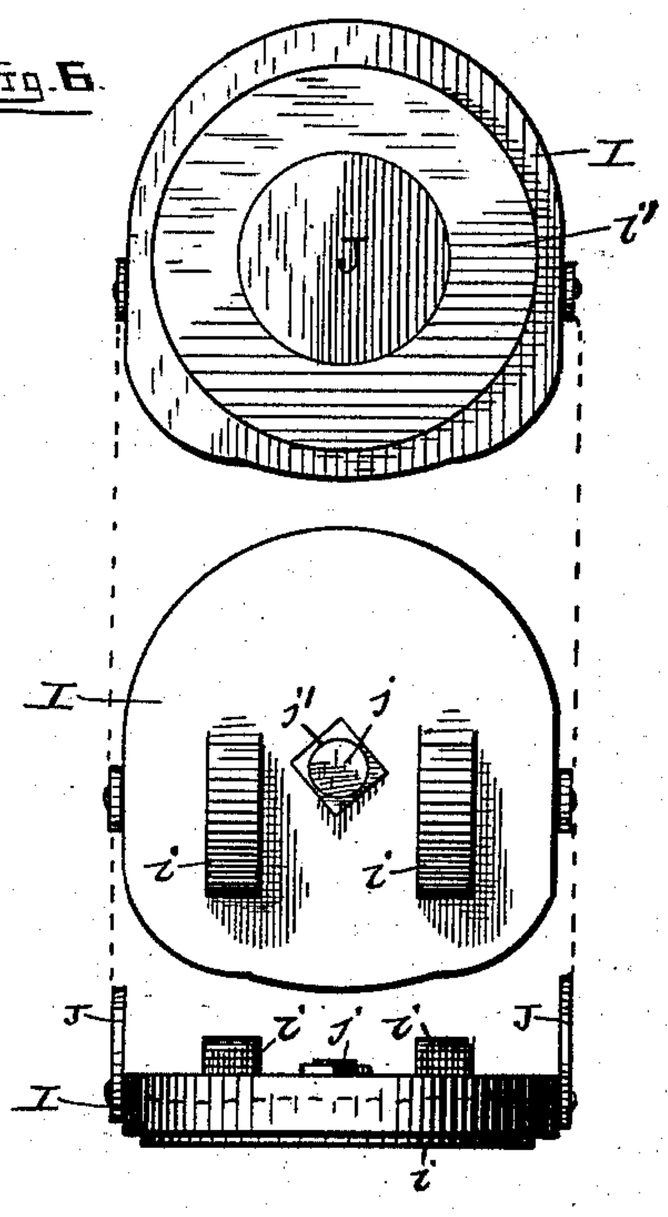
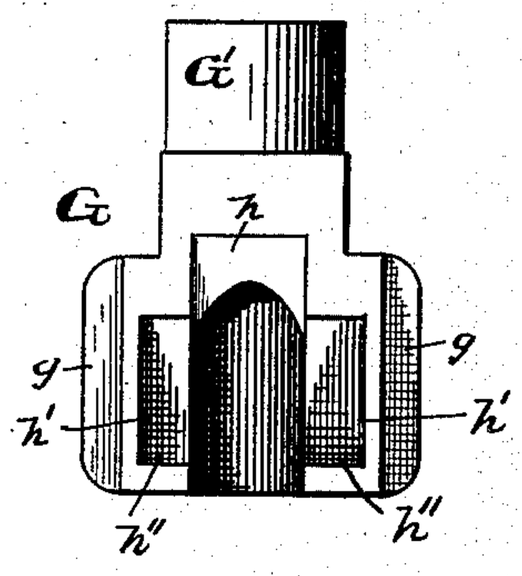


Fig. 7.



Witnesses
P. L. Brooks
A. E. Dowell

Inventor
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UNITED STATES PATENT OFFICE.

ELLIS L. ROWE, OF LANSINGBURG, NEW YORK, ASSIGNOR TO THE RENSSELAER MANUFACTURING COMPANY, OF SAME PLACE.

HYDRANT.

SPECIFICATION forming part of Letters Patent No. 410,026, dated August 27, 1889.

Application filed January 17, 1889. Serial No. 296,600. (No model.)

To all whom it may concern:

Be it known that I, ELLIS L. ROWE, of Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Hydrants; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a side elevation of my improved hydrant or fire-plug, partly broken away to show the internal parts. Fig. 2 is a central vertical section through the same. Fig. 3 is a transverse section on line *x x*, Fig. 1. Fig. 4 is an enlarged detail view of the drip-valve-operating parts. Fig. 5 is a detail vertical sectional view similar to Fig. 2, showing the main valve opened and the drip closed. Fig. 6 is a detail view of the gate-valve. Fig. 7 is a detail view of the casting carrying the gate.

This invention is an improvement in hydrants or fire-plugs, and relates especially to the kind known as "gate-valve hydrants;" and its object is to obviate the defects found in the leading gate-hydrants in present use—such as opening of the drip while the main valve is open, and choking of the drip by the sediment collecting in the hydrant-casing.

To this end the invention consists, essentially, in a novel construction of hydrant and the drip devices thereof, whereby the gate can be closed horizontally and truly against its seat without unequal wear or diagonal compression on its packing or facing. In other words, the gate will be first lowered to a position directly opposite the seat and then moved squarely against its seat, and not have any sliding movement up or down on said seat while being closed or opened.

Another important feature is that the drip-valve shall be opened simultaneously with the complete closing of the valve and cut off at the moment the valve begins to open, and to so construct and arrange the working parts of the drip-valve that they shall be protected from injury and not affected by variations of water-pressure in the hydrant-casing.

Another feature of the invention is to construct and connect the gate-valve and the drip devices with a main stem mounted in stationary bearings and having no longitudinal movement, and by which the gate and drip are operated simultaneously, and with which the working parts may be lifted entirely from or placed in the casing without disturbing the situation of the latter.

These several features are hereinafter clearly described and claimed.

Referring by letter to the drawings, A and A′ represent, respectively, the lower and upper portions of the casing of my improved hydrant. The upper portion A′ may be ornamented in any desired manner, and is provided with discharge-openings *a′* and closed by a cap *a″* in the usual manner. Portion A′ is flanged at bottom and bolted to a corresponding flange at the upper end of portion A. Portion A is provided with a drip-opening in its bottom and an entry-port B at one side near the lower end thereof, which port is properly dressed on its face within the casing to form a seat *b* for the valve.

B′ is a stop-lug projecting inwardly from the wall of the casing below seat *b*.

C designates a vertical inwardly-standing rib within portion A and diametrically opposite port B. This rib is preferably inclined from top to bottom, being widest at bottom and ending at a point about on a line with the bottom of said port. This rib, which is employed principally to transfer strain from the main stem to the casing, may be made straight, or, if the stem be made strong enough to withstand the pressure when the gate-valve is closed, might be omitted.

c c designate two inwardly-standing vertical guide-ribs within portion A on opposite sides thereof and between rib C and port B.

D represents a tube rising vertically and centrally in portion A at bottom thereof, and having a shallow-flanged mouth *d* at top, forming a seat for the lower end of the main stem. The upper portion E of the bore of tube D is rectangular, and its lower portion is cylindrical, as at *e*, while at bottom its walls converge slightly inward, forming a seat *e′* for a drip-valve. Just above the bottom of portion A tube D is perforated, as at D′ D′, to permit water to escape from the casing.

F is the main-valve stem rising centrally within the casing, its lower end being enlarged and formed into a tube *f*, which is threaded interiorly and rests upon shoulder *d* of tube D. The upper end of the stem is squared and engaged by the socketed end of a turning-key F′, properly mounted in the upper end of the casing and passing through cap *a″* thereof, so that it can be operated by a wrench in the ordinary manner to turn the stem. This stem has no longitudinal or vertical movement. The stem is threaded, as shown at *f′*, for engaging and operating a sleeve or casting G, which bears the gate-valve. This casting has a tubular portion G′ at top, threaded interiorly to engage the threads of stem F, and portion G′ has two opposite outstanding lateral flanges or wings *g g* and a rear outwardly-projecting rib H. The wings *g g* move opposite to guide-ribs *c c*, and rib H engages with and moves against rib C, as shown, the casting being thus properly centered and guided in its movements within portion A of the casing. The casting is hollowed interiorly to permit it to descend over the tube *f*, as indicated in the drawings. The face of the casting opposite port B is dressed plain, and in the lower portion of this face is formed a central channel *h*, which opens into the hollow interior of the casting, and on each side of channel *h* is a downwardly and inwardly inclined groove *h′*, forming shoulders *h″* at bottom.

I designates the valve or gate, consisting of a disk having a pair of inclined lugs *i i* projecting from its rear face at points corresponding to grooves *h′*. In the front face of this disk is a circular recess *l′*, having a beveled edge, and in this recess is seated a flexible packing-disk *i′* of any suitable material.

J is a metal plate having a central threaded stud *j* passed centrally through the valve and secured by a nut *j′*, the plate assisting in binding the packing to the valve, and also preventing cutting away of the same by gravel or sand carried by the water-currents. The gate is mounted on casting G by setting its lugs *i i* in grooves *h*, the lugs being supported on shoulders *h′*, and the gate is prevented from falling from the casting by means of slotted straps and pins J′, attached at their ends to the sides of the gate and casting, as shown, but permitting the gate a limited amount of vertical movement on the casting.

K designates the drip-valve stem playing in sleeve D, and having an enlarged and threaded upper end *k* engaging the threads of sleeve *f* and adapted to move within said sleeve. Below end *k* the stem is made angular for a short distance, as at *k′*, to engage the angular portion of the bore of tube D and prevent the stem turning therein, and below portion *k′* the stem is reduced cylindrically at *k″* and its extremity threaded, as shown.

L designates the drip-valve, which is cup-shaped and is secured mouth upward on the cylindrical end of stem *k* by means of a nut *l* or in other convenient manner. This valve is made, preferably, of flexible material—such as leather—and is of such external diameter that it will fit closely within the cylindrical part of the bore of tube D.

The operation of the parts is as follows: Stem K, carrying valve L, is engaged with sleeve *f* of stem F, and casting G is suspended on the stem also. Then, portion A of the casing being in proper position, stem F is lowered therein with the casting, gate, and stem K until its sleeve *f* is seated in the upper end of tube D, as shown, the casting and stem K being adjusted previously to the insertion so that valve L will pass and close openings D′, and the gate I will be suspended above the port B. Then stem F is rotated to lower casting G and gate I until the latter is stopped in its descent by lug B′, when it will be exactly opposite the port. Now, further lowering of the casting causes lugs *i i* of the gate to ride up in grooves *h′*, and as the opposed faces of the grooves and lugs are beveled the gate is forced away from the casting and against seat *b*, and by further depressing the casting by manipulating stem F the gate can be powerfully locked on its seat. The rib H of the casting engaging rib C of portion A transfers pressure from the gate and casting to the casing and relieves stem F of strain. The pressure exerted on the gate is applied directly and at right angles thereto, so that it is kept from rising in its seat and is properly seated before it is locked, so that dragging wear or rubbing on the flexible packing thereof is prevented. When the motion of the stem is reversed, casting G rises, disengaging lugs *i* and the grooves and loosening the gate; but the latter is not lifted until its lugs *i* are caught by shoulders *h″* and the pressure of water thereagainst will have forced it back from its seat, so there will be no rubbing or grinding on its face against the seat when it finally rises. The threads of part *k′* of stem K are opposite threads *f′* of stem F and are of less pitch than the latter, so that only about a sixth as much movement will be imparted to stem K as is given casting G, and the valve L is of such depth that perforations D′ will be closed except when the valve is at its highest position, as indicated in figures. At the moment when in closing gate I rests upon stop B, valve L, which has been rising during the lowering of the gate, begins to unclose openings D′, and the gate is locked as valve L rises sufficiently high to entirely free said openings, so that water in the casing can escape freely therefrom. The threaded end of stem K moves up and down within sleeve *f* as the latter revolves, and the squared portion *k′* of said stem is sufficient in length to allow the necessary movement of the stem, but prevent rotation thereof.

In opening the gate valve L begins to descend before the gate is entirely freed, and will close the openings D′ about the time that the gate is engaged and lifted by shoulders h'', and the valve-cup is deep enough to keep these openings closed during the remainder of its downward movement, and even when seated on e', as it is when the gate is fully opened, the sides of the valve prevent water entering the tube through these openings. A stop-collar O on stem F limits the upward movement of casting G. Thus it will be seen that the stem K is protected, as water is excluded from tube D above the valve, and any sand or gravel collecting in the bottom of the casing will not hinder the working of my drip-valve, as is the case with drip-valves operated by levers or wedges, as these are often rendered inoperative by gravel or sediment collecting in the casing. Should any sediment enter the tube below the valve, it can readily escape therefrom. By properly adjusting the parts it will be impossible for the drip-valve to be forced open by extreme water-pressure when the gate is opened, as is a common fault with well-known hydrants depending upon gravity of the internal parts to keep the drip closed, as the force of extreme water-pressure often overcomes the gravity and the drip is opened, saturating the ground to such an extent that the water remains in the casing and freezes or the hydrant is loosened and unearthed. By loosening the top of the casing the stem F can be withdrawn, and with it the casting G, gate-valve, stem K, and valve L, so that all the working parts are readily accessible for repairs.

Having thus described my invention, I claim—

1. In a hydrant, the combination of the casing having an internal upstanding tube in its bottom and drip-openings therein, and a main-valve stem supported and turning on said tube, but not vertically movable in the casing, and the main valve operated by said stem, with a non-rotatable valve-stem in said tube, having a threaded upper end engaging the threaded lower end of the main-valve stem and adapted to be raised simultaneously with the closing of the main valve by the rotation of the main stem and to be lowered simultaneously with the opening of the main valve by the opposite rotation of the main stem, and the drip-valve on said stem, playing in said tube and adapted to close the drip-openings, substantially in the manner and for the purpose specified.

2. The combination of the casing, the tube therein having drip-openings near its lower end, the inlet-port and valve-seat, and the main stem carrying the main valve having an internally-threaded lower end supported on said tube, but not vertically movable, with the drip-valve stem having a threaded upper end engaging the threaded lower end of the main stem, an angular portion engaging a corresponding angular bore of the tube to prevent rotation of the drip-valve stem, and the drip-valve on said stem adapted to close the drip-openings simultaneously with the unseating of the main valve and to open the same simultaneously with the closing of said main valve when the main stem is rotated, substantially as specified.

3. The combination of the casing provided with an inlet-port, an internal valve-seat for said port, and a valve-stop, with a threaded valve-stem mounted in said casing, but having no vertical or longitudinal movement, a casting mounted upon said stem and having inclined grooves on its front face, and a gate-valve suspended on said casting and having inclined lugs on its rear face engaging the inclined recesses of the casting, substantially as and for the purpose described.

4. The combination of the casing, the tube in the bottom thereof having the upper portion of its bore angular, and the drip-openings communicating with said tube, with the main-valve stem having an internally-threaded lower end resting on the upper end of said tube, a drip-valve stem having a threaded upper end engaging the threaded end of the main stem, an angular portion engaging the angular bore of the tube, and a lower depending portion in the cylindrical bore of the tube, and a drip-valve mounted on said lower portion and adapted to close the drip-openings, substantially in the manner and for the purpose specified.

5. The combination of the casing having an inlet-port and valve-seat, a vertical tube in its bottom and drip-openings communicating with said tube, and a main stem having a lower hollow interiorly-threaded end supported on said tube, and a casting supported on said stem carrying a gate-valve, with the valve-stem K, having a threaded portion engaging the lower end of the main stem, a rectangular portion engaging an angular part of the bore of the tube, and a cup-valve on the lower end of stem K within said tube, all substantially as described.

6. The combination of the casing having an inlet-port, valve-seat, valve-stop, and vertical guide-ribs, substantially as described, and a central vertical valve-stem mounted in stationary bearings in the casing and not vertically movable therein, with the casting G, mounted on said stem having a tubular portion g, side wings and rear rib engaging the guide-ribs of the casing, and inclined grooves h' and shoulders h'' in its front face, and the valve I, mounted on said casting and having inclined lugs i on its rear face engaging the grcoves and shoulders of the casting, all substantially as specified.

7. The combination of the casing, the inlet-port thereof and its valve-seat, the vertical tube in the bottom thereof, and drip-openings communicating therewith, with the main-valve stem F, supported on said tube having an internally-threaded sleeve on its lower end, a casting G, playing on said stem, the gate-

valve mounted on said casting, and the stem K, engaging the sleeve of stem F and operated thereby, mounted in the vertical tube and carrying a drip-valve, all constructed and arranged substantially in the manner and for the purpose specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ELLIS L. ROWE.

Witnesses:
T. H. ALEXANDER,
A. E. DOWELL.