No. 631,545. Patented Aug. 22, 1899.

C. E. LOETZER.

HYDRANT.

(Application filed Mar. 1, 1899.)

(No Model.)

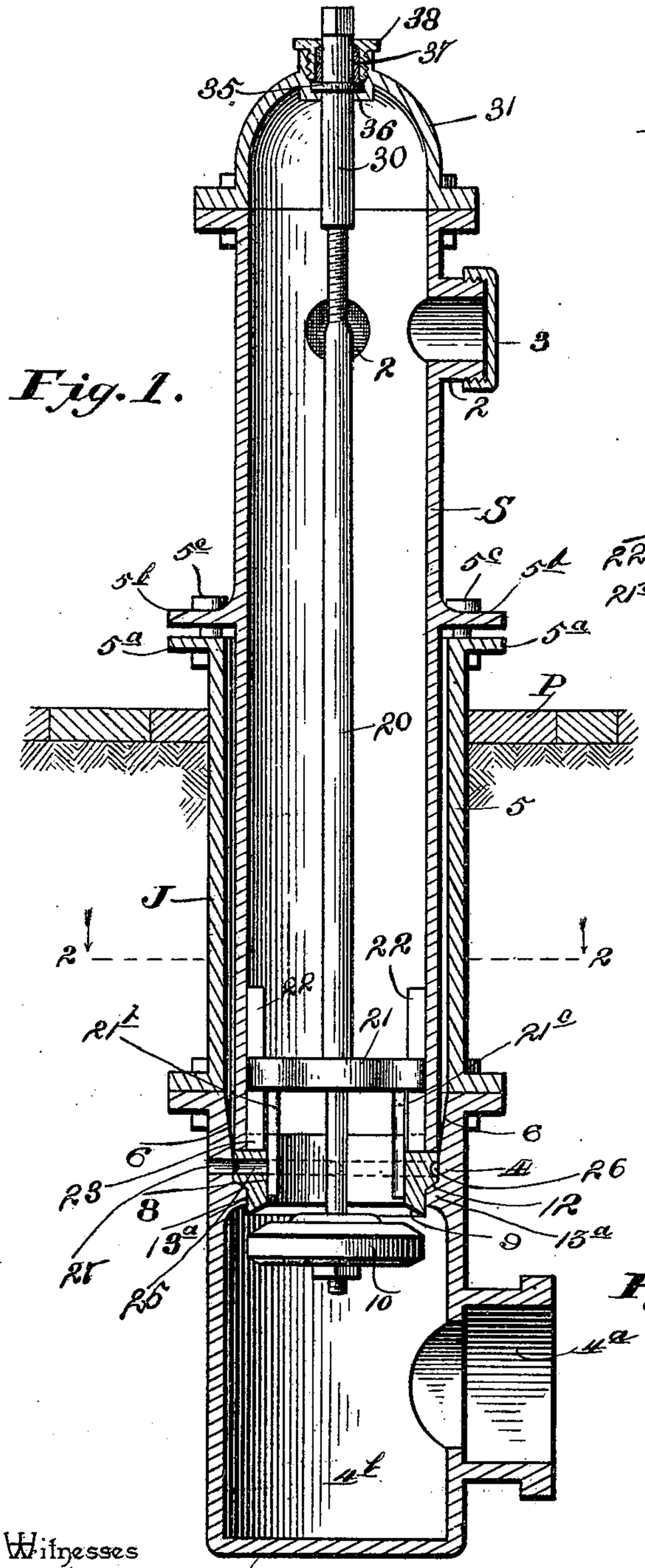


Fig. 1.

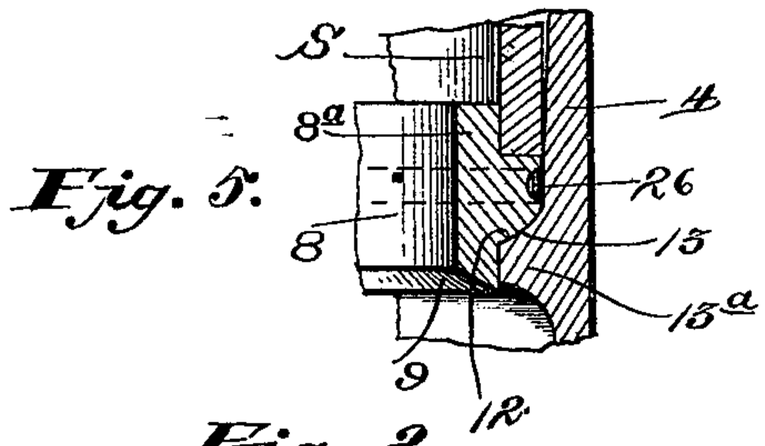


Fig. 2.

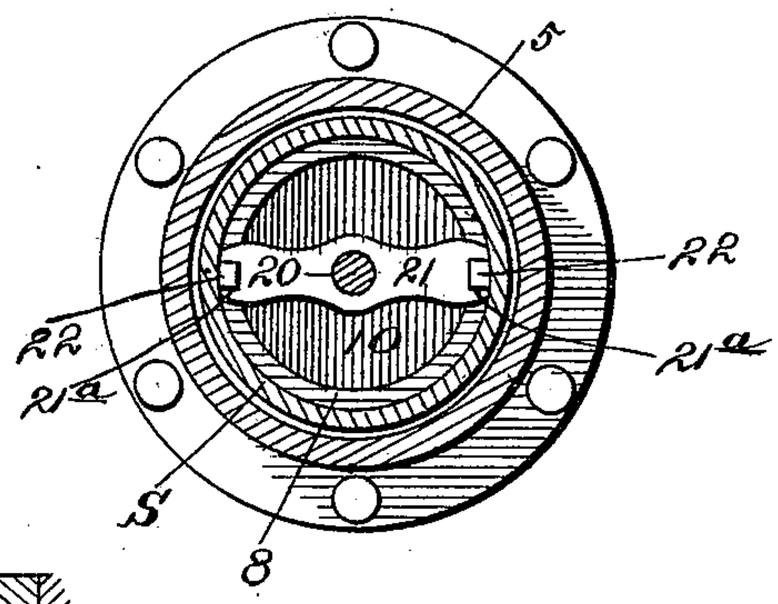


Fig. 3.

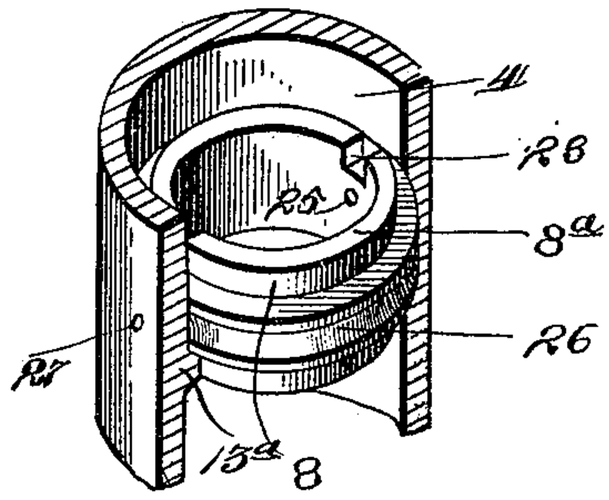
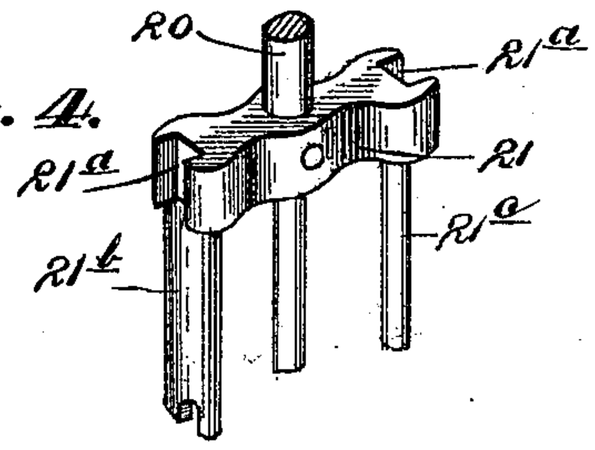


Fig. 4.



Witnesses
Clarence K. Walker.
Heath Sutherland

Christian E. Loetzer. Inventor.
By his Attorneys.
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

CHRISTIAN E. LOETZER, OF TOWANDA, PENNSYLVANIA.

HYDRANT.

SPECIFICATION forming part of Letters Patent No. 631,545, dated August 22, 1899.

Application filed March 1, 1899. Serial No. 707,286. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN E. LOETZER, a citizen of the United States, residing at Towanda, in the county of Bradford and State of Pennsylvania, have invented a new and useful Hydrant, of which the following is a specification.

My invention relates to improvements in hydrants, particularly fire-hydrants, employed in dispensing water from distributing-mains in which the water is maintained under pressure; and one object of the invention is to provide a simple, comparatively inexpensive, and efficient device wherein a removable member, such as a stand-pipe, may be displaced from a fixed member or casing without excavation, the valve mechanism (including the valve-seat) being carried by the removable member, and hence being displaced and exposed simultaneously with the displacement of the stand-pipe to facilitate repairing and cleaning the working parts of the structure. In the attainment of the above object I have devised means, permanently located above the plane of the surface of the ground or pavement, whereby the removable member of the hydrant is maintained in its operative position with relation to the stationary member, which forms the housing for the valve mechanism and by means of which connection is made with the distributing-main.

A further object of my invention is to provide centering devices whereby when the removable member of the hydrant is introduced into the stationary member the lower end of the former automatically drops into its proper relative position, and in this connection it is also my object to provide a seat or rest for the lower end of the removable member in which the latter may be rocked or secured in a slightly-inclined position without detracting from the efficiency of the joint formed between the removable and the stationary members, such joint being of necessity water-tight.

A further object of my invention is to provide means which are accessible without excavation and which are permanently exposed above the surface of the pavement, whereby the firm seating of the lower end of the removable member within the casing or stationary member is assured, the relation between the parts being such that any desired downward pressure of the removable member upon the supporting surface or shoulder may be obtained.

Furthermore, it is my object to provide such means for seating the removable member within the stationary member of the hydrant that accumulations of dust and other foreign material upon the rest or shoulder which supports the movable member is prevented, and I have found in practice that the same construction which enables me to obtain a firm seating of the lower end of the removable member, whether in a truly vertical or in a slightly-inclined position, insures the shedding from said rest or shoulder of any dust which may enter the stationary member of the hydrant when not occupied by the removable member.

A further object of my invention is to provide such a relation between removable and stationary members that while the latter occupies a fixed position controlled by the location of the distributing-main the former may be revolubly adjusted to arrange the outlet-nozzles in any desired radial positions to suit the circumstances under which the hydrant is or may be used.

The invention also has for its object to provide improved dripping or draining devices for insuring the disposal of all water remaining in the stand-pipe after the seating of the valve, whereby the existence of dead-water in the structure may be avoided to dispense with the inconvenience incident to freezing, and the particular object which I have in view in this connection is to provide a drip which is so located with relation to the plane of the valve as to leave the interior of the stand-pipe practically dry and also to provide such a construction of drip as to insure the draining of the interior of the stand-pipe even should one or more of the exposed or casing outlets become obstructed by foreign materials, such as dirt, pebbles, or roots.

A further object which I have in view in constructing my hydrant is to provide a stand-pipe having an unobstructed interior, and hence having no pocket or receptacle in which water may accumulate in a state of rest and freeze, and in the attainment of this object I have arranged the stuffing-box (through

which one member of the valve-operating devices extends to the exterior of the stand-pipe) at a point in the shell or wall of the cap or dome, whereby any water passing the stuffing-box by reason of the inefficiency of the packing reaches the exterior of the stand-pipe and is allowed an unobstructed escape, and is thus prevented from accumulating within the stand-pipe or in proximity to the valve-operating devices and thus interfering with the manipulation of such devices.

Further objects and advantages of this invention will appear in the following description and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a central vertical section of a hydrant constructed in accordance with my invention. Fig. 2 is a transverse section on the plane indicated by the line 2 2 of Fig. 1. Fig. 3 is a detail view in perspective of the valve-seating ring with an adjacent portion of the casing. Fig. 4 is a detail view in perspective of the drip-slide. Fig. 5 is a detail vertical section, enlarged, of one side of the valve-seating ring and the adjacent portion of the ring-supporting rest or shoulder to illustrate the rocking joint formed by said members.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

The hydrant embodying my invention comprises, essentially, a stationary or fixed member consisting of a casing or jacket J, and a removable member or stand-pipe S, which carries the valve mechanism. The casing or jacket preferably comprises separable lower and upper sections 4 and 5, suitably bolted or otherwise secured together at their abuting extremities, and by means of the lower or elbow section connection is made with the water-distributing main, (not shown,) as in the ordinary practice.

The removable member or stand-pipe has its lower portion housed within the stationary member formed by the casing or jacket, and the upper end of the latter, which is permanently located above the plane of the surface of the ground or pavement, (indicated at P,) is adapted for attachment to the stand-pipe, the means of attachment being such as to provide, first, for drawing the stand-pipe forcibly downward into the casing for a purpose hereinafter explained, and, second, for securing the stand-pipe at any desired revoluble adjustment with relation to the casing. The object of this revoluble adjustment of the stand-pipe with relation to the casing is to provide for arranging the outlet-nozzles 2, which communicate with the upper portion of the stand-pipe, in any desired positions with relation to the coupling 4^a, by which connection is made between the elbow-section of the casing and the distributing-main, whereby said nozzles may be arranged in any desired radial positions irrespective of the particular position of said main.

In the construction illustrated the upper casing-section 5 is provided at its upper end with a lateral flange 5^a, and the stand-pipe is provided at an intermediate point with a similar lateral flange 5^b, these flanges being provided with registering bolt-openings spaced at uniform intervals and adapted for the reception of adjusting and securing bolts 5^c. Obviously the tightening of these adjusting-bolts will serve to depress the lower portion of the stand-pipe within the casing, and owing to the equidistant spacing of the bolt-openings in the flanges 5^a and 5^b registration of the respective openings may be secured in a plurality of positions of the stand-pipe with relation to the casing. The nozzles 2, as illustrated in the drawings, are provided with the usual caps 3.

The lower or housed portion of the stand-pipe is of an exterior diameter which is somewhat less than the interior diameter of the inclosing portion of the casing to facilitate the introduction and removal of the stand-pipe; but the shoulder or rest 13, formed by the upper side of a rib 13^a, projecting inward from the wall of the casing and constituting the support for the stand-pipe, is of a diameter corresponding with the external diameter of the stand-pipe. In order, therefore, that the lower end of the stand-pipe may be accurately centered in the casing as it approaches said support, I have tapered the portion of the bore of the casing adjacent to and above said support to provide a centering-bevel which at its upper widest portion agrees in diameter with the upper portion of the bore of the casing and at its lower portion agrees in diameter with that of the rest or shoulder, as clearly indicated in Fig. 1. Preferably this centering-bevel and the inwardly-projecting rib 13^a are formed in the lower or elbow section of the casing, although I desire to be understood as not limiting myself to such an arrangement. The lower end of the stand-pipe, however, does not bear directly upon the support formed by the upper surface of the rib 13^a; but, on the other hand, a valve-seating ring 8 is interposed between the lower end of the stand-pipe and said support and is provided at an intermediate point with an annular shoulder 12, which bears directly upon said rest 13. The lower portion of the valve-seating ring projects through the space encircled by the rib 13^a, said lower portion being reduced for this purpose and preferably having a cylindrical exterior contour. This valve-seating ring is constructed separately from the stand-pipe and is provided at its lower reduced end with a valve-seat 9 for the reception of the valve 10, which closes upwardly, and hence when the valve is seated the valve-seating ring may be withdrawn from the casing with the stand-pipe, the diameter of the valve being sufficiently less than that of the

interior diameter of the rib 13^a to pass freely therethrough. The advantage derived from constructing the valve-seat separate from the stand-pipe is that the former may be replaced when necessary without incurring the expense of replacing any other portion of the apparatus, and by so arranging the parts that the valve-seating ring is interposed between the lower end of the stand-pipe and the rest or shoulder by which the stand-pipe is supported I am enabled to force the valve-seating ring downward, and thus firmly bind it in place by means of the bolts or other adjusting devices 5^c, which connect the stand-pipe with the upper casing-section. It will be seen that the flange 5^b is spaced slightly from the flange 5^a to provide for successive adjustments when necessary to compensate for any wearing or shrinkage of the parts.

Owing to the interval between the flanges 5^a and 5^b and the interval between the exterior surface of the lower portion of the stand-pipe and the interior surface of the casing-section 5, I have found that dust is liable to enter the upper portion of the casing, (this also being liable to occur when the stand-pipe is removed for repair or cleaning,) and hence in order to prevent such dust or foreign material from accumulating upon the rest or shoulder 13 I have arranged the latter to decline inwardly, or, in other words, have constructed a substantially trunco-conical rest, which forms a "shed" for dust. Hence as dust drops into the casing it is deflected and caused to find its way to the bottom of the lower or elbow section of the casing, said bottom being preferably depressed slightly to form a pocket or receptacle 4^b, where it is out of the way and hence is rendered harmless. Obviously the shoulder 12 of the valve-seating ring is constructed to correspond in taper with the rest or shoulder 13 in order to provide a snug and water-tight contact therewith. In addition, however, to this downwardly-tapered or substantially trunco-conical construction of rest 13 and shoulder 12 I have found it desirable in practice to slightly round the contacting surfaces of said rest and shoulder, the surface of the rest being slightly concaved spherically and the shoulder 12 being correspondingly convexed. This relation between the surfaces of the shoulder and rest forms what may be termed a "rocking joint," whereby in securing the stand-pipe in place within the casing any slight angular deflection of the stand-pipe from a truly vertical or axial position within the casing (due to tightening the bolts 5^c upon one side more than upon the other) does not affect the efficiency of the joint between the movable and stationary members of the hydrant. In other words, the movable member may be rocked or rolled slightly to one side or the other and still maintain a uniform and coextensive contact of the surfaces 12 and 13. I have illustrated this slight spherical rounding of the contacting surfaces in the detail view Fig. 5.

The stem 20 of the valve is provided at a point above the plane of the valve with a cross-head 21, provided with terminal guide-notches 21^a, which engage vertical keys 22, formed on the inner surface of the stand-pipe adjacent to its lower end, said keys forming means by which the valve is properly guided toward and from its seat 9. The valve-seating ring in addition to having a lower reduced portion which fits within the space encircled by the rest-rib 13^a is provided with an upper reduced portion or collar 8^a, which fits within the lower end of the stand-pipe, and as the guide-keys 22 extend to the lower end of the stand-pipe said reduced portion or collar 8^a is notched to form keyways 23 to engage the lower ends of said keys. This construction constitutes an interlocking connection between the stand-pipe and the valve-seating ring, whereby the latter may be turned with the stand-pipe, for instance, to still further insure the proper seating of the ring upon the rest, but more particularly to insure a fixed relation between the valve-seating ring and the drip-slide, which consists of the above-described cross-head 21 and tongues 21^b and 21^c, which depend from said cross-head and have their exterior surfaces cylindrically-convexed to snugly fit the inner surface of the valve-seating ring. One of these depending tongues (designated by the numeral 21^b) constitutes a cut-off slide designed when the valve 10 is unseated to close a radial drip-port 25, formed in the valve-seating ring. On the other hand, when the valve 10 is seated the upward movement of the drip-slide withdraws the cut-off slide from operative relation with the drip-port and allows water within the stand-pipe above the plane of the valve to escape. Formed in the exterior surface of the valve-seating ring is an annular drip-channel 21, communicating with the port 25, and formed in the wall of the casing-section 4 is a vent 27, arranged in a common plane for registration with said drip-channel, whereby water escaping from the interior of the stand-pipe finds an outlet through the vent and passes through the wall of the casing to the exterior thereof. Said drip-channel, which extends continuously around the valve-seating ring, thus forms a means of communication between the drip-port 25 and the vent 27 in all positions of the valve-seating ring; but a further advantage of this continuous annular channel resides in the fact that by its use I am enabled to provide the casing with a plurality of said vents 27, arranged at different points around the circumference of the casing, whereby should one or more of the vents become choked or obstructed by soil, pebbles, or the roots of trees the water will still find an exit by following the channel until it reaches an unobstructed vent. The object in employ-

ing a single drip-port and an interlocking connection between the stand-pipe, valve-seating ring, and drip-slide is to avoid the use of a plurality of cut-off slides and maintain the single cut-off slide in operative relation with the drip-port. A further advantage of this portion of the improved construction resides in the fact that while the drip-port is open when the valve 10 is seated but a slight unseating movement of the valve is necessary in order to advance the cut-off slide sufficiently to close said port, and thus prevent water under pressure from the main from being discharged through the drip-port, and hence undermining the hydrant. That water which remains in the stand-pipe after seating the valve 10 escapes comparatively slowly owing to the relatively small diameter of the vent, and hence the disadvantages incident to disturbing the surrounding soil and undermining the hydrant are not experienced.

The seating or unseating of the valve 10 is accomplished by means of valve-actuating devices consisting of the above-mentioned valve-stem 20 and a coöperating revoluble member 30, which in the construction illustrated consists of a stem-nut swiveled in the dome or cap 31 of the stand-pipe. This valve-operating member 30 projects terminally beyond the wall of the cap or dome, where it may be provided with a wrench or key-seat which is accessible to those desiring to operate the valve, and in order that escape of water around the member 30 may be prevented I extend the same through a stuffing-box having a check-nut 38 and a gland 37, said check-nut being counterbored to receive the gland and also a suitable packing-ring of any preferred material. The lower end of the check-nut bears upon a collar 35, with which the operating member 30 is provided, and said collar in turn is seated upon a shoulder or bearing-flange 36, which may be formed integral with the central portion of the cap or dome. Thus it will be seen that the bearing and stuffing-box which are provided for the operating member of the valve-actuating devices are arranged in the wall of the cap or dome, whereby in case the packing material should become dry, and thus in use allow the leakage of water through the stuffing-box and bearing, such water will pass to the outside of the hydrant, while any water remaining within the stand-pipe is effectually drained through the drip-port 25, as hereinbefore explained. Thus the interior of the stand-pipe is practically unobstructed, in that it is provided with no obstructions forming receptacles or pockets for the lodgment of water adjacent to the valve-actuating devices.

I have found in practice that when the construction of the hydrant is such as to locate the stuffing-box and stem-nut bearing within the stand-pipe any water which may leak through the stuffing-box is prevented from escaping, and thus is stored in the upper portion of the stand-pipe adjacent to the valve-operating devices. Hence in cold weather the water thus accumulated is liable to freeze and interfere materially with the operation of the valve, if it does not render the hydrant completely useless. When, however, as in in the above described construction, the bearing and stuffing-box are located in the wall of the cap or dome, such storage receptacles or pockets are avoided, and any moisture which passes through the stuffing-box reaches the exterior surface of the hydrant, and thus is allowed to flow off and leave the valve-operating devices free for efficient manipulation.

It will be understood that in practice various changes in the form, proportion, size, and minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. In a hydrant, the combination with a stationary terminally-exposed casing for connection with a distributing-main, and having an interior stand-pipe rest or support, a stand-pipe removably and rockingly fitted and housed at its lower end within the casing, adjustable securing devices for forcing the stand-pipe downward toward its rest or support, and a valve and operating devices carried by and removable with the stand-pipe, substantially as specified.

2. In a hydrant, the combination with a stationary terminally-exposed casing for connection with a distributing-main, and having an interior stand-pipe rest or support, a stand-pipe removably fitted and housed at its lower end within the casing, a valve-seating ring interposed between the lower end of the stand-pipe and the said rest or support and in rocking engagement with the latter, adjustable securing devices for forcing the stand-pipe downward toward its rest or support to clamp the seating-ring in place, and a valve and operating devices carried by and removable with the stand-pipe, substantially as specified.

3. In a hydrant, the combination of a stationary casing for connection with a distributing-main, and having an interior stand-pipe rest or support, a stand-pipe removably fitted and housed at its lower end within the casing, a valve-seating ring interposed between the lower end of the stand-pipe and said rest or support and in rocking engagement with the latter, adjustable securing devices for depressing the stand-pipe toward said rest or support, an upwardly-closing valve for coöperation with said seating-ring, and adapted to hold the latter in contact with the end of the stand-pipe when the former is displaced, and valve-operating devices carried by the stand-pipe, substantially as specified.

4. In a hydrant, the combination of a stationary casing for connection with a distributing-main and having an interior stand-pipe rest or support, a stand-pipe removably fitted

and housed at its lower end within the casing, a valve-seating ring interposed between the lower end of the stand-pipe and said rest or support and having rocking engagement with the latter, bolts for connecting adjacent flanges carried respectively by the casing and stand-pipe for depressing the latter toward said rest or support, and an upwardly-closing valve and operating devices mounted upon and carried by the stand-pipe, said valve being adapted to retain the valve-seating ring when the stand-pipe is displaced, substantially as specified.

5. In a hydrant, the combination of a casing for connection with a distributing-main, a stand-pipe provided with lateral nozzles and having its lower portion revolubly seated and housed within the casing, the latter being provided with a centering-bevel the casing and stand-pipe being provided with adjacent flanges having bolt-openings spaced at uniform intervals, bolts engaging said openings to secure the stand-pipe in an adjusted position with relation to the casing, and a valve and valve-operating devices mounted upon the stand-pipe, substantially as specified.

6. In a hydrant, the combination of a casing for connection with a distributing-main, a stand-pipe provided with lateral nozzles and having its lower portion removably and rockingly seated and housed within the casing the latter being provided with a centering-bevel, exposed means for securing the stand-pipe in its adjusted position, a valve-seating ring having an interlocking connection with the stand-pipe, a valve, and valve-operating devices mounted upon the stand-pipe, substantially as specified.

7. In a hydrant, the combination with a casing for connection with a distributing-main, a stand-pipe removably and loosely fitted within the casing, the latter being provided with a centering-bevel, a valve, and valve-operating devices mounted upon the stand-pipe, substantially as specified.

8. In a hydrant, the combination with a casing for connection with a distributing-main, and having an interior stand-pipe rest or support and an adjacent centering-bevel, a stand-pipe loosely fitted within the casing, and adapted for adjustment at its lower end by said centering-bevel, a valve, and valve-operating devices mounted upon the stand-pipe, substantially as specified.

9. In a hydrant, the combination with a casing for connection with a distributing-main, and having an interior stand-pipe rest or support provided with an inwardly and downwardly inclined upper surface, a stand-pipe removably fitted within the casing, a valve, and valve-operating devices mounted upon the stand-pipe, substantially as specified.

10. In a hydrant, the combination with a casing for connection with a distributing-main, and having an interior stand-pipe rest or support provided with an inwardly and downwardly inclined upper surface, a stand-pipe removably fitted within the casing, stand-pipe-centering devices arranged adjacent to said rest or support, a valve, and valve-operating devices mounted upon the stand-pipe, substantially as specified.

11. In a hydrant, the combination with a casing comprising upper and lower sections, of a stand-pipe fitted in said casing, the internal diameter of the upper section of the casing being greater than the external diameter of said stand-pipe, and the lower section of said casing having a tapered bore corresponding at its widest portion with the diameter of the upper section, and adapted for centering the lower end of the stand-pipe therein, substantially as specified.

12. In a hydrant, the combination with a casing for connection with a distributing-main, and having an interior stand-pipe rest provided with an inwardly and downwardly inclined upper surface, a stand-pipe removably fitted within the casing, a valve-seating ring having an interlocking connection with the lower end of the stand-pipe and provided with an exterior inwardly and downwardly inclined shoulder for contact with said rest, means for securing the stand-pipe in place, and a valve, and valve-operating devices carried by the stand-pipe, substantially as specified.

13. In a hydrant, the combination with a casing for connection with a distributing-main, and having an interior stand-pipe rest or support provided with a spherically-concaved supporting-surface, a stand-pipe removably fitted within the casing, a valve-seating ring interposed between the lower end of the stand-pipe and said rest or support, and provided with a spherically-convexed shoulder for contact with the supporting-surface of said rest, means for securing the stand-pipe in place in the casing, and a valve and valve-operating devices carried by the stand-pipe, substantially as specified.

14. In a hydrant, the combination of a stationary member for connection with a distributing-main, and having an interior rest or support, a valve-carrying removable member loosely fitted in said stationary member and having a rocking bearing upon said rest or support, to provide for angular deflection of said removable member without separation of the bearing-faces thereof, and means for securing said removable member in a fixed position with relation to the stationary member, substantially as specified.

15. In a hydrant, the combination of a casing for connection with a distributing-main, and having an interior stand-pipe rest and adjacent vents, a stand-pipe having its lower portion seated removably and rockingly within the casing, a valve-seating ring interposed between the lower end of the stand-pipe and said rest, and having a drip-port and a communicating exterior channel registering with said vents, and a valve and operating devices

carried by the stand-pipe, substantially as specified.

16. In a hydrant, the combination of a casing provided in its wall with vents, a stand-pipe revolubly fitted in the casing, a valve-seating ring having a drip-port and a communicating peripheral channel registering with said vents, means for communicating revoluble movement from the stand-pipe to the valve-seating ring, a valve, and operating devices carried by the stand-pipe, substantially as specified.

17. In a hydrant, the combination of a casing provided in its wall with vents, a stand-pipe revolubly fitted within the casing, a valve-seating ring having a drip-port and a communicating peripheral channel registering with said vents, an interlocking connection between the stand-pipe and the valve-seating ring, a valve, and operating devices carried by the stand-pipe, substantially as specified.

18. In a hydrant, the combination of a casing provided in its wall with vents, a stand-pipe removably fitted within the casing and provided near its lower end with vertical keys, a valve-seating ring provided with a reduced portion fitting within the lower end of the casing and provided with keyways for engagement with said keys, said valve-seating ring having a drip-port, a valve and operating devices carried by the stand-pipe, and a cross-head carried by the stem of said valve, guided by said keyways, and provided with a cut-off slide for closing the drip-port, substantially as specified.

19. In a hydrant, the combination of a casing having vents, a stand-pipe removably fitted within the casing, a valve-seating ring having an interlocking connection with the lower end of the stand-pipe and provided with a drip-port, a valve and operating devices carried by the stand-pipe, and a valve-actuated cross-head having an interlocking sliding connection with the stand-pipe, and provided with a cut-off slide for closing said drip-port, substantially as specified.

20. In a hydrant, the combination with a casing in two sections, of a stand-pipe fitted into said casing, and the internal diameter of the upper section of the casing being greater than the external diameter of the stand-pipe, and the lower section of said casing having a tapered bore, and also having a tapered seat below said tapered bore; a ring fitting against the stand-pipe, and provided with a downwardly-beveled annular shoulder fitting against said tapered seat; keys on the stand-pipe adapted to fit in keyways on said ring, and said ring having a port, and also having a peripheral channel in line with said port and located opposite vents in said casing; a valve; a stem connected with the valve; valve-operating means connected with said stem; and a cross-bar on said valve-stem having keyways for receiving the keys on said casing, substantially as specified.

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

CHRISTIAN E. LOETZER.

Witnesses:
JOHN H. SIGGERS,
E. G. SIGGERS.