T. H. BALLARD.

HYDRANT.

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1,044,336.

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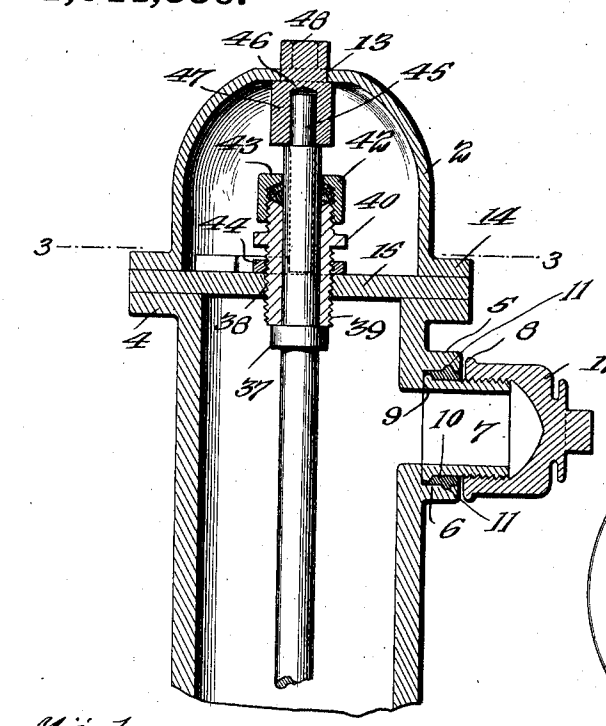


Fig. 1.

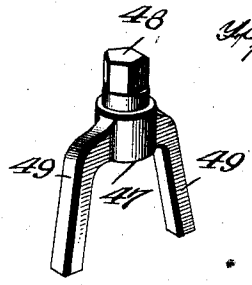


Fig. 4.

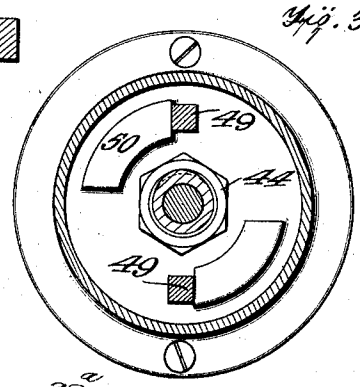


Fig. 3.

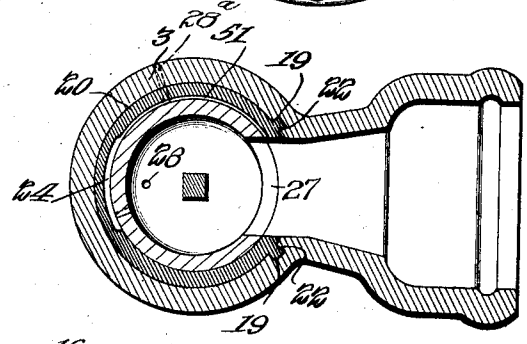
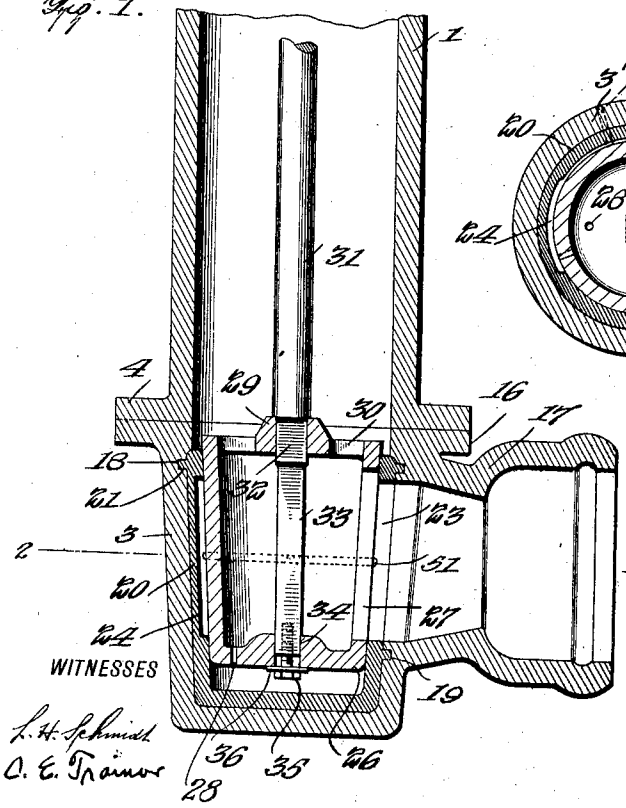


Fig. 2.



WITNESSES

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HYDRANT.

1,044,336. Specification of Letters Patent. Patented Nov. 12, 1912.

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To all whom it may concern:

Be it known that I, THOMAS HENRY BALLARD, a citizen of the United States, and a resident of Durango, in the county of La Plata and State of Colorado, have invented certain new and useful Improvements in Hydrants, of which the following is a specification.

My invention is an improvement in hydrants, and has for its object to produce a simple device of the character specified, having a rotatable valve at the inlet, and a removable seat coöperating with the valve and provided with means for equalizing the pressure on the valve, and having a peculiar character of port in the valve to insure a maximum flow of water with a minimum amount of rotation, together with means for limiting the rotation of the valve to a quarter turn, and means for pressing the valve into the seat to compensate for wear.

A further object is to provide a connection between the stem and the valve, that will permit the ports to be adjusted with respect to each other.

In the drawings: Figure 1 is a longitudinal vertical section of the improvement; Figs. 2 and 3 are sections on the lines 2—2 and 3—3, respectively of Fig. 1; and, Fig. 4 is a perspective view of the device for the valve stem.

The present embodiment of the invention comprises a casing composed of three sections 1, 2 and 3. The section 1 is the central section, a substantially cylindrical hollow casing, having each of its ends annularly flanged, as shown at 4. The section 1 is provided with the means for connecting the hydrant to a hose and preferably two such means are provided, but one being shown however in the drawing. Each of the said means comprises a laterally extending nipple 5, near the upper end of the section, and the said nipple is counter-bored at 6, to receive a thimble 7. The counterbore 6 is provided with an internal annular groove 8, intermediate its ends, and the thimble has an external annular rib 9, at its inner end.

A packing ring 10 of lead or the like is arranged between the thimble and counterbore, and has an annular rib 11, fitting into the groove 8, to hold the thimble in place. A cap 12 is threaded onto the outer end of the thimble.

The section 2 of the casing is a cap, having a central opening 13 at its top, and an annular lateral flange 14 at its lower end. A diaphragm 15 is seated between the cap and the section 1, the edge of the diaphragm being received between the flanges 4 and 14.

The section 3 is also a cap, having its lower end closed, and its upper end laterally flanged at 16. The flange 16 fits against the lower flange 4 of the section 1, and the said section 3 is provided with a lateral nipple 17, for connection to the main. The cap is provided with an internal annular groove 18 near its upper end, and with radial openings 19 on each side of the nipple 17, near its lower side. A valve casing 20 is seated in the cap, the said casing having its lower end closed, and fitting against the closed lower end of the section 3.

The casing has an external annular rib 21, fitting the groove 18, and has pins or lugs 22, fitting the openings 19. The casing has also a lateral opening 23, registering with the opening of the nipple 17, and is recessed on its inner face, intermediate its ends, and on the opposite side from the port, as indicated at 24. A valve 25 seats in the casing.

The valve casing 20, and the valve 25, are frusto-conical in shape, having their large ends upward, and the valve has its lower end 26 closed, and its upper end open. The valve is provided with a lateral port 27 adapted to register with the nipple 17 and has a vent opening 28 in its end wall. A central bearing 29 is provided at the upper end of the valve, supported by arms 30, connecting the bearing to the valve, and a stem or rod 31, is connected to the valve for operating the same. The bearing 29 has a polygonal opening, and the lower end of the stem 31 is reduced and polygonal in cross section, as shown at 32 to fit the opening. The said reduced portion is further reduced at 33 and extends into a polygonal opening 34 in the closed lower end of the valve. A cap screw 35 is threaded into the lower end of the rod, and bears against a washer 36, over the lower end of opening 34. The stem extends through the diaphragm 15, and just below the diaphragm it is provided with an annular rib or collar 37. The diaphragm has a central threaded opening 38, and an externally threaded bushing 39 fits over the stem and engages the opening 38, the lower end of the bushing bearing against the rib or collar. The bushing has an annular rib 40 above the diaphragm, and a packing nut 42 encircles the

stem, above the bushing and is threaded onto the said bushing. A packing 43 is arranged between the nut and the bushing and a nut 44 is threaded onto the bushing, just above the diaphragm. The upper end of the stem is reduced and of poylgonal shape, as shown at 45, and is secured in a polygonal recess or bore 46 in the end of a plug 47, having its upper end 48 reduced to fit the opening 13 of section 2. The nut 44 is polygonal, as is also the portion 48 of the plug for engagement by a wrench, and the said plug has outwardly and downwardly extending oppositely arranged arms 49, whose lower ends seat on the upper face of the diaphragm. Each arm bears against the end of an arc-shaped rib 50 on the upper face of the diaphragm.

The rib 40 of the bushing is polygonal, and may be engaged by a wrench to adjust the bushing vertically, and the nut 44 is a lock nut to hold the bushing in adjusted position, and the valve may be adjusted in the casing by means of the bushing, since it bears against the rib 37. The valve may thus be made perfectly water tight. There is considerable movement permitted to the bushing, that is, it is of considerable length, to provide for wear on the valve, and the valve is spaced above the bottom of the casing, so that as it becomes worn, it may be tightened by moving it downward. The recess 24 is an equalizing chamber, and communicates with the port 23 of the casing, by means of a groove 51 in the inner face of the casing.

The provision of the recess 24 and groove 51 equalizes the pressure on the valve. The arms 49 by their engagement with the ribs or stops 50, limit the rotation of the stem and the valve to a quarter turn, that is, they permit the stem to be rotated just far enough to open or close the valve. It will be noticed that the ribs or stops 50 are of such length, that when the arms 49 are moved from in engagement with the ends of the ribs to a position in engagement with the other end, the said arms have moved over a distance of 90 degrees.

The valve is rotated, by means of a wrench, engaging the polygonal portion 48 of the plug. The casing 20 is removable when worn or broken, and is a seat for the valve. The port 27 of the valve is rectangular in form, instead of circular as is usually the case, and is approximately equal in area to that of port 23 of the seat. This arrangement permits the passage of a maximum amount of water, with the least possible amount of rotation of the valve, to bring the ports in register with each other.

It will be noticed that the hydrant is provided with an opening 28ª extending through the cap 3 and the lining 20 and in such position that when the valve is closed, the port 27 thereof will just register with the said opening 28ª to permit the hydrant to drain. As soon as the valve 27 is turned to open the valve, the opening 28ª is cut off and closed.

I claim:

1. A hydrant comprising a casing having a lateral inlet at its lower end, and an outlet near its upper end, a cap for closing the outlet, a diaphragm in the casing above the outlet and having a central threaded opening, a valve casing in the casing at the lower end thereof, said valve casing having a lateral port registering with the inlet, a valve rotatable in the casing and having a lateral port for registering with the port of the valve casing, a stem connected to the valve and passing through the opening of the diaphragm, an externally threaded bushing threaded into the said opening and encircling the stem, said stem having a stop for engagement by the lower end of the bushing, a lock nut on the bushing above the diaphragm, a plug rotatable in the upper end of the casing and having means for engagement by a wrench outside of the casing, and a longitudinal polygonal recess in its lower end, the stem having a lug for engaging the recess, said plug having depending oppositely arranged arms and stops on the diaphragm for engagement by the arms to limit the rotation of the stem.

2. A hydrant comprising a casing having a lateral inlet at its lower end, and an outlet near its upper end, a cap for closing the outlet, a diaphragm in the casing above the outlet and having a central threaded opening, a valve casing in the casing at the lower end thereof, said valve casing having a lateral port registering with the inlet, a valve rotatable in the casing and having a lateral port for registering with the port of the valve casing, a stem connected to the valve and passing through the opening of the diaphragm, an externally threaded bushing threaded into the said opening and encircling the stem, said stem having a stop for engagement by the lower end of the bushing, a lock nut on the bushing above the diaphragm, a plug rotatable in the upper end of the casing and having means for engagement by a wrench outside of the casing, and having a detachable engagement with the stem at its lower end, said plug having oppositely arranged depending arms, and the diaphragm having stops for engagement by the arms to limit the rotation of the valve.

3. A hydrant comprising a casing having a lateral inlet at its lower end, and an outlet near its upper end, a cap for closing the outlet, a diaphragm in the casing above the outlet and having a central threaded opening, a valve casing in the casing at the lower end thereof, said valve casing having a lateral port registering with the inlet, a valve

rotatable in the casing and having a lateral port for registering with the port of the valve casing, a stem connected to the valve and passing through the opening of the diaphragm, an externally threaded bushing threaded into the said opening and encircling the stem, said stem having a stop for engagement by the lower end of the bushing, a lock nut on the bushing above the diaphragm, means engaging the stem for rotating the same, said means extending through the top of the casing, and having depending arms in the casing, the diaphragm having stops for engagement by the arms to limit the rotation of the valve.

4. A hydrant comprising a casing having a lateral inlet at its lower end, and an outlet near its upper end, a cap for closing the outlet, a diaphragm in the casing above the outlet and having a central threaded opening, a valve casing in the casing at the lower end thereof, said valve casing having a lateral port registering with the inlet, a valve rotatable in the casing and having a lateral port for registering with the port of the valve casing, a stem connected to the valve and passing through the opening of the diaphragm, an externally threaded bushing threaded into the said opening and encircling the stem, said stem having a stop for engagement by the lower end of the bushing, a lock nut on the bushing above the diaphragm, means for rotating the stem, the diaphragm having oppositely arranged stops, and means on the said rotating means for engaging the stops to limit the rotation of the stem.

5. In a hydrant comprising a casing having an inlet and an outlet and a valve controlling the inlet, a diaphragm in the casing, a stem for operating the valve passing through the diaphragm, and means engaging the stem for rotating the valve, said means having oppositely arranged arms extending toward the diaphragm and the diaphragm having stops for engagement by the arms to limit the rotation of the stem to a quarter turn.

6. In a hydrant comprising a casing having an inlet and an outlet and a valve for controlling the inlet, a seat in the casing for the valve, a diaphragm extending transversely of the casing and having a central opening, a stem connected to the valve and extending through the opening of the diaphragm, a bushing encircling the stem and threaded through the opening of the diaphragm, the stem having a stop for engagement by the bushing to permit the valve to be moved toward its seat by the turning of the bushing.

THOMAS HENRY BALLARD.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."