J. D. MARTIN.

HYDRANT.

APPLICATION FILED JAN. 26, 1909.

934,082.

Patented Sept. 14, 1909.

Fig. 1.

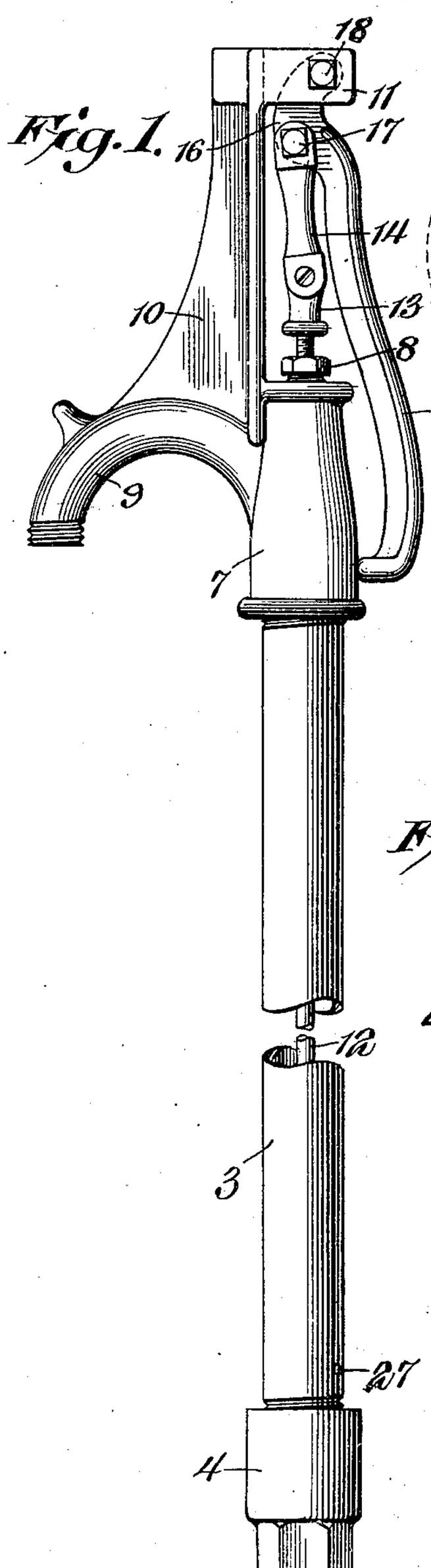


Fig. 4.

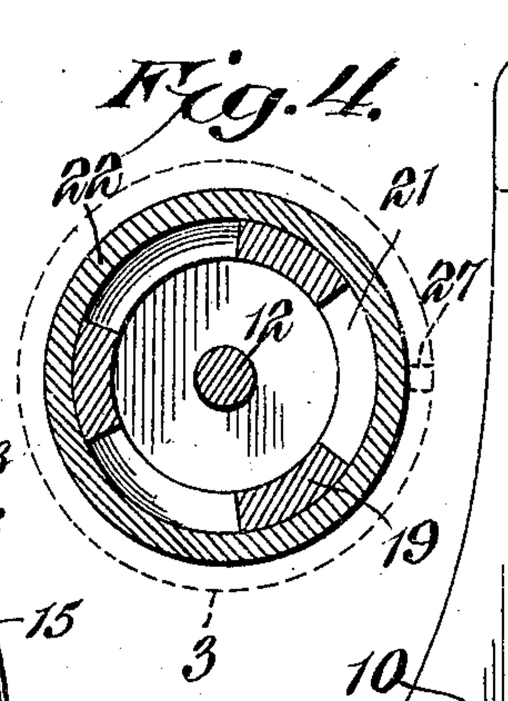


Fig. 2.

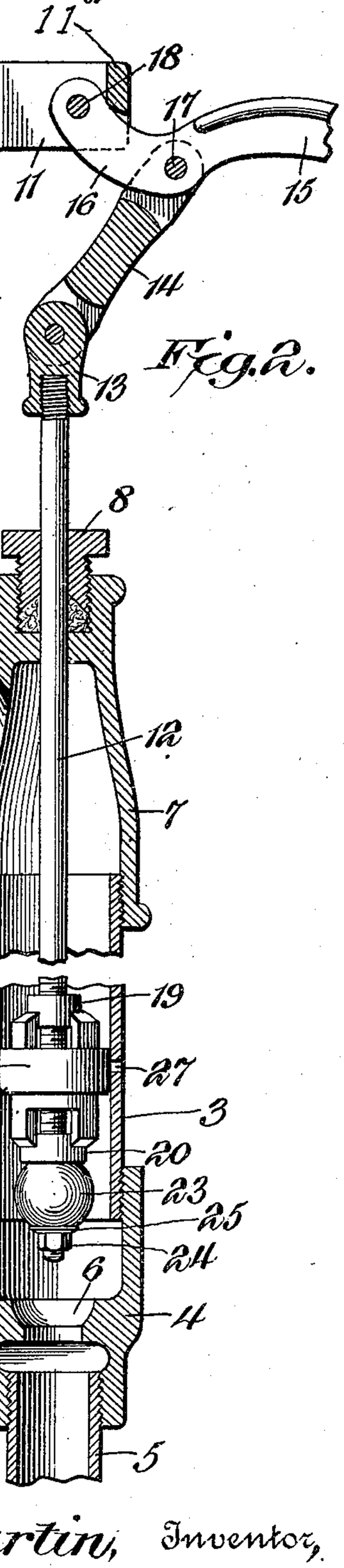
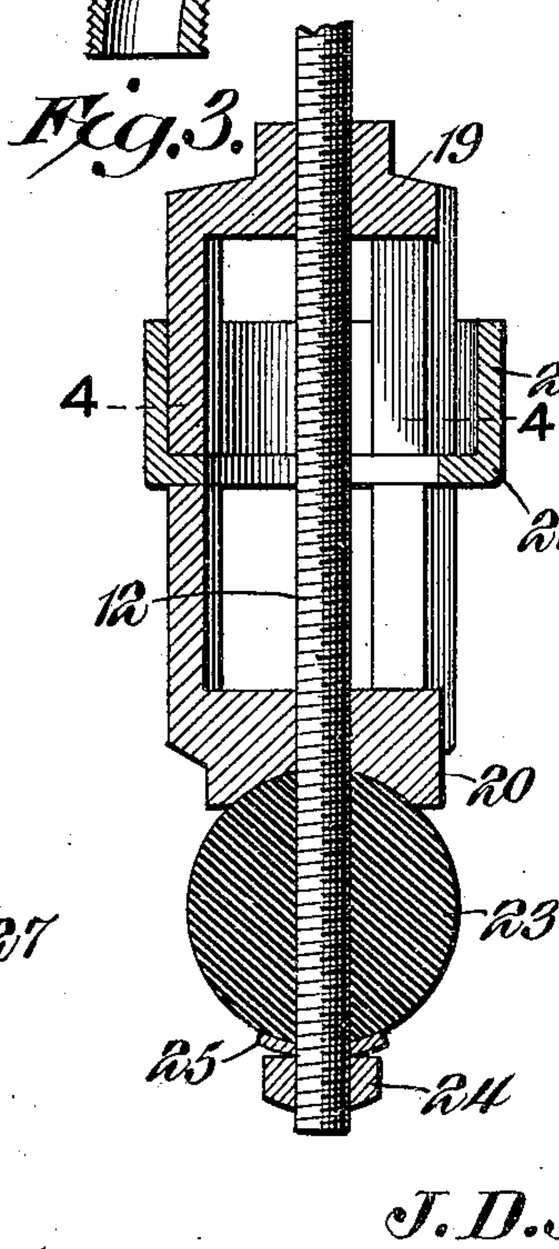


Fig. 3.



Witnesses

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HYDRANT.

934,082. Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed January 26, 1909. Serial No. 474,238.

To all whom it may concern:

Be it known that I, JAMES D. MARTIN, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Hydrant, of which the following is a specification.

My invention relates to hydrants or analogous structures, and particularly to a structure of this character having a stand-pipe, an internal valve and means whereby the valve may be raised from its seat to permit the flow of water through the hydrant or closed to stop said flow.

The object of my invention is to provide a hydrant wherein a single stand-pipe may be used, covered at its upper end by a cap readily detached from the stand-pipe and carrying with it when so detached, a valve, thus permitting the easy renewal or repair of the valve.

A further object is to provide the valve with a handle which in one position locks the valve to its seat, thus preventing accidental displacement, and to provide a peculiar form of valve which shall engage with the seat but not flatten out under pressure and therefore become deformed.

I further provide means whereby when the valve is closed against its seat to stop the flow of water through the lower portion of the stand-pipe, an outlet opening is left unobstructed above the valve, permitting any water in the upper portion of the hydrant to flow out therefrom and thus preventing the freezing of the hydrant.

In the drawings, Figure 1 is a side elevation of a hydrant constructed in accordance with my invention; Fig. 2 is a longitudinal diametrical section of Fig. 1; Fig. 3 is an enlarged longitudinal section of the valve; and Fig. 4 is a transverse section of Fig. 3 on the line 4—4.

In the drawings, 3 denotes a stand-pipe of any desired length, having at its lower end a reducer, 4, which is engaged with the pipe 5, which extends down to the water-main or other source of water supply. It is to be understood that the stand-pipe 3 is sufficiently long to extend into the ground below the freezing line. An annular valve seat, 6, is formed within the reducer 4, said valve seat as clearly shown in Fig. 2, having a relatively great depth and being a section of a hemisphere.

At its upper end the pipe 3 is screw-threaded into a cap or head 7, which is formed at its upper end with a stuffing box, 8, of any usual or desired construction. Extending out from the cap 7 is the nozzle 9, which is preferably formed in one piece with an upwardly extending bracket, 10, carrying at its upper end the outwardly projecting ears 11 for the pivotal support of the handle 15 as will be later described. Passing through the stuffing box 8 is the valve rod 12, which, at its upper end, is connected to a clevis 13, formed to have pivotal engagement with the bifurcated end of a link, 14. The upper end of this link is also bifurcated to engage with a projecting portion, 16, of a handle, 15. The inner end of the handle 15 is reversely curved as at 16 and is pivoted at its end to the ears 11 by the pivot bolt 18. A pivot bolt 17 passes through the handle and through the bifurcated end of the link 14. The inner end of the handle, as before stated, is curved inwardly at 16 so that when the handle is in the position shown in Fig. 1, the pivotal axis 17 of the link is thrown inward beyond the axial line of the valve rod 12. It will thus be seen that any upward pressure on the valve rod 12 will act to force the handle 15 inward and hold it more securely in the position shown in Fig. 1, and that in order to move the handle 15 outward and the valve upward, the valve rod 12 must first be depressed slightly. This, therefore, constitutes a locking means whereby the valve is held to its seat against any accidental displacement of the handle arm 15. In other words, there is a toggle joint connection between the handle 15 and the valve rod, and the members of the toggle joint are forced beyond the axial center of the rod, thus holding them in place.

The lower end of the valve rod 12 is screw-threaded as shown in Fig. 3 and engages with the opposed valve cages, 19 and 20, which support between them the leather packing ring, 21, having the upwardly-turned margin, 22, which contacts against the inside face of the pipe 3, and acts as a packing for the valve. This packing ring, is, of course, annular so as to leave a central opening through which water may pass from

the lower cage into the upper cage and so out into the upper portion of the pipe 3 above the valve. The lower end of the cage 20 is formed with a concaved seat adapted to bear against and support a ball, 23, preferably made of rubber, or other like material, and adapted to seat snugly against the seat, 6. The rod 12 passes entirely through the ball, 23, and at its lower end carries a nut, 24, and a washer, 25, this washer bearing immediately against the ball, 23. Of course, by screwing up the nut, 24, the ball, 23, is held firmly engaged with the rod 12 and with the cage 20. As before noted the valve seat 6 is relatively deep and engages over a large portion of its area with the ball 23. This is for the purpose of preventing the ball from flattening out when the valve is forced down, the sides of the ball being held by the inner surface of the seat so that the ball cannot flatten and therefore become deformed.

An outlet opening, 27, is formed at the lower end of the pipe 3 just above the reducer 4, and so located that when the valve is raised to the position shown in Fig. 2 to permit water to flow through the hydrant, that the packing 22 will close the opening 27, while, when the valve is on its seat and the hydrant closed, the perforation 27 will be unobstructed to permit water contained in the hydrant above the valve to leak out. Thus there is at no time any water in the upper portion of the hydrant when the valve is on its seat.

The operation of my device is obvious: When the handle 15 is raised the valve will also be raised, thus permitting the passage of water through the pipes 5, 3, and out through the nozzle, 9. When the handle is depressed to its full extent, the ball, 23, bears upon the seat, 6, closing the flow through the stand-pipe 3, and in this position the valve is locked by the toggle link, 14, being forced inward beyond its axial line. The opening, 27, is then unobstructed to permit the leakage out of water from the upper portion of the hydrant.

The upward movement of the handle 15 is limited by a stop 11^a, Fig. 2, and is so arranged that it will arrest the movement of the handle when the valve is opposite the port 27 so as to thereby close the latter, and the downward or locking movement of the handle is arrested by the free end of the latter striking the cap, as shown in Fig. 1, so that the pressure of the water in the service pipe 5 acting on the valve will not move it open, since the valve cannot move as long as the handle bears against the cap 7.

The advantages of my invention reside particularly in the ease with which the valve may be taken out from the stand-pipe for repair or renewal. The cap, 7, may be easily unscrewed without the necessity of taking up the stand-pipe, 3, or in any other way manipulating those portions of the hydrant which are beneath the ground. When the cap 7 is detached, it may be taken off, bringing the valve with it. The valve construction is also extremely simple and the packing may be easily renewed. The deep valve seat in connection with the ball, 23, prevents the deformation of the ball under pressure and consequent leakage past the valve.

Having thus described my invention, what I claim as new and desire to secure by Letters-Patent, is:

1. In a hydrant, a stand-pipe having a drain port, a nozzle-carrying cap at the upper end of the stand-pipe, a bracket on the cap, a valve in the pipe, a seat with which the valve engages for closing the flow of water through the pipe, and a handle mounted on the bracket and operatively connected with the valve, and means with which the handle engages for holding the valve locked to its seat or for holding the valve in a position to close the drain port.

2. In a hydrant, the combination of a stand-pipe, a seat at the lower end thereof, a nozzle-carrying cap at the upper end of the pipe, a valve in the pipe, said pipe having a drain port at a point above the said seat, a stem connected with the valve and passing through the cap, a bracket on the cap, a handle mounted on the bracket and operatively connected with the stem, and a stop on the bracket for limiting the upward movement of the handle for arresting the valve when the same is in a position to close the drain port, the free end of the handle being arranged to engage the cap to prevent opening of the valve by the water pressure acting on the latter when in closed position.

3. In a hydrant, a stand-pipe; a single piece structure at the upper end thereof forming a cap, a nozzle and a bracket; a handle pivoted directly on the bracket and limited in its upward movement by the bracket and in its downward movement by the cap; a valve in the pipe; a stem for the valve passing through the cap; and a link pivotally connected directly with the stem and directly with the handle.

4. In a hydrant, the combination of a stand-pipe, a valve casing at the lower end thereof and provided with a seat, a valve stem extending longitudinally of the pipe and having a threaded lower extremity, a ball arranged on the threaded end, opposed cages threaded on the stem and with one of which the ball engages, a cylindrical packing having an internal flange disposed between the cages, means for fastening the ball on the stem, there being a port in the stand-pipe adapted to be closed by the packing, and operating means carried by the

stand-pipe and connected with the stem for holding the ball in engagement with the said seat when the stem is depressed and for holding the packing closing the drain port when the stem is raised.

5. In a hydrant, the combination of a stand-pipe having a drain opening, a cap on the upper end thereof, a nozzle carried by the cap, a bracket rising from the nozzle, a valve stem passing through the cap, a handle connected with the bracket, means on the bracket for limiting the upward movement of the handle, a link pivotally connected with the handle and with the stem to form a toggle joint, the pivotal connection between the link and handle being disposed at one side of the center line passing through the stem when the handle is depressed, the free end of the handle being adapted to engage the cap for forming a stop, a valve casing secured to the lower end of the stand-pipe and provided with a seat, and a valve on the stem adapted to engage the seat when the handle is depressed and arranged to close the drain opening when the handle is raised to its extreme upper position.

6. In a hydrant, the combination of a stand-pipe having a drain opening, a valve casing secured to the lower end thereof and provided with a valve seat, a compressible ball forming a valve arranged to engage the seat, said ball having a diametrically-disposed passage, a valve stem extending through the passage, opposed cages fastened on the stem and with one of which the ball engages, means coöperating with the cages for holding the ball in place, a cylindrical packing having an internal flange clamped between the cages, the cylindrical portion of the packing extending around one of the cages and arranged to close the drain opening when the stem is raised, and operating means connected with the stem for moving the ball into and out of engagement with the seat and covering and uncovering the drain opening by the packing.

7. The combination of a threaded valve stem, oppositely disposed cages threaded on the stem, a cylindrical packing extending around one of the cages and having an internal flange clamped between the cages, a concave seat on one of the cages, a compressible ball on the threaded stem, and a device threaded on the stem for holding the ball engaged with the said seat.

8. In a hydrant, a stand-pipe having a drain opening, a nozzle, a cap, a bracket, a valve in the pipe, a seat with which the valve engages for closing the flow through the pipe, a stem connected with the valve and passing through the cap, a handle mounted on the bracket and operatively connected with the stem, and a stop on the bracket for limiting the upward movement of the handle for arresting the valve when the same is in a position to close the drain opening, the free end of the handle being arranged to engage the cap to prevent opening of the valve by the water pressure acting on the latter when in closed position.

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

JAMES D. MARTIN.

Witnesses:

SAMUEL M. ROBERTSON,

JAMES F. MOOTHART.