No. 609,805. Patented Aug. 30, 1898.

J. J. HARDY.

HYDRANT.

(Application filed Sept. 29, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

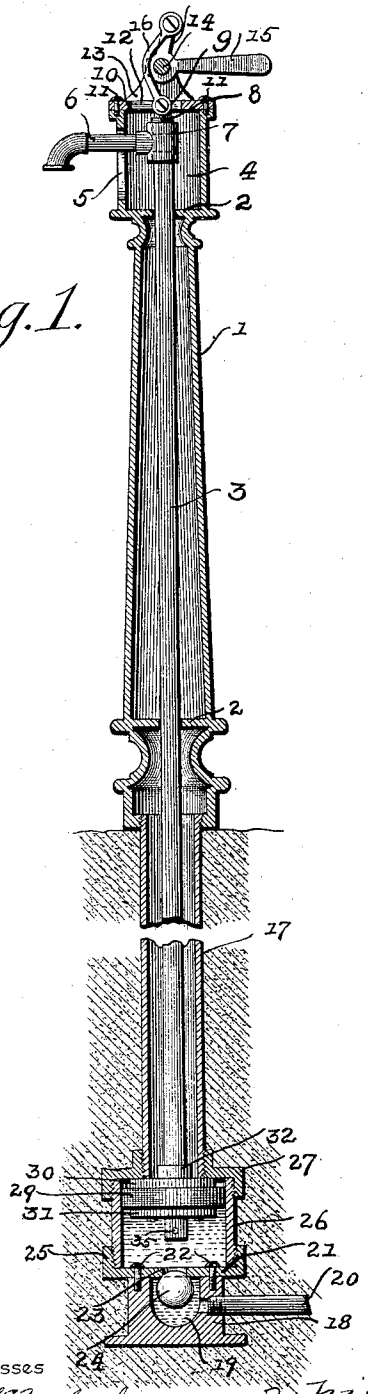


Fig. 4.

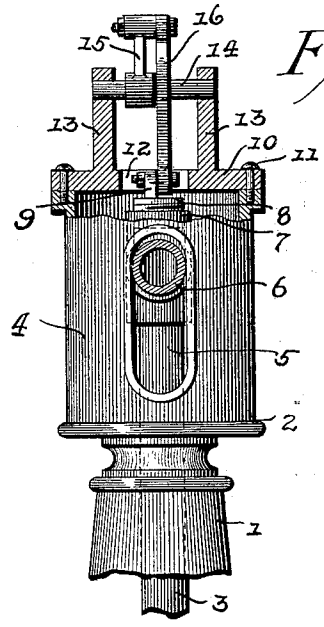
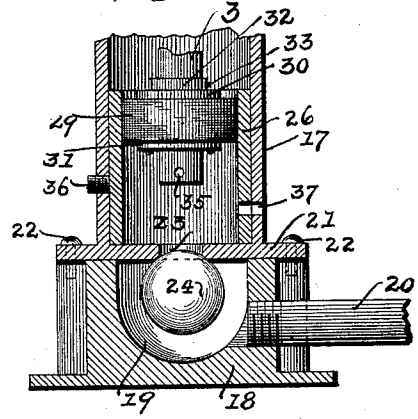


Fig. 5.



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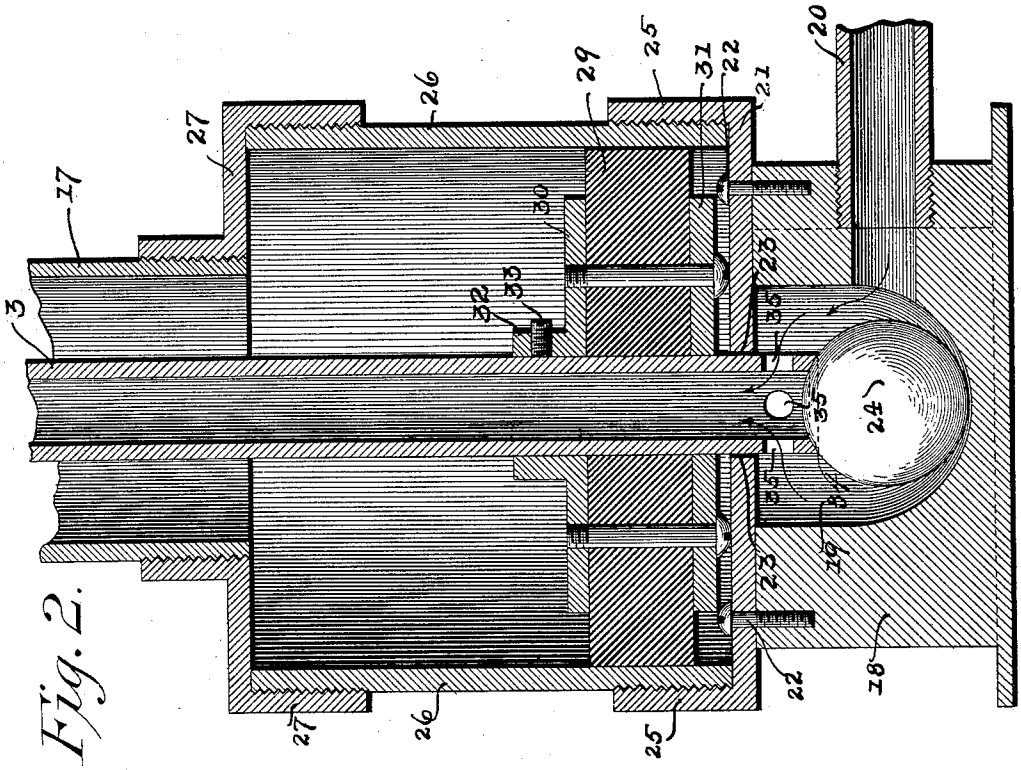


Fig. 2.

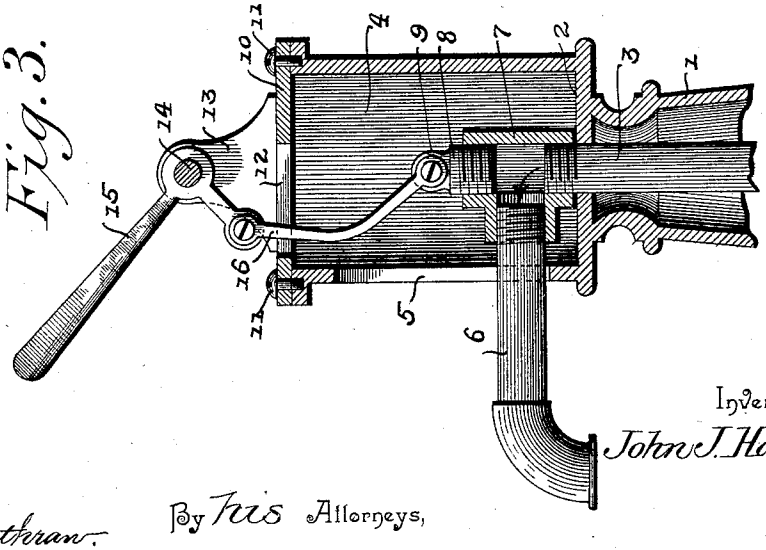


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN J. HARDY, OF COLUMBIA, PENNSYLVANIA.

HYDRANT.

SPECIFICATION forming part of Letters Patent No. 609,805, dated August 30, 1898.

Application filed September 29, 1897. Serial No. 653,458. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HARDY, a citizen of the United States, residing at Columbia, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Hydrant, of which the following is a specification.

This invention relates to hydrants, its object being to simplify and improve the valve mechanism thereof whereby the shut-off valve will automatically close the inlet to the hydrant-pipe when the latter is elevated and in which all ground joints are avoided.

The invention will be fully described hereinafter and its novel features clearly defined in the subjoined claims.

In the drawings, Figure 1 is a sectional elevation of a hydrant made in accordance with my invention. Fig. 2 is a similar view of the valve mechanism on an enlarged scale. Fig. 3 is a similar view, on an enlarged scale, of the head of the hydrant and the mechanism to move the hydrant-pipe vertically. Fig. 4 is a front view of the same, partly broken away. Fig. 5 is a view of the valve end of the hydrant, showing a modification.

Similar numerals of reference indicate similar parts in the several figures of the drawings.

1 indicates a casing which may be of any exterior formation desired and will preferably have two or more diaphragms or plates within it, which plates are centrally perforated for the passage of the hydrant-pipe 3 and serve as guides to keep the pipe in vertical position during its up-and-down movement. At the upper end of the casing is an enlarged chamber 4, provided with a slot 5 at one side, through which the spout 6, which is connected to the hydrant-pipe, projects. Preferably the spout will be connected to the hydrant-pipe by means of a T-coupling, and into the end of the coupling opposite that to which the hydrant-pipe is connected a plug 8 will be screwed, and this plug is provided with a perforated ear 9.

10 indicates a cap-plate which is detachably connected to the upper end of the chamber 4 by screws 11 or other suitable fastening devices, and this cap-plate is provided with an elongated opening 12.

13 indicates spaced ears projecting upwardly from the cap-plate on each side of the elongated opening, and a pin 14 is supported in the upper end of these ears.

15 is a crank-lever pivoted at its angle on the pin 14, and 16 indicates a curved link pivotally connected at its ends to the short arm of the lever 15 and the ear 9 at the top of the hydrant-pipe, respectively.

As shown in Fig. 1, the casing 1 is supported at its lower end on the surface of the ground, and a pipe extension 17 is connected to it and extends downwardly into the ground. It is of course obvious that the casing, if desired, might be continuous its full length; but the object of providing the pipe extension, which is of somewhat less diameter than the upper part of the casing, is to economize in material.

18 indicates a block provided with a flange at its lower end to afford a broad bearing-surface, and in this block a valve-chamber 19 is formed.

20 indicates the water-supply pipe, which is tapped into the side of the block and communicates with the valve-chamber.

21 indicates a flanged cap-plate secured to the upper face of the block over the valve-chamber by screws 22 or other suitable fastening devices, and this cap-plate is provided with a central opening 23, which forms a seat for the ball-valve 24. This valve will be of any suitable material, and when free, the pressure of the water from the supply-pipe will hold it to its seat. The flange 25 of the cap-plate is interiorly threaded and receives the threaded lower end of a cylinder 26, which forms a waste-chamber, as will be hereinafter more particularly referred to, and the upper end of this cylinder, which is of greater diameter than that of the pipe extension, is connected to the lower end of the pipe extension by means of a reduced collar 27.

A piston is fitted to work water-tight within the cylinder and comprises, preferably, a leather disk 29 or a series of such disks clamped between metal disks 30 and 31, which are of less diameter than the leather disks. All of these disks are centrally perforated for the passage of the lower end of the hydrant-pipe 3, which forms the piston-rod and projects below the lower end of the piston for a purpose to be hereinafter referred to. The

disk 30 is provided with a collar 32, which fits around the hydrant-pipe and is clamped thereto by means of a set-screw 33. The lower end of the hydrant-pipe is beveled inwardly, as indicated at 34, in order that when it is forced downwardly through the opening 23 in the cap-plate it will engage the ball-valve and form a seat therefor when the latter is forced away from its seat in the valve-chamber. The hydrant-pipe is also provided with a series of lateral openings 35 just about its lower end and below the piston in order that the water may pass from the valve-chamber into the hydrant-pipe. Instead of leather disks cup-washers may be used to form the piston.

In Fig. 5 the construction is substantially similar to that already described, except that the cylinder does not form a waste-chamber and is connected to the pipe extension 17 in a different manner. In this construction the cap-plate 21 is formed integrally with the pipe extension 17, and the cylinder 26 is fitted within the pipe extension and rests on the cap-plate, and the cylinder is clamped in position by set-screws 36. The cylinder and pipe extension are provided with registering lateral openings 37 near their lower ends, the purpose of which will be referred to hereinafter.

Referring to Figs. 1 to 4, inclusive, the operation of the hydrant is as follows: Assuming the parts to be in the position indicated in Fig. 1, it will be seen that the cylinder 26 is filled with water below the piston 27 and that the communication between the supply-pipe and the cylinder is closed by the ball-valve. If now it be desired to draw water through the hydrant, the crank-lever 15 is operated to force the hydrant-pipe downwardly, and this downward movement will also cause the piston to move downwardly in the cylinder, and the water contained in the cylinder will be forced up into the hydrant-pipe, and as the hydrant-pipe continues its downward movement the lower end of the pipe will pass through the opening 23 and force the ball-valve away from its seat, as shown in Fig. 2. The water will then be free to pass from the supply-pipe through the lateral openings 35 in the hydrant-pipe and up through the pipe and out from the spout. As soon as sufficient water has been drawn off, the lever 15 will again be operated to elevate the hydrant-pipe and with it the piston, and as soon as the lower end of the hydrant-pipe passes out of the opening 23 the ball-valve 24 will automatically seat itself in said opening and close it against the passage of any more water to the cylinder. When the piston has reached its highest point, as shown in Fig. 1, the water which remains in the hydrant-pipe will flow out into the cylinder, which forms a waste-chamber, and be confined therein until the piston is again depressed.

The advantage of having the cylinder confine the waste water is that such water cannot escape and be thereby lost, and consequently there is great economy in the use of the water, for in ordinary constructions where the water is permitted to escape from the hydrant-pipe when the hydrant is closed there is a loss of about a quart of water each time the hydrant is operated. Furthermore, this water which passes from the hydrant-pipe into the ground keeps the ground very damp, and consequently unhealthy, and, furthermore, such waste water is very liable to find its way into the cellars of houses or other places where it is undesirable to have it.

In Fig. 5 the lateral openings 37 are provided for the express purpose of permitting this water to escape should it be sometimes desirable to permit such escape, and this modified form of my invention is simply introduced to show that many features of the invention may be used regardless of whether the water is permitted to go to waste or is confined within the cylinder.

The general advantages arising from my invention are that there are no metal or ground joints or seats to wear out, as there are in most hydrants, and which frequently wear very fast and cause the hydrants to leak. With my invention the piston is of pliable or elastic material and sand will not affect it at all, and as the leather disk or cup washer of the piston will be expanded by the water it will work tight within the cylinder at all times. The ball-valve will close the opening between the valve-chamber and the piston securely at all times, and this ball will not be liable to become worn at any one part, since it will hardly ever seat in the same place twice in succession, as it is absolutely free within the chamber to turn in any direction. It is obvious that instead of connecting a special cylinder to the casing for the piston to work in the lower part of the casing could be turned out true for the piston to work in, and hence while I think it preferable to provide a special cylinder for this purpose I do not wish it to be understood that I restrict my invention thereto.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new is—

1. In a hydrant, the casing having a lower extension, a valve-chamber having a water-supply-pipe connection therewith, and a closure-cap at its upper side provided therein with a single valve-opening, a separate piston-cylinder removably fitted to the lower extension of the casing and arranged directly on top of the closure-cap for said valve-chamber, a ball-valve arranged within the valve-chamber, and the vertically-movable hydrant-pipe carrying an imperforate piston fitting said piston-cylinder and provided with a perforate end projecting below the piston and adapted

to pass through the valve-opening and engage against the valve when unseating the latter, substantially as set forth.

2. In a hydrant, the casing having a lower extension carrying the flanged cap, a valve-chamber having a water-supply-pipe connection therewith, and a flanged cap at its upper side provided therein with a single valve-opening, an enlarged cylinder interposed between and secured at its extremities within the oppositely-located flanged caps to form a waste-chamber, a ball-valve arranged within the valve-chamber, and the vertically-movable hydrant-pipe carrying an imperforate piston snugly registering within said cylinder, and having its lower extremity perforated and projecting below the plane of the piston so as to pass through the valve-opening and engage against the ball-valve when unseating the latter, substantially as set forth.

3. In a hydrant, the combination with a casing and the hydrant-pipe, of a series of perforated diaphragms within the casing through which the pipe passes, a removable cap detachably secured to the upper end of the casing and having an elongated opening, spaced ears projecting upwardly from the cap, a crank-lever pivotally supported between said ears, and a link extending through said elongated opening and pivotally connected at its ends to the short arm of the crank-lever and the upper end of the hydrant-pipe, respectively, substantially as described.

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

JOHN J. HARDY.

Witnesses:
J. E. SCHAD,
J. A. MEYERS.