(No Model.)

W. W. COREY, Jr.

HYDRANT.

No. 584,330. Patented June 15, 1897.

Fig. 1.

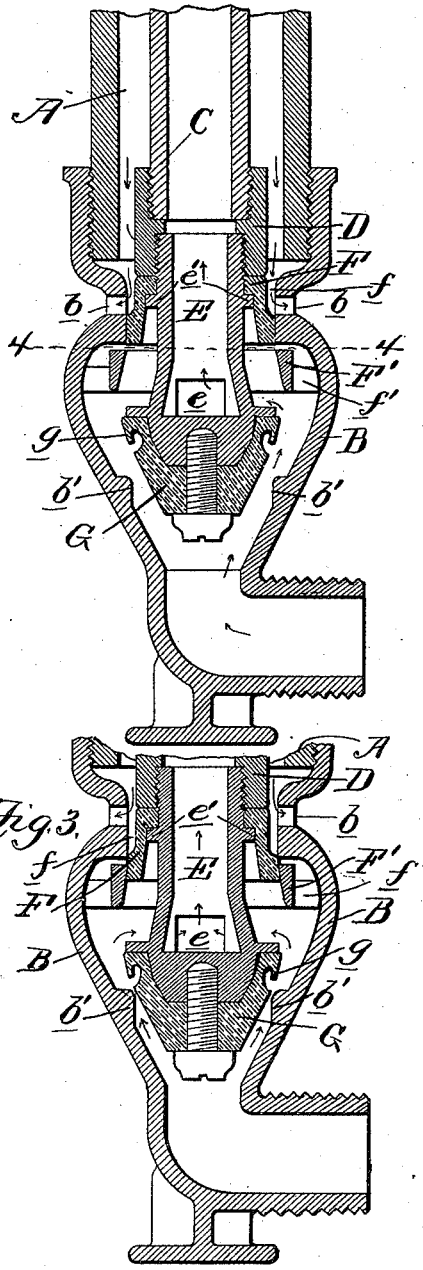


Fig. 2.

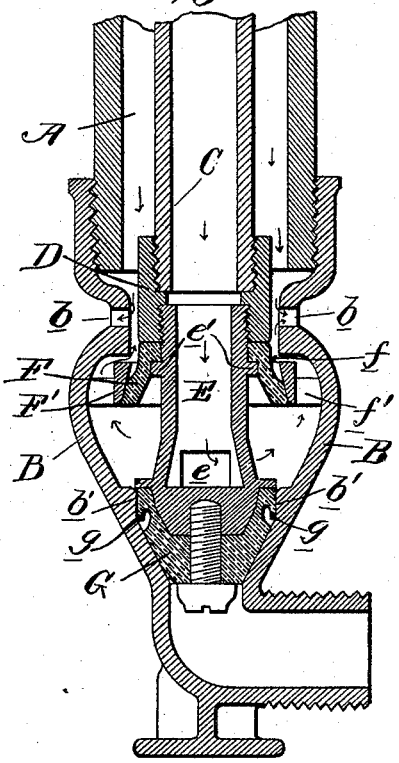


Fig. 3.

Fig. 5.

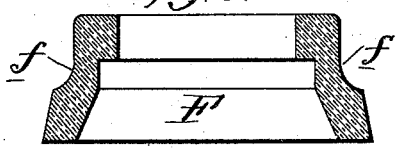
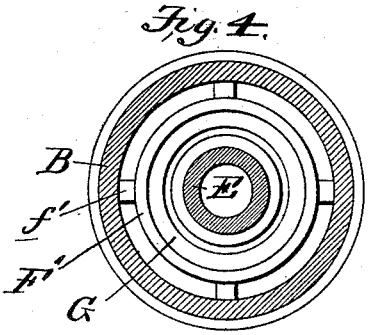


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM W. COREY, JR., OF ST. LOUIS, MISSOURI.

HYDRANT.

SPECIFICATION forming part of Letters Patent No. 584,330, dated June 15, 1897.

Application filed February 5, 1897. Serial No. 622,075. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. COREY, Jr., a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Hydrants, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a vertical sectional view through the lower portion of a hydrant embodying my invention, the main valve being full open and the drip-valve coöperating with the valve-casing. Fig. 2 is a similar view, the main valve being seated and the drip-valve lowered into the retaining-ring. Fig. 3 is a view showing the main valve partially raised to permit a small flow of water. Fig. 4 is a cross-sectional view on the line 4 4, Fig. 1. Fig. 5 is a detail sectional view of the drip-valve.

This invention relates to a new and useful improvement in hydrants; and it consists, generally stated, in the construction and arrangement of the valves, and more particularly the drip-valve.

Other features of invention reside in the construction, arrangement, and combination of the several parts, all as will hereinafter be described, and afterward pointed out in the claims.

In the drawings, A indicates a stand-pipe, on the lower end of which is threaded a valve-casing B, which casing has a suitable tap adapted to be connected with the water-main, and is also provided with drip-openings *b*.

C indicates a hollow valve-stem, upon the lower end of which is a coupling D, into which coupling is screwed a hollow extension E of the stem C.

One or more openings *e* are provided in the extension E, through which water is admitted to the hollow valve-stem C when the main valve is unseated. The extension E is formed with a flange *e'*, between which and the lower end of the coupling D is clamped the inturned flange of an inverted-cup-shaped drip-valve F. It is in the construction and arrangement of this drip-valve wherein the important features of my present invention reside. The drip-valve at its upper portion is cut away or reduced, as shown at *f*, said reduced portion extending slightly below the lower edge of the supporting-flange *e'* of the valve-stem section E.

The valve must of necessity be constructed of material—preferably hardened rubber—capable of withstanding wear which would result from frequent operations of the valve. In hardening the rubber, of course, resiliency is sacrificed to a certain extent, and the object of the cut-away portion *f* is to provide a flexible section between the lower contacting edge of the valve and its point of support.

F' indicates a ring supported concentrically within the valve-casing B by bridge-pieces *f'*. This ring is formed with an inclined face on its inner periphery which permits the drip-valve to expand in its lowered position, but gradually contracts or compresses the free lobes or flanges of the drip-valve when said valve is raised. The drip-valve when lowered moves into this ring, and is thereby limited in its expansion and prevented from getting out of shape.

G indicates the main valve, which is conical in shape and adapted to coöperate with a conical seat. I also prefer to form in addition to the conical bearing a vertical bearing *b'* in the valve-seat, against which the upper edge of said valve may expand and form a tight joint. This vertical bearing is important in this form of hydrant, because the drip-valve in order to perform its different functions, to be hereinafter described, preferably moves quite a distance before the water from the main is permitted to pass beyond the main valve G.

On the upper portion of the main valve is formed an overhanging lip *g*. When the valve is raised slightly and before the lower edge of the lip *g* has passed above the shoulder formed by the vertical bearing *b'*, the water from the main under pressure will force the lip against the vertical wall of the valve-seat and make a tight joint until the lip has passed beyond said vertical wall.

The operation of the invention is as follows: When the valve-stem is raised, carrying with it the main valve, thereby opening communication with the water-main, the drip-valve is also carried to the position shown in Fig. 1. The drip-valve, as shown, cuts off communication between the valve-casing and stand-pipe, the pressure of the water acting

under the cup-shaped drip-valve to press the depending free flange thereof against the wall of the valve-casing, thus insuring a tight joint. This is materially assisted by the expansibility of this flange. It will also be seen in this connection that owing to the cut-away or reduced portion the drip-valve when in this position permits any water which may be in the stand-pipe to pass off through the drip-openings. When the parts are in this position, the water must pass up through the hollow valve-stem and out through the nozzle.

In Fig. 2 the main valve is shown fully seated, the drip-valve being dropped down into the retaining-ring, and communication is thereby opened between the stand-pipe and valve-casing. Any water which may be in the valve-stem may now flow back and out through the drip-openings until the water in the hollow stem and valve-casing is on a level with the drip-openings. Any water which may be in the stand-pipe can also pass off through the drip-openings.

Sometimes—in extremely cold weather, for instance—it is desirable that the water be permitted to flow in a small but steady stream to prevent freezing. The main valve may be raised slightly, as shown in Fig. 3, until the drip-valve closes communication with the stand-pipe. The water will be permitted to flow up through the hollow valve-stem and out through the nozzle, while the drip-openings are open and free to drain the stand-pipe, the drip-valve closing the opening above the ring.

From the above it will be seen that no matter what the position of the main valve the drip-openings are free to drain the stand-pipe of water, which, if confined and not in circulation, would freeze and in turn cause the water in the hollow valve-stem to freeze. It will also be noticed that the upper edge of the contacting surface of the drip-valve with the valve-casing being below the flange *e'*, thus permitting a free movement of said depending flange of the drip-valve, renders said depending flange less liable to wear, and if wear should take place when the parts are in the position shown in Fig. 1 the natural expansibility of the material of which this drip-valve is composed, aided by the pressure of the water against the inner face of the depending flange of the drip-valve, would make a tight joint between the outer face of said flange and the valve-casing, preventing the leakage of water. Moreover, if water should leak past the drip-valve when the main valve is full open and the greatest pressure of water is beneath the drip-valve, at which time leakage is most liable to occur, any leakage past the drip-valve, if it did not exceed the combined capacity of the drip-openings, would flow through said openings and not up through the stand-pipe, as has heretofore been the case.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a hydrant, the combination with the stand-pipe, of a valve-casing mounted upon the lower end of the stand-pipe, a valve-stem, a main valve on the lower end of said stem, and a drip-valve, the point of contact of said drip-valve being on a plane below its point of support, the contacting face of the drip-valve with the casing expanding against an enlarged diameter of the casing when the drip-valve is in its normal position substantially as described.

2. A drip-valve for hydrants, having its point of contact on a plane below its point of support, and a reduced portion between said point of contact and point of support, and an expansion-ring into which said drip-valve moves when in its lowered position substantially as described.

3. An inverted-cup-shaped drip-valve for hydrants, having its upper portion reduced or cut away, and its point of contact below its point of support, in combination with a valve-casing, having drip-openings, the contacting face of the flange of the drip-valve contacting with the valve-casing below the drip-openings, substantially as described.

4. A cup-shaped drip-valve for hydrants, having a reduced portion between its point of support and point of contact, whereby the valve is yielding only below its point of support, substantially as described.

5. In a hydrant, the combination with the stand-pipe, and valve-casing, of a conically-shaped valve-seat formed in the lower end of said casing, said seat forming substantially a bell-mouth for the inlet, a hollow valve-stem forming a water-passage, and a cone-shaped main valve mounted on the lower end of the valve-stem and adapted to coöperate with said valve-seat by being forced downwardly thereinto; a cup-shaped drip-valve mounted upon the valve-stem above the main valve and adapted to coöperate with drip-openings, said drip-valve being reduced or cut away between its point of support and point of contact, and an expansion-ring into which the drip-valve moves when lowered substantially as described.

6. In a hydrant, the combination with the stand-pipe, and globe-shaped valve-casing, of a conically-shaped valve-seat formed in the lower end of said casing, a vertically-disposed portion immediately above said seat and forming part thereof, a hollow valve-stem, a cone-shaped main valve mounted on the lower end of said stem, said main valve having a vertically-disposed face at its upper edge to coöperate with the vertically-disposed portion in the valve-casing, when said valve is in its closed position, whereby, when said valve is

raised, its vertical face moves past the vertical face of the valve-seat before water can pass and a cup-shaped drip-valve mounted on the main-valve stem for coöperating with drip-openings in the upper end of the valve-casing; substantially as described.

7. In a hydrant, the combination with the stand-pipe, and valve-casing, of a conically-shaped valve-seat formed in the lower end of said casing, a vertically-disposed portion immediately above said seat and forming part thereof, a hollow valve-stem, a cone-shaped main valve mounted on the lower end of said stem, said main valve having a vertically-disposed face at its upper edge to coöperate with the vertically-disposed portion in the valve-casing, when said valve is in its closed position, said main valve also having an annular recess which opens to the exterior below said vertical face and extends up into the valve behind said face, whereby, pressure is admitted into said recess to force said vertically-disposed face outwardly, and a cup-shaped drip-valve mounted on the main-valve stem for coöperating with drip-openings in the valve-casing; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 4th day of November, 1896.

WILLIAM W. COREY, JR.

Witnesses:
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HUGH K. WAGNER.