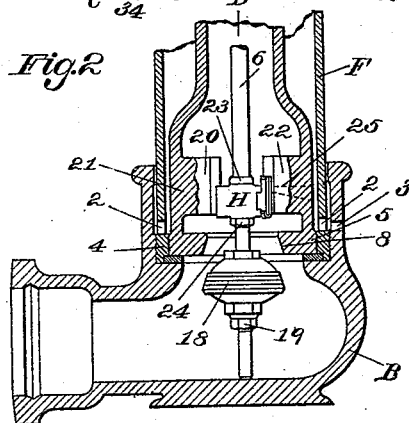
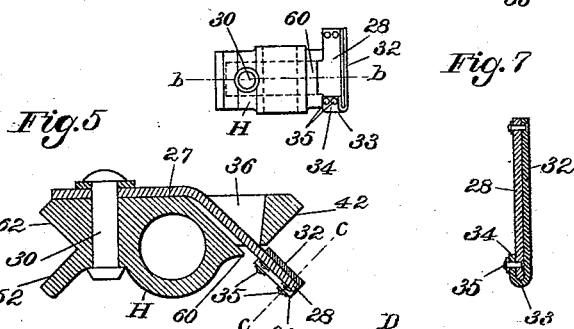
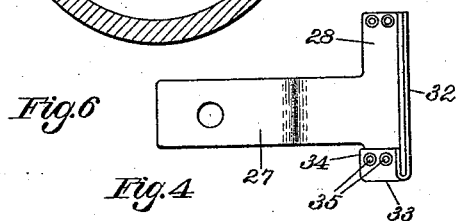
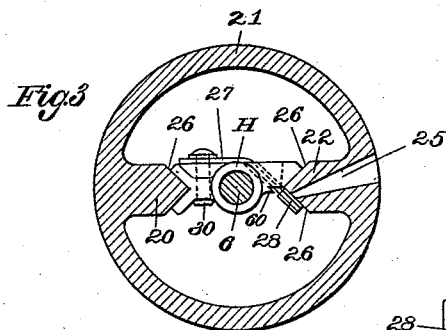
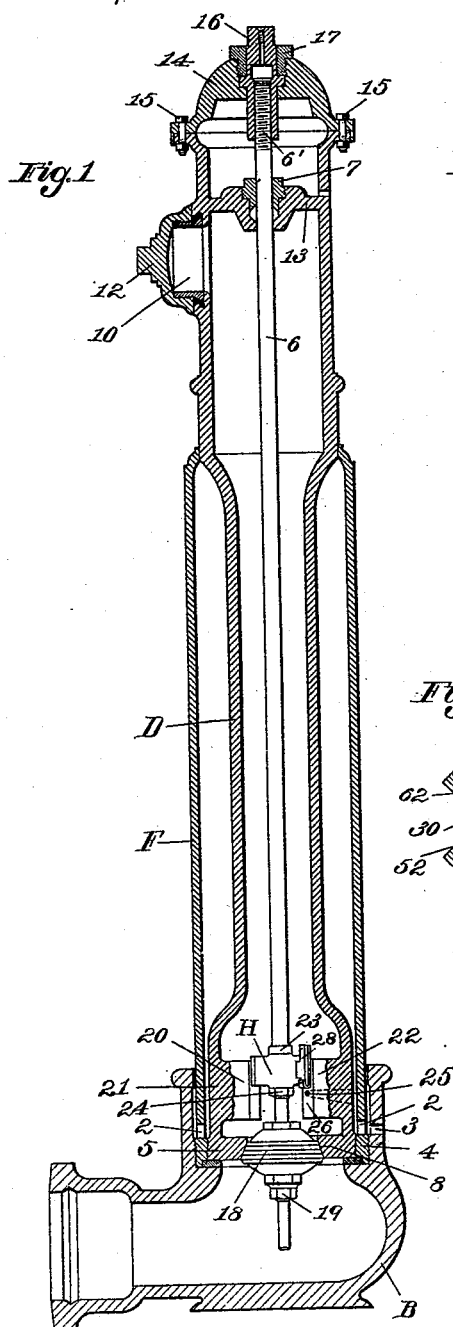


(No Model.)

F. H. RICHARDS.  
HYDRANT.

No. 490,601

Patented Jan. 24, 1893.



Witnesses:

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Inventor:

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# UNITED STATES PATENT OFFICE.

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## HYDRANT.

SPECIFICATION forming part of Letters Patent No. 490,601, dated January 24, 1893.

Application filed November 23, 1891. Serial No. 412,864. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hydrants, of which the following is a specification.

This invention relates to that class of hydrants generally known as "fire-hydrants," the object of the invention being to provide valve-rod-guiding means of improved construction and an improved waste-valve carried by the valve-rod.

In the drawings accompanying and forming a part of this specification, Figure 1 is a sectional elevation of my improved fire-hydrant; in this view the main valve is shown closed, and the waste-valve open. Fig. 2 is a sectional elevation similar to the lower part of Fig. 1, showing the main valve open and the waste-valve closed. Fig. 3 is an enlarged cross-sectional view through the stock or barrel of the hydrant, in the line of the waste-passage, showing the valve-rod cross-head or guide-block in place but not in section. Fig. 4 is a side elevation of the cross-head, with the waste-valve in place thereon. Fig. 5 is an enlarged sectional plan view, in line *b b*, Fig. 4. Fig. 6 is a side view of the spring waste-valve detached from the cross-head, and corresponds in scale to Fig. 5. Fig. 7 is a vertical sectional view, in line *c c*, Fig. 5.

Similar characters designate like parts in all the figures.

A hydrant embodying my improvements is shown at full length in Fig. 1, and with the exception of the lower portion of the stock or barrel D, and of the parts located within said lower portion, is or may be the same as the fire-hydrants of the same type now in common use. In the well-known type of the hydrant herein shown, the usual base or elbow B is furnished with a brass ring, 4, rigidly fixed therein and threaded on its inner side for receiving the correspondingly-threaded lower end, 5, of the stock or barrel D, as will be understood from the sectional elevations, Figs. 1 and 2. Near the upper end of the stock D, this is furnished with the usual nozzle, 10, rigidly fixed in the stock and ordi-

narly closed by the cap 12. Above the nozzle 10, the stock D is closed by a wall, 13, having a central bore for the valve-rod 6, and a stuffing-box, 7, for preventing leakage around said rod. At its extreme upper end, said stock or barrel is furnished with the usual cap or cover, 14, which is fixed to the stock by bolts, 15, and carries the nut or screw-stem 16, that engages with the threaded upper end, 6', of the valve-rod. Said stem or nut 16 is held in place in said cap 14 by the usual tubular bearing-screw 17, in a well-known manner. By turning said screw 16 to the right or to the left, the valve-rod may be lowered or raised as required.

The usual frost-case, F, is provided, having at the lower end thereof one or more waste-orifices, 2, through which the waste water may pass to the usual waste-passage or orifice, 3, in the base B. It will be understood that the orifices 2 (which, in practice, are usually simple notches in the lower end of the frost-case,) are only required when the frost-case shall be in its lowermost position shown in Figs. 1 and 2.

According to my present improvements, the stock or barrel D is furnished at its lower end with the usual valve-seat, 8, for the main valve 18, which valve is or may be fixed to the valve-stem 6 by a nut, 19, in the usual well-known manner. Within the stock D, at a little distance above said valve-seat 8, oppositely-disposed guides 20 and 22, extend from the wall, 21, of said stock inwardly, as will be understood by comparison of Figs. 1, 2 and 3. In practice, said guides should reach toward the valve-rod to lines within the circle of said valve-seat, so that the cross-head H, which is fitted to slide between said guides, may be withdrawn through the valve-seat when disassembling the hydrant. The cross-head is rigidly fixed upon the valve-rod 6 by means of the shoulder 23 formed on said rod and the nut 24, or by other equivalent or well-known means. The waste or vent passage 25 is formed in one of said guides, 20 22, the inner end of said passage opening into the interior of the stock D through one of the guide-faces 26, as will be understood by comparison of Figs. 1 and 3. The cross-head H

carries a waste-valve, which consists, in the preferred form thereof shown in the drawings, of the leather-faced valve or valve-plate 28 carried by, or forming one end of, the valve-spring 27, that is fixed at the opposite end thereof to the cross-head by the rivet or bolt 30.

The face, 32, of the waste-valve is usually of leather, and is attached to the plate 28 in an improved manner, so as to secure a rounded end 33 for passing over the outlet-passage 25 in the guide-face 26 and thus preventing the usual tendency of the leather (as the same is used in the old kinds of fire-hydrants) to catch and tear at the lower edge thereof. For this purpose, one end, 34, of the strip of leather is fixed upon the back side of said valve-plate 28 by one or more rivets 35; the leather is then drawn close under the lower end of said plate and passed upward upon the face-side thereof, and is then attached to the upper end of the plate by rivets or otherwise. This construction and arrangement of the said valve and its face will be best understood from Figs. 6 and 7.

The valve-spring 27 is shown passing through a mortise, 36, formed in the cross-head, by means of which construction the free end of the waste-valve is held in place vertically of the cross-head, while free to move laterally thereof within the required limits. As will be seen from Figs. 3 and 5, the waste-valve 32 constitutes one of the four guide-surfaces or end faces of the cross-head, said surfaces, designated by 32, 42, 52 and 62, Fig. 5, forming together two internal V's sliding upon the aforesaid two guides 20 and 22, respectively. Should the cross-head be turned in a direction over toward the left in Fig. 5, it is evident the end or face 42 will be thrown away from the guide 22, and thus carry the valve-rod laterally out of proper position; to prevent this, the cross-head has a stop 60, Figs. 3, 4 and 5, for limiting that lateral movement by limiting the motion of the waste-valve in the mortise 36.

The cross-head H being fitted to slide closely but freely between the guides 20 22, positively controls and guides the valve-rod 6 during the opening and closing of the main valve, and resists the torsional strain on said rod due to the turning of the valve-rod-actuating screw 16. The spring-valve which is carried by said cross-head H has the further function of maintaining the close contact of the cross-head upon both of its said guides; this is due, as will be evident upon comparison of the several figures of drawings, to the spring-pressure of the waste-valve upon the guide-face 26, which pressure tends, obviously, to force the cross-head against the opposite side of the guide 22, and also toward the left-hand against the opposite guide 20. This feature serves to effectually counteract the vibration which sometimes takes place in hydrants when the valve is open and there is a

slight play between the guide or guides and the cross-head, or the part corresponding to the same.

The operation of my improved fire-hydrant will be understood from the drawings and the preceding description. When the valve is closed as shown in Fig. 1, the cross-head stands between the upper ends of the guides 20 22, and the waste-valve stands above the waste-passage 25 as there shown. When the valve-rod 6 is forced downwardly to open the main valve 18, said waste-valve immediately passes over the inner end of the vent-passage 25, thus closing the same, and during the further movement of the valve-rod continues to cover said outlet, as will be understood from Figs. 2 and 3. On the closing movement of the main valve, the waste-valve continues to cover said outlet until near the close of the upward movement of the valve-rod, when the rounded lower end 33 of the waste-valve comes just above said outlet, thus permitting the stock D to be drained in the usual manner.

Having thus described my invention, I claim—

1. In a hydrant, the stock, or barrel, having a seat for the main-valve and having oppositely-disposed guides substantially as described located in said stock above the main-valve seat, of which guides one has opposing guide-faces and has in one of said opposing faces a laterally-opening discharge-outlet, combined with the main-valve rod fitted to slide in engagement with said guides and to engage the opposite faces of the guide having therein the discharge-outlet, and a spring waste valve carried with the valve-rod and bearing on said outlet-provided guide-face, all substantially as set forth.

2. In a hydrant, the combination with the stock or barrel having the valve-seat at the lower end thereof, and having oppositely-disposed guides extending into said barrel above said valve-seat, and having in one of said guides a discharge-outlet, of the valve-rod carrying the main valve, the cross-head fixed on said rod and fitted to slide between said guides, the spring waste-valve fixed at one end to said cross-head and at the other end bearing on the said guide having the discharge-outlet, and means for holding the free end of said valve in place vertically of the cross-head, substantially as described.

3. In a hydrant, the combination with the stock or barrel having the valve-seat at the lower end thereof, of the oppositely-disposed guides located within said barrel above said valve-seat and having in one of them a discharge-outlet, and both projecting inwardly to lines within the circle of said valve-seat, the valve-rod carrying the main valve, the cross-head of a length less than the diameter of the valve-seat and fixed on said rod to slide between said guides, and a waste-valve carried by said cross-head to open and close said discharge-outlet, whereby the discharge-outlet is

opened and closed on the upward and downward movements of the valve-rod, and whereby the valve-rod, with the cross-head thereon, may be passed through the valve-seat when  
5 disassembling the hydrant, substantially as described.

4. In a hydrant, the combination with a pair of guides substantially as described, having in one of them the discharge-outlet 25, of  
10 the cross-head fitted to slide between said guides and having the mortise 36, and a waste-valve bearing against the guide-surface having said opening, and carried by one end of a spring-plate which passes through said mor-  
15 tise and is fixed at the other end to the cross-head, substantially as described.

5. In a hydrant, the combination with the guides having in one of them the discharge-outlet, and with the cross-head fitted to slide  
20 between said guides, of the waste-valve 28 carried by the cross-head and having the face 32 fixed to said valve-plate on the back side

thereof, carried under the lower end, and connected to said plate at the upper end thereof, substantially as set forth.

6. In a hydrant, the combination with the stock or barrel having the valve-seat at the lower end thereof, of the oppositely-disposed  
25 guides 20 22 located within said stock above the valve-seat, the valve-rod carrying the main  
30 valve, the cross-head having at one end the faces 52 and 62 fitting the guide 20, and having at the other end the face 42 fitting one side of the guide 22, and a spring substan-  
35 tially as described fixed to the cross-head and bearing at its free end against the opposite side of the guide 22, whereby the cross-head is maintained in close contact with both guides for preventing vibration, substantially as set forth.

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