C. L. HOWES.

VALVE MECHANISM FOR STREET HYDRANTS.

APPLICATION FILED JUNE 4, 1907. RENEWED JAN. 18, 1911.

997,192. Patented July 4, 1911.

Fig. 4

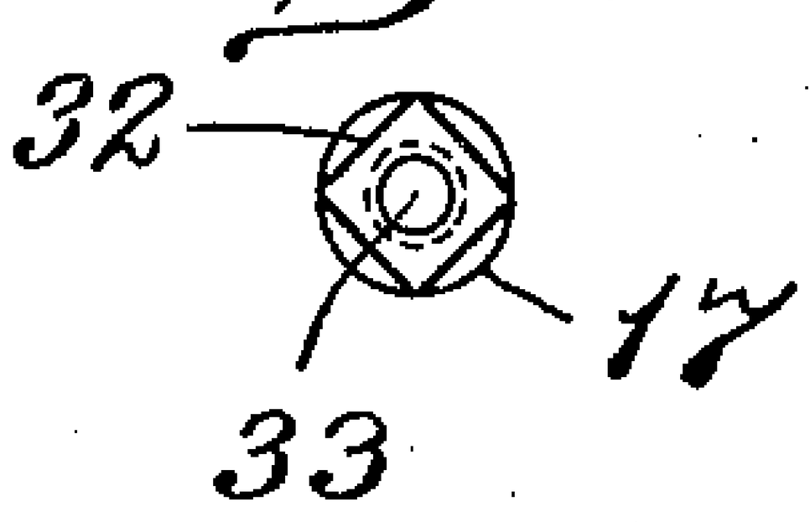


Fig. 1. Fig. 2.

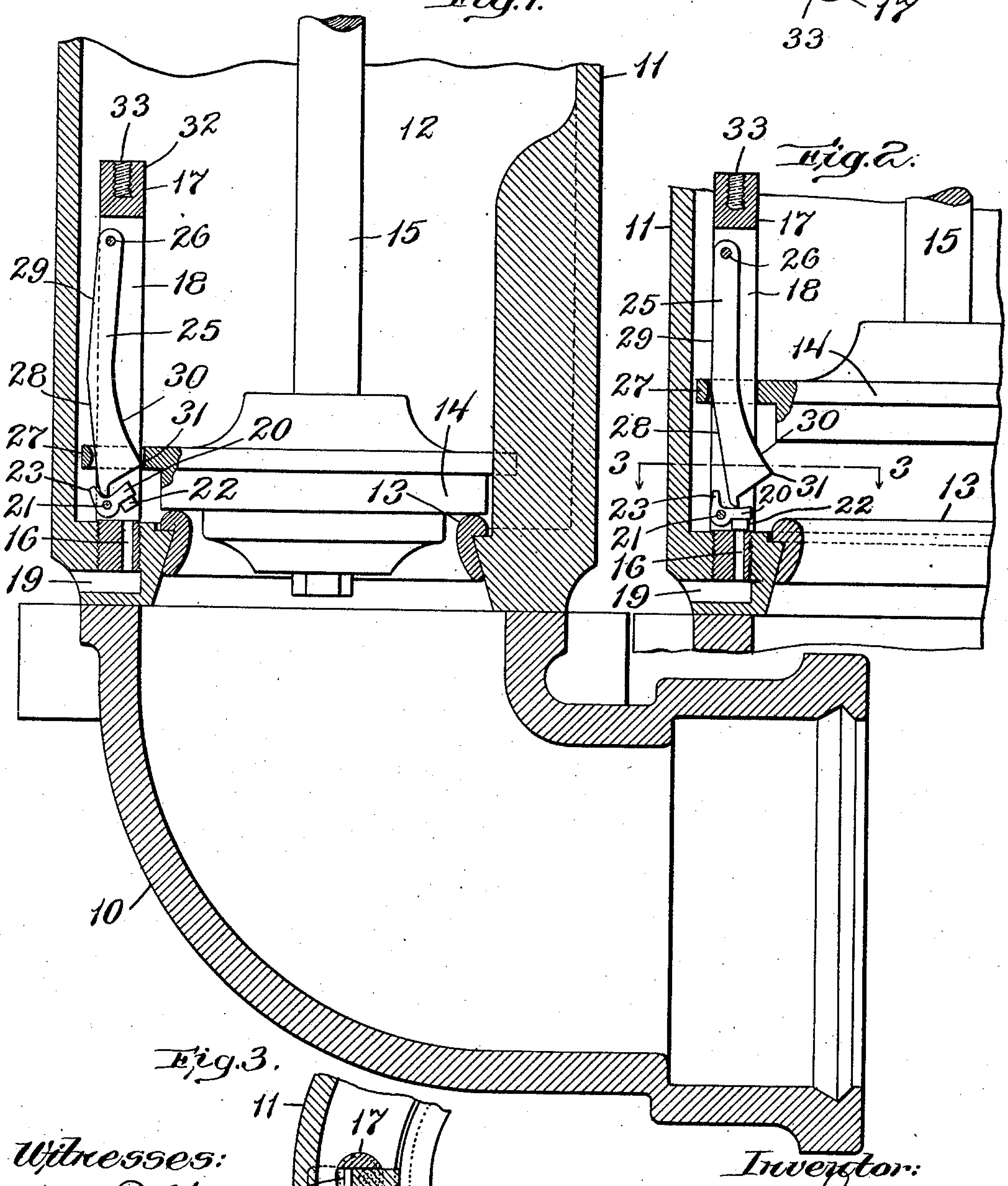
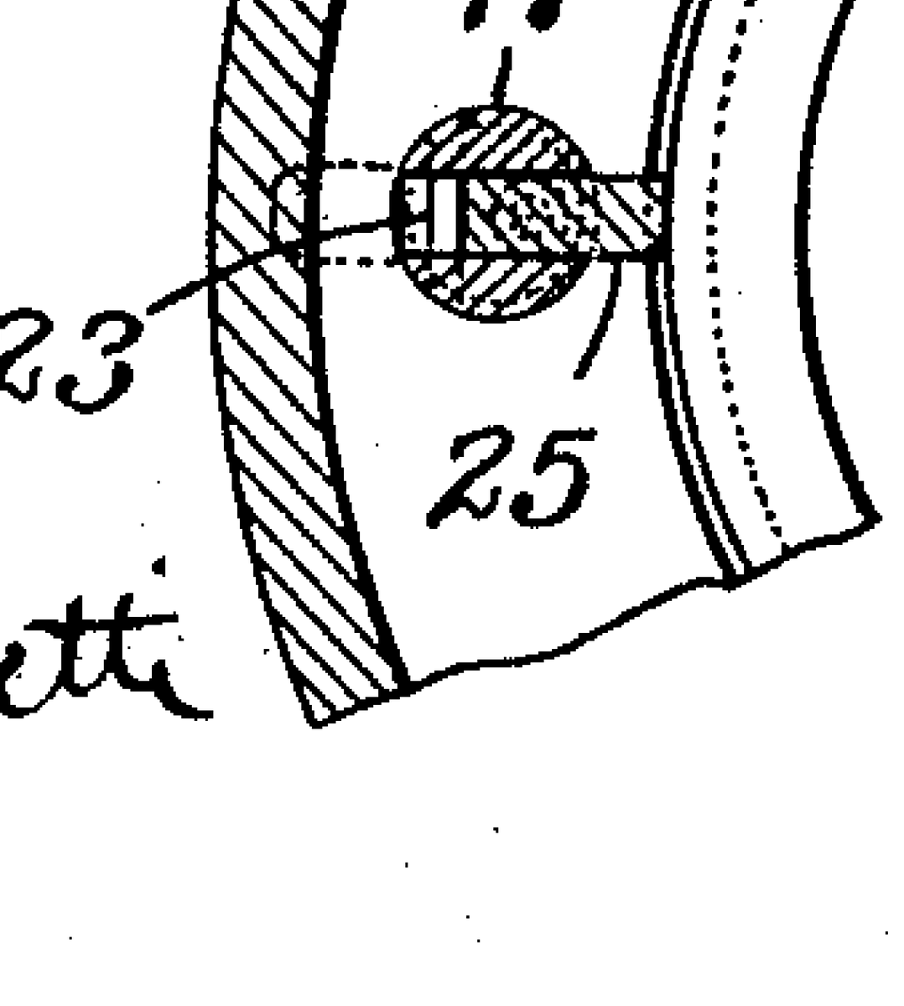


Fig. 3.



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VALVE MECHANISM FOR STREET-HYDRANTS.

997,192. Specification of Letters Patent. **Patented July 4, 1911.**

Application filed June 4, 1907, Serial No. 377,140. Renewed January 18, 1911. Serial No. 603,403.

To all whom it may concern:

Be it known that I, CLAUDE L. HOWES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Valve Mechanism for Street-Hydrants, of which the following is a specification.

This invention has relation to fire-plugs or street hydrants, and has for its object to provide an improved valve mechanism for permitting the escape of water contained in the body of the hydrant after the main valve is closed. In other words, the object of the invention is to provide an improved waste-valve mechanism, so constructed and arranged that the waste-valve is automatically opened and held so by the seating of the main valve, and so that, when the main valve is separated from its seat enough to admit water into the interior of the casing, the waste-valve has a tendency to find its seat, due to the pressure of the water thereon. In the present invention this construction is supplemented by a mechanism which is actuated by the main valve so as to move the waste-valve positively in either direction, independently of whatever tendency the waste-valve may have when subjected to pressure of the water. By reason of so actuating the waste-valve, it cannot become stuck or fail to operate when the main valve is moved because the two valves are mechanically connected so that the main valve cannot close without itself effecting the opening of the waste-valve, and it cannot open to any great extent without effecting the closing of the waste-valve. The main valve, however, after closing the waste-valve, may continue to open more and more without disturbing the position of the waste-vlave, and, moreover, when the waste-valve is in either its extreme open or closed position, it is positively locked by the mechanism which actuates it.

Referring to the accompanying drawings, forming a part of this specification,—Figure 1 is a vertical sectional view of the valve portion of a street hydrant, constructed in accordance with this invention. Fig. 2 is a vertical sectional view of a portion thereof in another position. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a top plan view of the waste-valve support.

The same reference characters indicate the same parts wherever they occur.

The numeral 10 indicates an elbow of a street water-main, which is connected and delivers to a hydrant having a casing 11 inclosing a suction chamber 12. This latter is termed the "suction chamber" because, when a steam fire-engine is working in connection with the hydrant, its excessive pumping action causes a strong suction in the hydrant and thereby demands a supply of water greatly in excess of the normal pressure thereof. The hydrant is further provided with a main valve-seat 13, a main valve 14, and a valve-rod 15, by which the valve may be moved to or from its seat.

16 is a waste-port, formed in the lower end of an upstanding rod 17 which is screwed into the interior of the base of the casing 11 close to the main valve-seat. The inner end of the port 16 opens into a slot 18 extending entirely through the rod 17, and the outer end thereof discharges into an outlet 19 with which it forms an outlet from the suction chamber to the exterior of the hydrant.

20 is a tilting waste-valve mounted in the slot 18 of the rod 17 by means of a pivot 21. The valve 20 is provided with a facing 22 of suitable material such as rubber, which is adapted to cover the inner end of the port 16 when the said valve is closed as in Fig. 2. The waste-valve is further provided with a finger 23 which projects therefrom at substantially a right angle, forming with the main portion 20 of the valve a piece similar to a bell-crank. The main portion 20 and the finger 23 serve as means whereby the waste-valve may be opened or closed, and for this purpose an actuator 25 is provided. One end of the actuator is pivoted in the slot 18 by a pin 26, and the other end is free to swing in the slot. The free end of the actuator is adapted to enter between the main portion 20 and the finger 23 of the waste-valve and to engage either of said portions so as to move the valve in either

direction. The actuator 25 is almost entirely contained in the slot 18 but certain portions, hereinafter described, may project slightly beyond the slot into the path of movement of an annular piece 27 which projects from the main valve 14 and closely encircles the rod 17. The member 27 is adapted to slide up and down on the rod 17 when the main valve is opened and closed, and when so moved is adapted to engage either of the faces 28 and 29 on the outer edge of the actuator, or the face 30 on the inner edge thereof, and by reason of such engagement to cause the actuator to either close or open the waste-valve. When the main valve is closed, as shown by Fig. 1, the member 27 locks the actuator in such position as to hold the waste-valve open. When, however, the main valve is opened so far as to raise the member 27 above the nose 31 on the lower end of the face 30, water is admitted from the main pipe 10 into the chamber 12. As is usually the case in practice, this is done prior to subjecting the hydrant to the pumping action of a fire-engine, and consequently the chamber 12 is subjected to an internally expanding pressure rather than a contracting or suction pressure. This initial pressure of the water upon the waste-valve has a tendency to close it over the port 16 as fast as the upward movement of the member 27 relatively to the face 30 will permit. As the face 30 is cut back from the nose 31 and upwardly, the actuator is free to swing from left to right as the member 27 rises. Thus the waste-valve is permitted to close under the pressure of water as fast as its finger 23 is permitted to force the actuator from left to right. If, for any reason, the waste-valve should fail to close under the pressure of water, continued upward movement of the member 27 would cause it to engage the inclined face 28 on the outer edge of the actuator, and positively force the actuator from left to right. This would then cause the end of the actuator to engage the main portion of the waste-valve and close it over the port 16. The upper face of the waste-valve is so curved that, when the valve is closed as in Fig. 2, the curvature is concentric with relation to the pivot 26 of the actuator; therefore, whatever additional movement the actuator has after closing the waste-valve is of no effect except to securely lock the valve over its port. By so locking the waste-valve over the waste-port, it cannot become dislodged by suction when the suction chamber 12 is subjected to the action of a pump. The inclined face 28 of the actuator leads to the face 29 which becomes parallel with the movement of the member 27, so that engagement of the member 27 with the latter face merely holds the actuator against retrograde movement. When the main valve is open and the waste-valve is closed, as last described, the face 30 of the actuator intersects the path of movement of the member 27. The point of intersection is, however, so near to the free end of the actuator that the member 27, in its downward movement, does not touch the said face until the main valve almost reaches its seat. When the member 27, in its downward movement, does engage the face 30, it swings the actuator from right to left, first causing the end of the actuator to release the waste-valve, and then to engage and move the finger 23 so as to raise the waste-valve to open position. The waste-valve is thus opened immediately prior to the seating of the main valve, and subsequent closing movement of the main valve causes the member 27 to encircle the nose 31 of the actuator and so lock it securely against all movement. Whatever water is left in the chamber 12 after the closing of the main valve may then escape through the waste-ports 16, 19 and leave the hydrant empty as before.

In regard to the construction of the waste-valve and actuating mechanism therefor, it will be seen that they are self-contained and removable as a unit. The upper end of the rod 17 is provided with a squared portion 32 adapted to receive a wrench by which the rod may be screwed into the casing 11. The portion 32 has a central threaded aperture 33 (see Fig. 4) which is adapted to receive a threaded rod by which the valve mechanism may be lifted. By so constructing the waste-valve mechanism, the whole, including the port 16, may be independently adjusted, inserted or removed with relation to the hydrant.

Having thus explained the nature of my said invention, and described a way of constructing and using the same, although without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim is:

1. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, an actuator arranged to open and close said waste valve, and means connected with the main valve for operating said actuator, said waste valve and actuator being free to move independently of the main valve when the latter is unseated.

2. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, a pivoted actuator arranged to open said waste valve, and means connected with the main valve for engaging the free end of said actuator to lock the latter and thereby hold said waste valve open, said waste valve and actuator being free to move independently of the main valve when the

latter is unseated, whereby the waste valve may be seated by the fluid pressure within said casing.

3. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, an actuator arranged to lock the latter in either open or closed position, and means carried by the main valve for operating and locking said actuator, said waste valve and actuator being free to move independently of the main valve when the latter is unseated, whereby the waste valve may be seated by the fluid pressure within said casing.

4. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a tilting waste valve, a swinging actuator to open and close said waste valve, and means connected with the main valve for operating said actuator alternately in opposite directions, said waste valve and actuator being free to move independently of the main valve when the latter is unseated.

5. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a tilting waste valve for said port, an actuator arranged to open and close said waste valve, and means connected with the main valve for operating said actuator, said waste valve and actuator being free to move independently of the main valve when the latter is unseated, whereby the waste valve may be seated by fluid pressure within said casing.

6. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, and means controlled by the main valve for opening and closing said waste valve, the latter being free to move independently of the main valve when said main valve is unseated, whereby the waste valve may be seated by the fluid pressure within said casing.

7. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, and means operated by the main valve at one limit of its movement to open said waste valve, and at the other limit of its movement to close said waste valve, said waste valve and its operating means being free to move independently of the main valve whereby the waste valve may be seated by the fluid pressure within said casing.

8. A street hydrant comprising a casing provided with an internal main valve and seat, a support removably secured within said casing and provided with a waste port leading to the exterior of the casing, a waste valve for said port pivotally mounted in said support, an actuator also mounted in said support and arranged to open and close the waste valve, and means connected with the main valve for operating said actuator, said support, waste valve and actuator being removable as a unit from the interior of the casing.

9. A street hydrant comprising a casing provided with an internal main valve and seat, and a waste port communicating with the interior of said casing, a waste valve for said port, an actuator arranged to open and close said waste valve and provided with cam faces, and means connected with the main valve for engaging said cam faces to operate said actuator, said waste valve and actuator being free to move independently of the main valve when the latter is unseated, whereby the waste valve may be seated by the fluid pressure within said casing.

10. A street hydrant comprising a casing provided with an internal main valve and seat and a waste port communicating with the interior of said casing, an angular waste valve for said port, an actuator provided with a lip arranged to engage said waste valve, and means connected with the main valve for operating said actuator, said waste valve and actuator being free to move independently of the main valve when the latter is unseated, whereby the waste valve may be seated by fluid pressure within said casing.

11. A street hydrant comprising a casing having an internal main valve and seat, and a waste port communicating with the interior of the casing, a waste valve for said port, an actuator adapted to open and close the waste valve, said actuator having cam faces, and means carried by the main valve for engaging said cam faces to move the actuator, whereby said waste valve may be opened and closed and locked in closed position.

12. A street hydrant comprising a casing having an internal main valve and seat, and a waste port communicating with the interior of the casing, a waste valve for said port, an actuator adapted to act positively upon the waste valve to open and close the same, said actuator having cam faces, and means carried by the main valve for acting positively upon said cam faces to move the actuator, whereby said waste valve may be positively opened and closed when the main valve is moved.

13. In a street hydrant, a casing having an internal main valve and seat, and a waste port communicating with the interior of the casing, a waste valve, and a holder for the waste valve, having screw-threaded connec-

tion with the casing, said holder having angular faces adapted to be engaged by a wrench, and a screw-thread adapted to be engaged by a complementally threaded member for inserting and removing the holder.

14. In a street hydrant, a casing having a screw-thread at its lower end, a valve, a valve holder having a screw-thread the complement of said screw-thread of the casing, and a seat for said valve, said valve holder having another screw-thread and angular faces adapted to be engaged respectively by a threaded member and a wrench inserted into the casing through the upper end for holding and turning said holder.

In testimony whereof I have affixed my signature, in presence of two witnesses.

CLAUDE L. HOWES.

Witnesses:
MARCUS B. MAY,
WALTER P. ABELL.