R. H. THORNE.

HYDRANT.

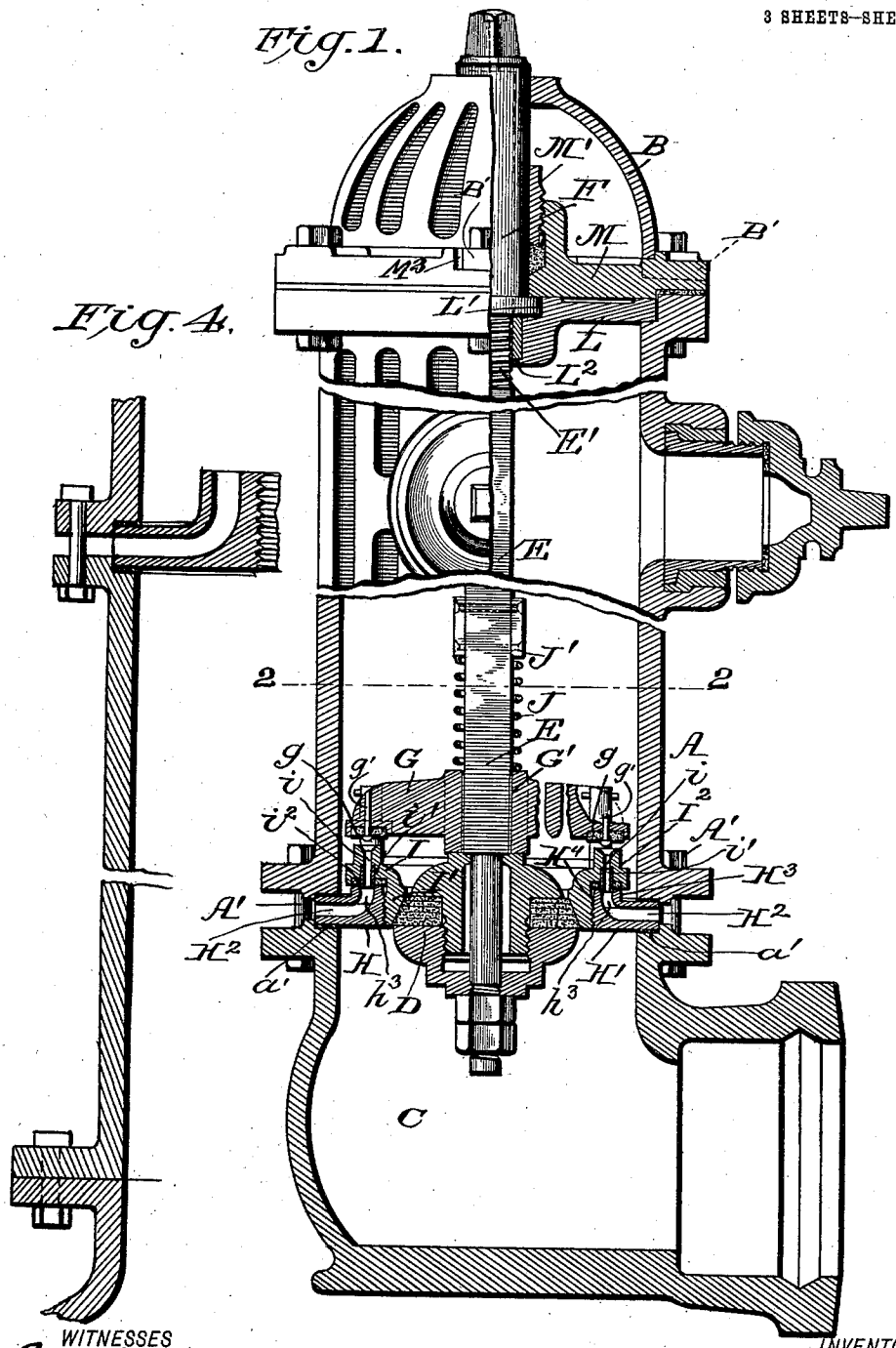
APPLICATION FILED FEB. 28, 1907. RENEWED MAY 27, 1912.

1,083,307.

Patented Jan. 6, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 2.

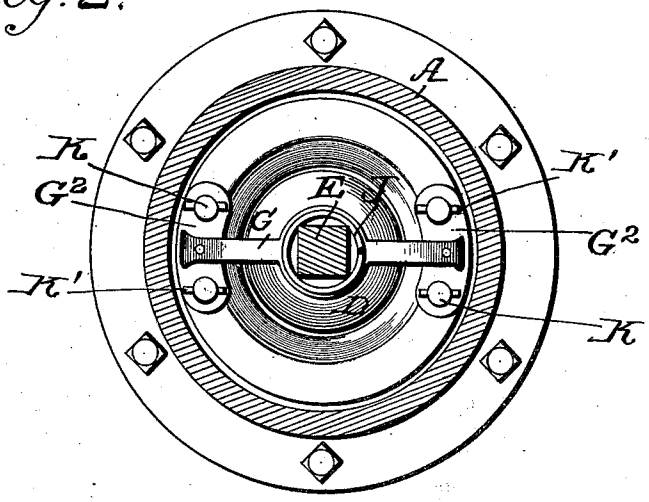
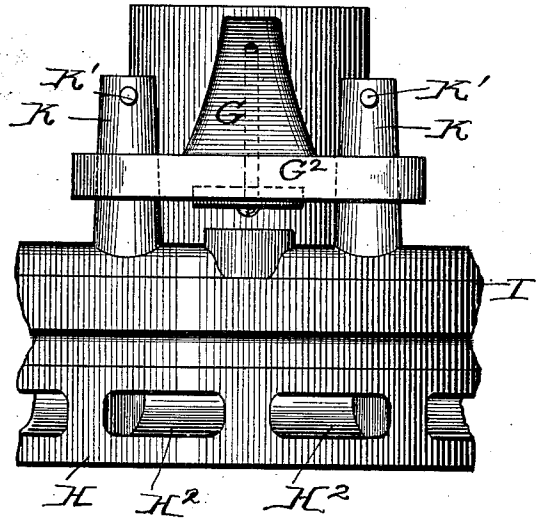


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 5.

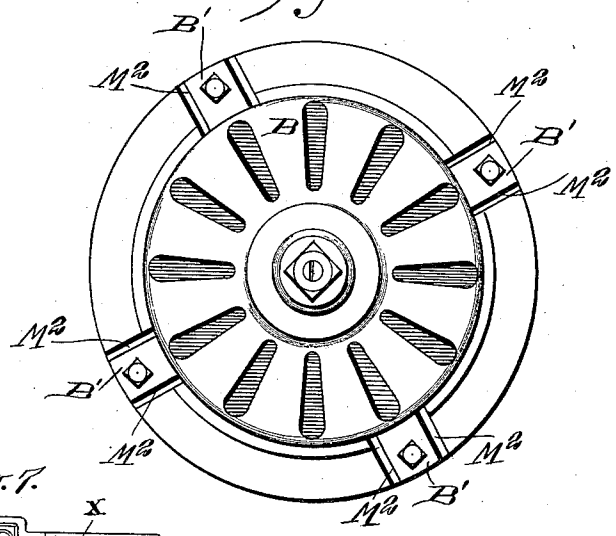


Fig. 7.



Fig. 8.

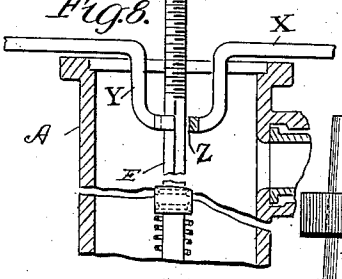


Fig. 6.

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HYDRANT.

1,083,307. Specification of Letters Patent. Patented Jan. 6, 1914.

Application filed February 28, 1907, Serial No. 359,716. Renewed May 27, 1912. Serial No. 700,118.

To all whom it may concern:

Be it known that I, ROBERT H. THORNE, a citizen of the United States, and resident of Williamsport, in the county of Lycoming and State of Pennsylvania, have made certain new and useful Improvements in Hydrants, of which the following is a specification.

This invention is an improvement in hydrants, and particularly in what is known as fire hydrants of the class usually described as inside compression hydrants; that is, hydrants in which the main valve may be held to its seat by the pressure of water behind it. It is important in this class of hydrants to provide for the convenient removal of all the working parts so they can be readily removed for repairs or replacement, by simply taking off the cap from the stock or upper barrel and removing the parts, using only a light wrench and necessitating the services of but one man. Such repairs are now ordinarily accomplished with hydrants of this class by unscrewing the upper barrel from the base elbow, the barrel being protected by an outer tube or covering known as a frost case, and the valve mechanism, drip and all working parts being removed by withdrawing the stock or barrel. This is cumbersome and expensive on account of the weight to be lifted, as special lifting devices and tools are required which have to be carted to the place where used as well as returned to the tool house.

At the present time the frost case type of inside compression hydrants appears to meet the requirement of a majority of the cities because of the ability to repair and replace the worn parts without taking up the ground or pavement, and is generally regarded as the best type produced at this time and it is effective in cold climates where there is danger of freezing, while in milder climates it entails the same expense to provide a frost case where no freezing occurs, which condition makes frost cases unnecessary.

By my present invention I seek to eliminate the frost case and to provide a mechanism so arranged that the working parts can be readily removed for repairs without displacing the barrel or stock and so avoid any disturbance or displacement of the street pavement or sidewalks. I also provide for making the working parts of non-corrodible metal, and by eliminating the frost case the barrel or stock can be made larger and with heavier walls, thus increasing the waterway and giving a larger flow of water, without increasing the cost of the hydrant.

Another and an important feature, is the ability to extend the hydrant by means of an extension between the upper barrel and the lower part and clamping the hollow waste discharge ring with all the removable parts between the upper barrel and the extension of the lower part to the lower end of the extension. This is practical only in the present style of hydrant, as the main valve is not dependent upon the lower part to arrest its downward movement, and on account of the increased area of the barrel the main valve does not interrupt or cut off the full flow when opened. No expense is attached except for the extension which is slight, and where street grades are raised, it is not necessary to buy a new hydrant or parts, but simply to provide the extension sleeve illustrated in Figure 4 and applied as shown in the said figure.

My improvement is susceptible of various changes in the form, proportion and minor details of construction, without departing from the principles or sacrificing any of the advantages thereof, and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings, Fig. 1 is an elevation partly in section and partly broken away of a hydrant embodying my invention. Fig. 2 is a cross section on about line 2—2 of Fig. 1, and Fig. 3 is a detail elevation partly broken away showing the waste discharge ring, the seat ring and the wrench bar or yoke as will be described. Fig. 4 is a detail view showing the extension tube. Fig. 5 illustrates in detail the construction whereby to permit the discharge of any water that may leak into the cap or cover B; and Fig. 6 illustrates a construction of waste discharge ring having but a single opening, and Figs. 7 and 8 illustrate a construction whereby a wrench is employed in unscrewing the seat from the drip ring.

As shown, the hydrant comprises the barrel A at the upper end of which is the cap B, the base elbow C, the main valve D, and the stem E of the main valve, such stem having

a threaded portion E′ on which is screwed a nut F which may be turned to raise and lower the main valve, the opening and closing of the main valve being thus effected without any turning movement of the valve stem. I provide, however, a suitable wrench for turning the valve stem when desired in order that the wrench bar or yoke G which is movable along but held from turning on the valve stem may be turned by the rotation of such stem and thus turn said seat ring I into and out of position for use, thus facilitating the removal and replacement of the said seat ring when desired as shown in Figs. 7 and 8.

The ring H which, for convenience of reference, I term the waste discharge ring, has a lateral outwardly projecting portion H′ which is clamped by bolts A′ between the lower end of the barrel A and the upper end of the base elbow, suitable packing being provided at a' as shown, and the outer edge of the ring H being unobstructed for almost its extreme height, as shown in Fig. 1, so that the discharge openings H^2 leading laterally from the annular channel h^3 in the upper face of the upwardly projecting annular wing H^3 of the waste discharge ring will have a free discharge outside the casing of the hydrant. This is best shown in Fig. 1 of the drawings, and it will be noticed that any water passing into the annular channel h^3 in the upper face of the waste discharge ring within the casing, will be conducted thence out through the discharge openings H^2 to the exterior of the casing, thus venting the barrel when the main valve D is closed, as shown in Fig. 1 of the drawings. It may be desirable in some cases to use a hydrant without the free drip, notably in warm climates where there is no danger of freezing and where for certain reasons it is not desired to fill the soil around the hydrant with moisture. In such case, the hydrant can be constructed with a solid waste discharge ring omitting the openings H^2, h^3 and i, and still retain all the desirable features of removing all the working parts of the hydrant for repairs or other purposes.

The central opening H^4 in the ring H is threaded to receive the threads on the outer face of the depending portion I′ of the seat ring I. This depending portion I′ is tapered in its inner side near its bottom to form a proper seat for the main valve D, and the seat ring is provided at the upper end of its wing or portion I′ with a lateral outwardly projecting wing I^2 which extends over the channel h^3 in the upper face of the ring H, and this wing I^2 is provided on its under side with a packing ring i^2 which overlaps the edges of the channel h^3 and at intervals discharge channels i are formed through the wing I^2 and communicate at their lower ends with tubes i' which extend through the packing rings i^2 and enter the annular channel h^3 in the upper face of the waste discharge ring when the parts are in the position for use as shown in Fig. 1. Thus when the parts are in the position shown in Fig. 1, the wrench bar G being raised clear of the seat ring I, the water in the barrel may waste out through the ports in the seat ring and through the waste discharge ring as will be understood from Fig. 1.

The wrench bar G is in the form of a yoke having a central non-circular opening G′ fitting the corresponding form of the valve stem E so the valve stem can move freely in a longitudinal direction through the bar G in opening and closing the valve D, and any turning movement of the valve stem will correspondingly turn the wrench bar. It is also provided with a recess in its lower side to receive a gasket g to act as a cut-off or packing for the drip when closed, and this gasket is held in place by pins or rivets g' which can be removed to renew the packing. The wrench bar is pressed downwardly by a spring J bearing between the top of the said bar and an abutment J′ on the valve stem E, and the valve D when closed as shown in Fig. 1, lifts the wrench bar by engagement with the lower side thereof as shown in Fig. 1. If the valve be lowered from the position shown in Fig. 1, the wrench bar G will be lowered until the packing strips g on the under side of the wrench bar close the upper ends of the ports i in the seat ring, so that when the valve is open, the wrench bar forms a drip valve for preventing the waste or drip of the water out of the barrel. While I have shown the spring J for pressing the wrench bar down, and while this construction is preferred where it is desired to quickly close the drip valve when opening the main valve, it will be understood that the spring is not absolutely necessary in all cases, for the reason that the projection J′ in the action of opening the main valve will press against the cross bar G and cause it to firmly seat over the drip valve opening i. The wrench bar while it is free to move up and down independently of the said ring I, is so connected with the said seat ring that it may be operated to turn said ring into and out of position for use. To this end, I provide one of said parts G and I with vertical pins sliding through the other part, and in the construction shown, the said pins K are mounted on the seat ring and project upwardly through openings in lugs G^2 at the opposite ends of the wrench bar, being provided with cross pins K′ above the said lugs G^2 as shown. Manifestly, however, this construction may be reversed, and the pins might be on the wrench bar and operate in sockets in the seat ring, and I do not desire to be limited to their arrangement in the broad features of my invention. The pins

K may be of any suitable cross sectional shape, such as round or square, and while I have shown the wrench bar as having two arms, it is manifest it could be made with three or more arms if desired, as in some of the larger sizes of hydrants I find it desirable to use three or more drip openings and three or more arms on the wrench bar.

The upper end of the barrel is provided with one or more outlets or nozzles for attaching hose and steam suction nozzles in the usual manner.

As best shown in Fig. 1, the top of the hydrant stock has some special features, the main stock being flanged and having a recess into which is fitted a thrust plate L which is recessed at L′ to receive the flanged end of the nut F for operating the valve stem longitudinally, and a nut bushing L^2 is forced into the lower part of the thrust plate L and has a slightly larger internal diameter than the valve stem which passes through it, the bushing presenting a smooth surface to the valve stem when the latter is closed, thus aiding in preventing corrosion and at the same time strengthening and supporting the stem at the time when the greatest strain is imposed upon it in starting to open the valve. I also provide a packing plate M with a stuffing box M′, through which the revolving screw nut passes. I also prefer to provide the cap or cover B with two or more extended lugs enough lower than the edge of the main body of the cap to permit the water which leaks from stuffing box to escape without freezing, and these lugs engage in recesses in the packing plate M, said lugs being somewhat narrower than said recesses in order to form passageways beside the lugs for the escape of water, with bolts passing through the flange of the barrel A, the packing plate M and the lugs on the cap B, thus enabling the cap B to be removed and the packing around the valve nut to be adjusted without disturbing the packing plate M or the thrust plate L.

The construction for permitting the leakage of water from the bonnet is best illustrated in Figs. 1 and 5. In this construction it will be noticed that the lug or projection B′ is somewhat narrower than the corresponding slot M^2 of the packing plate in which slot the lug fits, thus providing passageways on opposite sides of the lugs B′ through which the water can escape when it leaks through the packing or around the gland M′.

It will be noticed that the waste discharge ring forms a connection between the barrel and the base elbow having as described the circular opening threaded to receive the seat ring, and the laterally projecting wing which is clamped between the parts A and C as before described. By providing the annular channel h^3 in the upper surface of the ring H, the seat ring has a full outlet for drip no matter in what position the seat ring may be stopped in turning the same into position for use as shown in Fig. 1. Instead of making the waste discharge ring with openings on all sides of the hydrant, to discharge the water in all directions, this ring may be made with its outer edge closed and have but a single opening H^{13}, as shown in Fig. 6, the said opening being adapted to receive a pipe where it is desired to have the water pass directly to a sewer or similar discharge.

It will be noticed that the main valve, the seat ring, and the wrench bar or yoke, may all be readily removed from the barrel by turning the valve stem to cause the wrench bar to unscrew the seat ring from the waste ring and then lifting the parts bodily out of the barrel.

The tubes i' not only insure a discharge of the waste into the annular channel in the upper face of the discharge ring H, but they also keep the packing i^2 from buckling or twisting while the seat ring is being screwed to its seat.

It will be noticed that the working parts can be readily removed, and that the repair parts are very inexpensive. The drip valve used employs nothing more than a plumber's washer, and the main valve seat can be repacked and fitted with leather at slight expense, thus avoiding delay and the expense of procuring parts from manufacturers of the hydrant.

As best shown in Fig. 1, it will be noticed that the hydrant casing is made up of sections A and C, and that the waste discharge ring is clamped between these sections having channels which open outwardly and thus discharge out of the casing, while it is provided within the casing with an annular channel communicating with said passages and discharging the drip thereto as the same is received from the seat ring, the latter being arranged for operation by the wrench bar as before described.

As shown in Figs. 7 and 8, a wrench X having a drop portion Y is provided with a central angular opening Z to fit upon the squared portion of the valve stem whereby to turn the same as desired.

I claim:

1. In a hydrant, the combination with a casing, a waste discharge ring having a central threaded opening to receive a seat ring and provided in its upper side with an annular channel and also having ports or discharges communicating at their inner ends with said annular channel and extending thence to the outer edge of the waste discharge ring, the said seat ring having a depending portion threaded within the discharge ring and provided with a lateral out-

wardly projecting portion overlying the annular channel in the discharge ring, and provided with ports communicating with said annular channel, the main valve, the main valve stem, a wrench bar turning with the valve stem and through which the valve stem may move freely in a longitudinal direction, said wrench bar being provided with valve devices to close the drip ports or openings in the seat ring and connected pins between the wrench bar and the seat ring and having a sliding movement in one of said ports, whereby the wrench bar may move up and down independently of the seat ring and will operate to turn the seat ring when rotated substantially as set forth.

2. The improvement in hydrants herein described, comprising a waste discharge ring having a central threaded opening for a seat ring, and provided in its upper side with an annular channel and also having passages discharging laterally from said channel, a seat ring screwed into the threaded opening in the discharge ring and having a lateral wing or portion overlying the annular channel in the discharge ring and provided with ports communicating with the said annular channel for the discharge of drip, and means for closing said ports when the main valve of the hydrant is open, substantially as set forth.

3. The combination with a casing, a main valve and its stem, of a waste discharge ring having a central opening to receive a seat ring and provided in its upper side with an annular channel and having ports discharging laterally from said channel, a seat ring having a depending portion fitting within the central opening of the discharge ring and also provided with a lateral portion overlying the channel of the discharge ring and provided with ports communicating with said channel, and a wrench bar having valve devices for closing the ports of the seat ring, such wrench bar being arranged to turn with the valve stem and connecting devices between the seat ring and the wrench bar whereby the bar may when turned operate to turn the seat ring, substantially as set forth.

4. The combination in a hydrant with a casing, a main valve and its stem, of a waste discharge ring having passages for the outlet of the drip, a seat ring above and detachably connected with the waste discharge ring and having upwardly extending ports for the passage of drip to the said discharge ring and valve devices controlling the passage of drip through the seat ring, substantially as set forth.

5. In a hydrant, a discharge ring having a laterally extending wing, adapted to be clamped between adjacent casing sections, laterally opening channels extending from the outer face of said wing and an annular channel being provided in the upper face of the ring in communication with the said laterally opening channels, and a seat ring fitting removably within the said discharge ring, substantially as set forth.

6. The combination in a hydrant, of a casing, a main valve and its stem, a waste discharge ring, a seat ring fitted removably in the waste discharge ring, and a wrench bar connected with the valve stem for operation thereby, said wrench bar being movable laterally with the seat ring and vertically independent of said ring, substantially as set forth.

7. In a hydrant, the combination of a barrel and a base elbow provided at their adjacent ends with flanges and having said adjacent ends recessed, and a discharge ring seated at its edges in said recesses whereby it is properly centered, the said discharge ring having lateral passages or channels for the escape of drip, means controlling the passage of drip to the said channels or passages, a main valve seat fitting removably in said discharge ring and the main valve, substantially as set forth.

8. The combination of a main valve, its stem, the waste discharge ring having a channel for the discharge of drip, a seat ring having a portion overlying said channel, and provided with ports communicating therewith, a wrench bar movable toward and from said overlying portion of the said ring and adapted to open and close the ports thereof, and a spring for closing said wrench bar on the said ports, the main valve being arranged to operate said wrench bar in opposition to the spring to open the ports, substantially as set forth.

9. The combination in a hydrant, of an upper barrel and a base elbow having the lateral flanges, a laterally flanged discharge ring, the seat ring fitting removably in said discharge ring, the wrench bar having the drip valve devices, the main valve and its stem, and a flanged extension adapted for insertion between the upper barrel and the base elbow, substantially as set forth.

10. In a hydrant, the combination of an upper barrel, a main valve and its stem, said stem having screw threads, a revolving screw nut flanged at its lower end and threaded internally to receive the threaded portion of the valve stem, a thrust plate recessed to receive the flange of the nut, a non-corrodible bushing in said thrust plate below the said nut and encircling the valve stem, and a stuffing box above the thrust plate and encircling said nut, substantially as set forth.

11. In a hydrant, the combination of a top or bonnet, a thrust plate, a packing plate between the thrust plate and the bonnet, a stuffing box, an operating shaft, lateral lugs on the bonnet, the packing plate being provided with recesses receiving said lugs, and

made wider than the lugs they receive, whereby to afford passageways for the escape of water which may leak into the bonnet, substantially as set forth.

12. In a hydrant substantially as described, a waste discharge ring having a laterally extending ring and adjacent casing sections between which said discharge ring is clamped, the ring being provided with laterally opening channels extending to its outer edge, valve devices controlling said channels, a valve seat being provided within the discharge ring and a valve operating in connection with said seat, substantially as set forth.

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Witnesses:
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C. L. RADER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."