O. O. STORLE.

HYDRANT.

APPLICATION FILED JULY 11, 1910

985,469.

Patented Feb. 28, 1911.

Fig. 4.

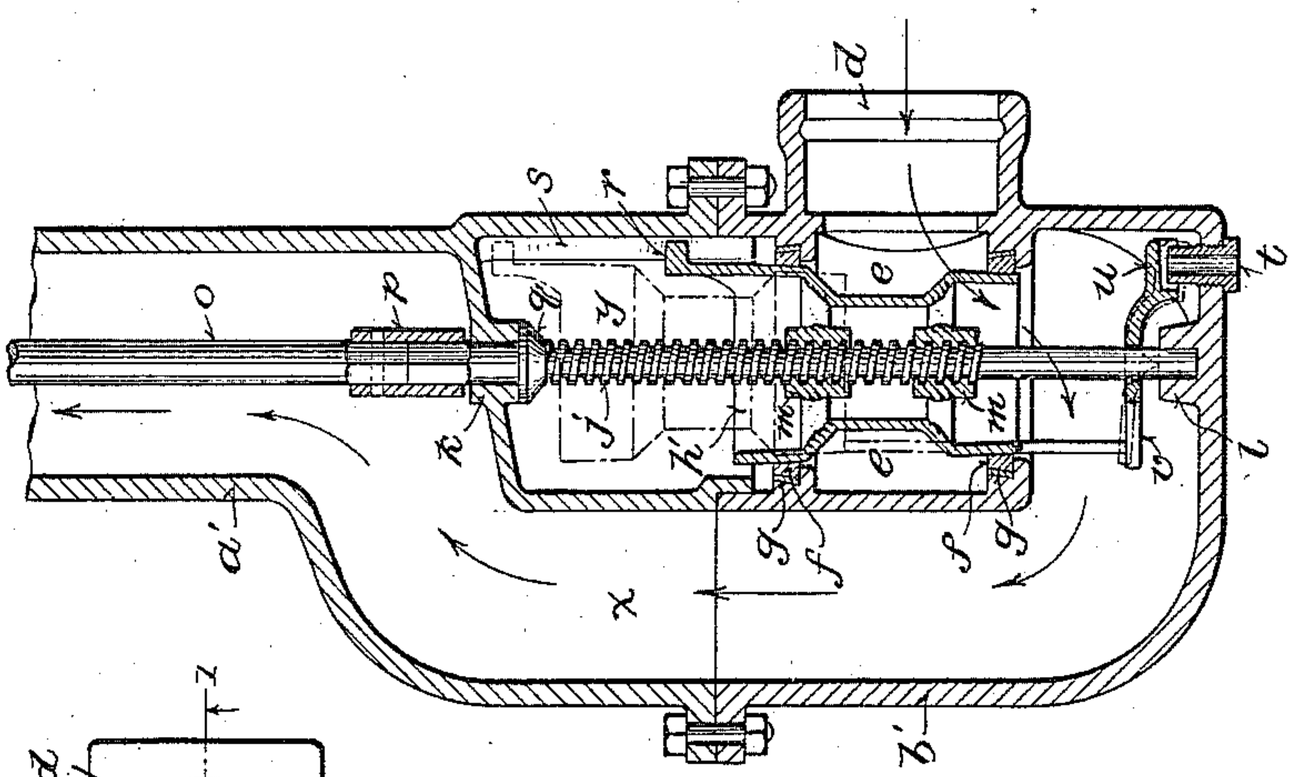

Fig. 2.

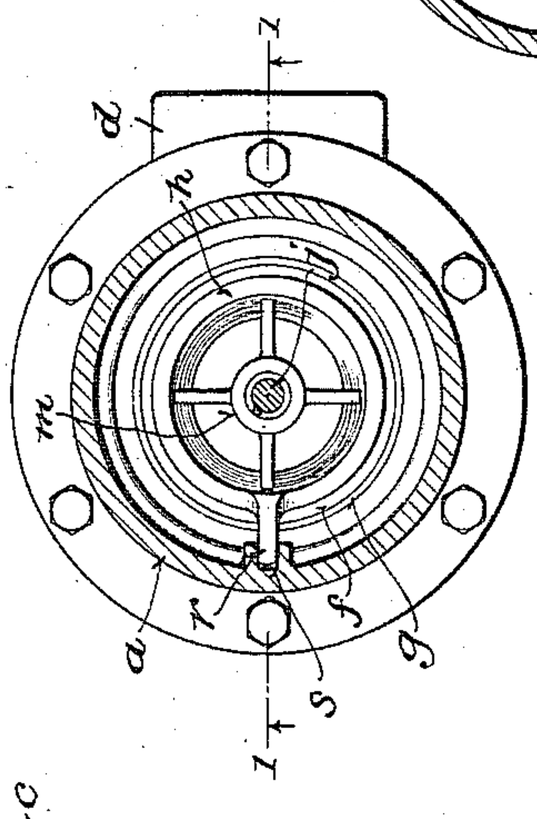

Fig. 3.

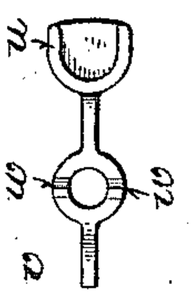

Fig. 1.

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UNITED STATES PATENT OFFICE.

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HYDRANT.

985,469. Specification of Letters Patent. Patented Feb. 28, 1911.

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To all whom it may concern:

Be it known that I, OLE O. STORLE, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Hydrants, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates more particularly to outdoor service connections with underground water mains. Its main objects are to insure and maintain a tight closure of the valve and thus avoid leakage and waste of water and the bursting of the hydrant by the freezing of water leaking into it; to facilitate the operation of the valve; and generally to improve the construction and operation of devices of this class.

It consists in the construction, arrangement and combination of parts as hereinafter particularly described and defined in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is a central vertical section on the line 1 1, Fig. 2, of one form of hydrant embodying the invention; Fig. 2 is a horizontal cross section of the same on the line 2 2, Fig. 1; Fig. 3 is an inverted plan view of the waste valve; and Fig. 4 is a partial central vertical section of a modified form of hydrant also embodying the invention.

Referring to Figs. 1 to 3 inclusive, the hydrant comprises a tubular body preferably formed as shown in Fig. 1, of two sections *a* and *b*, which are flanged and bolted together. The upper section *a*, which projects above the ground, is provided at or adjacent to its upper end with one or more discharge nozzles or connections *c* for attaching hose thereto.

The lower section *b* is formed with a lateral inlet connection *d* opening into an inlet chamber *e* between two alined openings, one above and the other below or on opposite sides of said inlet connection by which the hydrant is coupled to the water main below ground. The openings above and below the inlet chamber *e* are formed or provided with coaxial valve seats *f*, which for the purpose of renewal and to facilitate manufacture, are preferably made separate from the body of the hydrant and are inserted and calked with soft metal rings *g* or otherwise secured in undercut grooves in the inwardly projecting diaphragms or partitions which define the inlet chamber *e* on the upper and lower sides thereof.

An axially movable tapering tubular valve *h* is fitted in the seats *f* so as to control communication between the inlet chamber *e* and the passage in the tubular body leading upwardly therefrom to the discharge nozzles or connections *c*. An operating stem for opening and closing the valve extends therefrom upwardly through the tubular body and projects at its upper end which is squared or formed with a wrench head, through a stuffing box *i* at the top of the body, as shown in Fig. 1. For convenience in making and assembling the parts of the hydrant this stem is preferably made as shown, in sections. The lower section *j*, which has central bearings *k* and *l* at its upper and lower ends in the body of the hydrant, is threaded and engages with central spider nuts *m* in the upper and lower ends of the valve. The upper section *n* passing through the stuffing box *i*, is formed at its lower end with a socket which engages with the squared upper end of an intermediate section *o*, which is squared at its lower end and connected by a sleeve *p* with the squared upper end of the threaded section *j*. To hold the threaded section *j* in place and prevent endwise movement thereof when the sections of the hydrant body are assembled, it is provided just below the bearing *k* with a collar or shoulder *q*.

The valve is prevented from turning with the operating stem by a projection *r* at the upper end thereof engaging with a vertical guideway *s* formed in one side of the upper section *a* of the tubular body, which is enlarged at its lower end to receive the valve when it is opened.

To provide for escape of water from the hydrant when the valve is closed and to prevent the bursting of the hydrant in cold weather by the freezing of water therein, a waste or drain opening or connection *t* is provided in the lower part of the body, and a valve *u* is arranged to close this opening or connection when the main valve *h* is opened. The valve *u*, which may be made as shown, to close by gravity, is formed or provided with an arm *v*, which is fulcrumed on the step bearing *l* and projects into the

path of the main valve *h* so that the closing of the latter will open the valve *u*. The operating stem of the main valve passes loosely through an opening in the arm *v* to hold it in place and said arm is formed or provided on each side of the opening with fulcrum points or projections *w*, as shown in Fig. 3, and indicated by dotted lines in Fig. 1.

In the operation of the hydrant, to open the main valve *h* the operating stem is turned with a wrench in the proper direction to withdraw the valve upwardly into the enlarged lower portion of the upper section *a* of the body, as indicated by dotted lines in Fig. 1. This movement of the valve opens both the ports above and below the inlet chamber *e*, whereupon water flows first through both ports, the water passing through the lower port into the drain chamber in the lower part of the hydrant and thence through the tubular valve into the upper part of the hydrant. When the main valve is fully open, as indicated by dotted lines on Fig. 1, the water flows directly upward through the upper port, and both through and around the valve into the upper part of the hydrant, as indicated by arrows. When the main valve *h* is withdrawn from its seats in opening it, the waste valve *u* is released and closes the opening or passage in the waste connection *t*. The main valve *h* being completely surrounded by the inlet chamber *e*, is balanced laterally to whatever head or pressure it may be subjected in said chamber, and forming an open passage between the upper and lower parts of the hydrant through the inlet chamber, is substantially balanced endwise, so that it is easily opened and closed and subjected to even and uniform wear. In closing, the stem is turned in the opposite direction, moving the main valve downward to the position in which it is shown by full lines in Fig. 1, the tapering working faces of the valve engaging both seats *f* and closing the upper and lower ports simultaneously. Any wear of the valve and its seats is compensated for by a further traverse of the valve in closing, so that a tight closure of the valve is insured under all conditions, and the effective life of the valve is prolonged indefinitely.

Referring to Fig. 4, showing a modification of the hydrant, a by pass *x* is formed in the upper and lower sections *a'* and *b'* of the body around the inlet chamber *e* and a chamber *y* above it, into which the main valve *h'* is withdrawn in opening it. In this form the main valve is reduced in diameter between its tapering faces which close against the seats *f* above and below the chamber *e*. In other respects the construction and arrangement of parts is or may be substantially like that shown in Fig. 1. The operation of this form of hydrant is substantially like that of the form shown in Fig. 1, except that when the main valve is fully opened, the water flows, as indicated by arrows, from the inlet connection *d* downward through the lower port of the inlet chamber into the lower part of the hydrant, thence upward through the by pass *x* into the upper part of the hydrant to the discharge nozzle or nozzles, which may be like those shown in Fig. 1. With this form of hydrant the sweep of the water through the lower part thereof will take up and carry off any sediment or foreign matter which would otherwise settle and remain in the bottom of the hydrant.

Various changes in the minor details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention.

I claim:

1. In a hydrant the combination with a tubular body having a discharge connection at the upper end, an inlet chamber and a lateral inlet connection opening into said chamber at the lower end and alined openings and valve seats on opposite sides of said inlet connection, a tapering tubular valve fitted to said seats, and an operating stem extending upwardly through said tubular body and adapted to move said valve axially.

2. In a hydrant the combination of a tubular body having a discharge nozzle at the upper end, an inlet chamber and a lateral inlet connection opening into said chamber at the lower end, and alined openings and valve seats on opposite sides of said inlet connection, an axially movable tapering tubular valve fitted to said seats and in open communication at one end through said tubular body with said discharge nozzle, and an operating stem connected with said valve and extending upwardly through said body.

3. In a hydrant the combination of a tubular body having a discharge nozzle at its upper end, an inlet chamber with alined openings and valve seats on opposite sides thereof and a lateral inlet connection opening into said chamber between said seats, an axially movable tapering tubular valve fitted to said seats and provided with means to prevent its turning relative thereto, and an operating stem threaded axially in said valve and extending upwardly therefrom through said tubular body.

4. In a hydrant the combination of a tubular body having a discharge nozzle at its upper end, a waste opening at its lower end, an inlet chamber with alined openings and valve seats on opposite sides thereof and a lateral inlet connection opening into said chamber between said seats adjacent to its lower end, an axially movable tapering tubular valve fitted to said seats, an operating

stem connected with said valve and extending upwardly through said body and a valve for closing said waste opening adapted to be opened by the closing of the tubular main valve.

5. In a hydrant the combination of a tubular body having a discharge nozzle at the upper end, an inlet chamber with alined openings and valve seats and a lateral inlet connection opening into said chamber between said seats adjacent to the lower end, a by pass leading from the lower opening of the inlet chamber upwardly around said chamber to the discharge nozzle, an axially movable tapering tubular valve fitted to said seats and an operating stem connected with said valve and extending upwardly therefrom through said tubular body.

In witness whereof I hereto affix my signature in presence of two witnesses.

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Witnesses:
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