

No. 618,224.

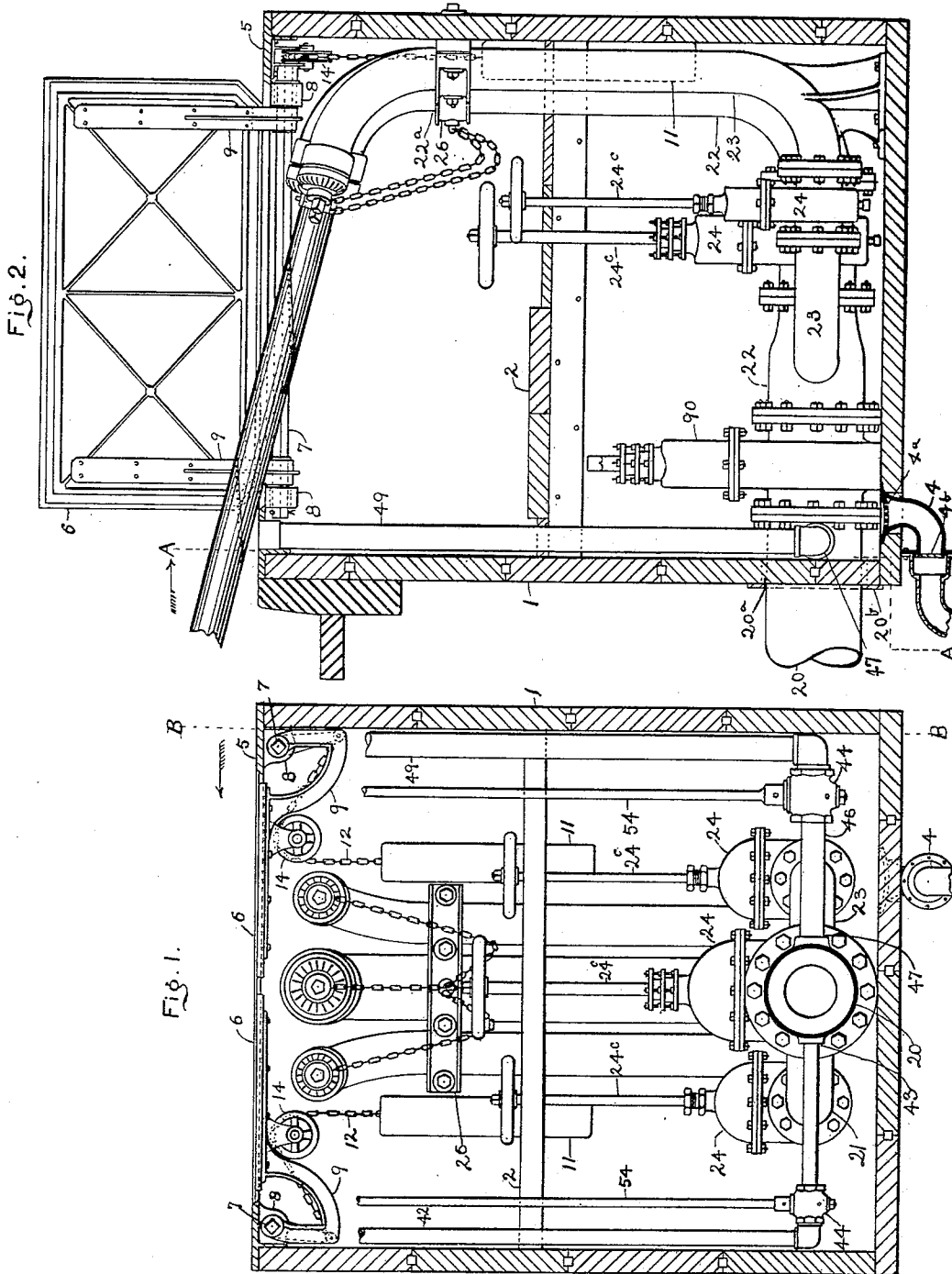
Patented Jan. 24, 1899.

A. S. GEAR.  
APPARATUS FOR SUPPLYING WATER.

(Application filed Feb. 18, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses  
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John H. Dale

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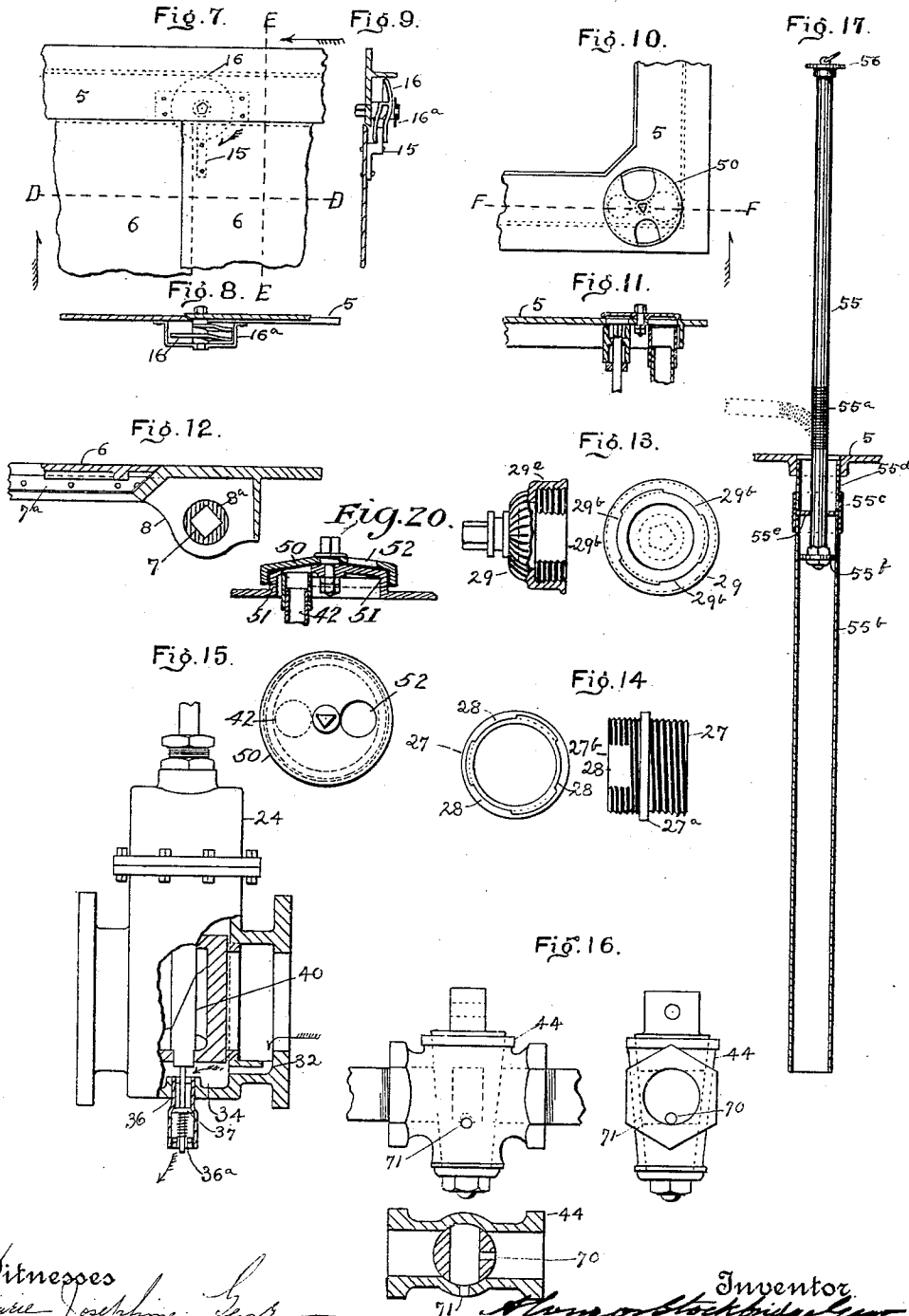


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4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

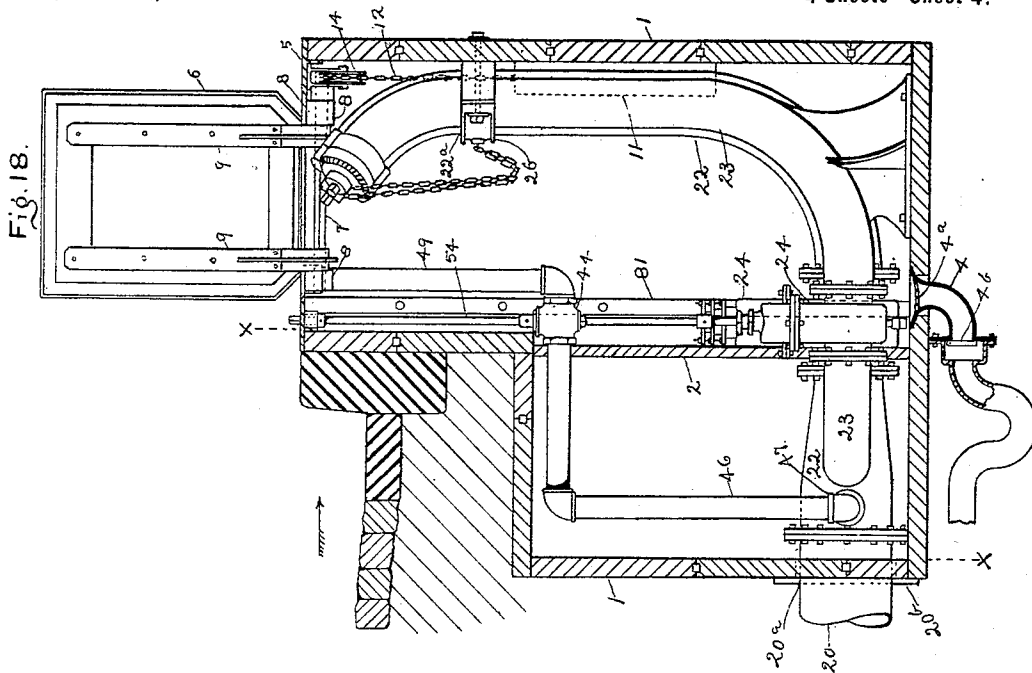


Fig. 18.

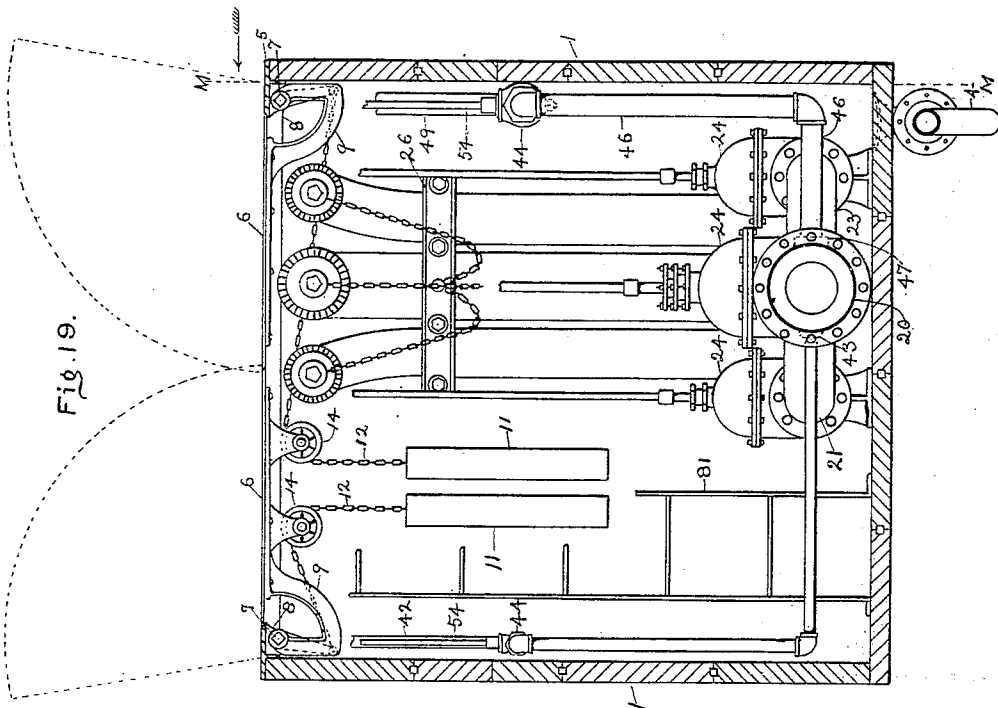


Fig. 19.

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# UNITED STATES PATENT OFFICE.

ALONZO STOCKBRIDGE GEAR, OF NEW YORK, N. Y.

## APPARATUS FOR SUPPLYING WATER.

SPECIFICATION forming part of Letters Patent No. 618,224, dated January 24, 1899.

Application filed February 18, 1897. Serial No. 624,004. (No model.)

*To all whom it may concern:*

Be it known that I, ALONZO STOCKBRIDGE GEAR, a citizen of the United States, and a resident of New York city, in the county and State of New York, have invented new and useful Improvements in Apparatus for Supplying Water for Extinguishing Fire and other Purposes, of which the following is a specification.

My invention relates to an apparatus for receiving, controlling, directing, conveying, and discharging water and other fluids under pressure or by suction, principally for extinguishing fire and for other purposes, and mechanism and apparatus for accomplishing this result.

The object of my invention is to provide a receptacle, case, or box with nearly water or air tight sides, a partition, division-floor, or platform, and with a bottom when the locality in which it is placed makes it desirable, said box to be placed beneath sidewalks or streets, or both, and having suitable covering and containing a branch from a water-supply pipe, also curved or straight hydrants or stand-pipes and gate-valves and stop-cocks. Said receptacle or box is to be sufficiently large to permit a person to enter and conveniently work in same for the purpose of inspection and to regulate and make repairs therein.

Another object is the conveying of water or other fluids through unobstructed true curved waterways and discharging the same at or near the surface of the sidewalk or street.

Another object is to provide a valve or valves with automatic dripping devices that will not only drip said valve, but also the pipes connected to same, supplied with water or other fluid by the opening of the same.

Another object is to provide a receptacle or box with a flexible indicator that will automatically adjust itself when disturbed to locate the apparatus when covered with snow.

Another object is the arrangement of a hydrant stand pipe or pipes and valve or valves in said box, so as to provide several departments of a municipality with a supply of water independently of each other.

Another object is to provide a cover or

covers for said box, or door or doors, and a device that will draw down and tightly fasten and unfasten and force open the same automatically and rapidly.

My invention consists, first, in a comparatively or nearly water or air tight receptacle or box placed beneath the sidewalk or street (either or both) and provided with or without a bottom and a removable partition, division-floor, or platform, for the purpose hereinafter mentioned.

It also consists in providing said receptacle or box with a discharge or drainage outlet-pipe, provided with a strainer connected with a trap, a sewer, or cistern, provided either with or without a check-valve, for the purpose hereinafter described. Besides this the receptacle is provided with a cover or covers or with door or doors, preferably hinged to the box by an improved hinge.

My invention consists, further, in providing a mechanical device for drawing down and locking the covers and unlocking and forcing them open and in an automatic device for throwing them open when unlocked, to which (the covers) is attached a chain, serving in connection with said covers or doors as a guard to three sides of the receptacle or box when the same is open.

My invention consists also in placing a part of a main branch or branches leading from a water-supply provided with valves and straight or curved hydrants or stand-pipes provided with gate-valves or stop-cocks within the receptacle or box and also in giving the said hydrant or stand pipe or pipes a graceful and easy curve or bend, facilitating thereby the free passage of the water or fluid through the same, preventing what is commonly termed "water-ram," and, lastly, my invention consists in an indicating device for designating the locality of the receptacle or box or apparatus in same when covered with snow.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a vertical sectional view of my apparatus on line A A, Fig. 2, looking in direction of arrow, showing the covers or doors closed down. Fig. 2 is another vertical sec-

tional view on line B B, Fig. 1, looking in direction of arrow, showing one of the covers or doors raised or open. Fig. 3 is a plan view of the same with the covers or doors raised for the purpose of showing the interior of the receptacle or box. Fig. 4 is a detached sectional view of the top plate of the receptacle or box, showing the doors and the hinges and slightly-overbalanced counterweights connected therewith. Fig. 5 is a sectional view on line C C, Fig. 6, looking in direction of arrow. Fig. 6 is a detached side view of the hinge and its lower arm. Fig. 7 is a plan view of part of the lid of the box and part of the covers, showing the position of the locking-cam. Fig. 8 is a sectional view of the same on line D D, Fig. 7, in direction of the arrow. Fig. 9 is another sectional view on line E E, Fig. 7, in direction of arrow. Fig. 10 is a plan view of part of the frame of the receptacle or box, showing the revolving cover for the sprinkling and street-watering pipes. Fig. 11 is a sectional view of the same on line F F, Fig. 10, looking in direction of arrow. Fig. 12 is a sectional view of part of the receptacle-frame, showing the gasket-packing. Fig. 13 is an inside plan view and a sectional view, respectively, of a nozzle-cap. Fig. 14 is an end view and an elevation of the nipple for the nozzle-cap. Fig. 15 is an elevation, partly in section, of one of the gate-valves. Fig. 16 is an end, plan, and side elevation, respectively, of the stop-cock. Fig. 17 is an elevation, partly in section, of the indicating device. Fig. 18 is a vertical sectional view on line M M, Fig. 19, of my apparatus, showing the modifications in the formation of the receptacle or box whereby part of the same is under the sidewalk and part beneath the street. Fig. 19 is another vertical sectional view on line X X, Fig. 18. Fig. 20 shows, respectively, plan and sectional views of modified forms of the revolving cover of the sprinkling and street-cleaning pipes.

Similar numerals refer to similar parts throughout the several views.

Numeral 1 represents the receptacle or box with nearly air or water tight sides and bottom. It can be made of any suitable material—of wood prepared to prevent decay, iron, concrete, brick, cement, or paper. It can be made of any size or shape adapted to the locality. The receptacle is intended to be placed beneath the sidewalk, as shown in Figs. 1 and 2. The shape and depth of the box in that case is six feet deep by four feet square, (more or less.) When the receptacle is placed partly beneath the street and sidewalk, as shown in Figs. 18 and 19, which is preferable, the shape and size change. It is six feet deep by five feet long by twenty-eight inches wide (more or less) under the sidewalk and four feet deep (more or less) under the street. The construction shown in Figs. 1 and 2 is provided with a horizontal partition, division-floor, or platform 2, made of

any suitable material. In the construction shown in Figs. 18 and 19 the underground chamber is divided by a vertical partition. The drainage of the receptacle is done by a drainage-pipe provided with a strainer 4<sup>a</sup>, leading into a sewer or cistern provided with a trap containing a check-valve 4<sup>b</sup>, which prevents the sewer or cistern gases entering the receptacle and likewise prevents the overflow of the cistern or sewer returning into the box. The trap and also the check-valve 4<sup>b</sup> in said opening 4 may be dispensed with in some cases.

The upper or open end of the receptacle or box is partly covered by a plate 5, made of metal or any other suitable material and provided with an opening for cover or covers 6 6. The flange-walls of said opening are beveled in order to present a ledge for the said cover or covers to rest against or upon when closed. (See Fig. 12.) A gasket 7<sup>a</sup> is placed in the beveled edge of the flange (see Fig. 12) for the purpose of preventing any considerable amount of air or water entering the receptacle between the edge of the doors and the top plate and reducing the chances of the same freezing to a minimum, so as not to prevent the opening of the cover or covers when required.

The doors or covers are hinged to the top plates, as clearly shown in Figs. 4, 5, and 6, the hinges consisting of the shafts 7 7, made either round or square, but preferably square, supported or revolving in the lugs or projections 8 8 on the under side of the top plate. A sleeve 8<sup>a</sup> is used at the bearings. (See Figs. 5 and 12.) The cover or covers are connected to the shafts by the brackets 9 9, each having a curved member and a straight member. (See Fig. 4.) The straight right-angle member is slipped over the square shafts and held by a collar-pin, but is keyed on when a round shaft is used. This manner of hinging the door or doors has an advantage—namely, of allowing the doors to be closed flush with the top plate without presenting any raised obstacles on the surface of the sidewalk or street.

The cover or covers, as the case may be, are thrown and held open by the weight 11 11, attached to the chains 12 12, secured by the lever-arms 13 13, secured on the shaft 7. (See Fig. 4.) Suitable wheels 14 are used for the chain to travel over. (See Fig. 4.)

When two doors are used, as shown in Fig. 1, it will be observed that one overlaps the other when closed. (See Figs. 7, 8, and 9.) In that case the overlapping door is provided with the lip or lug 15, with horizontal member, (see Fig. 9,) which is intended to engage with the groove or screw cam-wheel 16, which serves as the locking and unlocking device. This cam-wheel is provided with a spindle having bearings in the yoke 16<sup>a</sup> and top plate. (See Fig. 8.) The end extending through top plate is provided with a five-sided (more or

less) nut, by which the cam-wheel is turned by a wrench. When the cover or covers are closed and the cam-wheel is turned in direction of arrow, Fig. 7, the long arm of the lip will be under the groove of the cam-wheel, and as the said wheel is turned farther around it will forcibly draw down the doors and press them tightly upon the heretofore-mentioned gasket-packing. By reversing the movement of the cam-wheel the covers are quickly unlocked, and as soon as the cam-wheel releases its hold thereon the covers will by reason of the weights before mentioned fly open. Should the covers become stuck to the top plate from frost or other causes, the cam-wheel will while unlocking have sufficient force to free the door or doors from their frozen condition.

Numeral 20 represents the inlet or supply pipe, being a branch from the main or reservoir. (Not shown.) This branch pipe enters the receptacle or box at 20<sup>a</sup> or at any convenient place at or near the bottom, as shown in Fig. 1, and to prevent any dirt or water entering the receptacle through the hole cut (purposely large to allow for contraction and expansion or being disturbed by action of frost) for the pipe I surround the same with a collar 20<sup>b</sup>, placed on the outside of the box. (See Fig. 2.) This branch main pipe 20 extends within the box to about the center of same, at which point it separates into three branches 21, 22, and 23. (See Fig. 3.) Each of said branches is provided with a gate-valve 24. The center branch 22 is the largest in diameter. This order may be changed in some cases, as it might be desirable to make the outer branches the largest in diameter. These branches are each extended from the valve and curved upward (see Fig. 2) and carried up on a straight line to point 22<sup>a</sup>, where they are each again given a curve inward until the upper edges come at or near the top of the box. (See Fig. 2.) The three branches referred to above may branch off from the main branch or from hydrant or stand-pipe at any desirable point. The branches or stand-pipes are collectively held to the box by the strap or yoke 26 and are also fastened at the bottom of the box, as shown.

The open ends of the branches or stand-pipes are each provided with a hollow nipple 27, (see Fig. 14,) having threads cut on the outside circumference, and a central collar 27<sup>a</sup>. All but two threads of the threaded portion 27<sup>b</sup> is cut out at three points 28, (see Fig. 14,) below the bottom of the threads. Over these nipples are placed the nozzle-caps 29. (See Fig. 13.) The hollow ring or cap part 29<sup>a</sup> of each cap is provided with threads around the inner circumference, and the threaded side or wall of this cap is cut away at three places 29<sup>b</sup> to a depth equal to that of the said nipple. The manner of using these nozzle-caps is obvious, and the object of forming them in this manner is to enable them to be quickly removed and replaced, which is essential with

fire-hydrants or stand-pipes. Each nozzle-cap is provided with a turning-nut, made five-sided or any other shape, for turning the same by a wrench. The chain is used to retain the nozzle-caps to their respective branch-pipes.

The gate-valves 24 are each provided with a dripping device, which not only drips the stand-pipe, but also the valves. This dripping device consists in forming in each valve the orifice 32, leading into space 34 in the bottom of the valve. (See Fig. 15.) A vertical opening 36 is cut through the bottom of the valves, leading from the outside to the space 34. Into this opening 36 is placed a valve 37, with upper and lower stem. The latter holds a spring for closing the valve. When the gate 40 is raised to open the gate-valve, the small dripping-valve is closed by the spring for the purpose of preventing the water in passing from inlet to branch or branches flowing through hole 36<sup>a</sup>. The gate is provided with an extension at the bottom for pressing down the upper stem of dripping-valves for opening the same.

Numeral 42 is the street-cleaning pipe, tapped into the branch main at 43 and provided with a stop-cock 44. The vertical member of this pipe extends upward to the top of the receptacle or box.

Numeral 46 is the street-sprinkling pipe, tapped into the branch main at 47 and provided with a similar stop-cock and a vertical member 49, extending up to the top of the receptacle.

The stop-cocks 44 are provided with a dripping device consisting of the holes 70 and 71, cut in plug and casing. (See sectional view of Fig. 16.) When the same are shut, they permit the water flowing from pipe through the valves and out of the same. The hole 70 in plug is placed at the bottom of the bore. The other hole may run off at any angle or it may be on a straight line. It will be observed that the upper ends of these pipes, with collars, pass through the top of the top plate and nearly flush therewith. (See Fig. 3.) Each of these pipes is covered with an inclined boss that will shed water, (see 51,) on top of which revolves the cover 50, with holes or openings 52, corresponding with hole in said boss. The tops of the covers are provided with nuts of any suitable shape for turning the same by wrench, preferably three-sided, as shown, Fig. 20.

The stems 54 of the stop-cocks extend upward through the top plate and are provided with a shoulder and three-sided nut for turning the same. Underneath the top plate these stems are provided with a suitable packing to prevent water entering the box thereby.

In Fig. 10 the covers 50 close pipes and stems; but in Fig. 20 they only cover the pipes. If the device shown in Fig. 10 is employed, two openings should be cut in the

covers. If the device shown in Fig. 20 is used, only one hole is necessary. By turning the covers the pipes are free to receive the bent pipe end or connection of a hose, as the case may be.

In Figs. 1 and 2 construction the stems 24<sup>c</sup> of the gate-valves extend up through the partition or platform, for the purpose hereinafter mentioned.

In Figs. 18 and 19 the stems of the gate-valves extend up through the top plate after the manner of the street-sprinkling and street-cleaning stems.

The construction shown in Figs. 1, 2, 3, and 19, called the "flush-hydrant system," is provided with an indicating device consisting of a rod 55, partly flexible at or near the lower end, made so by a coil-spring 55<sup>a</sup>. To the under side of the top plate 5 is attached by threads the nipple 55<sup>b</sup>, with a coupling 55<sup>c</sup>. After coupling is put in place a washer 55<sup>e</sup> is inserted, resting against the end of the nipple. The tube 55<sup>b</sup> is then screwed up against it. Through the washer 55<sup>e</sup> (having hole) passes the rod 55, which is also provided with a flexible friction-washer 55<sup>f</sup>, having the same diameter as the bore of the tube, the top of the rod being provided with a cap 56, having a ring to pull said rod up. (See Fig. 17.)

Whenever the receptacle is covered with snow or about to be, the rod is pulled up, as shown in Fig. 17, and the elevated position of which indicates the locality of the box. Should it be run into or be disturbed by any means, it would yield to the blow and would turn upright again when released, ever announcing the locality of the box. The coil-spring of the rod can consist of a solid piece of rubber of same diameter and effect the same result.

Suppose the apparatus is being used by the fire department. In that case the first thing necessary would be to unlock the covers in the manner hereinbefore described, then step into the box or platform, remove the nozzle-cap from the hydrant-pipe, if used, which may not be in some cases, and couple on the hose. Then open the necessary gate-valves.

In Fig. 18 construction it is not necessary to enter the box to couple on the hose or take off nozzle-cap, the nipple being protected by covers to the box. The cap to nozzle need not be used. The opening of the box is the same as in Fig. 1.

The sprinkler and street-cleaner can obtain water for their respective uses without interfering with each other or meddling with the fire system, as each have separate wrenches, which will only fit the nuts of the covers and of the respective pipe-stems.

The partitions or division-floors will effectually keep out the frost from the lower portion or compartment of the box. The valves and pipes leading therefrom being free from water there is no chance of this system or apparatus freezing. In extreme cold weather

the portions of the apparatus containing water that are not drained may be covered with a frost-protecting substance, if deemed necessary.

I am aware I can use an ordinary sewer-manhole cover, round or square, in place of the hinged covers shown. (See Fig. 24.)

A supplementary valve 90 can be placed on the inlet branch from main pipe (see Figs. 2 and 3) should there be no valve on the branch of main leading into box outside of the said box.

The dripping device to the gate-valve is also useful and may be removed and replaced for the purpose of removing the sediments that may collect in the gate-valve.

The flexible gasket may be fastened to the door or doors instead of to the jamb of the top plate.

What is claimed as new is—

1. The combination with an underground box or chamber of an automatically-opening lid or cover flush with the pavement, a branch pipe, a hydrant extending from the branch and terminating below the lid or cover, and a valve for controlling the flow of fluid from the branch through the hydrant, substantially as specified.

2. The combination with an underground box or chamber, of a lid or cover flush with the pavement, a branch pipe, one or more hydrants extending from the branch pipe and terminating below the lid or cover, street service-pipes extending from the water-supply, and means for obtaining water from said street service-pipes without opening the lid or cover of the box or chamber, substantially as specified.

3. The combination with an underground box or chamber, of a lid or cover flush with the pavement, a branch pipe, one or more hydrants extending from the branch pipe and terminating below the lid or cover, street service-pipes extending from the branch pipe up to and terminating on the upper surface of the box or chamber, valves for said street service-pipes located below the pavement-surface and means for operating said valves from the outside without opening the cover or lid of the box or chamber, substantially as specified.

4. The combination with an underground box or chamber of sufficient size to permit of a man entering and making repairs, of a lid or cover flush with the pavement, a branch pipe, a hydrant extending from the branch pipe and terminating below the lid or cover, a valve for controlling the flow of fluid from the branch through the hydrant and located in the lower portion of the chamber, and means for operating said valve, said box or chamber being free from any partition between the valve and the lid or cover, substantially as specified.

5. In an apparatus of the character described, a cover provided with hinges con-



sisting of a bracket provided with a curved member attached to the cover, a straight member journaled on the inside of the box or chamber, and a suitable counterweight for said cover, substantially as specified.

6. In combination with the hinged cover, the lug 15, the locking device, consisting of the grooved cam-wheel 16, revolving on a stud on the under side of the top plate of the box or chamber, substantially as specified.

7. In an apparatus of the character described, the device for throwing the cover open, consisting of the weight 11, attached to chain 12, fastened to the arm 13, secured on shaft 7, substantially as specified.

8. The combination with the top plate of the box or chamber, of stand-pipes for sprinkling and cleaning service, an opening in the top plate of the box or chamber for the end of the said stand-pipe, a cover provided with an opening corresponding to the opening in the top plate, said cover being pivoted so as to be capable of angular movement to cover and uncover the opening in the top plate of the box or chamber, substantially as specified.

9. In an apparatus of the character described, an indicating device for locating the position of the box and apparatus, consisting of a partially-flexible rod, passing through the top plate and into the box or chamber, and means within said box or chamber for maintaining the rod in position when the same is drawn out, substantially as specified.

10. In an apparatus of the character described, the combination of an indicating device for locating the position of the box and apparatus, the same consisting of a partially-flexible rod 55, passing through the top plate of the box or chamber and into a tube 55<sup>b</sup>, supported within the box as shown, a flexible friction-washer secured in the tube, and a similar friction-washer secured to the rod, substantially as specified.

11. The combination with the valve of any of the hydrant or service pipes, of a draining device consisting of the orifice 32, leading into the space or chamber 34, below the seats of the valves, an opening 36, provided with a

valve 37, provided with a stem, against which the main valve impinges, and a lower stem carrying a coiled spring, substantially as specified.

12. In an apparatus for receiving, controlling, directing, conveying and discharging water or fluids, under pressure or by suction, the combination of the following parts: the receptacle or box, with nearly water or air tight sides and bottom and placed beneath the sidewalk or street, and provided with top plate, having flexible gasket and cover or covers, hinged thereto in the manner described, the partition, the sewer-trap provided with check-valve; and connected to the sewer or cistern opening of said box; the main reservoir or branches therefrom partly entering the box; the curved or straight hydrants or stand-pipes, branching from main pipe, and extending nearly up to the top of box; said stand-pipes provided with gate-valves, having the herein-described drip-valves, the nozzle-caps placed over the ends of stand-pipe, in the manner described and shown; the branch pipes of the main pipe used for sprinkling and cleaning purposes, provided with stop-cocks with dripping device described; the revolving covers placed on top plate of box, over the mouth of the street cleaning and sprinkling pipes for the purpose set forth; the cover or covers locking device, consisting of the cam-wheel pivoted to the top plate and acting on lip or cover; the device for throwing open doors consisting of a weight on chain, revolving on wheel, and an arm on hinge-shaft; the guard attached to covers, and the indicating device, consisting of a partly-flexible rod, moved up and down in the manner shown, and described all arranged to effect the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 17th day of February, A. D. 1897.

ALONZO STOCKBRIDGE GEAR.

Witnesses:

MARIE JOSEPHINE GEAR,  
JOHN H. DALE.