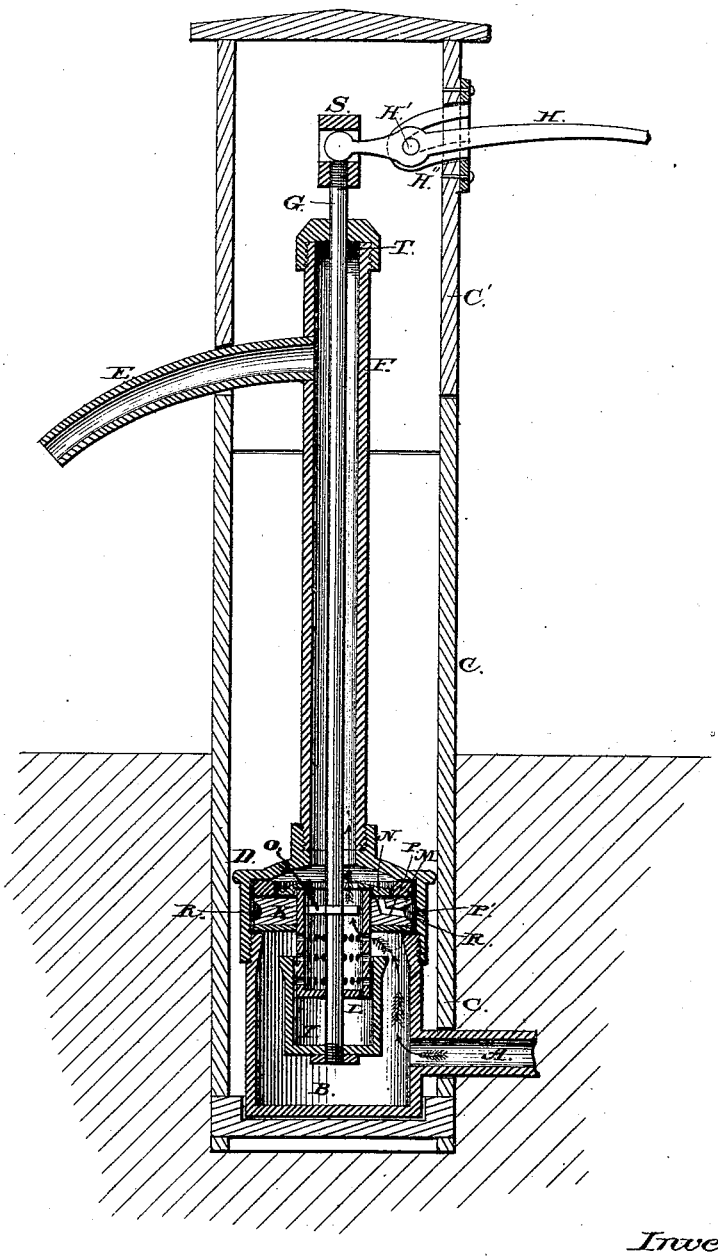
H. FLINT.

HYDRANTS.

No. 194,814. Patented Sept. 4, 1877.



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HENRY FLINT, OF KEOKUK, IOWA.

IMPROVEMENT IN HYDRANTS.

Specification forming part of Letters Patent No. **194,814**, dated September 4, 1877; application filed June 30, 1877.

To all whom it may concern:

Be it known that I, HENRY FLINT, of Keokuk, Iowa, formerly of St. Louis, Missouri, have invented a new and useful Improvement in Hydrants.

This is made substantially as set forth hereinafter, referring to the accompanying drawings, in which the figure is a vertical section of the hydrant.

This invention relates to a self-closing hydrant, for use in cities having water-works; and consists in improved construction and features, as set forth and claimed hereinafter.

The service or delivery pipe A from the water-main bearing water under pressure enters the chamber B. This, for out-door use, is set under ground in a boxing, C, which may be packed with straw or sawdust in winter to avoid freezing.

The lower end of the hydrant enters and is connected securely to chamber B by a cap, D, which closes over it, and is held by a screw-thread or otherwise. The cap D is the lower end of the upright part of the hydrant-pipe F. It is connected and disconnected with the base-chamber B through the boxing C without digging or other trouble, by simply screwing it on or off the base, using the spout E as a crank after removing the upper portion of the boxing C′. All the parts of the hydrant are connected so as to be removed by this action.

The upper part of the boxing C′ is made readily detachable by removing screws or otherwise, so the hydrant may be removed for any purpose.

The hydrant is operated by means of a rod, G, which runs down in the center of the pipe F, and projects at the top with endwise or thrust movement. This rod is moved down to let the water flow by means of a lever, H. This is inserted through the top boxing C′, which has an escutcheon and key-hole which just permits the insertion of the end of the lever with projecting pivot-bearings at the sides or other arrangement for the purpose. This lever has fixed pivots H′ projecting from its sides near its end, arranged so it may be inserted as a key and used for discharging water, and then removed as a key, leaving the hydrant locked effectually.

There is a part, H″, projecting inward from the boxing on each side of the lever-hole, which contains slotways for the lever-pivots H′, so that the key-lever may have bearings so near its end that, no matter what the pressure of water is on the hydrant, there will be leverage enough in the handle for a child to operate it readily. The boxing C and C′ is made of wood or other material.

The rod G bears a cup, I, at its lower end. This projects down into chamber B. Its top has an enlarged bearing to act against the face of a plate, K, which acts as a valve on it, having a rubber face for bearing and packing. The plate K bears a cup, L, solidly forming part of it. This projects down into cup I, and fits it so as to move freely up and down in it with little space between, but without reaching the bottom of cup I, when the plate K rests on the top of cup I, closing it. The cup L has rows of holes drilled in its sides around it in spiral or inclined lines, so as to let the water flow into cup L through them, when the plate-valve K is raised from its seat on the top of cup I. The inclination of the lines of holes permits the flow of water to be graduated to any degree by the degree to which the cup I may be pushed down by rod G from the cup L, making the increase easy and gradual.

The plate-valve K, having the rubber face below, rests on the top edges of bowl B, so as to pack it all around. Its upper edges rest against an annular packing-ring, M, which rests against a bearing in the top of cap D. When the cap D is screwed down onto bowl B it compresses this plate K and its packing, above and below, between the two, securely closing the joint between them. This prevents the escape of water out of the bowl B, between it and cap D, or up the pipe F, except through the cup L, when the cup I is pressed down. The pressure of the water in bowl B presses the cup I up against the packed face of plate K as a valve, preventing the escape of water through the hydrant.

When the rod G is forced down by lever H

it pushes the cup I down in proportion to the degree of pressure on the lever. This exposes a proportionate part of cup L, with more or less of its holes. Through these the water escapes, so as to pass up the pipe F, as shown by the lines of the two arrows in the drawings. When the pressure on the rod G is removed, the pressure of the water forces the cup I up against its seat and closes all. The space between the bottoms of cups I L is filled with water, which takes a little time to escape. This forms a water-cushion to relieve the reaction of pressure and shock on the pipes in suddenly closing the hydrant.

The central stem G is often made of pipe, instead of solid, open into bowl B below and closed above, to contain air. This forms an air-cushion for the same purpose.

The rod or stem G bears arms O. When the stem is pressed down these descend into cup L free of contact. When the stem rises and hydrant is closed, these rise and lift a flat ring, N, which rests on plate K. This exposes a leak-hole, P, which discharges into a groove, R, around the edge of plate K. This groove discharges into a leak-hole, P′, in the cap D, however the plate K may be turned. This action allows the water in pipe F to escape, to avoid freezing whenever the hydrant is closed. As soon as the hydrant is opened, the arms O let the ring-valve N down on its seat, and close the leak entirely. The leak and hydrant thus act alternately only, so there is no leakage while the hydrant is running. The pressure of water holds the valve N down secure when the water is flowing.

The cup I is adjusted on the rod G by a screw-thread and nut to any degree. By screwing the cup I upon this stem the leak-valve N may be left on its seat when the hydrant is closed, when desired.

The stem G has a stirrup-block, S, which screws onto its top to receive the end of lever H to operate the hydrant. This may be removed to take out the stem, and take the parts of the cups and valves below apart. There is a rubber ring, T, in the top of pipe F, around the stem G. The water acts on this below to pack the stem.

The boxing C′ incloses all the operating parts of the hydrant, so they cannot be operated except by the removable key H. When water for a hose or other continuous stream is desired, the handle H is fastened up, so as not to require it to be held continuously.

The hydrant-boxing parts below spout E, so that the portion C′ above is removable. This enables the spout E to be used as a handle to screw on or off the hydrant to or from the bowl B below. The packing K and bearings are arranged so this can be readily done.

I claim—

1. The hydrant with cups I and L, valve-seat K, and stem G, arranged to operate together, substantially as set forth.

2. The inclosing valve-cup I, combined with the cup L, having holes arranged in graduated order, so as to regulate the flow of water, as set forth.

3. The hydrant with a packing acting against the edge of bowl B and top of cap D, combined with a screw or other means of connecting the bowl and cap, substantially as set forth.

4. The hydrant with leak and groove R and outlet P′, to enable the water to escape whatever may be the position the leak P is turned to, substantially as set forth.

5. The hydrant, with valve-stem G through outlet-pipe F, and with packing part T arranged to be operated by the water, substantially as set forth.

6. The hydrant with a valve, I, to open against water-pressure, in combination with a water-chamber, against the contents of which the valve must act in closing, arranged to form a water-cushion to relieve reaction in closing, substantially as set forth.

7. The hydrant combined with leak-hole P, valve N, and arms O, substantially as set forth.

8. The hydrant with central pipe and a spout arranged to act as a handle, for attaching it to and removing it from its base, combined with a casing divided and removable below the spout, substantially as set forth.

9. The hydrant having separately-removable key-lever handle and casing-top, with an internal bearing for the key-lever pivot in the removable casing-top, substantially as set forth.

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Witnesses:

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