

D. C. CREGIER.
Stop-Gates in Water-Mains.

No. 141,426.

Patented August 5, 1873.

Fig. 1.

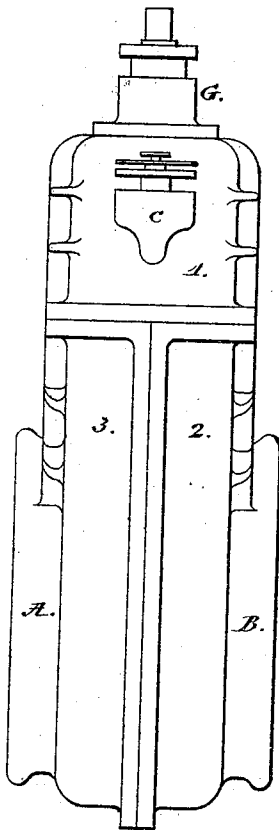


Fig. 2.

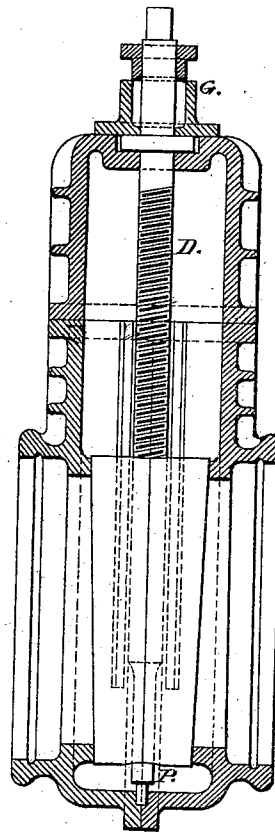


Fig. 3.

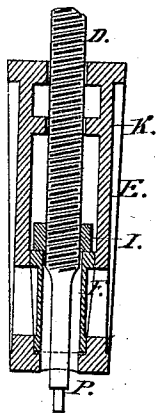
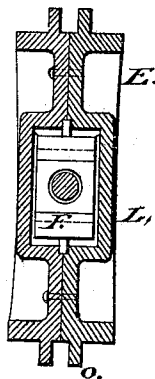


Fig. 4.



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Fig. 5.

Fig. 6.

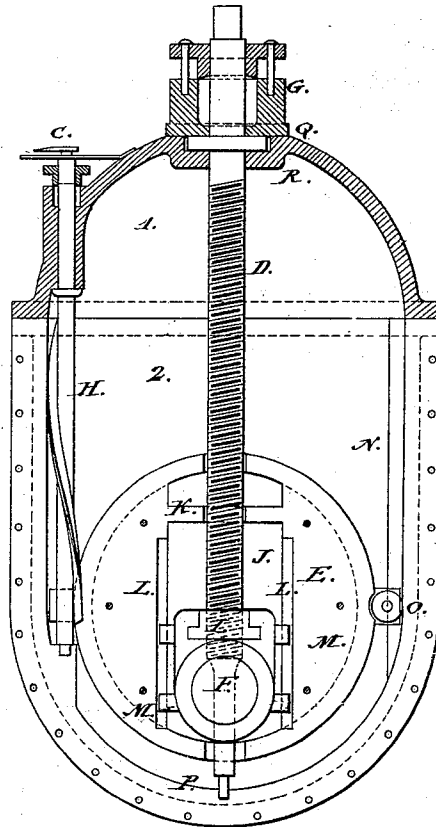
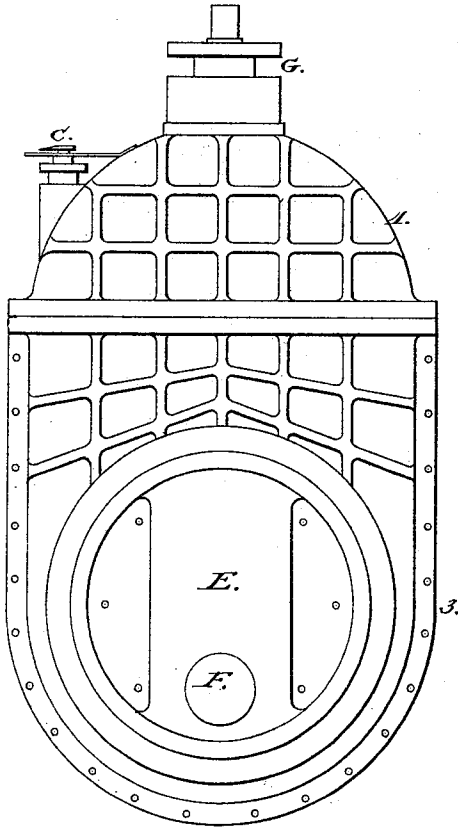
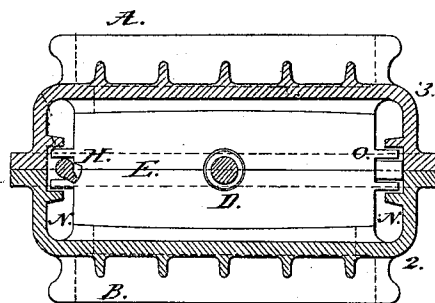
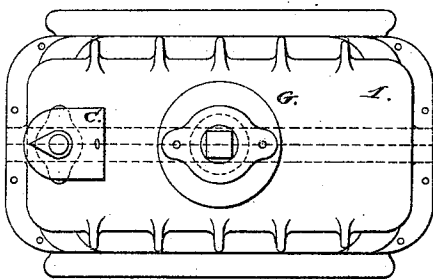


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

DEWITT C. CREGIER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN STOP-GATES IN WATER-MAINS.

Specification forming part of Letters Patent No. 141,426, dated August 5, 1873; application filed May 17, 1873.

To all whom it may concern:

Be it known that I, DEWITT C. CREGIER, of the city of Chicago, State of Illinois, have invented an Improved Stop-Gate for Water-Mains; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a central vertical section of the case; Fig. 3, a vertical section of the valves; Fig. 4, a horizontal section of the main valve; Fig. 5, a front elevation; Fig. 6, a transverse vertical section; Fig. 7, a plan or top view; Fig. 8, a horizontal section of the case just above the valves.

The same part is marked by the same letter of reference wherever it occurs.

The drawings represent a valve or gate for a thirty-six-inch main. The device, however, is applicable to all sizes of mains, and will be found useful for smaller sizes.

In all water-gates the power required to open and close them is in proportion to the hydrostatic head to which they are subjected; hence, in order to operate them when under heavy pressure, it has heretofore been considered necessary to transmit power to the operating-screw through intermediate gearing, as, under an ordinary head of one hundred and fifty feet, the valve or gate of a thirty-six-inch main would, without counteracting pressure, be subjected to an aggregate load or pressure of thirty-three tons. To overcome this resistance a multiplicity of gearing has been resorted to, which renders the devices intricate and expensive, and further objectionable because unskilled laborers are usually employed to operate them, and such persons are liable to turn the wrong way and injure or strip the screw-thread, disable or buckle the working-shaft or break the gearing, and thus render the gate useless, and, for a time, also, an important main. This is more especially the case where the gate has no reliable "tell-tale" to indicate its relative position. My improvements obviate these objections and difficulties, and improve the gate in its adaptation to water-mains and other pipes.

The nature of my invention consists in so constructing the gate and combining it with the exterior case that no gearing whatever is

required to operate it; in the direct application of the power by means of a single screw, so that one man can operate it notwithstanding the great pressure; in arranging a small valve within a larger one, so that both are operated by a single screw; in combining with the case a tell-tale or indicator, and in the several combinations hereinafter claimed as new.

In constructing my improved valve, I make the case of three parts, two sides and a top, marked respectively 1 2 3, thus forming a large interior chamber, as shown in Figs. 2 and 6. A B represent bells for connecting the main; C, the top of the indicator; D, working-shaft or screw-stem passing through the valves, as shown in Figs. 2 and 3. E is the main valve; F, the supplemental valve; G, the stuffing-box and gland; H, the indicator-shaft provided with a spiral feather. I is a nut on the supplemental valve F, by which this valve operated. J is a chamber or passage in the main valve for operating the supplemental valve. K is a bar to limit the independent movement of the valve F, and for raising the main valve E. L is a guide, which, with the ears or projections *m*, serves to guide and support the supplemental valve. N marks the guides for the government of the valve E. O is an anti-friction wheel to be used when the case is placed in an inclined or horizontal position. P is a step or bearing for the lower end of the screw-stem D. Q is a ring or ledge on stem D, between the case and the stuffing-box; and R is a recess in the top of the case for ring Q. The entire gate may be made of iron or suitable metal; but I prefer to make the stem D and nut I of brass, and to face the valves E and F with brass, to prevent corrosion and sticking, and therefore the difficulty of operating resulting therefrom. Both valves E and F are made thicker at the top, or wedge-shaped, as shown in Figs. 2, 3, and 4. The valve E is made in halves, as shown, while the valve F is cast in one piece and provided with a hole for the passage of the stem D, as shown in Fig. 3, and with jaws or grooves on the top for the reception of the nut I, as shown in Fig. 6.

The case 1 2 3 is made of cast-iron, and planed at the joinings, so as to come metal to metal without packing, and is provided

on the exterior surface with ribs to give it the required strength. The sections are fastened together by bolts or rivets, or by both, passing through at suitable points. The top of the case is slightly depressed, and provided with a recess, R, for the collar Q so as to bring the stuffing-box immediately over it, and give the stem a bearing in either direction by the same fastenings which secure the stuffing-box to the case. The stuffing-box is provided with a packing-chamber and gland, in the usual manner. The tell-tale or indicator-shaft H is provided with a stuffing-box at its upper end, and its lower end is journaled in a suitable step, as shown in Fig. 6. It is also provided with a spiral feather, which passes half-way around it, and engages with a slot in or with ears or lugs attached to the main valve so as to turn the shaft as the valve is made to ascend or descend, and show by the index at its top the exact position of the main valve, said index having a finger and dial to show the position of the valve at all points. The valve F is eight inches in diameter, while that of the main valve is thirty-six inches; and I use about the same relative proportion to the main valve when the size of that valve is changed. A positive movement is given to the stem D when turned in either direction by means of the ring or collar Q; and by making the recess R in the case, as shown, the collar-chamber is formed by simply bolting on the stuffing-box G, and the use of one set of bolts or fastenings.

In operation, power is applied to the upper end of the stem D by the use of a suitable wrench, which is turned with the sun or in a natural direction, in order to raise the valve. The turning is continued until the nut I or valve F comes in contact with the bar or shoulders K, when it is discontinued sufficiently long for the water to fill the main beyond the valve, and relieve the valve of the pressure on one side and establish an equilibrium. The turning is then resumed, and the main valve is lifted by hanging on the nut I of the valve F inside thereof until it is entirely out of the way. In order to close the valve, the turning is reversed. The main valve E comes to its seat by its own weight, and the supplemental valve comes to its seat partly by its gravity and partly by force from the screw-stem. When it is down the screw will then force both valves to

their seats. By this arrangement one man can operate a valve for a thirty-six-inch or larger main under heavy pressure; and as the main valve is wedge-shaped, it comes to its seat before reaching the bottom of the case or chamber, so that any sand or sediment which may have accumulated in the case will not interfere with the operation of the valves. The "tell-tale" index is so arranged that it will point from the case when the valve is down, and toward the case when it is up, so that the position of the valves may always be known.

In practice, I usually set the case at an angle so as to be able to bury it below frost at a less depth, and to partly relieve the stem from the weight of the valves when elevated; but it may be placed either vertical or horizontal, or in any other desired position.

I am aware that a valve has been heretofore used which was made in two parts, and each part provided with and operated by a separate gearing; but this is complicated and expensive in its structure, difficult and unsatisfactory in its operation, and liable to get out of order and leak. I make no claim to such a valve.

What I claim as new, and desire to secure by Letters Patent, is—

1. The main valve E, when provided with an interior recess or chamber, J, guides L, and impinging bar or projection K, substantially as specified.

2. The combination of the main valve E and supplemental valve F with the stem D and outer case, so as to operate both valves by a single stem, substantially as set forth.

3. The combination, in a water-gate, of the shaft H, provided with a spiral feather, with the valve E, stem D, and indicator C, substantially as specified.

4. The stuffing-box G, when attached to the case so as to form a chamber or recess, R, in combination with the stem D and ring or collar Q, substantially as and for the purposes specified.

The above specification of my said invention signed and witnessed at Chicago this 15th day of May, A. D. 1873.

DEWITT C. CREGIER.

Witnesses:

ALBR. BECHER,
ROBT. FARON.