D. T. PERKINS.
Water-Gate.

No. 217,954. Patented July 29, 1879.

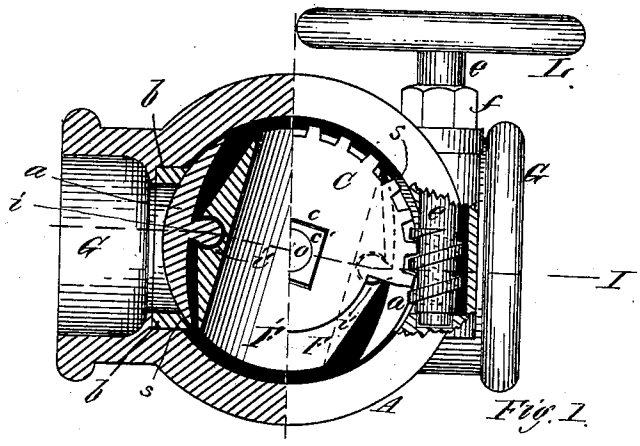


Fig. I.

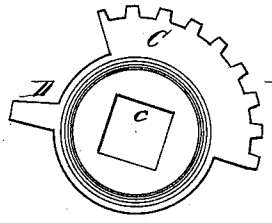


Fig. II.

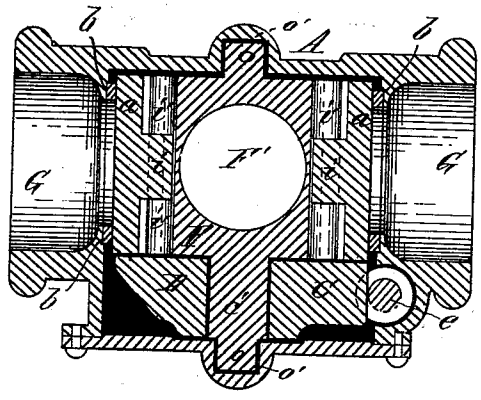


Fig. III.

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UNITED STATES PATENT OFFICE.

DUANE T. PERKINS, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN WATER-GATES.

Specification forming part of Letters Patent No. **217,954**, dated July 29, 1879; application filed December 28, 1878.

To all whom it may concern:

Be it known that I, DUANE T. PERKINS, of Springfield, in the State of Massachusetts, have invented a new and useful Improved Water-Gate; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

My invention relates to a water-gate having a plug with a hole made transversely through it for a water-passage, and having on opposite sides thereof movable valves, hinged thereto, said plug moving upon trunnions within a shell, and the hinged valves being forced against corresponding seats at the orifices, which open into the shell to close them when the plug is rotated in one direction, and being drawn away from the seats to open the orifices when the plug is rotated in the opposite direction, as will be more fully hereinafter explained.

Figure I is a half end view with the cover removed and a portion of the operating-spindle socket broken away, and a half vertical section through one orifice, valve-seat, and valve. Fig. II is a front view of the toothed segment which holds the valves in place, and by which the plug is rotated; and Fig. III is a horizontal section of my invention at line I of Fig. I.

In the drawings, A represents the shell, having two water-way connections, G, one opposite the other, by which to make connections with an ordinary water-pipe, and which communicate with the shell A through orifices, at which there are fixed the seats *b*, and these seats are arranged to project into the shell a short distance, that side of each seat marked *s* projecting into the shell somewhat more than its opposite side, as seen clearly in the drawings.

The plug F, having a trunnion, *o*, at each end, moving in bearings *o'*, is made somewhat smaller in diameter than the interior of the shell A, and is provided on two opposite sides with a cylindrical recess, *i'*, and the valves *a*, whose outer convex sides are made to fit closely the concave form of the seats *b*, are provided on their inner concave sides with a cylindrical projection, which fits into the corresponding cylindrical recess *i'* in the plug, so that when the valves are in place they may have a rocking movement, the projection *i* on each valve acting as the pivot upon which the valve rocks.

The plug has a toothed segment, C, secured to its stem c^1, and may have also a projection, D, thereon, which, when the segment is in place, serves to hold one of the valves *a* in its proper position, the segment itself operating to hold the other valve in position.

The plug is rotated in its trunnion-bearings *o'* in the shell by means of a worm-spindle, *e*, with a winch or hand-wheel attached, the worm or thread of which engages with the teeth of the segment C, as shown clearly in Fig. I.

When the plug is turned into a position with the hole F in line with the two ways G, a straight water-passage is provided for the water through the gate; but when the plug is rotated in the opposite direction, as the valves *a* approach the seats *b* they move upon their pivots *i*, to adapt themselves to the curved incline of the seats, until the valves become so firmly wedged in between the plug and the seats that the plug can be moved no farther, and the valves are then firm against their seats to close the orifices.

When the plug is rotated in the opposite direction to open the valves, as soon as the plug commences to turn, the valves are moved away or loosened from their seats, so that an outlet and inlet are made at the very first movement of the valve, and the water-pressure being thus relieved, the plug is rotated to completely open the gate with little or no friction.

The cylindrical recesses *i'* in the plug being more than a half-circle in their cross-section, and the projections *i* on the valves being of a corresponding form and made to fit the recesses closely, it is evident that the attachment of the valves to the plug cannot be made, nor can the valves be removed therefrom, or be detached therefrom, except by sliding the projections *i* endwise out of the recesses, so that by this peculiar attachment of the valves to the plug the former are pulled directly away from their seats at the first movement of the plug, and the water-pressure against the valves is entirely removed at the begin-

ning of the rotary movement of the valve and plug.

The advantages of this feature will be more fully appreciated in large gates, such as are used in water-mains and the larger pipes conveying large columns of water, where the pressure is very great and great force is required to open the ordinary gates used, but which, when the gates are constructed as hereinbefore described, may be operated as easily as those in the smallest pipes, as there is no friction in either resulting from water-pressure upon the valves.

Having thus described my invention, what I claim as new is—

1. In an improved water-gate, the perforated plug F, operating in bearings at each end, in combination with the valves *a*, pivoted or hinged to the said plug, the shell A, and the seats *b*, projecting into the shell A, more at one side than at the other, in the form of a concave incline, whereby the said valves are driven or forced against their seats firmly to close the orifices by the rotary movement of the plug, substantially as described.

2. The combination of the plug F, provided with the cylindrical recesses *i'*, and the valves *a*, provided with the cylindrical projections *i* to fit said recesses, whereby the said valves are confined securely to the said plug, and are yet capable of a rocking movement, substantially as described.

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