

No. 646,446.

Patented Apr. 3, 1900.

A. G. MATHER & W. W. McCALLUM.

MEANS FOR AUTOMATICALLY OPENING OR CLOSING GAS COCKS.

(Application filed July 1, 1899.)

(No Model.)

Fig. 1.

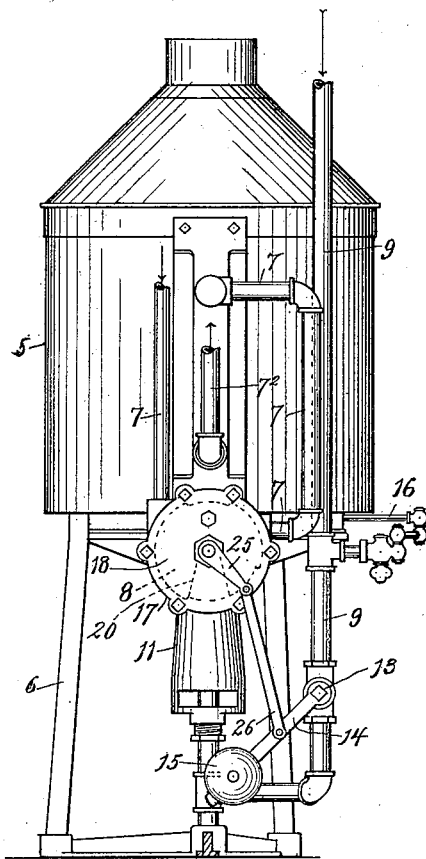


Fig. 2.

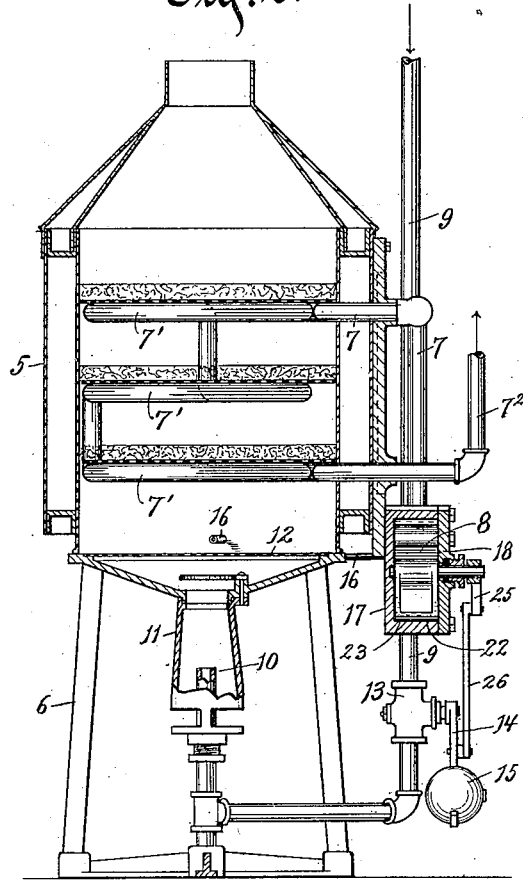
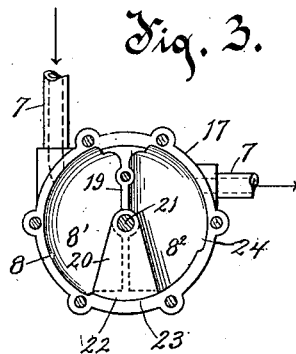


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## MEANS FOR AUTOMATICALLY OPENING OR CLOSING GAS-COCKS.

SPECIFICATION forming part of Letters Patent No. 646,446, dated April 3, 1900.

Application filed July 1, 1899. Serial No. 722,593. (No model.)

*To all whom it may concern:*

Be it known that we, ALLAN G. MATHER and WILLIAM WARNER McCALLUM, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Means for Automatically Opening or Closing Gas-Cocks, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

In connection with a water-service system it is common to provide means for heating water in a pipe forming a part of such system, the heated water being adapted for general household purposes, and this heating of the water is accomplished by the combustion of gas, the gas being supplied from a burner connected with a gas-service system, and it is convenient and desirable to have an apparatus provided adapted automatically to turn on and shut off the gas by means of the action of the water in the water system induced by starting and stopping the flow of the water.

Our invention relates chiefly to the improved valve and its connections in the water system adapted to be actuated by the flow of the water and being actuated thereby to open a gas-cock and to permit of its being closed when the flow of the water acting on the valve ceases.

We illustrate our improved valve and the related apparatus in connection with so much of a water-service system and a gas-service system as is desirable to clearly show our invention and its operation.

The invention consists of the device, its parts and combination of parts, as herein described and claimed, or the equivalents thereof.

In the drawings, Figure 1 is an elevation of an apparatus, in connection with water and gas systems, embodying our improved valve and its connections. Fig. 2 is a central transverse section of the same apparatus and improved valve and its connections, the section being at a right angle to the view shown in Fig. 1. Fig. 3 is a detail of our improved valve, the head or one end of the valve-cylinder being removed, exposing interior construction.

In the drawings, 5 is the case of a heater, supported on a frame 6. A water-pipe 7 leads into and through the valve-chamber 8 and thence into the upper portion of the case 5, where it is preferably arranged in a series of coils 7' and continues therefrom in the pipe 7<sup>2</sup> to the place of discharge. A gas-pipe 9 from the gas-service system leads to a nozzle 10 below the coils of water-pipe and discharges its gas upwardly through a burner-tube 11 against and through a perforated plate 12, above which the gas is ignited and burns. The gas-pipe 9 is provided with a rotatable plug gas-cock 13, which gas-cock is provided with a laterally-extending arm 14, having thereon an adjustable weight 15. This arm 14 and weight 15 are adapted normally to hold the gas-cock 13 in such position as to shut off the flow of gas through the pipe 9. A small gas-pipe 16, leading from the gas-pipe 9 in front of the cock 13, terminates in the case 5, just above the plate 12, and discharges gas therefrom constantly, which is lighted and burns continuously with a very small flame directly above the plate 12 and is adapted to ignite the supply of gas that is discharged upwardly through the plate 12 from the nozzle 10.

Our improved valve in the water system, adapted to open and permit the closing of the gas-cock 13, is located in the pipe 7 and is so arranged that water running through the pipe passes through the chamber 8 of this valve. The valve is conveniently constructed in cylindrical form, one head 17 and the circular perimeter of the valve-chamber being constructed integrally and the other head 18 being bolted to the open end of the perimeter of the cylinder. On the inside of the valve-chamber there is a partition-wall 19, extending longitudinally interiorly across the valve-chamber and laterally from one side of the cylinder partially across the chamber. This partition is permanent in the cylinder. As a continuation of this partition 19 across the cylinder, dividing the chamber normally into two compartments, there is a hinged leaf 20, which is pivoted adjacent to the edge of the partition 19, the pivot-pin 21 being preferably in the longitudinal axis of the cylin-

der. The leaf 20 extends therefrom to the curved outer wall of the cylinder and from end to end of the chamber thereof. The leaf 20 is preferably provided with an enlarged or laterally-extended outer edge 22, fitted to the interior curved surface of the cylinder and movable substantially water-tight thereon. The ends of the leaf 20 also fit substantially water-tight, but movably against the heads of the cylinder. The water-supply pipe 7 enters that compartment 8' of the chamber of the valve that is at the left in Fig. 3, and thence passing into the compartment 8<sup>2</sup> is discharged therefrom at the right in Fig. 3 through the pipe 7, leading to the coils 7'. Opposite the leaf 20 the wall of the curved portion of the cylinder is carried inwardly slightly, as shown at 23 in Fig. 3, forming a surface on this curved wall of the cylinder, against which the leaf fits movably, and this surface extends around toward the right or in the direction of the movement of the water for a distance toward the discharge-port, and beyond this raised surface the wall of the perimeter of the cylinder is cut away, as shown at 24 in Fig. 3, so that when the leaf has by the action of the water been carried around to the cut-away portion of the wall of the cylinder there is a considerable aperture or space between its outer edge and the wall of the cylinder, so that the water therein can flow freely past the cylinder into the compartment 8<sup>2</sup> and out through the discharge-pipe. The pivot-pin 21 is secured rigidly to the leaf 20 and has its bearings in the heads of the cylinder and extends through the outer head 18 in a stuffing-box therefor and on its outer extremity is provided with a crank-arm 25, connected at its outer extremity by a rod 26 to the arm 14 medially, the construction being such that the swinging of the leaf 20 toward the right in the chamber 8 under the action of the flow of water through the chamber lifts the arm 14 and opens the gas-cock 13, and when the flow of water through the chamber is stopped the leaf 20 returns to its normal position (shown in Fig. 3) by gravity, aided to some extent by the backlash of the water in the service-pipe.

What we claim as our invention is—

1. In apparatus for heating water in a water-service system, the combination of a water-service pipe, a chamber in the line of the service-pipe a portion of the wall of which chamber is a segmentally-curved bearing-surface the wall of the chamber being cut away following the bearing-surface, a leaf pivoted in the chamber at a distance from and opposite said curved bearing-surface, the leaf being adapted to fit normally movably on said bearing-surface and under the movement of water in the chamber to be swung beyond and free from said surface, a gas-supply pipe provided with a burner disposed to heat water in the water-supply pipe, a cock in the gas-

pipe and means connecting said water-actuated leaf operatively to said gas-pipe cock.

2. In apparatus for heating water in a water-service system, the combination of a water-service pipe, a chamber in the line of the service-pipe a portion of the wall of which chamber is a segmentally-curved bearing-surface, the wall of the chamber being cut away following the bearing-surface, a leaf pivoted in the chamber at a distance from and opposite said curved bearing-surface, the leaf being adapted to fit normally movably on said bearing-surface and under the movement of water in the chamber to be swung beyond and free from said surface, a gas-supply pipe provided with a burner disposed to heat water in the water-supply pipe, a cock in the gas-pipe, a crank-arm on the pivot-pin of the leaf, and means connecting said crank-arm operatively to the cock in the gas-pipe.

3. In apparatus for heating water in a water-service system, the combination of a water-service pipe, a chamber in the line of the service-pipe a portion of the wall of which chamber is a segmentally-curved bearing-surface the wall of the chamber being cut away following the bearing-surface, a leaf pivoted in the chamber at a distance from and opposite said curved bearing-surface, the leaf being adapted to fit normally movably on said bearing-surface and under the movement of water in the chamber to be swung beyond and free from said surface, a crank-arm rigid to the leaf, a gas-supply pipe provided with a burner disposed to heat water in the water-supply pipe, a rotatable cock in the gas-supply pipe, a radial arm on the gas-cock and a rod connecting the crank-arm on the leaf to the radial arm on the gas-cock.

4. In apparatus for heating water in a water-service system, the combination of a water-service pipe, a chamber in the line of the service-pipe a portion of the wall of which chamber is a segmentally-curved bearing-surface, the wall of the chamber being cut away following the bearing-surface, a leaf pivoted in the chamber at a distance from and opposite said curved bearing-surface, the leaf being adapted to fit normally movably on said bearing-surface and under the movement of water in the chamber to be swung beyond and free from said surface, a crank-arm rigid to the leaf, a gas-supply pipe provided with a burner disposed to heat water in the water-supply pipe, a rotatable cock in the gas-supply pipe, a radial arm on the gas-cock, a depressing weight on the radial arm, and a rod connecting the crank-arm on the leaf to the radial arm on the gas-cock.

In testimony whereof we affix our signatures in presence of two witnesses.

ALLAN G. MATHER.

W. WARNER McCALLUM.

Witnesses:

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