

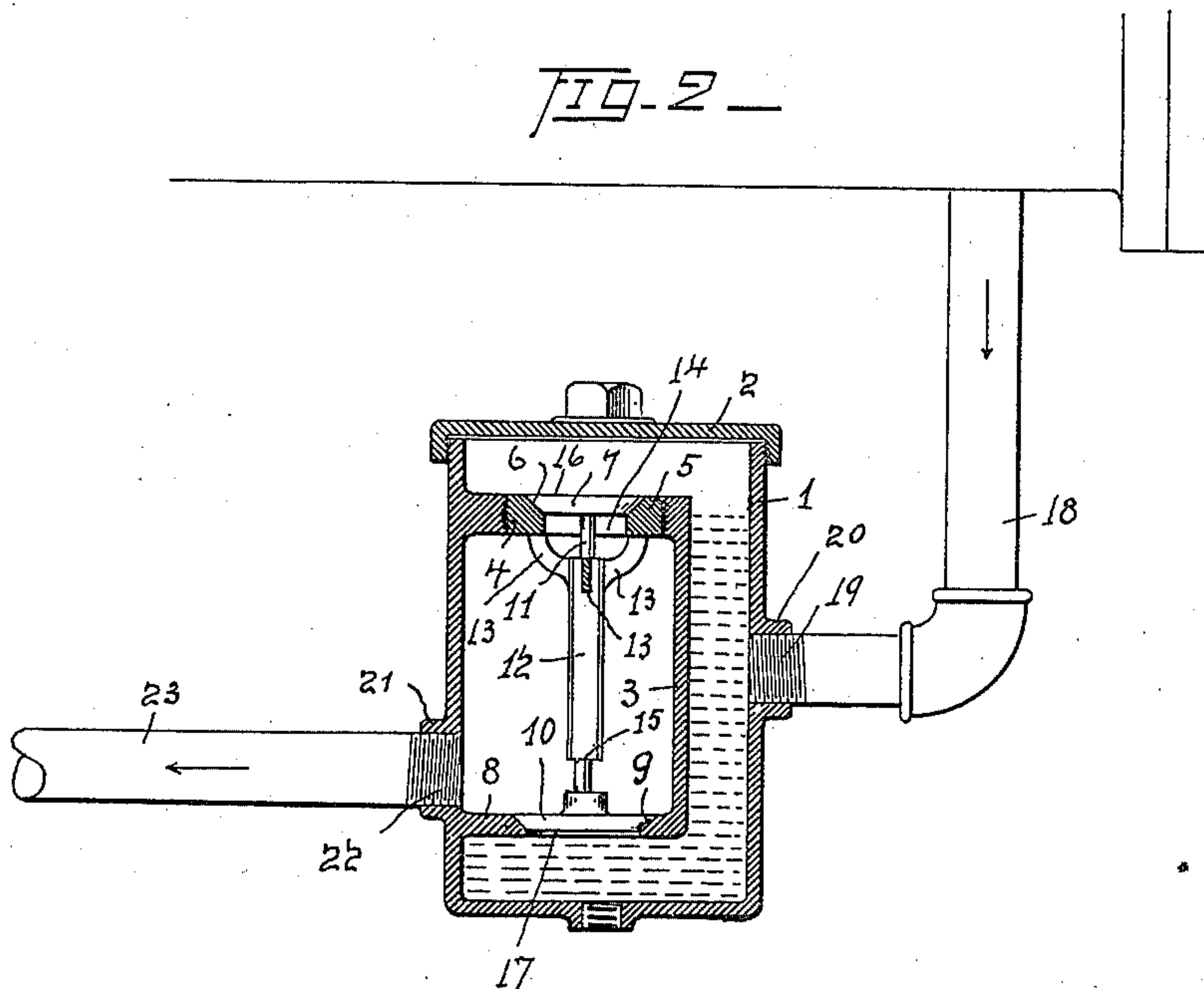
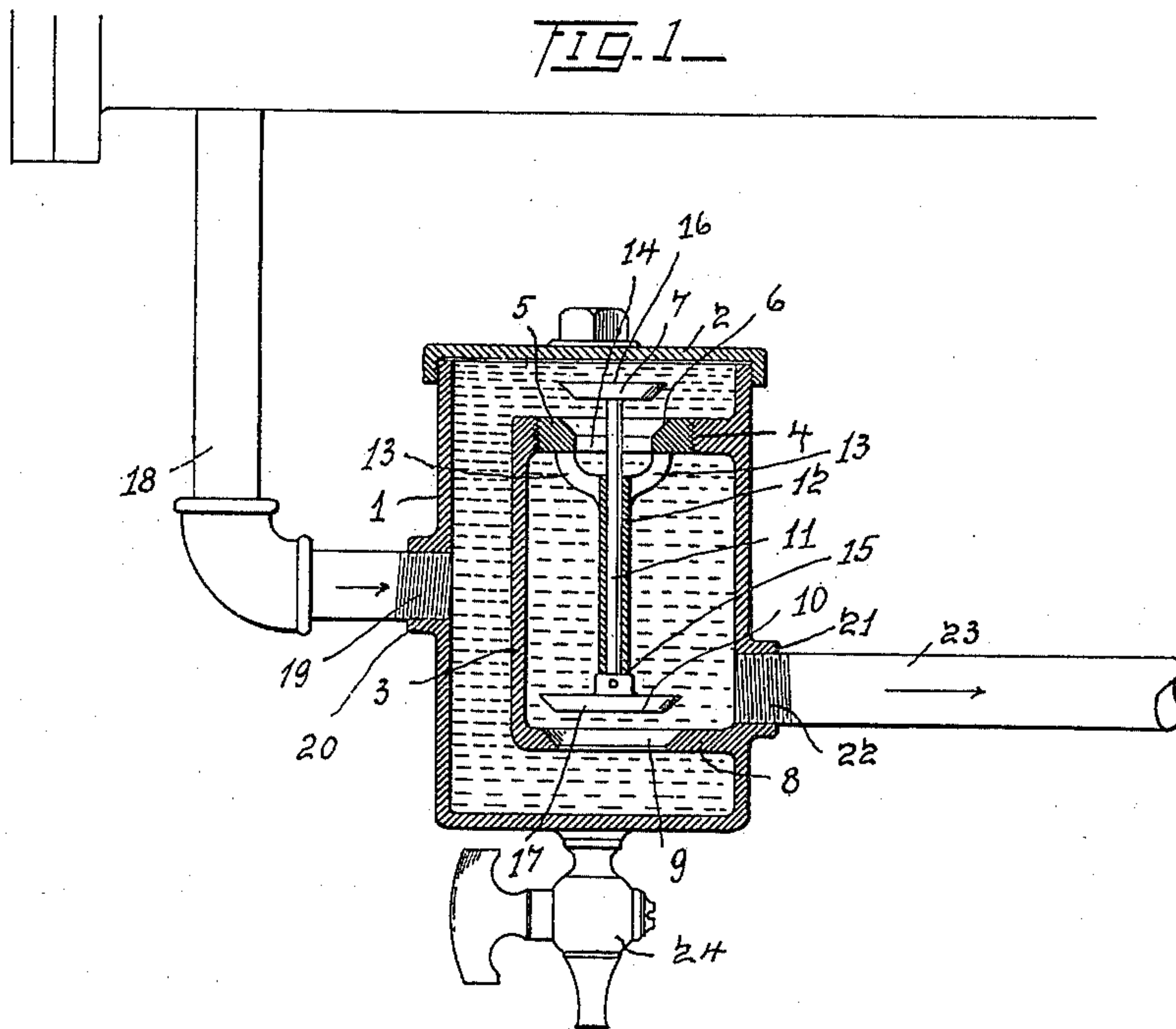
No. 687,794.

Patented Dec. 3, 1901.

C. L. TORREY.
AUTOMATIC CYLINDER COCK.

(Application filed Sept. 5, 1901.)

(No Model.)



WITNESSES—
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UNITED STATES PATENT OFFICE.

CHARLES L. TORREY, OF TOLEDO, OHIO, ASSIGNOR OF ONE-FOURTH TO
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AUTOMATIC CYLINDER-COCK.

SPECIFICATION forming part of Letters Patent No. 687,794, dated December 3, 1901.

Application filed September 5, 1901. Serial No. 74,369. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. TORREY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Automatic Cylinder-Cocks, of which the following is a specification.

My invention relates to an automatic cylinder-cock, and has for its object to provide a device of the kind that is adapted to prevent any dangerous accumulation of water in the cylinder of an engine arising from condensation or accidental flooding from the heater or condenser by draining it from the cylinder as fast as it accumulates and automatically discharging it without loss of steam; furthermore, to provide a simple, inexpensive, and effective device of the kind that may be readily applied to an engine-cylinder. I attain these objects by constructing a cylinder-cock as hereinafter described, and illustrated in the drawings, in which—

Figure 1 is a view in vertical section of an automatic drain-cock constructed in accordance with my invention and showing the valves open to discharge the accumulated water, and Fig. 2 is a like view showing the valves closed.

In the drawings, 1 designates a reservoir of suitable capacity and preferably of cylindrical formation with an integral bottom and is provided with a top-closure 2, which is suitably attached to the reservoir-body.

3 designates a valve-cylinder located eccentrically within the reservoir and integrally connected with the wall of the reservoir at one side and is of a length and diameter to leave an open space above, below, and surrounding the cylinder, except at its connection with the wall of the reservoir, for the free circulation of water or steam, or both. In the top of the valve-cylinder there is formed a threaded opening 4, adapted to receive and engage the closure 5 for the valve-cylinder, and in the closure there is formed a valve-seat 6, which is adapted to accurately receive and seat the valve 7. In the bottom 8 of the valve-cylinder and in vertical alinement with the valve-seat 6 there is formed a valve-seat 9 for the valve 10. Valves 7 and 10 are secured to opposite ends of a common stem 11,

which is of a length adapted to simultaneously seat both valves vertically downward in their respective seats. Stem 11 is guided in an elongated sleeve 12, which is formed integral with the closure 5 and is pendently supported therefrom within the cylinder 3 by means of the spider-arms 13, disposed around the valve-port 14. The sleeve is made of such length that the lower end 15 will operate as a stop for the movement of the valve-stem by contacting with the top of valve 10. The two valves are balanced by making the top face 16 of valve 7 equal in area to the bottom face 17 of valve 10, and by thus equalizing the valve areas exposed to pressure the valves, which are normally seated by gravity, will be held seated by gravity—the steam-pressure being always equal on the two valves—until the weight of the valves is overbalanced by the weight of an accumulated column of water in the reservoir.

The reservoir 1 is connected to the end of an engine-cylinder by a drain-pipe 18, suitably attached to the cylinder in position to drain off all the water from that end and to the reservoir by means of threaded connection 19, formed in the nipple 20, integral with the wall of the reservoir.

21 designates a nipple, also integral with the reservoir-wall and communicating through a suitable port 22 with the interior of valve-cylinder 3, and to the nipple 21 there is secured a discharge-pipe 23 for draining water from cylinder 3 to any suitable place.

To the bottom of the reservoir there is also secured a drain-cock 24 for drawing off all the water from the reservoir should occasion require.

In the operation of my device each end of the cylinder of an engine is provided with an automatic drain-cock constructed and secured thereto, as described, whereby all water accumulating in the cylinder, whether from condensation of steam or accidentally by the bursting of a heater or condenser pipe, is drained into the reservoirs, where it accumulates in each respectively until the weight of the water overbalances the weight of the valves 7 and 10 and their stem. Preferably the weight of the valves is adjusted to be balanced by a column of water of a height to fill

the reservoir and a fixed distance above it in pipe 18. The operation would then be as follows: When sufficient water has accumulated to fill the reservoir above the inlet to the reservoir, the steam in the upper end of the reservoir will be confined therein until the water rises high enough in pipe 18 to open the valves. The steam in the upper part of the reservoir will then escape through the valve 7 and the water through valve 10 into cylinder 3 and thence through the discharge 23. The pressure of steam in the engine-cylinder will force the water downward through pipe 19 until it is below the level at which the weight of the water is sufficient to hold the valves open and they will then close and the pressure of steam in the engine-cylinder will then fill the reservoir, and the valves will remain closed until water again accumulates in pipe 18 to the predetermined height at which its weight overbalances the valves, when they will again open and water will be discharged through both the upper and lower valves until it reaches a level in pipe 18, where the weight of the valves is sufficient to overbalance the weight of the water, when they will again close, after which they will open and close at intervals of time proportioned to the rate of accumulation just sufficient to discharge the overweight of water as it accumulates in pipe 18. In the event of a sudden flooding of the engine-cylinder through its exhaust-ports, occurring from the bursting of a water-pipe in the heater or condenser, the valves of the drain-cock will remain open until the water is fully discharged and prevent the breaking of the engine that is liable to occur from such cause.

Having fully described my invention, what I claim to be new is—

1. An automatic cylinder-cock, comprising a closed reservoir having a drain-pipe adapted to connect it with the cylinder of an engine in position to drain water from the cylinder into the reservoir and fill it, a closed chamber in the reservoir located to leave an open space extending above, around and beneath the chamber for the free circulation of water or steam, a port in the top in vertical

alinement with a port in the bottom of the inner chamber, the ports being provided with valve-seats for valves movable vertically upward, valves for the seats having a common connecting-stem and equal outer pressure areas, the valves thus connected being adapted to be seated by gravity and to be opened by a column of water in the reservoir and its connection of a height sufficient to overcome the weight of the valves and their stem, means to guide and to limit the movement of the valves, and a discharge adapted to drain the valve-chamber.

2. In an automatic cylinder-cock, the combination with a reservoir having a detachable top closure and a drain-pipe adapted to connect it with a cylinder of an engine in position to drain water from the cylinder into reservoir and fill it, of a valve-cylinder within and integral with the reservoir located therein to leave an open space extending above, along and beneath the valve-cylinder for the free circulation of water or steam, an opening in the top of the valve-cylinder, having a detachable closure, a port in the top closure of the valve-cylinder in vertical alinement with a port in the bottom of the valve-cylinder, the ports being provided with valve-seats for valves movable vertically upward, valves for the seats having a common connecting-stem and equal outer pressure areas, the valves thus connected being adapted to be seated by gravity and to be opened by a column of water in the reservoir and its connection of a height sufficient to overcome the weight of the valves and their stem, a sleeve for guiding the valve-stem, pendently supported from the top closure of the valve-cylinder by spider-arms integral with the closure, and a discharge-pipe adapted to drain the valve-cylinder substantially as shown and described.

In witness whereof I have hereunto set my hand this 29th day of August, A. D. 1901.

CHARLES L. TORREY.

Witnesses:

WILLIAM H. MOOR,
A. HARRINGTON.