

L. M. MOORE & W. J. IRVIN.
GAS VALVE.

APPLICATION FILED DEC. 6, 1902.

NO MODEL.

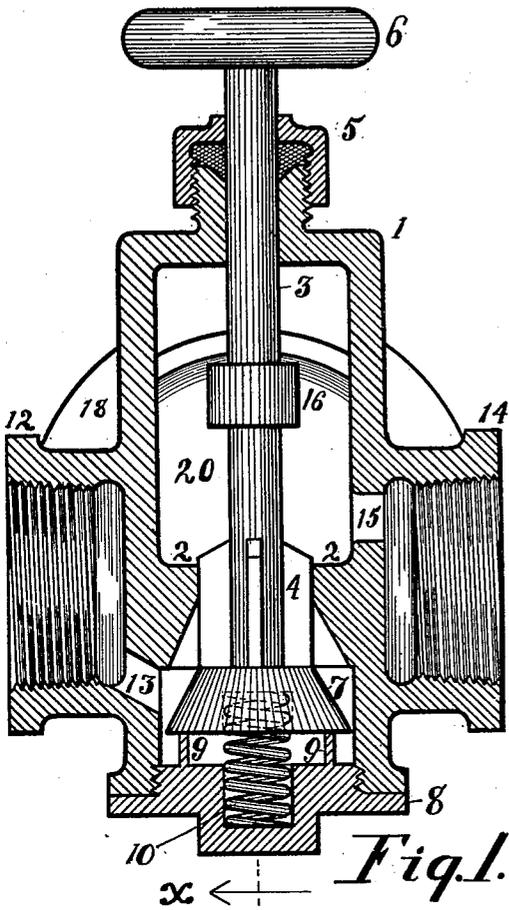


Fig. 1.

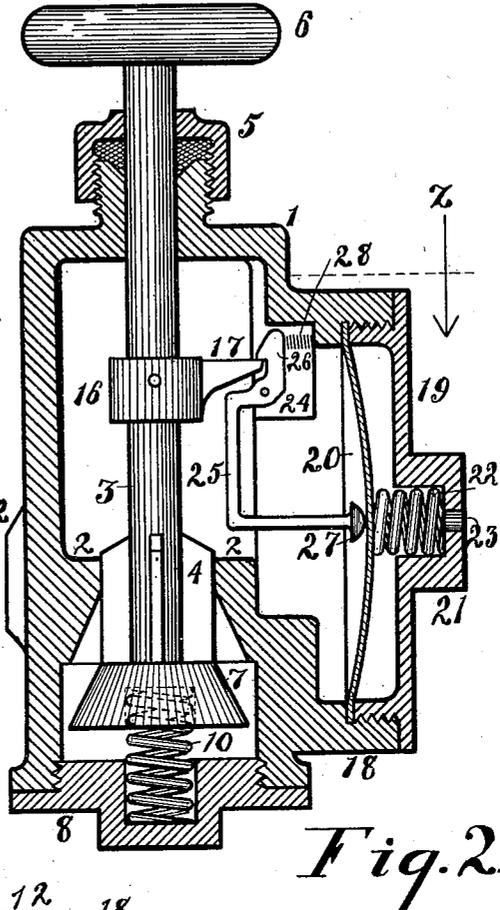


Fig. 2.

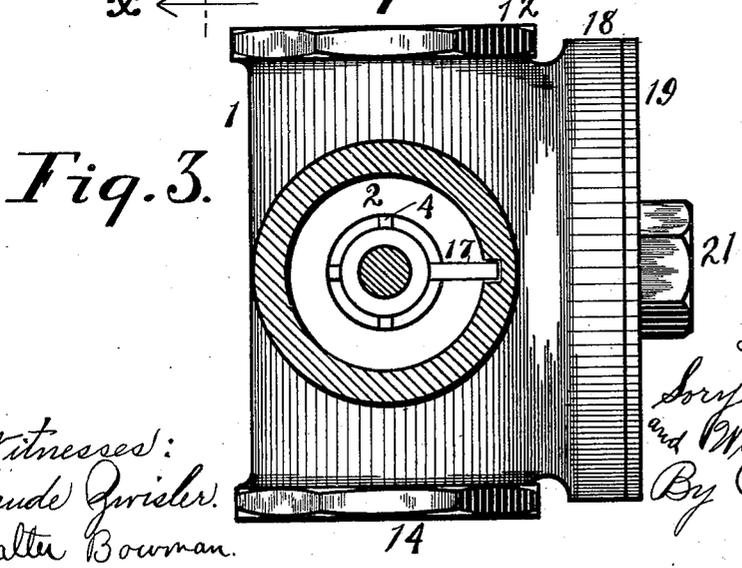


Fig. 3.

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UNITED STATES PATENT OFFICE.

LORY M. MOORE AND WALTER J. IRVIN, OF AKRON, OHIO.

GAS-VALVE.

SPECIFICATION forming part of Letters Patent No. 723,402, dated March 24, 1903.

Application filed December 6, 1902. Serial No. 134,141. (No model.)

To all whom it may concern:

Be it known that we, LORY M. MOORE and WALTER J. IRVIN, citizens of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Gas-Valves, of which the following is a complete specification.

Our invention has relation to automatically-closing gas-valves to be placed in the service-pipe by which the gas from the street-main is conveyed to the consumer with a view to shutting the gas off automatically upon a failure of the gas-supply for any reason to prevent upon the return of the gas-pressure the filling of the apartments in which the stove or gas-light is situate.

The object of our invention is to produce a simple, compact, positively-acting valve susceptible of being placed in any pipe used for the transportation of gas in which the cessation of the flow of gas will cause the valve to automatically close to prevent a return of the gas until the valve has been opened by hand.

To the accomplishment of the aforesaid object our invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically claimed, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a section of our valve through the inlet and outlet ports; Fig. 2, a section at the line x of Fig. 1, and Fig. 3 a section at the line z of Fig. 2.

In the drawings, 1 is a vertical substantially cylindrical casing of cast metal, across the interior of which is a diaphragm 2, through the center portion of which is a circular opening, in which opening is arranged to play vertically a stem 3, provided near its lower extremity with four blades 4, projecting radially from the sides of the stem 3, and these blades are of such width as to nicely fit in the opening in the diaphragm 2. This stem 3 projects upward through the upper end of the casing 1 and is there provided with an ordinary stuffing-box 5 to prevent the escape of gas therefrom. On the upper end of the stem 3 is a

head 6 for convenience of the operator in pressing down the stem 3 when desired.

The under face of the diaphragm 2 is conical and is adapted to receive and nicely fit a head 7, fastened to the lower end of the stem 3. Into the bottom of the casing 1 is screwed a cap 8, provided with upright integral pins 9 to sustain the head 7 a convenient distance from the cap 8. In this cap 8 is a seat or depression for a spring 10, which also enters the bottom face of the head 7. The normal tendency of this spring 10 is to press upward the head 7 and the valve-stem 3.

On the left side of the casing 1 in Fig. 1 is an inlet-port 12, provided on its interior with a gas-pipe thread, into which is secured the pipe leading from the gas-supply. From the port 12 extends an opening 13, by which the gas is permitted to enter below the diaphragm 2. On the opposite side of the casing 1 is an exit-port similarly screw-threaded and which is connected with the interior of the casing 1 by an exit-duct 15.

Mounted midway on the valve-stem 3 is an adjustable collar 16, having extending radially from one side a finger 17. This finger extends from the collar 16 such a distance that it would encounter the interior of the casing 1 were it not for the fact that at the point where the finger 17 is located a longitudinal slot is cut in the side walls of the casing 1. (See Figs. 2 and 3.) In this slot the finger 17 plays upward and downward and is held from horizontal rotation by the edges of this groove.

At right angles with the axes of the ports 12 and 14 is an offset chamber 18, which is closed on its outer side by a cap 19, threaded to mesh into similar threads in the interior of the offset chamber.

Held between the cap 19 and the offset chamber 18 on a shoulder therein is a circular diaphragm 20, made of a material capable of considerable elasticity and yet of sufficient rigidity to retain its normal form. In the center of the cap 19 is an integral nut 21, by which it is rotated, and in the center of this nut 21 is a depression in which is situated a spring 22, whose normal tendency is to press outward the diaphragm 20 toward the central line of the valve-stem 3. Through

the center of the nut 21 is an orifice 23 to prevent a vacuum forming between the diaphragm 20 and the cap 19.

Depending into the opening of the offset 18 and in alinement with the sides of the groove in the casing 1, in which the finger 17 travels, are lugs 24, integral with the casing and slightly separated from one another. Between these lugs and suspended pivotally by any well-known means, as a pin passing through the lugs or by conically-pointed pins passing through the lugs and centering therein, is a trigger 25, the upper end of which is provided with a latch 26, adapted when in normal position to engage the outward end of the finger 17 and having its lower end bent inward toward the valve-stem 3, thence downward, and thence outward with a half-round head 27 to press against the inner face of the diaphragm 20. A spring 28 normally holds the latch end 26 of the trigger 25 against and in engagement with the finger 17.

The operation of the device is as follows: Before gas is permitted to pass through the device by way of the port 12 the operator presses down on the head 6 of the valve-stem 3 until the conical head 7 on the bottom of the valve-stem 3 rests upon the pins 9 of the cap 8. In doing this the finger 17 passes over and pushes back the latch end of the trigger 25 until it passes the catch situated thereon, and as soon as this has occurred the spring 28 will return the trigger 25 to the position shown in Fig. 2, which prevents a return of the valve-stem 3 to its upward position. Gas being admitted through the inlet 12 it passes down through the orifice 13 and around the valve-stem 3 between the radial blades 4 and up into the interior of the casing 1 and outward through the outlet-port 14 until the pressure in the pipe system in the house extending through the outlet-port 14 equals the pressure in the supply-pipe connecting with the port 12. This pressure in the pipe system presses the diaphragm 20 outward from the valve-stem and contracts the spring 22, the movement of the diaphragm being permitted by the escape of air situated between the diaphragm 20 and the cap 19 through the outlet 23, and this permits the latch 26 to retain the finger 17 and the valve-stem 3 in its lowest position, as shown in the drawings. Now if for any reason the gas-supply fails the following operation takes place: The diaphragm 20 released from the pressure of gas and influenced by the spring 22 is pressed inward toward the valve-stem 3, which causes the trigger 25 to swing on its pivot and release its engagement with the finger 17. The spring 10 instantly raises the valve-stem 3 upward until the conical head 7 nicely seats in the under conical opening of the diaphragm 2, thereby shutting off the supply of gas to the house until by hand the valve-stem 3 is depressed.

What we claim, and desire to secure by Letters Patent, is—

1. An automatic gas shut-off for the purpose described consisting of a casing having inlet and outlet ports, a slidable valve-stem therein, a conical head on said valve-stem capable of closing a diaphragm in said casing, a second diaphragm mounted in said casing arranged to be moved in one direction by the pressure of gas in said casing, means to move said second diaphragm in the opposite direction, a trigger to be operated by said second diaphragm to release said valve-stem, and means to cause the movement of said valve-stem.

2. The combination in an automatic gas shut-off of the class described having inlet and outlet openings, means to connect said openings, a slidable valve-stem and valve to close the opening from the inlet to the outlet openings, a spring to operate said valve positively, a pressure-actuated diaphragm in said casing, a trigger influenced thereby, capable of releasing said valve and valve-stem, and means to operate said valve and valve-stem.

3. The combination in an automatic gas shut-off of the class described having inlet and outlet openings, a perforated diaphragm in said casing interposed between the inlet and outlet openings thereof, a slidable valve-stem and valve capable of closing said perforation, a spring to actuate the valve and stem, a trigger to retain said valve and stem in one position, a second diaphragm held in one position by the pressure of gas in said casing, means to move said second diaphragm in the opposite direction, said second diaphragm being arranged to trip said trigger when influenced by said last-named means.

4. An automatic gas shut-off of the class designated having inlet and outlet openings, normally communicating through an internal diaphragm in the casing of said shut-off, a slidable valve and stem to close said diaphragm, an offset chamber connected with the interior of said casing, an elastic diaphragm in said offset chamber arranged to be moved in one direction by the pressure of gas in said casing, means to move said diaphragm in the opposite direction, a pivoted trigger normally arranged to retain said valve and stem in one position and arranged to be tripped by the movement of said diaphragm upon a release of the pressure of gas in said casing, and means to operate said valve and stem when released from engagement with said trigger.

5. The combination in an automatic gas shut-off of the class designated having an inlet and an outlet opening, a perforated division-wall to separate said inlet and outlet openings, a valve and valve-stem slidable in the casing of said shut-off, a spring to actuate said valve and stem positively in one direction, a trigger to hold said valve away from said perforation normally, an elastic diaphragm in said shut-off capable of being moved in one direction by the pressure of gas in said casing, means to move said elastic dia-

phragm in one direction upon a release of
pressure of gas, said elastic diaphragm being
arranged to be in contact with the end of said
trigger and to trip the same upon its move-
5 ment due to a decrease of pressure in said
casing.

In testimony that we claim the above we

hereunto set our hands in the presence of two
subscribing witnesses.

LORY M. MOORE.

WALTER J. IRVIN.

In presence of—

C. E. HUMPHREY,

MAUDE ZWISLER.