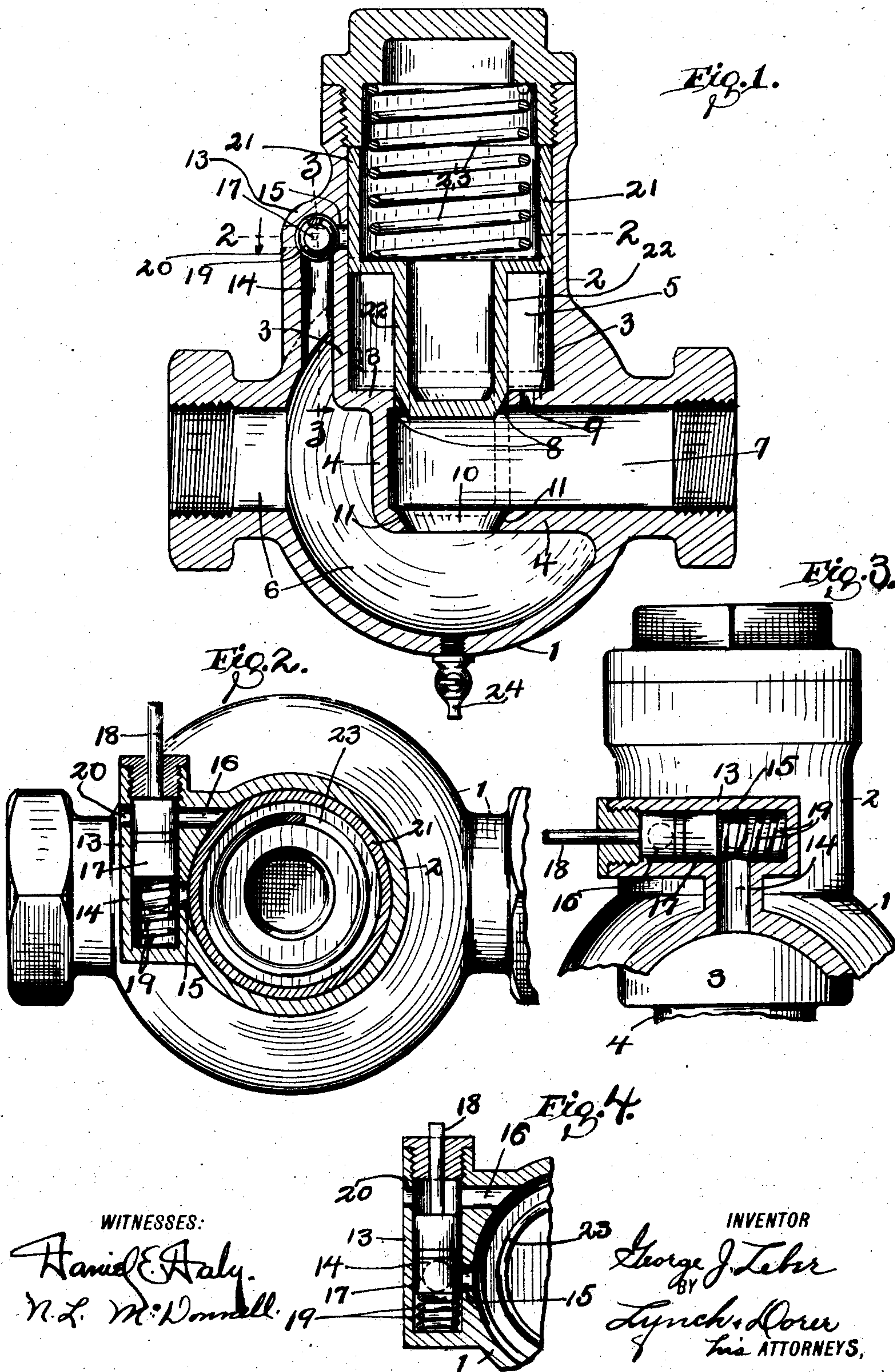


No. 854,047.

PATENTED MAY 21, 1907.

G. J. LEBER.
SHUT-OFF VALVE.

APPLICATION FILED MAR. 14, 1906.



WITNESSES:

Samuel E. Haly.
N. L. McDonnell.

INVENTOR

George J. Leber
BY
Lynch & Dorr
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE J. LEBER, OF CLEVELAND, OHIO.

SHUT-OFF VALVE.

No. 854,047.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed March 14, 1906. Serial No. 305,947.

To all whom it may concern:

Be it known that I, GEORGE J. LEBER, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Shut-Off Valves; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to new and useful improvements in automatic shut-off valves.

The object of this invention is to provide a valve of this type especially designed for shutting off the flow of gas from the service pipes of a building after the pressure in the gas main has fallen below a predetermined pressure.

My invention, therefore, consists in the features of construction and combination of parts as described in the specification, pointed out in the claims, and illustrated in the accompanying drawings.

In the accompanying drawings, Figure 1 is a central section of a valve embodying my invention. Fig. 2 is a section on line 2—2, Fig. 1. Fig. 3 is a section on line 3—3, Fig. 1. Fig. 4 is a detail view showing the release valve open.

Again referring to the drawings, 1 represents the body portion of the valve casing, which is preferably globular in form, and 2 represents the upper or neck portion. The upper portion of the valve casing is divided from the lower portion by a wall 3, and the lower portion is sub-divided by a wall 4 so that within the valve casing there are formed three chambers 5, 6 and 7, which may be designated as the valve chamber, the intake chamber and the outlet chamber. In the wall 3 is formed a large opening 8 and a small opening 9, and in the wall 4 is formed an opening 10, around which is formed a valve-seat 11. In the wall of the neck portion is formed a horizontal valve chamber 13. A passage-way 14 extends from the intake chamber 6 to the valve chamber 13 and two passage-ways 15 and 16 connect the small valve-chamber 13 with the valve chamber 5. In the valve-chamber 13 is arranged a slide-valve 17, which is provided with a valve-stem 18 which extends beyond the outer surface of the valve-casing. Between the valve 17 and the end wall of the valve-chamber 13 is arranged a coil-spring 19, which normally

holds the valve so that it closes the passage-way 16. In the side of the valve-chamber 13, in line with the passage-way 16, is formed a passage-way 20. The passage-ways 14 and 15 may be regarded as a single channel and the passage-ways 16 and 20 may be regarded as a single channel, as the valve-chamber 13 is merely an enlargement in the channels so that one valve can be utilized for opening or closing both channels. The valve 17 may be called a relief valve. In the valve-chamber 5 is arranged a hollow-valve comprising a head-portion 21 having the same diameter as the valve-chamber and a reduced neck-portion 22, the lower end of which has a diameter equal to the diameter of the valve-seat 11 so that when the lower end of the valve is on the seat 11 it will shut off communication between the intake chamber 6 and the outlet chamber 7. In the head-portion 21 is arranged a spring 23 which abuts against the upper end of the valve-casing and is arranged to normally hold the valve in its lowest position, that is with its end on the seat 11. The valve is so arranged that the head-portion 21 will cover the ends of the passage-ways 15 and 16 except when the end thereof is on the valve seat 11. In the bottom of the intake chamber 6 is arranged a test-cock 24 which may be opened in order to find out if any gas is in the intake chamber.

The operation of the valve is as follows:—When the pressure in the gas main is normal the valve will be open and in the position shown in the full lines in Fig. 1. When the valve is in its open position, the pressure will be exerted on both the end of the neck portion 22 and also on the bottom of the head-portion 21 of the valve, and the valve will therefore be held up as long as the pressure of the gas does not fall below a predetermined pressure. Now, when the pressure of the gas does fall below the predetermined pressure, the valve will move down under the influence of the spring 23 until the bottom of the neck portion of the valve is seated on the valve seat 11 which cuts off communication between the intake chamber and the outlet chamber and consequently shuts off the gas from the service pipes. When the valve moves down on the seat 11, the ends of the passage-ways 15 and 16 are uncovered and the gas in the chamber 6 will pass up through the passage-way 14, through the valve-chamber 13 and through the passage-way 15 into the valve and the pressure

in the valve-chamber 5 and the intake chamber 6 will be the same, and even if the pressure in the gas main increases to its normal pressure the valve will remain on the seat as the
 5 pressure in the chamber 6 will only act upon the outer surface of the end of the valve, while the pressure in the chamber 5 will act upon both the inner surface of the end of the valve and also on the inner surface of the bot-
 10 tom of the head portion so that there will be a greater pressure of gas holding the valve down than there is acting to lift it. Now when it is desired to open the valve the relief valve is moved in by pressing on the stem 18. The
 15 end of the passage-way 16, in the valve-chamber 13, is then uncovered, and the end of the passage-way 15 is closed. The gas in the chamber 5 will then pass out through the passage-way 16 and the passage-way 20 into
 20 the open air, thereby reducing the pressure in the chamber 5 to atmospheric pressure and the greater pressure in the chamber 6 will then force up the valve to its highest position, closing the passage-ways 15 and 16
 25 and as long as the pressure remains normal the valve will be held open.

What I claim is:—

1. In combination, a valve casing having a valve chamber, an intake chamber, an out-
 30 let chamber communicating with both the valve chamber and the intake chamber, a hollow valve arranged to slide in the valve chamber and when in its lowest position cutting off the communication between the
 35 intake chamber and the outlet chamber, a second valve chamber, a channel extending from the valve chamber to the intake chamber through the second valve chamber, a channel extending from the first named
 40 valve chamber to the outer surface of the valve casing through the second valve chamber, the mouths of said channels being located so that they will be closed when the valve is in its upper or open position and
 45 will be uncovered when the valve is in its lower or closed position and a valve arranged in the second valve chamber.

2. In an automatic valve, a valve casing having a valve chamber, an intake chamber,
 50 an outlet chamber communicating with the

valve chamber, and the intake chamber, a hollow valve arranged to slide in the valve chamber and when in its lowest position cutting off communication between the intake chamber and the outlet chamber, a spring arranged
 55 between the top of the valve casing and said valve, a second valve chamber, a channel extending from the valve chamber to the intake chamber through the second valve chamber, a channel extending from the first
 60 named valve chamber to the outer surface of the valve casing through the second valve chamber, the mouths of said channels being located so that they will be closed when the valve is in its upper or open position and
 65 will be uncovered when the valve is in its lower or closed position and a valve arranged in the second valve chamber.

3. In an automatic-valve, a valve casing having a valve chamber, an intake chamber,
 70 an outlet chamber communicating with both the valve chamber and the intake chamber, a hollow valve arranged to slide in the valve chamber and having a neck portion arranged to extend down through the outlet chamber
 75 and cut off communication between the intake chamber and the outlet chamber, a spring arranged between the top of the valve casing and said valve, a relief valve chamber formed in the wall of said valve casing and
 80 having a passage-way extending to the outer surface of the valve casing, a passage-way extending from the relief valve chamber to the main valve chamber in line with said passage-way, a passage-way extending from
 85 the intake chamber to the relief valve chamber, a passage-way forming a continuation of the last-mentioned passage-way extending from the relief valve chamber to the main valve chamber and a valve arranged
 90 in the relief valve chamber so that in its outer position it will close the passage-way extending to the outer surface of the valve casing.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses. 95

GEORGE J. LEBER.

Witnesses:

VICTOR C. LYNCH,
 N. L. McDONNELL.