(No Model.)

H. J. BELL.

GAS PRESSURE REGULATOR.

No. 409,626. Patented Aug. 20, 1889.

Fig. 1.

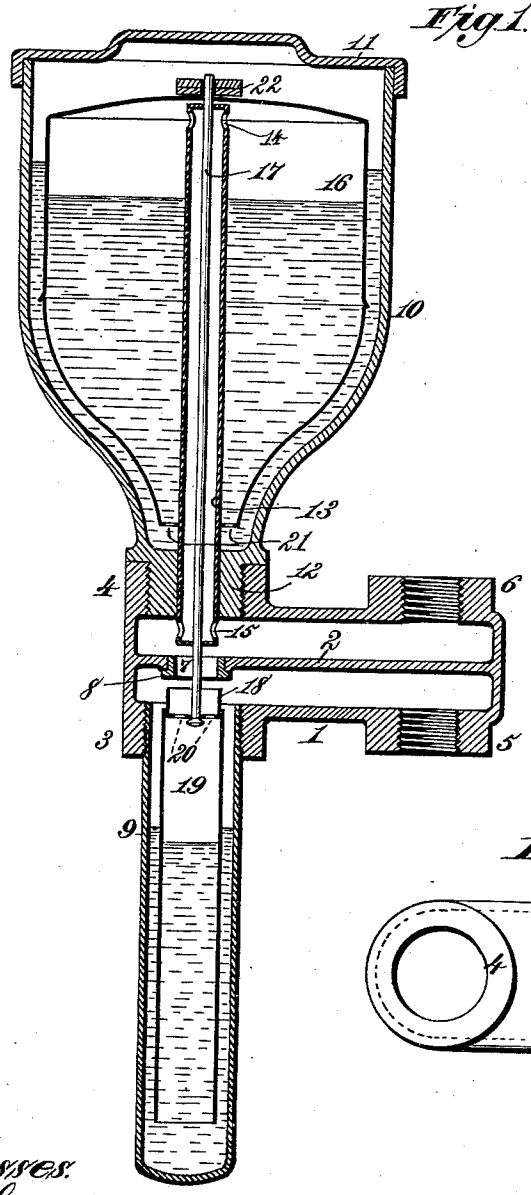
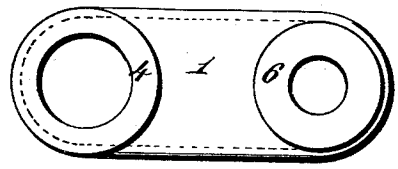


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

HAROLD J. BELL, OF GLOUCESTER CITY, NEW JERSEY, ASSIGNOR TO THE WELSBACH INCANDESCENT GAS LIGHT COMPANY, OF NEW JERSEY.

GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 409,626, dated August 20, 1889.

Application filed June 6, 1889. Serial No. 313,324. (No model.)

To all whom it may concern:

Be it known that I, HAROLD J. BELL, a citizen of the United States, residing at Gloucester City, in the county of Camden and State of New Jersey, have invented new and useful Improvements in Gas-Pressure Regulators, of which the following is a specification.

This invention relates to a tubular balanced-valve gas-pressure regulator of that class in which a tubular form of valve is inclosed in a partly-tubular valve-case having a liquid seal, said valve being balanced and regulated by means of a hollow float inclosed in a separate regulator-casing provided with a liquid seal, and having a central stationary tube that communicates with the valve-casing, and also serves as a guide at top and bottom for the stem that connects the float and valve.

The invention consists in the construction and combination of parts in a gas-pressure regulator, as hereinafter more fully described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical section of a liquid-sealed tubular balanced-valve gas-pressure regulator embodying my improvements. Fig. 2 is a plan of the main portion of the valve-case.

The numeral 1 designates a valve-casing having a horizontal partition 2, and provided on its upper and lower sides with internally-screw-threaded bosses 3, 4, 5, and 6, two on the upper side and two on the lower side near its opposite ends, as shown.

In the partition 2 between the lower and upper bosses 3 and 4 of one end is an opening or gas-passage 7, provided with a bushing 8, that serves as a valve-seat. The lower boss 3 receives the screw-threaded end of a depending tubular or elongated valve-case extension 9, that is closed at its lower end. To the opposite upper boss 4 is attached a regulator-casing 10, having at its upper end a detachable cover 11, and provided at its lower end with a screw-nipple 12, that engages and fills the boss of the valve-casing. In the screw-nipple 12, which is centrally perforated, is secured a vertical tube 13, that is preferably closed at both ends and provided with openings 14 and 15 for the passage of gas. This tube 13 extends nearly to the top of the regulator-casing 10, and its lower end may project into the upper part of the valve-casing 1, as shown.

Within the regulator-casing 10 is a hollow float 16, having a stem 17, that is passed through and guided at both ends in the vertical tube 13, which is surrounded by the hollow float. This float-stem 17 is also passed through the gas-passage 7 of the partition 2 in the valve-casing, and to its lower end beneath the valve-seat is loosely attached a cup-shaped balanced valve 18, having a tubular extension 19, that projects downward in the tubular extension 9 of the valve-casing. In the bottom of the cup-shaped portion of the valve are perforations 20, and in the bottom of the hollow float 16 are perforations 21, as shown. The lower boss 5 of the valve-casing is arranged for the attachment of a gas-inlet pipe, and the upper boss 6 is for attachment of a delivery-pipe. It will be observed that these bosses 5 and 6 are in line with each other and so located that a straight delivery-pipe can be attached without coming in contact with the regulator-casing.

The regulator-casing 10 and the depending tubular extension 9 of the valve-casing are supplied with glycerine or other sealing-liquid. When gas is admitted to the lower part of the valve-casing 1, it passes the valve 18, which is normally open, enters the upper part of the casing through the passage 7, and passes from the upper part of the casing to the delivery-pipe. Gas from the valve-casing also enters the depending tubular extension 9 above the surface of the sealing-liquid, and, passing through the perforations 20 of the valve 18, enters the tubular extension 19 of said valve, also above the sealing-liquid, which rises through the open lower end of said tubular valve-extension. From the valve-casing 1 gas also passes through the perforated tube 13 into the space within the hollow float 16 above the sealing-liquid, which rises in said float through the perforations 21 in its lower end. With the rise and fall of the hollow float 16, caused by variations in the pressure of the gas, a corresponding movement is imparted to the valve 18, the gas inclosed in the

tubular valve-extension 19 finding a vent back and forth through the perforations 20 with each movement of the valve. It will thus be seen that the valve is balanced in an effective manner to automatically control or regulate the volume and pressure of gas flowing through the apparatus.

If desired, weights 22 may be placed on the upper end of the stem 17, which projects above the float.

What I claim as my invention is—

1. In a gas-pressure regulator, the combination of a valve-casing having a depending tubular extension and a partition provided with a gas-passage and a valve-seat, a regulator-casing attached to the upper part of said valve-casing in line with said tubular extension, a stationary perforated tube vertically and centrally supported in the regulator-casing and communicating with the valve-casing, a liquid-sealed float inclosed in the regulator-casing and having a stem that is passed through said tube, and a tubular liquid-sealed balanced valve attached to the float-stem and inclosed in the tubular extension of the valve-casing, substantially as described.

2. In a gas-pressure regulator, the combination of a valve-casing having an inlet and outlet and a horizontal partition provided with a gas-passage and valve-seat, a tubular extension depending from one end of the valve-casing, a regulator-casing above and in line with said extension, a vertical stationary tube supported in the regulator-casing and communicating with the valve-casing, a hollow liquid-sealed float inclosed in the regulator-casing and having a stem that is passed through and guided in said tube, and a tubular liquid-sealed valve inclosed in the tubular extension of the valve-casing and having a perforated cup-shaped portion attached to the float-stem, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

H. J. BELL.

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.