

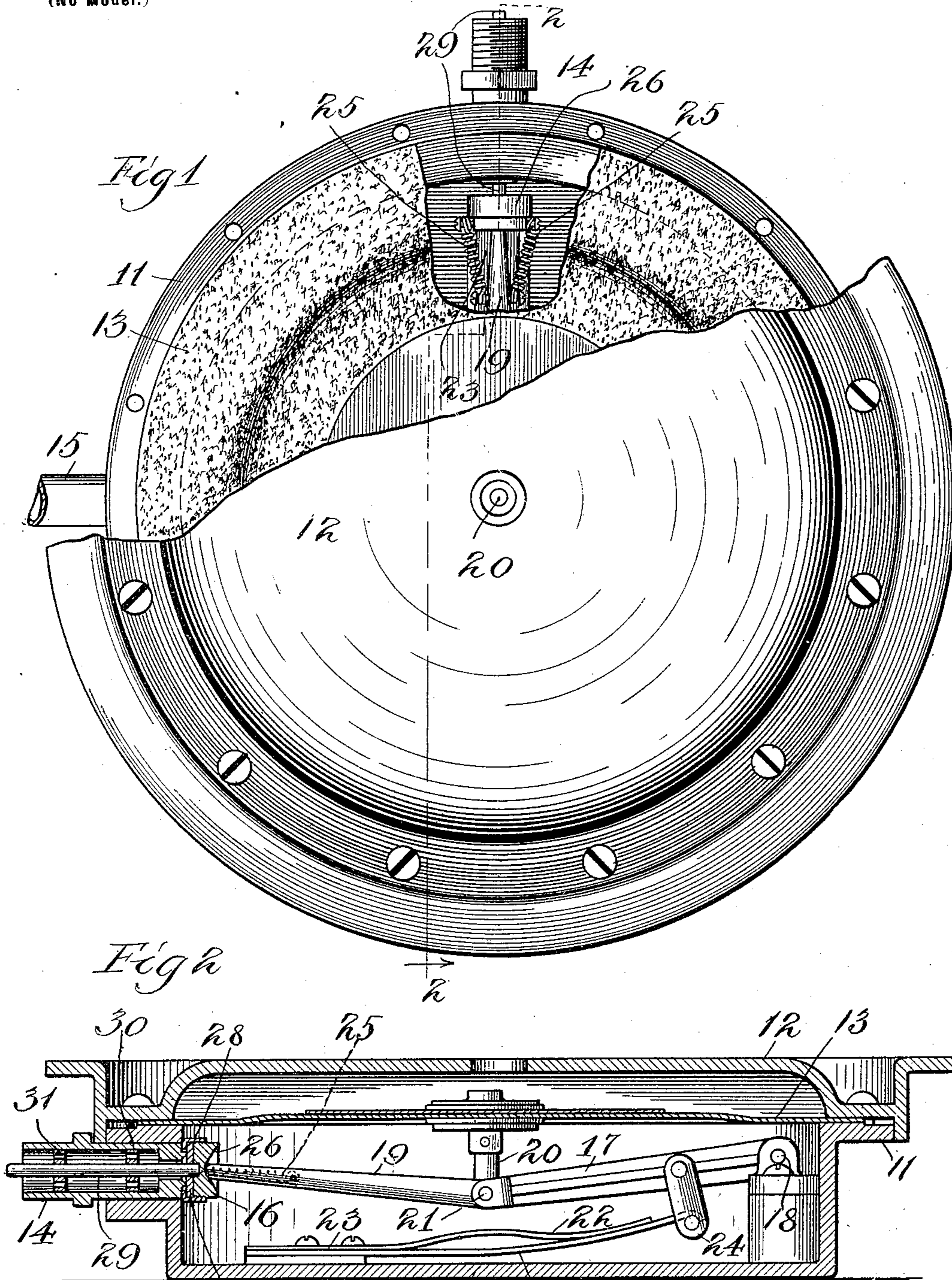
No. 658,570.

Patented Sept. 25, 1900.

J. A. MOSHER & W. WISHART.  
PRESSURE REGULATOR.

(Application filed Apr. 16, 1900.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 658,570, dated September 25, 1900.

Application filed April 16, 1900. Serial No. 13,032. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN A. MOSHER and WILLIAM WISHART, citizens of the United States, and residents of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Pressure-Regulators, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

This invention relates to regulators particularly adapted to control the pressure of gas, and is designed especially for service in connection with the gas that is to be delivered at a low pressure.

The objects of the invention are to simplify the construction of devices of this type, to render the regulator extremely sensitive, and to secure durability. These objects are attained in the construction hereinafter described, and which is shown in the accompanying drawings, in which—

Figure 1 is a plan view of the regulator with some of the parts broken away for the purpose of showing the internal construction, and Fig. 2 is a sectional view on the broken line 2 2 of Fig. 1.

The case 10 is cup or dish shaped, having at its upper edge a radial flange 11 and being covered by a plate 12, adapted to rest upon and be secured to the flange. A flexible diaphragm 13 is secured between the plate 12 and the flange 11, so as to make a tight joint therewith. The plate 12 is preferably perforated, as shown, so as to allow the free movement of air therethrough.

The induction-nipple is shown at 14 and the eduction-nipple at 15. The induction-nipple is provided with a valve 16, controlled by the diaphragm 13 through the medium of a toggle comprising the members 17 and 19 and the stem 20. The toggle member 17 is pivoted at 18 to a bracket secured within the case 10. The toggle member 19 bears against the back of the valve 16 and is joined to the toggle member 17 by means of a pin 21, which also passes through the stem 20.

A leaf-spring 22<sup>a</sup>, secured at 23 to the bottom of the case 10, engages a stirrup 24, depending from the toggle member 17 near its anchored end, the action of the spring being

to flex the toggle, while the outward movement of the diaphragm under the influence of the gas-pressure within the case tends to straighten the toggle in opposition to this spring.

The back of the valve 16 is centrally recessed to receive the end of the toggle member 19, and the valve is connected to such member by means of the contractile coil-springs 25 25, which draw the valve tightly against the end of the toggle member.

The valve 16 comprises the metallic block 26 and the facing 27 of a yielding material, such as leather, these two parts being secured together by a band 28, threaded to engage the periphery of the block 26 and having an instanding flange for securing the facing 27. The valve is provided with a stem 29, rigidly secured to the block 26 and projecting outwardly through the nipple 14, which is provided with internal guide-brackets 30 and 31 for such stem.

In regulators of this type, particularly such as are designed for use in connection with gas to be delivered at a low pressure, it is of great importance that extreme sensitiveness of action be secured, and to this end it is important that the spring tension for opening the valve, while being light, shall nevertheless be certain, and it is also of the utmost importance that lost motion be avoided, so that the valve will be moved however slight may be the movement of the diaphragm. These advantages are secured in the construction forming the subject of this application by the use of the strong leaf-spring 22<sup>a</sup>, which may be, as shown, reinforced by a supplemental spring 22, this spring being applied to the toggle member near its pivotal point, so that the diaphragm controls it by a strong leverage, the spring nevertheless having great reserve force because of its size. This arrangement of spring has the added advantage that the use of fine wire, which is necessarily short-lived, is avoided.

By the form of connection shown between the toggle member 19 and the valve, whereby there is a simple thrust contact, while the two parts are always held tightly together by the action of the springs 25, all lost motion at this point is avoided, so that the slightest

movement of the toggle insures a movement of the valve. This form of connection has the added advantage that any lateral movement of the toggle does not tend to cant the valve, and hence prevent it from being firmly seated. The pivots of the toggle being transverse to the plane of its movement, no lateral displacement is possible beyond the range of the slight lost motion which may exist, so that should there be any lack of uniformity in the flexibility of the diaphragm there can be no sidewise movement of the toggle connection thereby.

We have found in actual practice that with a gas-service pressure of fifteen pounds the delivery pressure can be reduced to two ounces and maintained without fluctuation, so that there is no appreciable variation in the flame at the gas-burners.

We claim as our invention—

1. In a gas-pressure regulator, in combination, a case having induction and eduction ports, a valve for the induction-port, a flexi-

ble diaphragm within the case, a lever actuated by the diaphragm and having a thrust-bearing against the valve, and a spring connection between the lever and the valve to hold them in contact.

2. In a gas-pressure regulator, in combination, a case having induction and eduction ports, a flexible diaphragm within the case, a valve applied to the induction-port, a toggle having one member pivotally anchored to the case and its other end having a thrust-bearing against the valve, spring connection between the valve and the toggle to hold them in contact, connection between the diaphragm and the toggle, and a leaf-spring for flexing the toggle and being fixed to a wall of the case and applied to the anchored toggle member.

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Witnesses:

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