

No. 776,384.

PATENTED NOV. 29, 1904.

W. T. CROSLIN.
GAS PRESSURE REGULATOR.
APPLICATION FILED MAY 13, 1904.

NO MODEL.

Fig. 1.

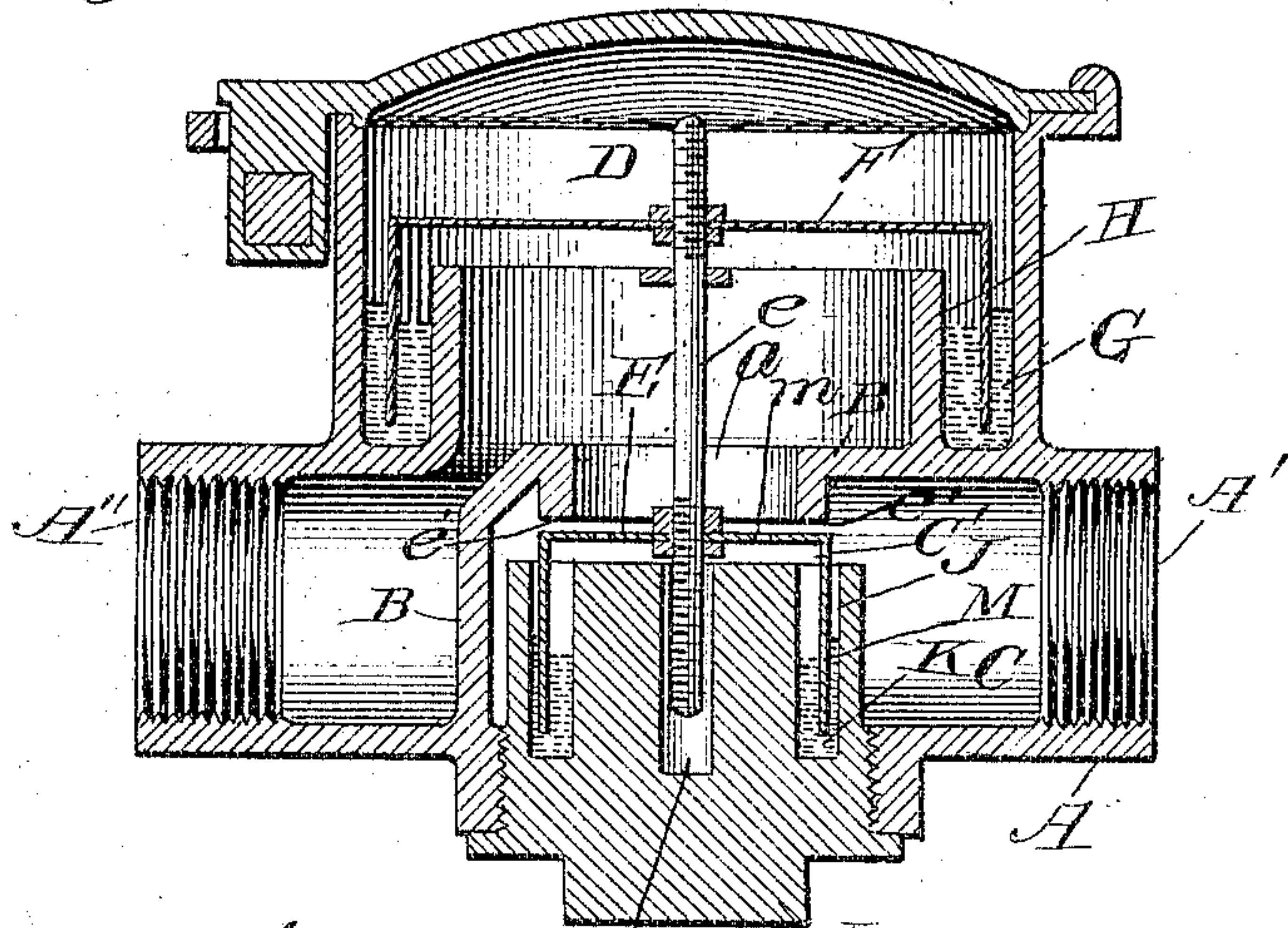
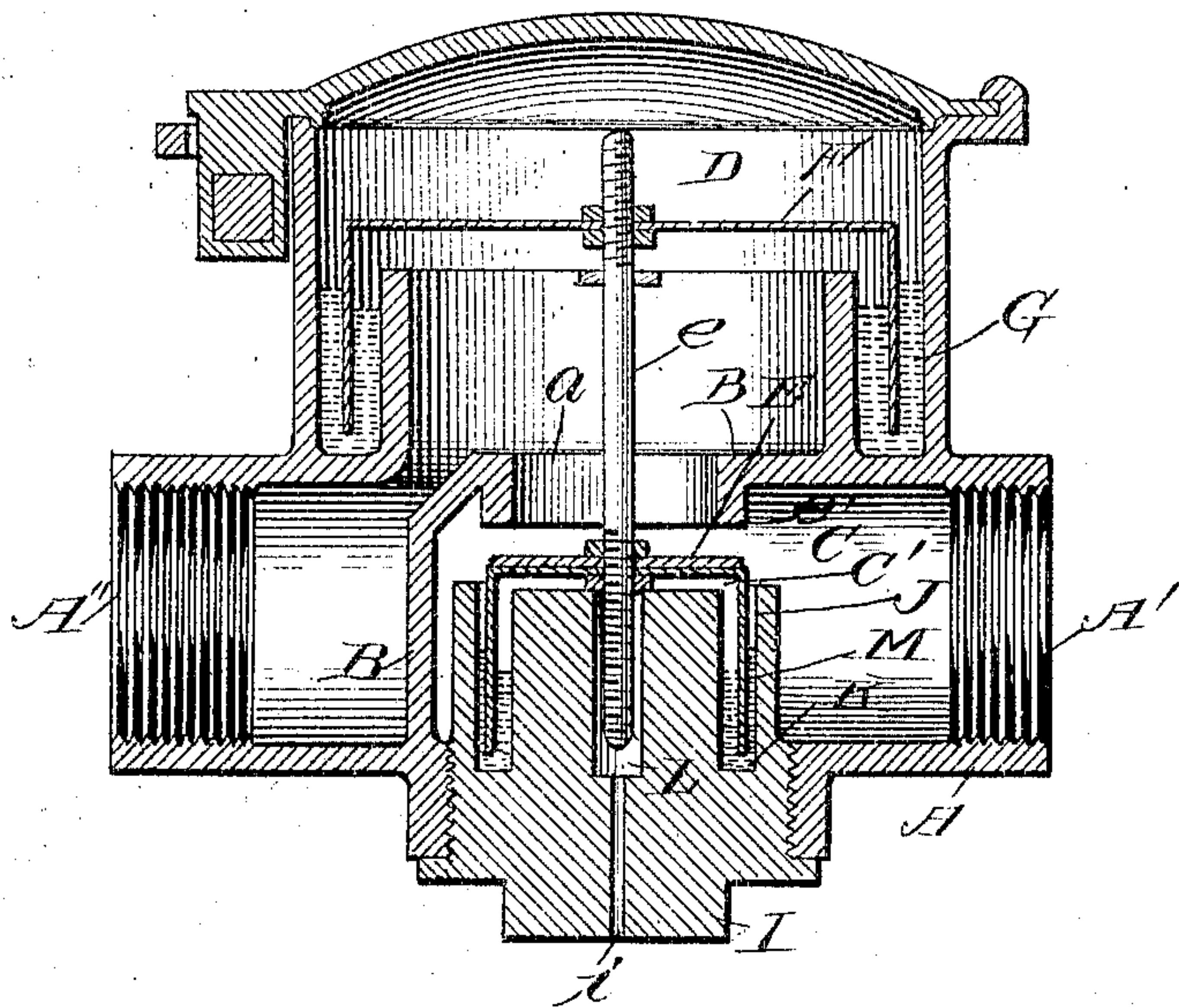


Fig. 2.



Witnesses:

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By *[Signature]*
His Atty.

UNITED STATES PATENT OFFICE.

WILLIAM T. CROSLIN, OF OAK PARK, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO WILLIAM O. McCULLOUGH, OF CHICAGO, ILLINOIS, AND ALBERT C. BROWN, OF IRVING PARK, ILLINOIS.

GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 776,384, dated November 29, 1904.

Application filed May 13, 1904. Serial No. 207,789. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. CROSLIN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Pressure Regulators, of which the following is a specification.

The present invention relates to that class of regulators in which the gas in its passage from the inlet to the outlet of the casing flows through a valved port into the space beneath a mercury-sealed bell to which the stem of the valve for controlling said port is attached, so that variations in the pressure will cause the bell to rise and fall and thereby operate the valve in well-known manner. A difficulty experienced in the practical use of these regulators is that the comparatively heavy pressure on the inlet side of the valve itself tends to seat it, and when once it is seated this pressure may hold it seated and wholly cut off the supply to the outlet.

The object of the present invention is to obviate this difficulty. To this end I provide means for protecting the inlet side of the valve from the high pressure of the gas, and in addition to this I expose it to a comparatively low pressure, as hereinafter described.

In the accompanying drawings, which are made a part of this specification, Figure 1 is a sectional elevation of a regulator embodying the invention in its preferred form. Fig. 2 is a similar view of a portion thereof under a slight modification.

The casing A has within it suitably-disposed webs B, which divide its interior into a chamber C, with which the inlet A' is in direct open communication, and a chamber D, with which the outlet A'' is in direct open communication, the two chambers being in communication with each other through a port *a* under the control of a valve E, located in the inlet-chamber and seating in the direction of the flow. This valve is carried by a stem *e*, which passes through the port *a* and is attached to a bell F. The bell is located in the outlet-chamber, and its bottom dips into a body of mercury G, contained in an annular space be-

tween the wall of the outlet-chamber and an annular flange H therein, so that it is hermetically sealed and kept sealed during the normal operation of the device. In order to protect the bell and prevent it from being meddled with, the top of the chamber D is closed, but not hermetically, so that the pressure above it is lower than the pressure within it, whereby it is made to rise and fall in customary manner as the pressure within it varies. Through the bottom of the casing, directly opposite the port *a*, is a threaded opening, into which is screwed a plug I, which is provided in its top side with an annular groove J, containing a body of mercury K, and also with a centrally-located socket L, into which the stem of the valve projects. This plug terminates a sufficient distance from the valve-seat *e'* to allow the valve the necessary movement. The valve E either forms the top of a second bell M, as shown in Fig. 1, or else the second bell, complete in itself, is secured to the valve or the stem thereof, as shown in Fig. 2. In either event the valve and bell move as a single member. The bottom of the bell dips in the mercury K, whereby it is sealed, and the under side of the valve is thus covered and protected from the gas as it comes from the inlet under high pressure. When the valve is seated, the space or chamber C' within the bell is maintained at a pressure lower than the pressure in the inlet, and this may be done by perforating the valve and top of the float, as shown at *m* in Fig. 1. This places the chamber C' in communication with the chamber D, so that the pressure upon opposite sides of the valve is balanced, or it may be done by placing the chamber C' in communication with the atmosphere by means of a passage *i* through the plug I. This maintains on the under side of the valve a pressure even lower than that in the chamber D. With either of these arrangements or any other that maintains a comparatively low pressure on the under side of the valve and protects it from the gas under inlet-pressure it is impossible for the gas to close the valve and hold it closed. In practice the weight of the valve and its

associated parts is depended upon for producing the opening movement of the valve, its closing movement being produced by an abnormal rise in the pressure within the bell, the interior of which is in constant open communication with the outlet. When the pressure is normal and regular, the valve will be maintained in a position between the limits of its up-and-down movement; but upon an increase in the pressure it will be closed more or less, depending upon the extent of the increase, and may be even wholly closed in order to entirely cut off the flow from the inlet-chamber to the outlet-chamber until the pressure in the latter is reduced by consumption. When closed, and even when open, the lower bell completely protects the inlet side of the valve from the pressure of gas in the inlet-chamber, so that this pressure has absolutely no tendency to hold the valve seated.

I am aware that it has been proposed to balance the inlet-pressure against the valve and do not claim this, broadly, as my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a pressure-regulator the combination with a casing having an inlet and an outlet and a port through which the gas flows from one to the other, of a valve seating with the flow, controlling said port, said valve having one face exposed to the pressure on the outlet side of the port, means for maintaining on the other face of the valve pressure lower than the inlet-pressure, and means actuated by an increase in the pressure on the outlet side of the port, for seating the valve, substantially as described.

2. The combination with a casing having an inlet-chamber, an outlet-chamber, and a port through which they communicate and having also inlet and outlet ports communicating di-

rectly with said chambers respectively, of a valve for controlling said port, a bell located in the outlet-chamber, the interior of the bell being in open communication with the outlet-port and with the port through which the two chambers communicate, means connecting the bell and valve and means for maintaining a comparatively low pressure on the inlet side of the valve, substantially as described.

3. In a pressure-regulator the combination of a casing having inlet and outlet ports, inlet and outlet chambers with which said ports communicate directly, and a port through which the chambers communicate directly, of a valve located in the inlet-chamber and seating with the flow for controlling the port through which the chambers communicate, a sealed bell located in the outlet-chamber, the interior of the bell being in open communication with the outlet-port and with the port through which the chambers communicate, means connecting the bell and valve, a sealed bell operatively connected with the valve, and means for maintaining a comparatively low pressure within said bell, substantially as described.

4. In a pressure-regulator the combination with a casing having an inlet-chamber and an outlet-chamber, and a port through which they communicate, of a sealed bell located in the outlet-chamber, the interior of said bell being in open communication with the outlet and with the port aforesaid, a valve for controlling said port, means connecting the bell and valve, a second sealed bell located in the inlet-chamber and operatively connected with the valve, and a vent connecting the interior of the second bell with the outlet-chamber, substantially as described.

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Witnesses:

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