

J. L. CHAPMAN.  
Gas Regulator.

No. 210,750.

Patented Dec. 10, 1878.

Fig. 1.

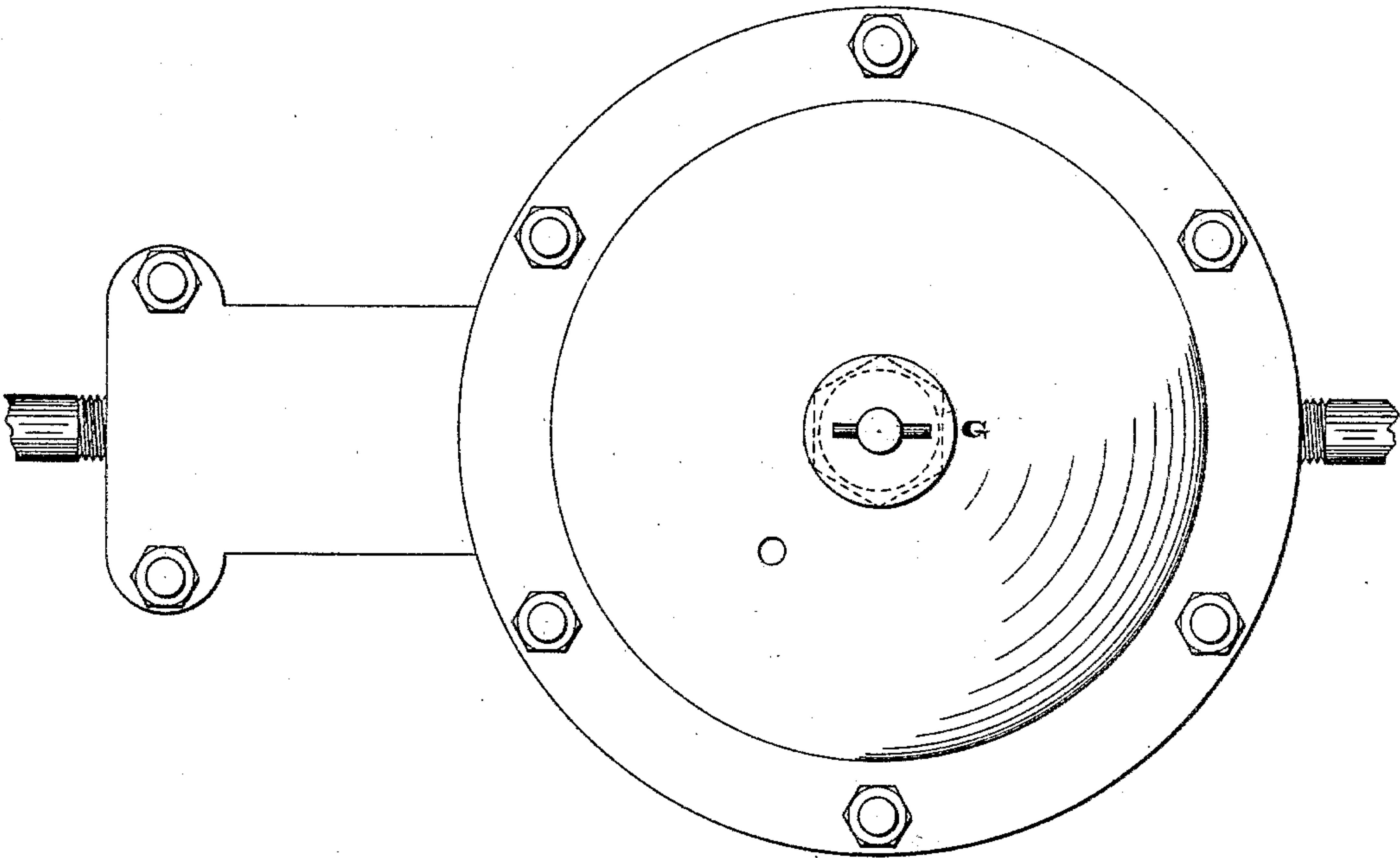
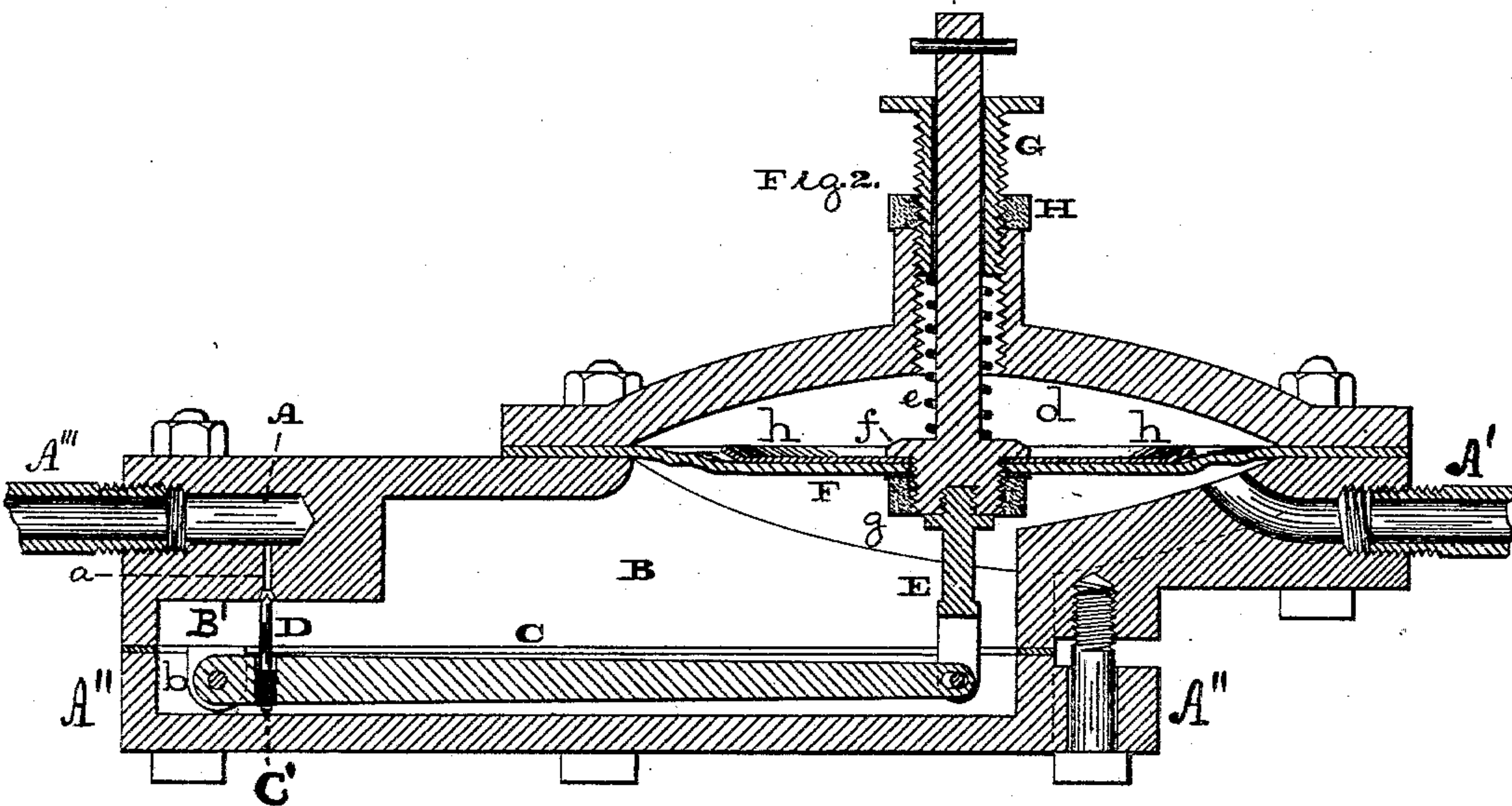


Fig. 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JOSEPH L. CHAPMAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF  
ONE-HALF HIS RIGHT TO JOHN ROBERTS, OF SAME PLACE.

## IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **210,750**, dated December 10, 1878; application filed  
August 16, 1878.

*To all whom it may concern:*

Be it known that I, JOSEPH L. CHAPMAN, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Gas-Regulators, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top or plan view of the regulator embodying my invention. Fig. 2 is a longitudinal vertical section thereof.

Similar letters of reference indicate corresponding parts in the two figures.

My invention consists of a regulator especially adapted for gas received under high pressure, and supplied to the burners under a proper pressure, as in the case of illumination of cars and other places where gas is forced into a receiving-tank, the objectionable feature whereof is that when the supply approaches the minimum the light is low and almost useless. To correct this difficulty a chamber is employed, into which gas is primarily received under high pressure from a tank, and directed into another chamber controlled by a valve connected to a diaphragm adjustable to the required burning-pressure, so that the gas passes properly to the burner or burners, and the flame is uniform at all times, regardless of the supply in the receiving-tank.

My invention consists in extending the low-pressure chamber and mounting the lever of the diaphragm and valve on ears, which are suspended beneath the high-pressure chamber, thus enabling me to employ a long lever, so that the valve is operated without abruptness, and the gas passed directly into the low-pressure chamber is regulated with nicety.

It also consists in forming the lower portion of the low-pressure chamber with a detachable cap, whereby access is had to the valve, &c., without disturbing any of the parts of the regulator.

It also consists of means for adjusting the movable power of the diaphragm from the exterior of the chamber of said diaphragm.

Referring to the drawings, A represents a chamber, formed in a proper casting, and communicating with another chamber, B, by means

of a valve-opening, *a*, said chamber B being formed with a bottom cap, A". C represents an arm or lever, which is hinged at one end to ears *b* in the chamber B, adjacent to the opening *a*, and carries a valve, D, whose seat is the base of said opening *a*. The other end of said arm C is hinged to a spindle, E, intermediate of the ends of which is clamped a flexible diaphragm, F, whose circumference is bolted to the walls of the chamber *d*, within which said diaphragm pulsates.

On the upwardly-extended portion of the spindle E there is fitted a spring, *e*, which presses against the clamping-collar *f* on the upper side of the diaphragm, and against which presses a screw-nut, G, which is fitted centrally in the upper wall of the chamber *d*, and operated outside of said chamber. On said nut is fitted a jam-nut, H, which tightens against said upper wall of the chamber *d*.

The operation is as follows: The required degree of pressure of gas to the burners or other place of service is regulated by adjusting the tension of the spring *e* so as to increase or decrease the movable power of the diaphragm, and correspondingly controlling the valve D, this being accomplished by properly moving the nut G, which, being on the outside of the diaphragm-chamber, is always conveniently reached, access to the interior of the chambers being unnecessary for the required adjustment of the diaphragm. The gas, under high pressure, enters the chamber B through pipe A', and passes into the chamber A, regulated by the valve D, and from thence through the branch A''' to the burners. Should the pressure in said chamber A rise, due to increased flow of gas thereinto, the diaphragm rises and the valve is correspondingly closed. Again, should the pressure in said chamber lower, due to decrease in the flow of gas thereinto, the diaphragm falls, and the valve opens to a greater extent, wherefore the flow of gas into and out of the chamber A is uniformly maintained. When the tension of the spring *e* is adjusted, by means of the nut G, the nut H is screwed tight on the upper wall of the chamber *d*, thus preventing movement of the nut G, and consequently preserving the adjustability of the diaphragm F and valve D.



In order to adjust the valve D with nicety to its seat, said valve is fitted loosely in the upper side of the arm C and rested on or connected to a set-screw, C', likewise fitted to said arm, whereby the valve may be raised and lowered.

In order to produce a gas-tight joint between the spindle E and diaphragm F, I employ the collar *f* and a nut, *g*, on the spindle, on opposite sides of the diaphragm. A washer, *h*, is fitted on the spindle and interposed between the diaphragm and the collar *f* or nut *g*, or both, and by tightening the nut *g* the diaphragm and washer are firmly clamped between said nut and the collar *f*, the advantages whereof are evident.

When the valve D is to be regulated regardless of the diaphragm, the bottom cap, A'', is removed, thus affording access to the set-screw C' without in any manner disturbing or removing any inner part of the regulator.

The chamber B is extended laterally under the high-pressure chamber, thus forming an extension, B', of said chamber B. The ears *b*, on which the lever C is mounted, are suspended beneath the high-pressure chamber, and the valve-opening *a* extended vertically in the bottom wall thereof. By this provision I am enabled to employ a long lever without enlarging the casting, and as the sweep of the lever is increased the valve D, which is supported near the axis of the valve, is moved without rapidity, and consequently without abrupt-

ness, whereby the adjustment or regulation of the flow of gas is accomplished with nicety and delicacy.

I am aware that gas-regulators have been constructed with chambers and a lever having connected to its opposite end a valve and diaphragm for regulating the flow of gas from one chamber to another. Such features are hereby disclaimed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The chamber B, with lateral extension B', under the chamber A, in combination with the valve-carrying lever C, connected to the diaphragm F, and mounted on ears *b* beneath the high-pressure chamber A, whose lower wall has a vertical valve-opening, *a*, arranged substantially as and for the purpose set forth.

2. The high-pressure chamber A and diaphragm-chamber *d*, with a detachable top, in combination with the low-pressure chamber B, having a detachable cap, A'', at its bottom, substantially as and for the purpose set forth.

3. The diaphragm F, in combination with the upwardly-extending spindle E and spring *e*, and with the adjusting-nut G outside of the casting, substantially as and for the purpose set forth.

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Witnesses:

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