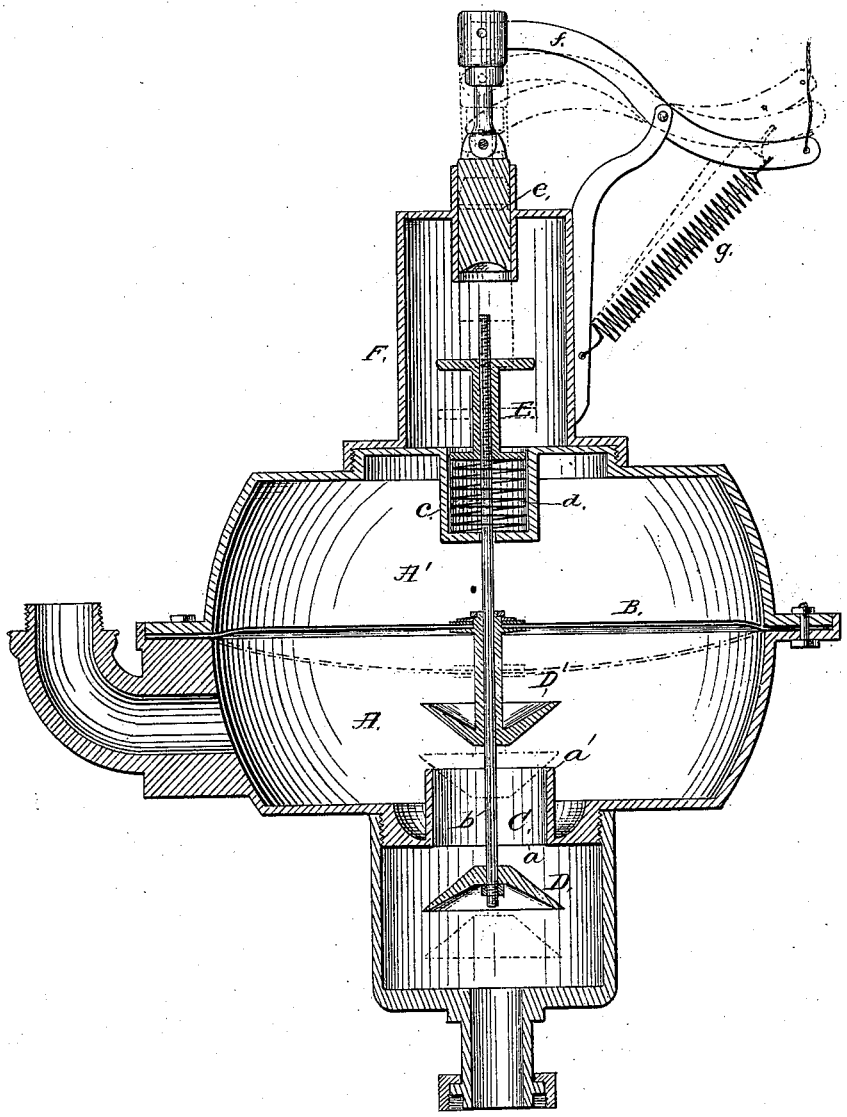
J. ADAMS.
Gas-Regulators.

No. 209,638. Patented Nov. 5, 1878.



WITNESSES:

John F. C. Brinkerhoff

Edw. W. Byrn.

INVENTOR:

Joseph Adams

BY Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH ADAMS, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **209,638**, dated November 5, 1878; application filed October 18, 1878.

To all whom it may concern:

Be it known that I, JOSEPH ADAMS, of Washington city, District of Columbia, have invented a new and Improved Combined Gas-Regulator and Cut-Off; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which the figure is a vertical central section.

My invention relates to certain improvements in gas-regulators, designed either to cut off the gas entirely or to let on a larger amount of gas than its automatic action would ordinarily permit, or to allow the regulator to operate with an automatic action, as usual.

In the patent for an improvement in gas-regulators which was granted me September 17, 1878, provision was made for closing the automatically-operating valve, positively and at will, from any point of the house through connecting-wires. The arrangement there shown allows the valve to have its ordinary automatic action until it is rendered wholly or partially inoperative by being wholly or partially closed. It sometimes happens, however, that a larger supply of gas is required for special purposes (in the laboratory, for instance) than the automatic action will permit, and in this case some provision is desirable for holding the valve open positively. My present invention consists of means for accomplishing this result, still allowing the regulator its automatic action, and also permitting it to be positively cut off when desired. In the attainment of these ends, I employ a double valve in connection with a double-valve seat and means for holding said valve in any of the desired relations, as hereinafter more fully described.

In the drawing, A A′ represent two hemispherical shells, between which is clamped a flexible diaphragm, B, supporting the valve in the manner heretofore well known. In constructing the lower hemisphere it is formed with a tubular portion, C, each end of which constitutes a valve-seat, *a a′*.

D D′ are two conical valves, arranged upon the same stem *b*, and tapered in opposite directions so as to play upon the two seats by the vertical movement of the stem from the varying pressure of gas beneath the diaphragm. In constructing the upper hemisphere it is formed with a cup-shaped recess or seat, *c*, through the center of which the upper end of the stem projects, and by which it is guided.

In this seat and around the upper extension of the stem is arranged a spiral spring, *d*, which at its upper end rests against the lower flange of a sleeve, E, which sleeve is screwed upon the upper end of the stem. Around this sleeve, and closing in the upper end of the case, is screwed a cylindrical case, F. In the upper end of a guide in this case there rests a plunger, *e*, having a concave bottom, which is held above the upper end of the stem. This plunger is connected to one end of a lever, *f*, the outer end of which lever is held down by a spiral spring, *g*, and is connected to the wire running to the portion of the building from which it is desired to operate the valve.

Now, for the varying pressure of gas, the lower valve, D, will, when allowed its automatic adjustment, play upon the lower valve-seat, opening the annular space between the valve and valve-seat wider when the pressure is lower and closing it when the pressure is greater, thus equalizing the flow.

Now, if it is desired to cut off the flow entirely, a pull upon the wire lifts the outer end of the lever, depresses the plunger *e*, and the concave bottom of the same, coming in contact with the upper end of the valve-stem, forces it down, and as it descends the attached upper valve, D′, seats itself on the valve-seat in the upper portion of the tubular inlet, and shuts off the supply, as shown in dotted lines.

If a larger flow of the gas is required than the automatic action of the governor will permit, the pull on the wire is so regulated by a graduated device at the other end of the wire that the lever is only pulled half-way up, as shown by the intermediate dotted lines, whereby the lower end of the plunger holds the stem about half-way down against the pressure of the gas under the diaphragm, so that the two valves D D′ are equidistant from their respective seats, in which position it will be seen the size of the annular orifice is constant, and the largest possible flow of gas is obtained which could pass through said orifice.

For adapting the device to localities where

there is a low pressure of gas, I especially employ the spring *d*, which, by pressing upwardly against the flange-sleeve on the valve-stem, prevents the upper valve, D′, from dropping down and sticking to its seat.

In practicing my invention I prefer to use it in connection with the form of governor described; but I do not confine myself to the same, as any other form of automatic gas-governor could be constructed to operate upon the same principle.

Instead of forming the valve-seats *a a′* upon the ends of a tube, as shown, I may dispense with this tubular construction and arrange a single valve-seat between the two valves so that it shall fulfill the function of a valve-seat to either valve.

From the foregoing description it will be seen that the flow of gas may be regulated, or it may be cut off entirely, or, when occasion requires, it may be let on in unlimited supply from any point of the house.

Having thus described my invention, what I claim as new is—

1. An automatic gas-regulator provided with two valves located upon opposite sides of an inlet-orifice, and made positively adjustable either to cut off the gas or admit it in unlimited supply, substantially as herein shown and described.

2. The gas-regulator case, having a tubular inlet forming valve-seats *a a′*, in combination with the two reversely-arranged valves located upon the stem suspended from the diaphragm, substantially as and for the purpose described.

3. The combination, in a gas-regulator, with a suspended stem carrying two valves arranged upon opposite sides of the inlet-orifice, of a lifting-spring, substantially as described, arranged to prevent the upper valve from permanently seating itself, as set forth.

4. The combination, with the upper hemisphere, A′, formed with a cup-shaped recess, *c*, of the valve-stem *b*, extended through said recess, and provided with a sleeve having an offsetting flange, together with the spiral spring *d*, located in said recess *c*, and arranged to bear against the flange of the sleeve, as and for the purpose described.

5. The combination, with the upper extension of the valve-stem, of the plunger *e*, the lever *f*, and spring *g*, substantially as and for the purpose described.

The above specification of my invention signed by me this 15th day of October, 1878.

JOSEPH ADAMS.

Witnesses:
EDWD. W. BYRN,
SOLON C. KEMON.