

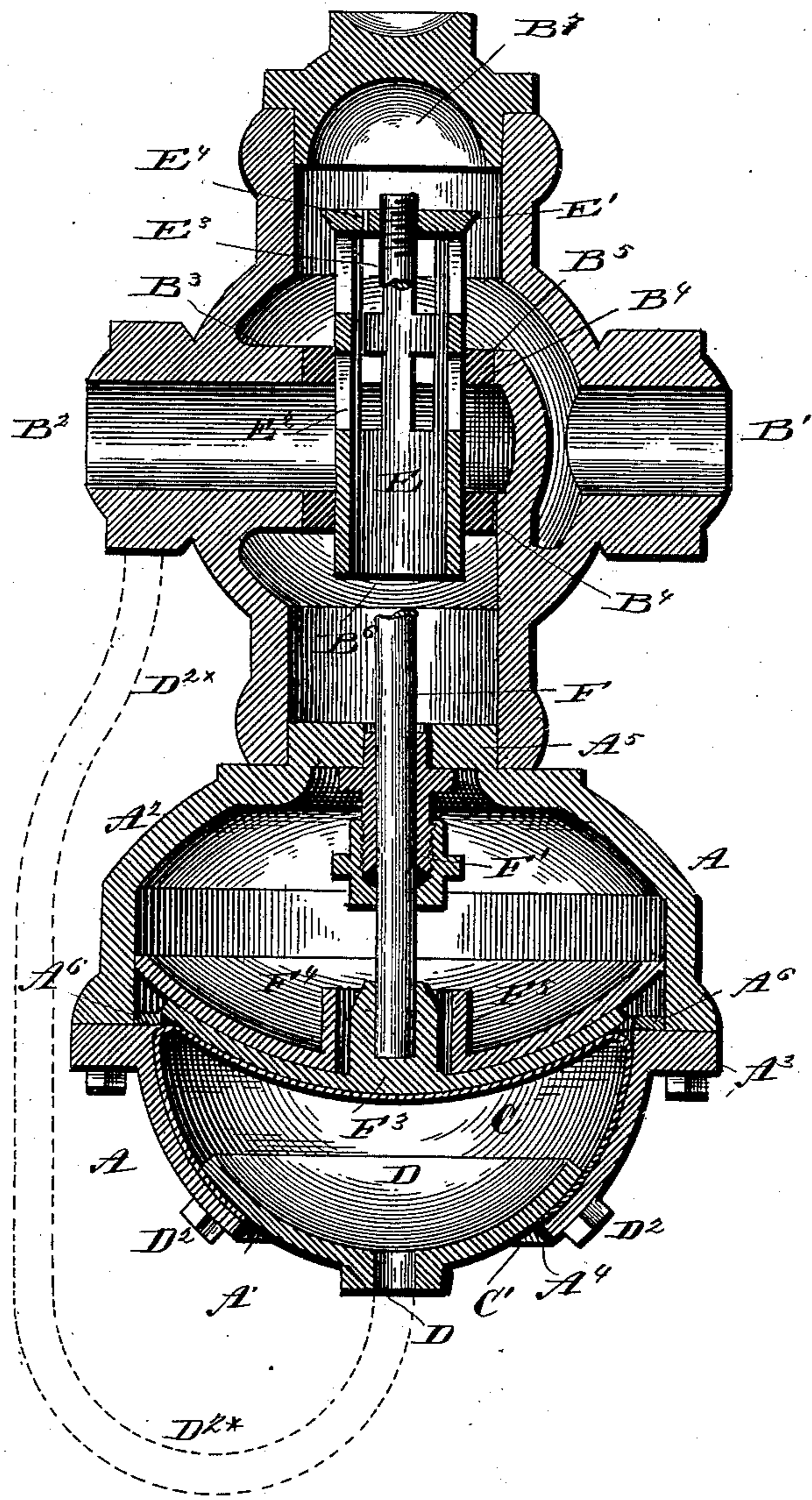
(No Model.)

W. S. PATTERSON.

GAS REGULATOR.

No. 370,886.

Patented Oct. 4, 1887.



Witnesses

L. C. Hills

W L Duwall

Inventor

Wm S. Patterson

Hz Erb Stöckung
HzHz-

UNITED STATES PATENT OFFICE.

WILLIAM S. PATTERSON, OF ALLEGHENY CITY, PENNSYLVANIA.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 370,886, dated October 4, 1887.

Application filed November 2, 1886. Serial No. 217,798. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. PATTERSON, a citizen of the United States, residing at Allegheny City, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas-Regulators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to air and gas regulators; and my object is to provide a device that will automatically regulate the supply of gas or air to a system of pipes in accordance with the requirements.

The invention consists in certain features of construction, hereinafter referred to, and particularly pointed out in the claims.

The drawing represents a central vertical section of a regulator constructed in accordance with my invention.

A represents a regulator-chamber, which in this instance has mounted thereon a valve-chamber, B.

The form of regulator used is similar to that shown and claimed in Patent No. 353,081, granted me November 23, 1886; and I deem it proper to state at this point that certain features not herein broadly claimed are described, shown, and claimed in the above-referred-to application.

The chamber A is preferably formed of two substantially-hemispherical castings, A' A², flanged and bolted at A³, as usual. Within the chamber, and conforming somewhat to the interior outline of the the same, is the elastic regulator C, one portion of which is removed, as at C', registering with an opening, A⁴, formed in the bottom of the chamber A. A concave clamping-plate, D, apertured, as at D', serves to retain the elastic governor C in position, said plate being held by ordinary binding-screws, D², passing through the bottom of the chamber A into the governor and plate.

Mounted upon the chamber A is the valve-chamber B, which is formed with the entrance B' and the exit B², the latter extending into the chamber B and forming a receptacle for the valve. The exit-chamber B² is formed with diametrically-opposite openings B³, which are centrally arranged within the chamber B. The openings B³ are provided with bushings B⁴, and the upper one is cut away to form a valve-seat, B⁵.

Mounted within the bushings and adapted to slide vertically therein is the valve E, the top of which is closed, as at E', and the bottom of which is open and communicates with a chamber, B⁶. At or about the center of the valve E are formed ports or openings E², above which are similar ports or openings, E³, the former adapted to register with the exit-chamber B² and the latter with the receiving-chamber B'.

Screw-threaded into the top of the valve, extending down through the same and the chamber B⁶, and through a stuffing-box, F', secured within a diaphragm, A⁵, in the top of the chamber A, is a valve-stem, F, to the lower end of which is fixed a pressure-plate, F², which is mounted upon the elastic governor C, the stem being secured within a lug, F³, arranged centrally and projecting upwardly from said plate. A guiding-plate, F⁴, provided with a collar, F⁵, adapted to surround the lug F³, and with peripheral shoulder F⁶, adapted to come into contact with an internal wall and with a shoulder formed on the lower hemisphere, as at A⁶, serves as additional means to prevent the valve-stem F from binding within its stuffing-box and aids in retaining it in a vertical position.

For the purpose of cleaning or repairing the device or any of its adjuncts, the top of the chamber B is provided with a removable screw-threaded plug, B⁷. In this instance a pipe, D^{2*}, (see dotted lines,) extends from the outer end of the chamber B², or it may be from a pipe leading therefrom, down to and communicates with the opening D' in the plate D, thereby forming a means of communication between the exit-chamber and the interior of the elastic governor C. In this instance, also, a small aperture, E⁴, is formed in the head of the valve, for a purpose hereinafter explained.

The operation of this regulator is as follows: Supposing, for instance, gas or air is let into the chamber B', it passes into the valve D through the ports E³, out into the chamber B² through the ports E², and also down through the bottom of the valve into the chamber B⁶. The air or gas being within the chamber B⁶ and B' both above and below the valve-head, it forms a perfect balance-valve, to be regulated by a means which I will now proceed to describe. When the gas or air passes into the

chamber B², it also passes into the pipe D^{2*}, hereinbefore referred to, and down through it into the elastic chamber C. The valve is of course arranged to receive and dispense a normal quantity or pressure of air or gas, and should the supply be below the normal it will be insufficient to distend or inflate the elastic chamber or governor C, and the weight of the valve and stem will cause the valve to be drawn down toward its seat. By noting the position or relative location of the ports or openings E² E³ with relation to each other and with the exit-chamber B² it will be seen that the ports E² in such case would be opened to their full extent, so that the gas or air could pass unobstructed into the chamber B². Now, should the supply wholly be cut off or be insufficient to retain the valve and its adjuncts above its seat, the valve would naturally fall within the seat provided for it. This having occurred—that is, the valve having fallen to its seat—were it not for the provision I have made, when the gas was again turned on or the supply strong in pressure it would have no way of getting to the elastic governor, and thereby lifting the valve once more and admitting gas or air to the chamber B². For this reason I have provided a small aperture, E⁴, in the head of the valve, through which a small quantity of air or gas may be admitted, which will gradually expand the governor by passing through the pipe D^{2*} (shown in dotted lines) beneath the governor, so that it will assume a position in accord with the degree of pressure in the main and lift the valve, whereby it will perform its proper function. So long as the port E⁴ is retained in the valve E said valve will not act to completely cut off the supply, while if said supply is otherwise cut off completely the valve E will fall to its lowest position.

Having described my invention and its operation, what I claim is—

1. In a gas and air regulator, the combination of the chambers A and B, one mounted upon the other, the chamber A being provided

with an elastic governor and the chamber B comprising an exit and an entrance passage or compartment, one contained within the other, and provided with a valve, the stem of which passes through the wall of the chamber A and bears upon the elastic governor contained therein, and is provided with a weight acting upon the valve and governor and a projection for intercepting the action of the weight, and a pipe, as D^{2*}, connecting with both chambers, substantially as specified.

2. The combination of the chamber A, provided with the opening A', with the elastic governor C, having the opening C', and with the convex removable binding-plate D, apertured, as at D', and provided with bolts, substantially as specified.

3. The combination of the chamber A, formed with the shoulders A⁶, with the elastic governor C, the valve-stem F, the plate F², and the guiding-plate F⁴, substantially as specified.

4. The combination of the chambers B' B², the valve E, having ports E² E³, with the valve-rod and governor C, connected directly with the rod for raising the valve from its seat, substantially as and for the purpose described.

5. The combination of the chambers B' B² B⁶, the chamber B² provided with openings and having a bushing, B⁴, formed with a valve-seat, B⁵, with the valve E, perforated, as at E², for communication with the chamber B², and at E³ for communication with the chamber B', and perforated, as at E⁴, substantially as and for the purpose specified.

6. The combination of the stem F and stuffing-box F', with the guiding-plate F⁴, having the collar F⁵ and shoulders F⁶, the pressure-plate F², and with the chamber A, having shoulders A⁶, substantially as specified.

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

WILLIAM S. PATTERSON.

Witnesses:

WILLIAM H. MORTON,
WM. H. CONNER.