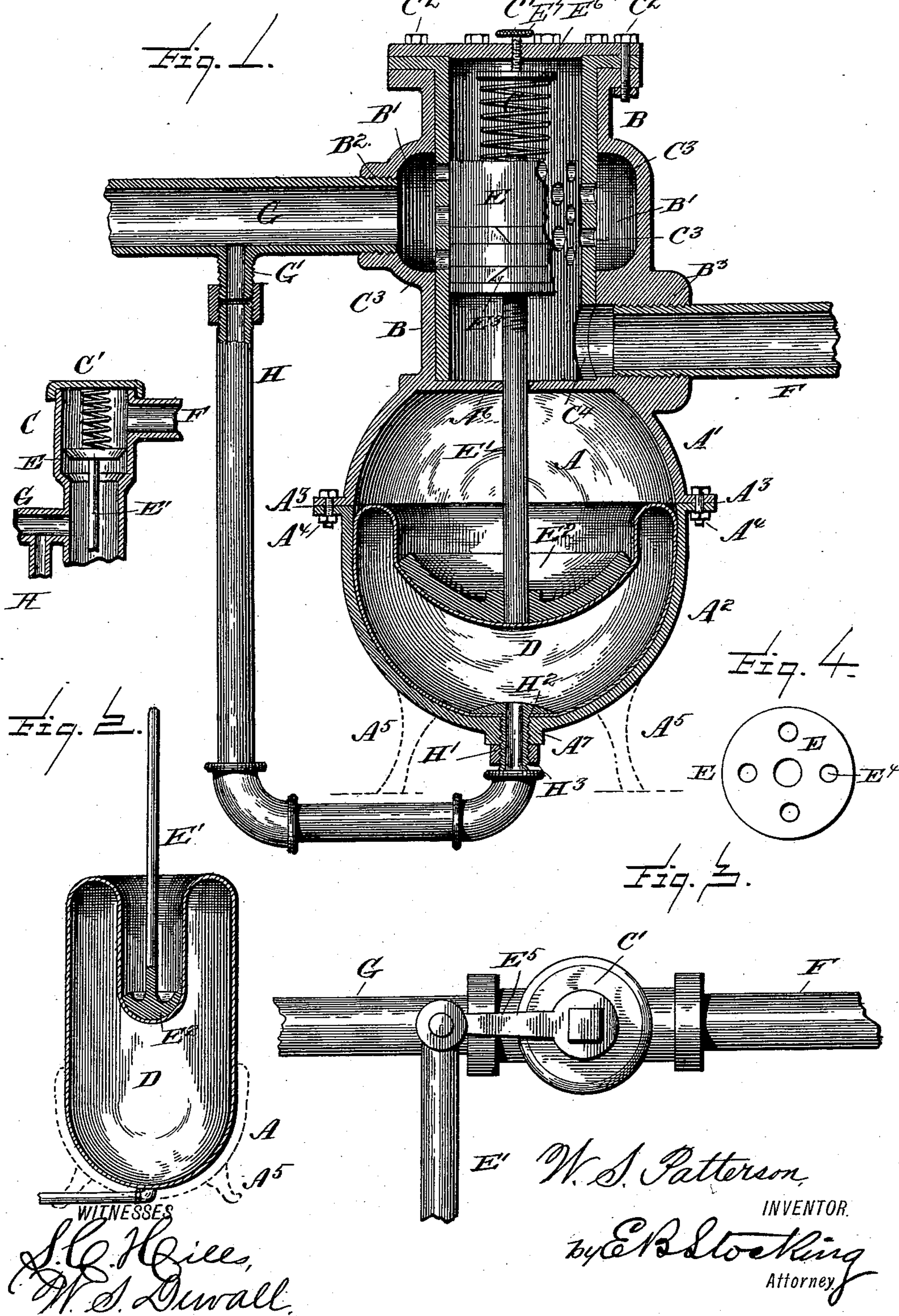


(No Model.)

W. S. PATTERSON.
PRESSURE REGULATOR.

No. 353,081.

Patented Nov. 23, 1886.



UNITED STATES PATENT OFFICE.

WILLIAM S. PATTERSON, OF ALLEGHENY CITY, PENNSYLVANIA, ASSIGNOR
OF ONE-FOURTH TO GEORGE W. BISHOP, OF SAME PLACE.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 353,031, dated November 23, 1886.

Application filed July 21, 1886. Serial No. 203,624. (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 county of Allegheny, State of Pennsylvania, have invented certain new and useful Improvements in Regulators for Gas, Air, Steam, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to gas, air, steam, and water governors or regulators; and the object of the invention is to provide a governor for the above purpose that may be cheaply and easily manufactured, simple in construction, and that will act automatically, directly, and positively on the supply to increase or decrease the same, as the case may be.

20 With these general objects in view the invention consists in certain features of construction hereinafter specified, and particularly pointed out in the claims.

25 This device, although not confined with regard to its use, will be found particularly well adapted in the distribution of natural or manufactured gas.

30 Referring to the drawings, Figure 1 is a central longitudinal section of a valve and governor constructed in accordance with my invention. Fig. 2 is a modified construction in central section of my governor or regulator. Fig. 3 is a modified construction in side elevation of valve-operating mechanism. Fig. 4 is a bottom plan of the piston.

35 Like letters indicate like parts in all the figures of the drawings.

40 A represents a substantially globe-shaped metallic cylinder divided into an upper and a lower half, $A^1 A^2$, and connected by means of flanges and bolts $A^3 A^4$. The bottom half, A^2 , may be provided with feet A^5 , (see dotted lines, Fig. 1,) if desired. Cast integral with or bolted to the upper half, A^1 , is the cylinder B, which is formed with an annular chamber, B^1 , and openings for pipe-connections $B^2 B^3$. This cylinder B is provided with a bushing or lining, C, which is flanged at its top, and it and a suitable head, C^1 , are bolted to the cylinder B, as at C^2 . Ports C^3 , that communicate with the annular chamber B^1 of the cylinder, are formed in the bushing, which is also provided with an

opening, C^4 , which registers with the opening or pipe-connection B^3 therein.

55 Within the globular chamber A is fitted a flexible ball, D—in this instance rubber, but it may be of any desired flexible material—said ball exactly fitting said chamber, and upon this ball is adapted to bear a valve-plate, E^2 , which may be somewhat round, as shown, and is connected to a valve-stem or piston-rod, E^1 , which passes through a diaphragm, A^6 , in the globe, and is connected to a piston, E, which is snugly fitted and adapted to move vertically within the bushing C. This piston is provided in this instance with suitable spring-packing, E^3 , and is longitudinally bored, as at E^4 . (See Fig. 4.)

65 F represents the supply-pipe, which is connected to the opening or pipe-connection B^3 of the cylinder, and G the exit-pipe, which is connected to the opening or pipe-connection B^2 of said cylinder. Extending from the exit-pipe G is a branch coupling, G^1 , to which is connected a branch pipe, H, that passes down under the globe A and connects with a hollow bolt or tube, H^1 , that is threaded in an opening, A^7 , in the half A^2 of said globe, said bolt being held in place by means of a flange, H^2 , and nut H^3 . A gas-tight joint is made for the governor at this point by inserting the flexible material thereof between the flange and the bottom of the globe.

75 Referring to Figs. 2 and 3, which are modifications of the governor or regulator and valve-operating mechanism, it will be seen that I may do away with the upper half of the globe A and change the form of my elastic flexible governor—that is to say, I may flatten the opposite sides thereof and extend the lower half of the globe more or less high against said sides. I also show in the latter figure a modified construction of the valve-connecting mechanism, by which an ordinary stop-cock may be employed in lieu of a balance-valve. This construction consists in pivotally connecting the stem E^1 to a lever, E^5 , which, when raised at its free end, will diminish the supply, and when lowered will increase the same; or it may be to the contrary, in accordance with the construction of the valve.

80 The operation of the device will be apparent to

from the above description. Taking, for instance, a supply of gas entering the pipe F, it will flow into the bushing C under the piston and up through the apertures E⁴ in the same, and out through as many of the ports C³ as may be exposed or uncovered by the piston, into the annular chamber B' and out of the outlet or exit pipe G. The pressure of the gas at the top and bottom of the cylinder C cushions the piston, thus rendering it a balance-valve. Should the pressure of gas be greater than is necessary, the over-supply will pass down into the branch pipe H, through the hollow tube H', into the flexible chamber D, causing it to expand and force up the stem E', which, in a device shown in Fig. 1, would cause the piston E to close more of the openings or ports C³ and restore the equilibrium of the valve, or in a device as shown in Fig. 3, (an ordinary stop cock or valve,) would lift the lever E⁵ and diminish the supply accordingly.

The piston may be adjusted by means of a screw-thread on the stem E' and an interposed spring, E⁶, and set-screw E' passed through the top of the cylinder C.

At the left of Fig. 1 I have shown an ordinary check-valve provided with my improved governor, said valve being supposed to form a portion of the gas system; and the purpose of this valve is to cut off the supply or prevent the entrance of gas into the house when left lighted at night, should the supply be cut off from the street for the purpose of making repairs and afterward turned on again. It will be seen that in this event, after the gas has been shut off, the spring will force the valve to its seat, and when the gas is again turned on it cannot enter the pipes leading to the burners, and thus accidents from suffocation are prevented.

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

1. A regulator for the purposes described, comprising a flexible governing-chamber and its support, a valve-stem bearing upon said chamber and connected to a piston, the bushing for which is provided with ports communicating with inlet and outlet pipes, and a branch pipe connecting the outlet-pipe with the flexible chamber, substantially as specified.

2. In combination with a regulator of the class described, a valve comprising an outer cylinder provided with inlet and outlet ports or openings and an annular chamber, and an inner bushing or lining provided with ports registering with said annular chamber, and a valve adapted to cover said ports, substantially as specified.

3. A casing for governors of the class described, comprising a governor-receptacle, a cylinder mounted thereon and provided with an annular chamber having openings, in combination with a bushing or lining apertured to register with said chamber and one of said openings, substantially as specified.

4. The combination of the chambers A and D, the cylinder B, having chamber B' and openings B² B³, the diaphragm A⁶, pipes F, G, and H, hollow bolt H', stem E', piston E, and plate E², substantially as and for the purpose set forth.

5. The combination of the chambers A and D, with hollow bolt H', having flange H², and with the nut H³, substantially as specified.

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

WILLIAM S. PATTERSON.

Witnesses:

SAMUEL M. BOYD,
JOHN D. BLAKELEY.