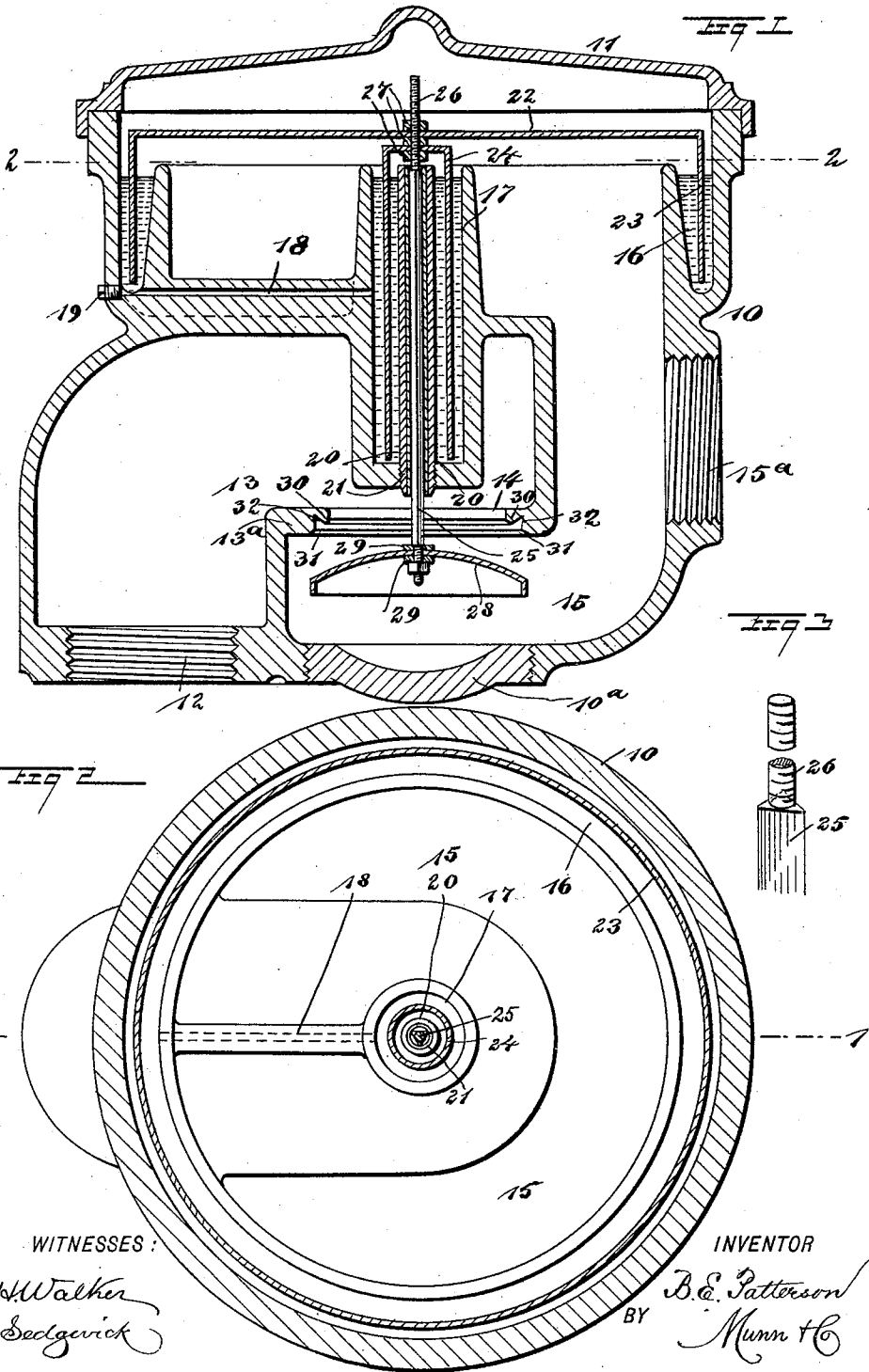


(No Model.)

B. E. PATTERSON.
GAS GOVERNOR.

No. 489,324.

Patented Jan. 3, 1893.



WITNESSES:

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BENJAMIN E. PATTERSON, OF NEW YORK, N. Y.

GAS-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 489,324, dated January 3, 1893.

Application filed May 11, 1892. Serial No. 432,668. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN E. PATTERSON, of New York city, in the county and State of New York, have invented a new and Improved Gas-Governor, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of gas governors, having outer and inner wells, and the object of my invention is to produce an extremely simple, cheap, compact and durable gas governor, which will perfectly regulate the flow of gas so as to prevent waste at the burner, which will also deliver gas under all conditions at a steady, uniform and economical pressure, and which has its regulating valve and the well floats for actuating the same, arranged so that the movement of the valve will be steady and positive, thus preventing all jumping, rattling and telegraphing through the connected parts.

To this end, my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical section of the gas governor embodying my invention, on the line 1—1 in Fig. 2; Fig. 2 is a sectional plan on the line 2—2 in Fig. 1; and Fig. 3 is a broken detail view of the valve stem.

The governor is provided with a case 10 of general circular cross section, which has a plug 10^a at its lower end, this being for the purpose of facilitating the construction and insertion of parts in the valve, and a removable cover 11. The governor has an inlet 12, entering a chamber 13, which is arranged in the lower portion of the governor, and has near the center of the governor a horizontal floor or partition 13^a, separating it from the main chamber of the governor, and through this floor is a passage 14 for the passage of gas, which flows through into the lower portion of the main chamber 15, and thence out through the outlet 15^a.

In the upper portion of the governor, and within the main chamber is a large annular well 16, and in the center of the governor is

an annular well 17, which is very much deeper than the outer well 16, so as to provide for a large, heavy, central column of mercury, which is adapted to steady the movement of the floats and prevent pulsation, as hereinafter described. The outer and inner wells are connected by a transverse bore 18, which is produced by boring through from the outside of the governor, and the outer end of the bore, that is, the part in the wall of the governor outside the well 16, is closed by a plug 19. Extending centrally and vertically through the inner well 17, is a pipe 20 which is screwed into the well bottom and extends entirely through the same, the pipe having preferably a lining 21, of brass or other non-corrosive metal. A float 22 is held in the upper chamber, and has an annular depending flange 23, which enters the mercury held in the outer well 16, and the float thus acts as a seal and prevents any escape of gas around it, and it also serves to operate the regulating valve as described below. The inner well 17 is also provided with a cylindrical float 24, which extends downward to near the bottom of the well, and this float is closed at its upper end so that no gas can escape around it. Extending vertically through the pipe 20, is a valve stem 25, which is of triangular cross section, thus providing bearing edges which will have but little friction on the pipe so that the stem may be moved vertically with the greatest ease. The stem is reduced and screw-threaded at its upper end, as shown at 26, this threaded portion being made to extend through the center of the two floats 22 and 24, and suitable nuts 27 are used for adjusting and fastening the floats, the nuts being arranged above the float 22, beneath the float 24, and between the two floats. It will be understood that suitable packing may also be inserted between the nuts. The lower end of the valve stem is fastened by a nut to a valve 28, which has a convex upper surface and is adapted to close the passage 14. Suitable packing washers 29 are placed around the valve stem and above and below the valve so as to guard against leakage. The packing 29 is also adapted to close against the lower end of the pipe 20 when the valve 28 is raised, and thus prevent the gas from passing up through the pipe and exerting pressure beneath the inner float.

The valve 28 is adapted to close the passage 14, and to provide against any possible leakage, the passage is provided with two concentric seats 30 and 31, one being a little above 5 the other, and the two are separated by an annular groove 32. These seats are made sharp so that the valve will close snugly upon them, and if the gas should pass one seat by reason of a pin hole or other imperfection in 10 the seat, it will be checked at the seat above. It will be understood that still more seats may be used, on the same principle, if desired. When the valve is closed upon these seats it compresses the gas in the groove 32, which 15 has a tendency to prevent the too sharp action of the valve. It will be noticed that the inlet chamber 13 extends entirely around the lower portion of the inner well 17, so that the inflowing gas will press downward equally 20 upon every portion of the valve 28 so as to move it steadily downward. It will be also noticed that the diameter of the valve is considerably less than the diameter of the outer well 16, and that the diameter of the inner 25 well is less than the diameter of the valve.

The operation of the valve is as follows: The inflowing gas passes into the inlet 13, presses down the valve 28, and passes on and out through the outlet 15^a. When the pressure becomes too heavy it lifts the float 22, 30 thus closing or partially closing the valve 28, and when the pressure is lessened, the float and the valve drop. The street pressure or pressure in the service pipe which acts from the inlet chamber 13, presses downward upon 35 the valve 28, and upward against the inner float 24, while the house or back pressure acts against the larger float 22. The diameter of the valve being greater than that of the inner 40 float, it is obvious that the street pressure can never raise the float; but the street pressure is opposed by the tall heavy column of mercury in the deep inner well 17, and thus the pulsation is counteracted and destroyed before 45 the gas reaches the valve 28. The house or back pressure acting on the large float 22 alone, serves to raise the connected floats, and hence it mainly controls the action of the governor as a whole. The result is, that the 50 deep inner float and well act as a counterbalance, so that the pressure at the burners is uniform, and all rattling, jumping and sudden movements of the valve are obviated.

All gas governors of the outer and inner

well class have the inner well made to balance 55 the valve, the well corresponding in cross section to the outside diameter of the valve, but in my machine, the inner well and float, on account of the extra depth of mercury in the well, is always of one diameter 60 but the depth of the inner well varies in different sizes of machines.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent,— 65

1. A gas governor, comprising a case 10, having an inlet chamber 13, a main chamber 15, and a horizontal partition 13^a separating the chambers, a passage extending through the horizontal partition and having a plurality of valve seats, a relatively large outer well 70 16, arranged in the upper portion of the governor, a deeper inner well 17 connected with the outer well and having a vertical bore, the two wells containing a body of mercury, a 75 float suspended in the outer well and held to close the main chamber of the governor, a relatively long float mounted in the deeper well, a valve stem secured to the two floats and held to move in the bore of the inner well, 80 a valve secured to the lower end of the valve stem and having a convex upper surface, the valve being held to close the passage in the horizontal partition, and an outlet from the main chamber, all substantially as described. 85

2. The combination, with the main case having an inlet chamber and a main chamber provided with an outlet, and a horizontal partition having a passage therein connecting the two chambers, of an annular well arranged 90 in the upper portion of the governor and extending around near its outer wall, a deeper inner well arranged vertically above the passage in the horizontal partition, a float mounted in the larger well, an inner float mounted 95 in the inner well, a body of mercury held in the two wells, a vertical pipe extending centrally through the inner well, a flat-sided valve stem extending through the pipe and having its upper end secured to the floats, and 100 a convex valve secured to the lower end of the stem and adapted to close the passage between the chambers, substantially as described.

BENJAMIN E. PATTERSON.

Witnesses:

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EDGAR TATE.