(No Model.)

M. G. WILDER.

GAS REGULATOR.

No. 352,940. Patented Nov. 23, 1886.

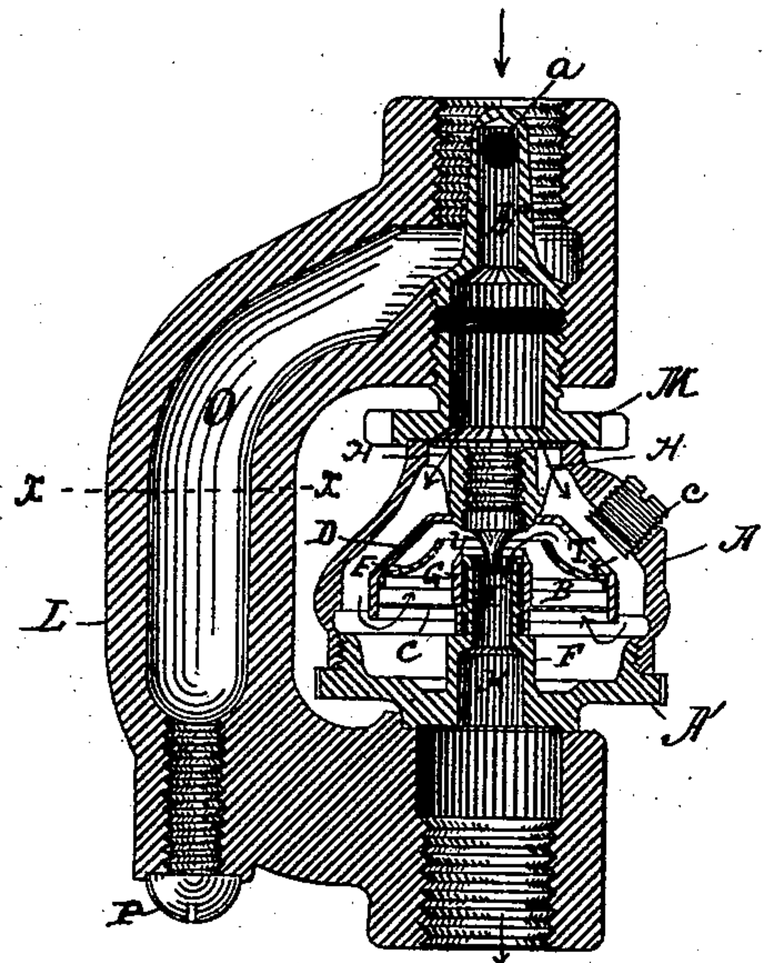

Fig. 1.

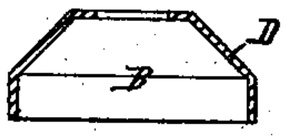

Fig. 3.

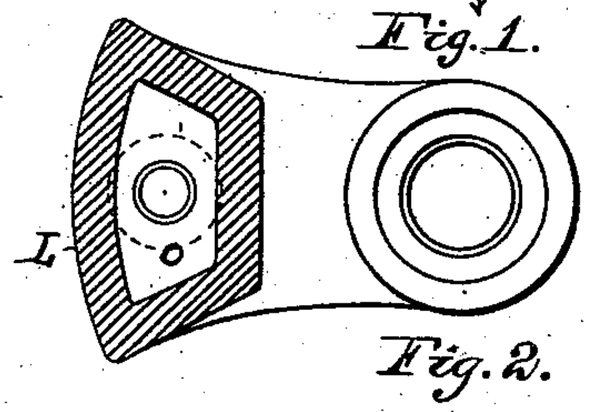

Fig. 2.

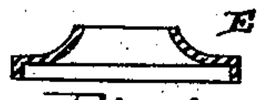

Fig. 4.

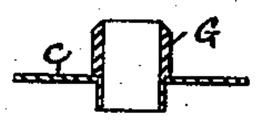

Fig. 5.

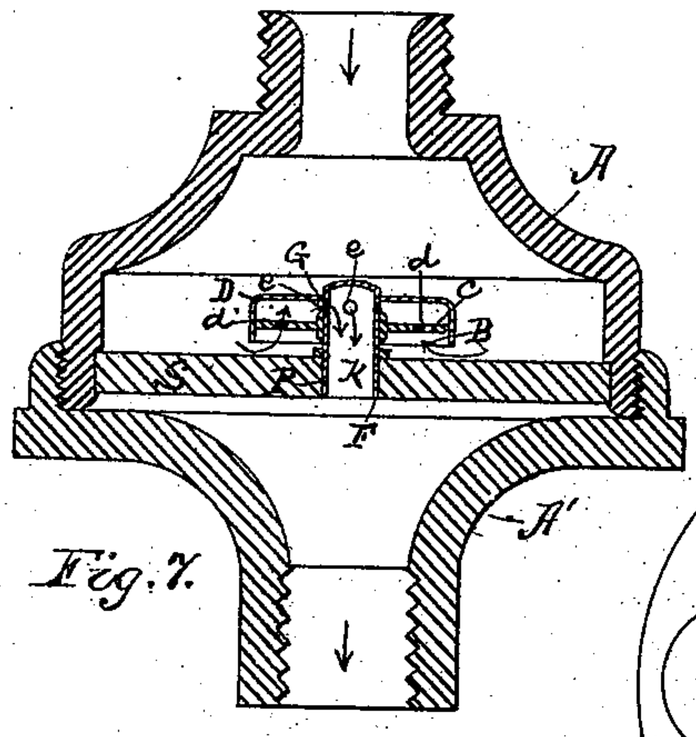

Fig. 7.

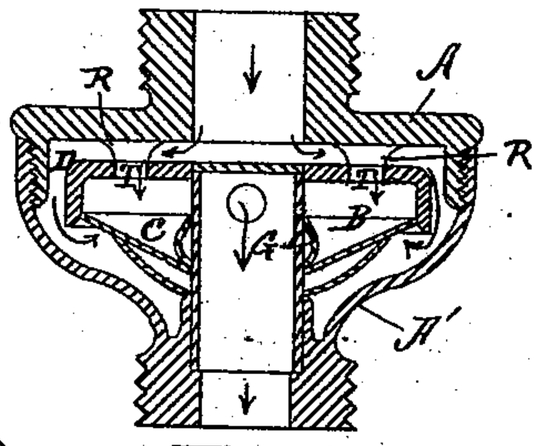

Fig. 6.

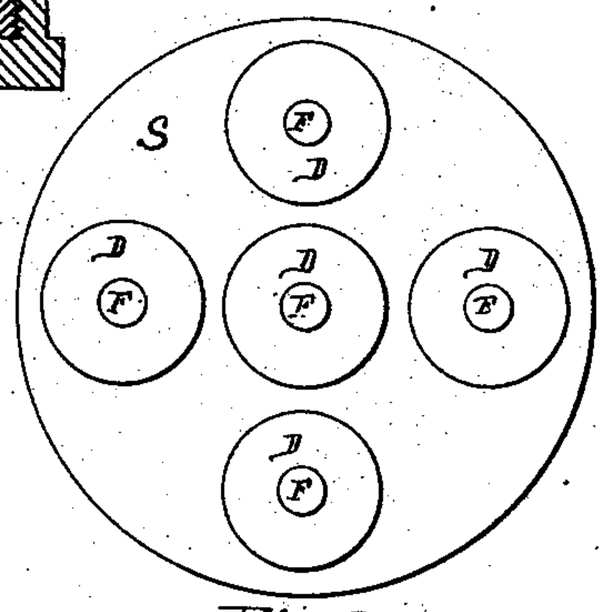

Fig. 8.

WITNESSES:

William K. Hewson

Chas A. Mahony

INVENTOR

Moses G. Wilder

by his attorney

Chas A. Rutter.

UNITED STATES PATENT OFFICE.

MOSES G. WILDER, OF PHILADELPHIA, PENNSYLVANIA.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 352,940, dated November 23, 1886.

Application filed April 6, 1886. Serial No. 198,040. (No model.)

To all whom it may concern:

Be it known that I, MOSES G. WILDER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Volumetric Gas or Fluid Regulators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The object of my invention is to furnish a gas or fluid regulator for controlling a descending current of gas or fluid; and my invention consists of a metal body or shell inclosing a check, disk, or diaphragm and valve, in combination with suitable passages for conveying the gas or fluid to and from the said valve.

In the drawings, Figure 1 is a central sectional elevation of my regulator and yoke for holding it; Fig. 2, a section of the yoke on line *x x*, Fig. 1; Fig. 3, a sectional elevation of the central shell, Fig. 4, a sectional elevation of the distributing-diaphragm; Fig. 5, a sectional elevation of the check and valve; Figs. 6 and 7, sectional elevations of modifications of my regulator, and Fig. 8 a plan of a modification of Fig. 7.

Referring to Fig. 1, A and A′ are the upper and lower portions of the shell of the regulator, which are screwed together, as shown. B is the gas-chamber, within which the check C is placed, and in which it can move freely up and down.

D, Figs. 1 and 3, is a shell which is carried by the upper part, A, of the main shell, and in which the check C works, and which forms the gas-chamber B.

E, Figs. 1 and 4, is an annular concave distributing-diaphragm which is placed in shell D.

F is a hollow central post projecting upward from lower part, A′, of the main shell, which guides the check C in its up and down movements, and through which the gas passes downward to the burners.

G, Figs. 1 and 5, is the valve; H H, openings in the upper part, A, of the main shell, through which the gas passes to the interior of this shell. I is a conical pin projecting downward from upper part, A, of shell into the hollow K of post F. L is the yoke; M, a hollow thimble screwing into yoke; N, a cap for preventing dust or drip from entering the regulator, and O a chamber in yoke L for receiving dust or drip.

The yoke L is placed in the pipe which delivers the gas to the burners, one part of the pipe being screwed into the upper part of the yoke and the other into the lower part. The gas flows downward, as indicated by the arrows, passes through hole *a* in the top of cap N, down through hollow thimble M, through openings H H, and into the interior of shell A A′, from whence it passes, as described hereinafter, to the burners. The gas after being admitted to the interior of shell A A′ passes partly through openings T in shell D, and partly to the bottom of this shell, where it acts upon and tends to lift the check C and close the valve G. The gas which is admitted to the space B within the shell D, through the opening T in this shell, acts against the upward pressure of the gas on check C and prevents a total closing of valve G. In other words, the valve G and check C are poised and float upon the gas within shell D. By means of the screw *c* the amount of gas which enters space B through opening T in shell D may be regulated. The gas, after passing through opening T, strikes against the annular convex distributing-diaphragm E and is dispersed, passing all around this diaphragm. The conical pin I, which projects downward into hollow K of post F, breaks up the current of gas and prevents buzzing or humming of the gas as it passes into the hollow post. The gas which passes to the burners will be in proportion to the pressure at which the check will be poised. The pressure under the check operates to close the valve, while the pressure above operates to depress the check and to open the valve; therefore the valve will be held in a position where the gas entering the chamber B under screw *c* is permitted to flow through the opening V of valve above valve G. Thus by changing the position of screw *c* the supply of gas to the burners can be varied as desired, while the volumetric function remains and the supply to the burners is constant at widely-varying pressures in the supply. All dirt or drip is prevented from en-

tering the interior of the burner by the cap N, and the dirt or drip passes into the chamber O in yoke L, and it may be drawn off by simply taking out the screw P, or by means of any ordinary stop-cock or any other suitable means.

The regulator is held in place within the yoke by the thimble M, which may be screwed up or down in the yoke. The lower part, A′, of the regulator has a seat on the lower part of the yoke, and the upper part a seat against the thimble M. If it is desired to remove the regulator, the thimble M is simply screwed up, when the regulator may be lifted out of the yoke. The joints are packed in any suitable manner, so as to be gas-tight.

Fig. 6 is a modification of my invention, in which G is the valve, C the check, D the central shell, and T T openings in this shell, as before. The shell A is furnished with lugs R, (instead of screw *c*,) which are adapted to pass over and close the holes T in the top of shell D. By turning the shell A relatively to the shell D these lugs R will either open or close the holes T, and the flow of gas through these holes will be consequently increased or diminished. In its essential features this modification is similar to my invention described above.

In Fig. 7 another modification is shown. In this case the gas enters chamber B by passing through small holes *d* in the check C, and it passes from this chamber through holes *e* in the central post, F, which is closed at its top, as shown, and through the hollow of this post to the burners. A too great pressure of gas causes check C to rise, and valve G closes the holes *e* to a corresponding extent, and, vice versa, a low pressure permits the check to fall and the holes to be opened.

In Fig. 8 a plan of the diaphragm or partition S, Fig. 7, is shown, which is furnished with five shells, D, instead of the one shown in Fig. 7. In this modification the disk S is fitted to receive one or more of the small regulators, as shown in Fig. 7, in position in said disk. Thus the total capacity of the regulator would depend upon the number of these small regulators which were used.

The regulator herein described may be applied to the general supply-pipe or to the gas-burner itself, its action in either case being the same.

I am aware that pressure-regulators have been made that would operate in various positions. My present invention is of an entirely different nature from these, and produces results that are quite impossible with a regulator of pressure. The volumetric function is essential to the perfect operation of a regulator for a single burner, and a regulator of this kind can be also used to control a group of burners; but it would be undesirable as an attachment to the general supply-pipe, unless the flow was to be for any reason limited to a stated volume in cubic feet per hour. For the above reasons I limit my claims so as to include a volumetric opening for the passage of the gas. I wish to state, however, that this opening can be made in a great variety of ways, to allow the gas to flow at the constant pressure due to the action of the poised or floating diaphragm or check which is placed in the gas-chamber of such a regulator. I limit myself, therefore, to regulators in which there is such an opening or openings as would secure the volumetric function in the regulator, inasmuch as this function cannot be unless an opening or openings are acted upon by the difference of pressure above and below the diaphragm or check due to its control of the gas.

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

1. A shell or body having an inlet or inlets opening downward to convey the gas to a volumetric opening or openings, in combination with a check or diaphragm and valve, and said volumetric openings and a suitable outlet-passage or passages opening downward from said valve, substantially as set forth.

2. A volumetric regulator consisting of a check or diaphragm, substantially as described, a valve which is opened when the check falls and closed when the check rises, combined with a volumetric opening or openings to convey the gas to the valve, and an outlet-passage which opens downward to permit of the discharge of the gas to the burners, and a suitable shell for inclosing the same, all substantially as described.

3. A volumetric regulator consisting of a check or diaphragm, substantially as described, and a volumetric opening or openings, a valve which opens when the check falls and closes when the check rises, in combination with a suitable shell or body, and an inlet passage or passages which open downward into said shell to convey the gas to a point where it is acted upon by the said valve for the purpose of limiting and controlling the volume delivered, substantially as set forth.

4. In a volumetric gas or fluid regulator, and in combination with the check, valve, and volumetric opening or openings, all substantially as described, the hollow central post, substantially as and for the purposes set forth.

5. The combination, with a gas or fluid regulator, as described, and as a device for breaking up and preventing buzzing of the current of gas or fluid entering the hollow post F, the pin I, substantially as described.

6. In a gas-regulator, and in combination with shell D, the distributing-diaphragm E, substantially as and for the purposes set forth.

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

MOSES G. WILDER.

Witnesses:

OTIS EGAN,

CHAS. A. RUTTER.