J. P. WARNER.
Gas-Regulators.

No. 197,434. Patented Nov. 20, 1877.

Fig. 1.

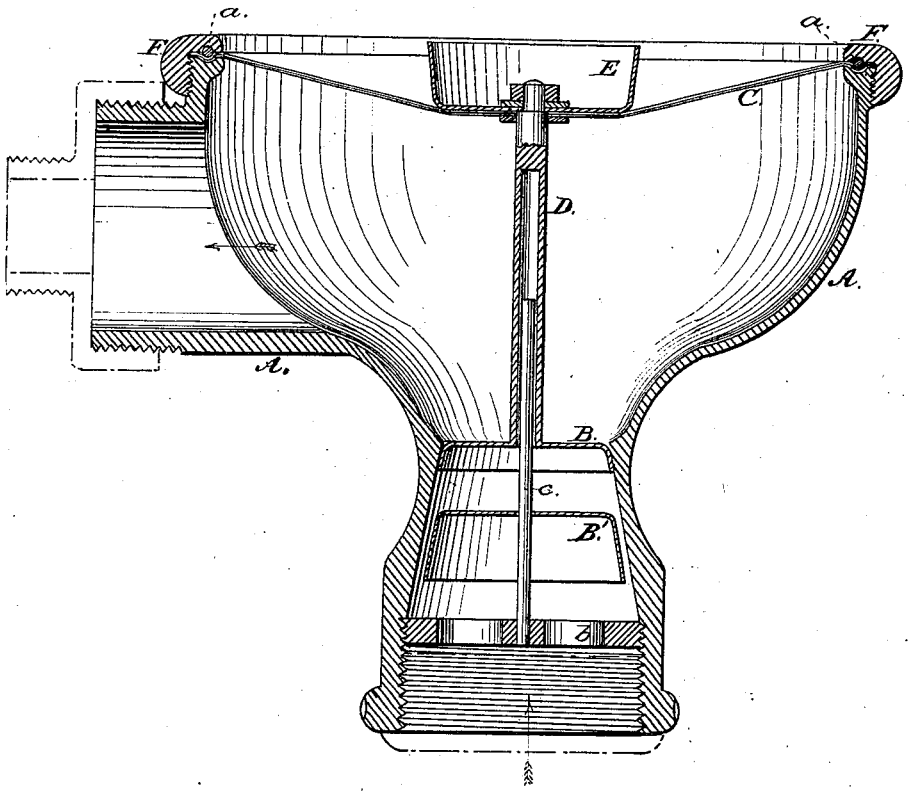
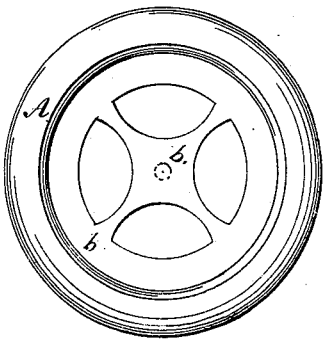


Fig. 2.



Witnesses:

Inventor:

John P. Warner

UNITED STATES PATENT OFFICE.

JOHN P. WARNER, OF BALTIMORE, MD., ASSIGNOR OF THREE-FOURTHS OF HIS RIGHT TO THOMAS G. STEWART, I. MITCHEL, AND E. RAINE, JR.

IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **197,434**, dated November 20, 1877; application filed March 9, 1877.

To all whom it may concern:

Be it known that I, JOHN P. WARNER, of Baltimore city, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Gas Regulators or Governors; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a gas regulator or governor that is very simple in its construction, durable, and not likely to get out of order.

The invention consists of a diaphragm, governor, or regulator, having its lower end or receiving-nozzle made of conical or tapered shape, into the upper end of which a cup-valve, of slightly conical shape, fits, and which is weighted, by shot or other suitable weights, to the pressure desired. An auxiliary or secondary valve is arranged a short distance below the upper valve, by which the action of the regulator becomes more sensitive, as a greater surface is exposed to the gas.

The diaphragm is held in place in the shell between the cap and case by a packing-wire, which fits into suitable grooves in the upper and lower edges or faces thereof, and by which it is clamped in position. The cap or flange is screwed down onto the outside of the shell, instead of being held by the usual screws or bolts, all of which will be more definitely described in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a vertical cross-section of my governor or regulator. Fig. 2 is a bottom view, showing the guide for the valve-stem, &c.

In the drawing, A is the outer shell or case, made of any suitable material, having its lower end tapered or conical, and into which the cup-valve B fits, and closes the entrance-opening when drawn to its seat by the diaphragm C, which is connected to the valve by the hollow stem D. A secondary or auxiliary valve, B′, is arranged a short distance below the valve B, and also of cup shape, and made of thin metal, the object of which is to give a greater exposed area than when one valve is used to be operated upon by the gas. The valve becomes thereby more sensitive, and will act quicker.

On the upper side of the diaphragm is arranged a cup or receptacle, E, into which shot or other weights are placed, to weight the valve to the desired pressure.

The diaphragm C is clamped between the cap or flange F and the upper edge of the shell A by a packing-wire, *a*, which fits into recesses in the upper and lower faces of the cap and shell, and, as the cap F is screwed down, it firmly clamps the diaphragm without the use of red lead or other packing material. Into the lower end of the shell is screwed a guide-piece, *b*, to which is secured the upright *c*, upon which the hollow stem of the valve fits, and is guided in its up-and-down movements as the pressure increases or decreases.

To suit different sizes of gas-pipes and meters, and compensate for different sizes of governors, I make use of a peculiar-shaped coupling-nut, which has different-sized openings to fit them, and for which I desire to make a separate application for Letters Patent, and said nuts are shown in dotted lines in the drawing.

The operation is as follows: The valve being weighted to the desired pressure intended, and gas being admitted through the lower end, the gas will open or close more or less the valves as the said gas impinges against the diaphragm C when the pressure increases or decreases, as will be readily understood by those conversant with the art.

The advantages of my improved governor or gas-regulator are, that it is very simple in its construction, not liable to get out of order, it can be furnished at a very small cost, it is reliable, and there is no danger of leakage by the use of the wire packing. It is also much more sensitive than any other valve.

Having thus described my invention, what I

claim, and desire to secure by Letters Patent, is—

1. A governor or gas-regulator having its lower end tapered, and provided with a cup-valve, B, fitting the taper, and the secondary valve B′, held in place by a diaphragm, C, substantially as shown, and for the purpose described.

2. In the gas-regulator herein described, the recessed faces of the shell A and cap F, in combination with the diaphragm C and packing-wire *a*, all constructed and arranged as shown and described.

3. The governor or gas-regulator herein described, consisting of the shell A, double-cup valve B B′, stem D, diaphragm C, weight-cup E, recessed cap F, and recessed shell A for the packing-wire *a*, all constructed and arranged substantially as shown and specified.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JOHN P. WARNER.

Witnesses:
T. DENNY,
JOS. MITCHELL.