

(No Model.)

W. H. METCALF.
GAS PRESSURE REGULATOR.

No. 401,048.

Patented Apr. 9, 1889.

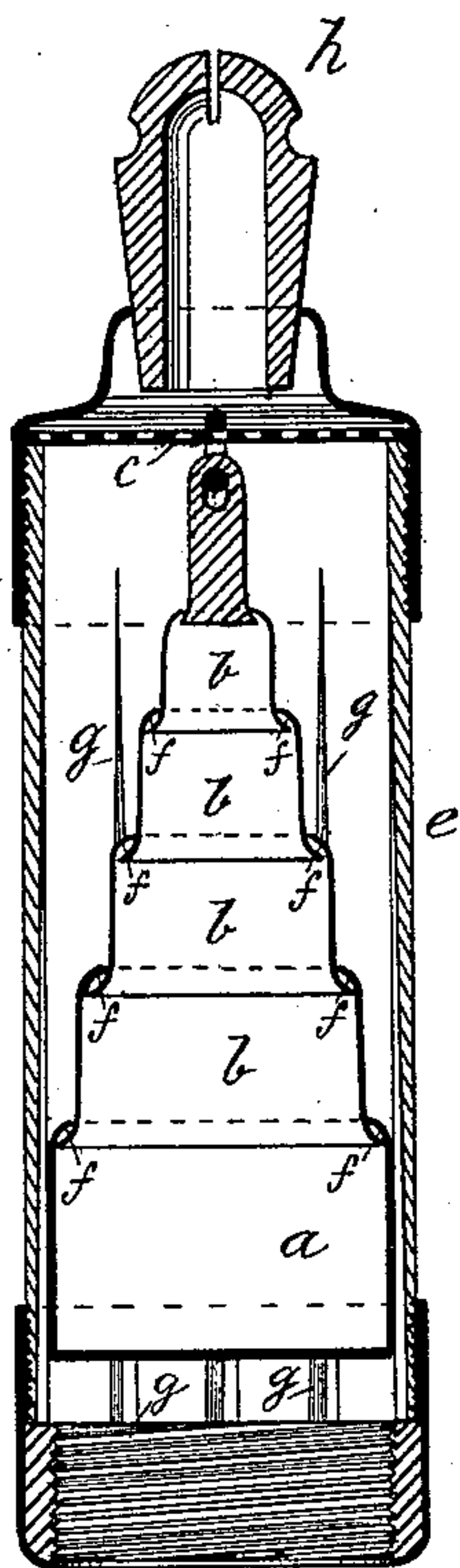


FIG. 1.

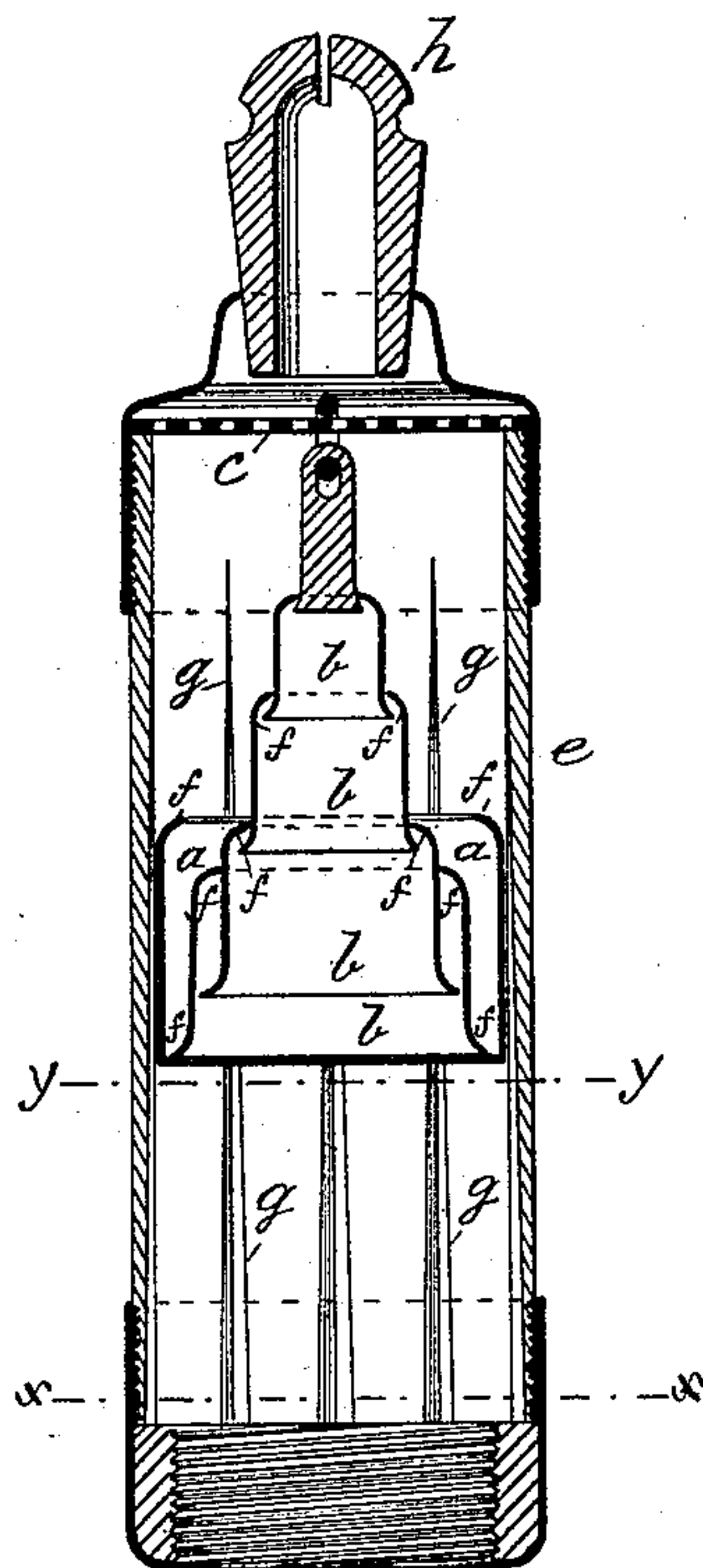


FIG. 2.

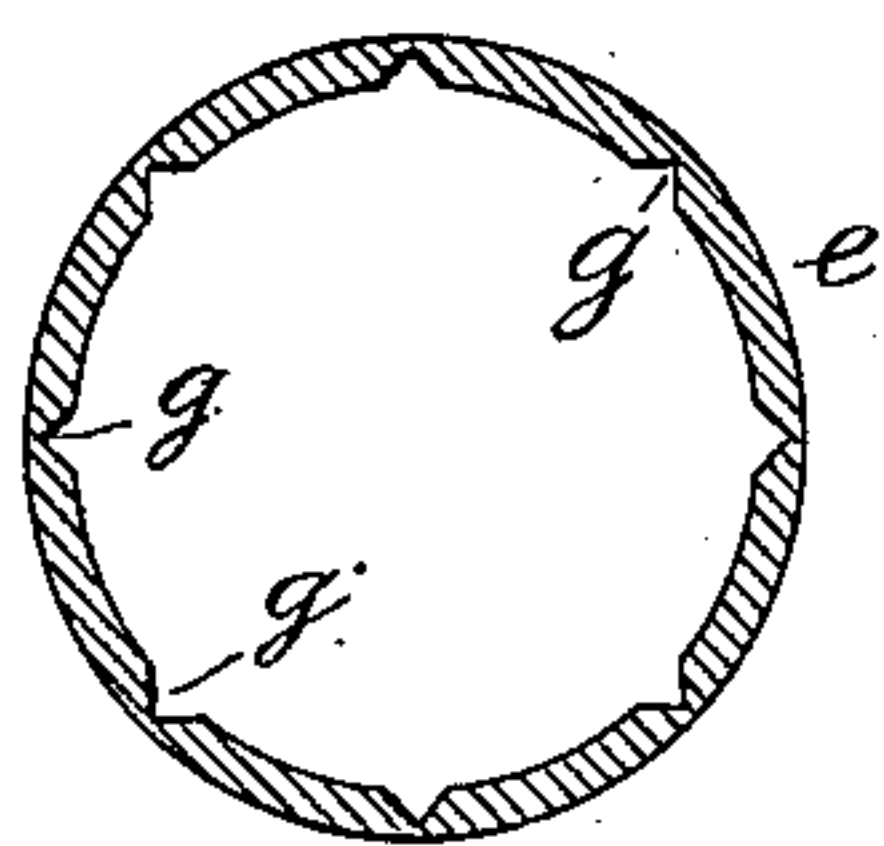


FIG. 3.

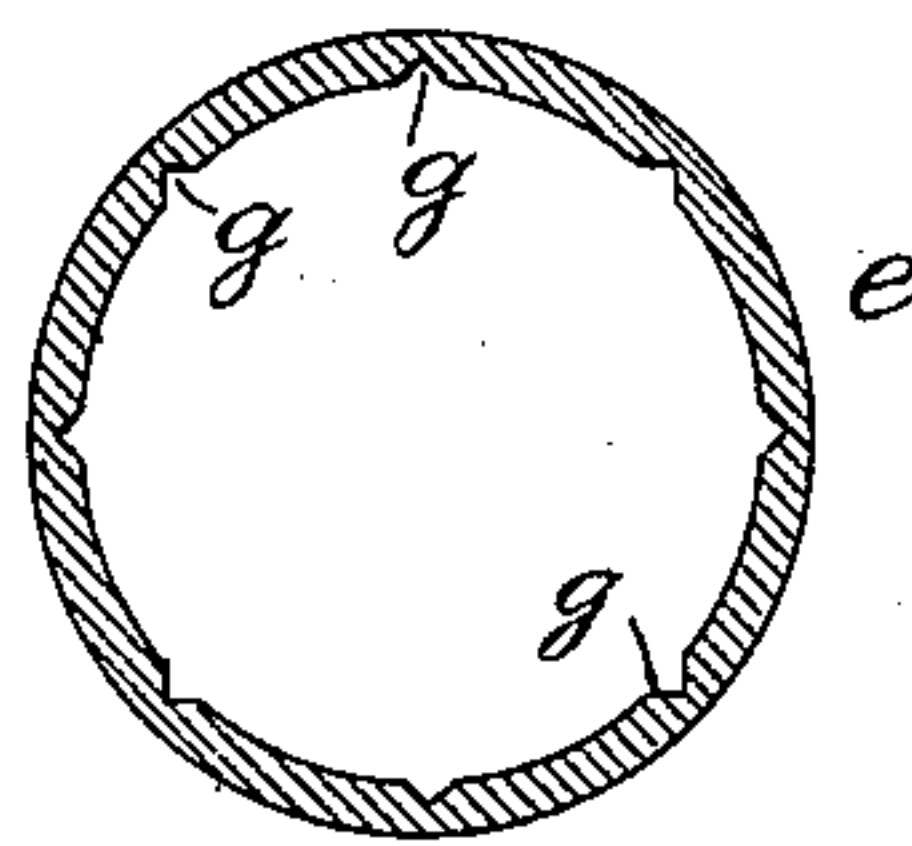


FIG. 4.

WITNESSES,

Wm. A. Lowe
J. H. Morgan

INVENTOR

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By A. P. Thayer
attor

UNITED STATES PATENT OFFICE.

WILLIAM H. METCALF, OF NEW HAVEN, CONNECTICUT.

GAS-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 401,048, dated April 9, 1889.

Application filed April 27, 1888. Serial No. 272,026. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. METCALF, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Gas-Pressure Regulators, of which the following is a specification.

This invention consists of an improved contrivance for a graduated valve to be used in combination with a tube of gradually-decreasing area in the upward direction, and which rises and falls therein by the varying pressure of the gas to graduate the area of opening according to the pressure, as hereinafter described, reference being made to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved regulator, showing the valve in the position it occupies when the pressure is at the lowest point. Fig. 2 is a similar view showing the valve raised to a higher position, as when the pressure of the gas is higher. Fig. 3 is a transverse section of the tube on the line $x x$; and Fig. 4 is a similar section of the tube on the line $y y$, showing how the area of the tube is graduated by means of taper grooves in the interior surface, which is the way I prefer for so graduating the tube; but it is to be understood that the same result may be had by making the tube itself in taper form upwardly.

I make the valve to consist of the cup a and a series of short telescopic tubes, b , fitted to suspend one by another and connected by the upper tube with the perforated disk c , or other approved means of suitably hanging the valve in the gas tube or shell e of the valve, said cup and tubes being flanged or ribbed at f to allow them to slide freely one within the other, and at the same time to hold or suspend one by another at the limit of their telescopic extension, and for graduating the gas-tube or

valve-case I prefer to make the taper grooves g in the inner surface and extending upward from a point slightly lower than the bottom of the cup when it hangs in the lowest position; but I may use a plain or smooth-bore tube or shell slightly tapered. In the operation of this valve the weight is increased by that of the telescopic tubes as the cup is raised by the increasing pressure of the gas, and they are successively lifted by it the same as when the cup is suspended by a chain, of which the weight of the links is added to the cup as the links are successively taken up by the cup.

When a chain is used, the links do not pack symmetrically in the cup. They are apt to kink and sometimes double against and bind on the sides of the valve-case.

The telescopic tubular construction enables a much greater range of graduation in a given length, and is therefore suited to much greater range of variation of pressure of the gas.

In this example I have represented the arrangement of the regulator as for a single gas-burner, of which the burner-tip h is attached directly above the valve; but it is to be understood that it is alike applicable for gas-mains according as it is made larger therefor.

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

In a gas-pressure regulator, the combination, with the valve case or shell having diminishing area upwardly, of the graduated valve, consisting of the cup, and a series of short telescopic tubes fitted to suspend one by the other and connected by the upper tube with a support, substantially as described.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 13th day of April, A. D. 1888.

WILLIAM H. METCALF.

Witnesses:

WALTER A. GRAHAM,
FRANCIS HILLHOUSE.