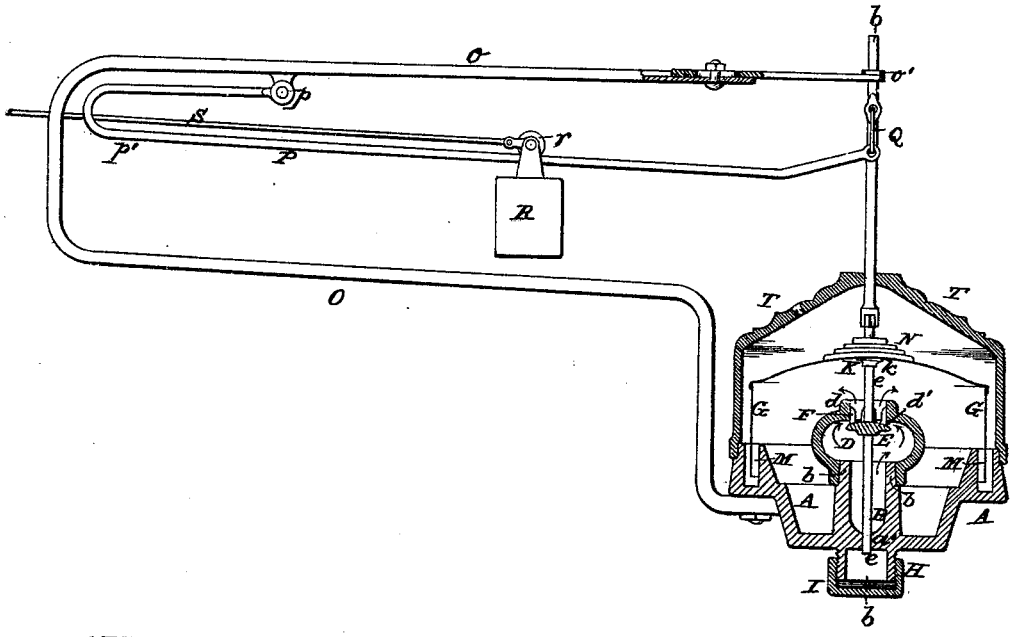
2 Sheets—Sheet 1.

I. COOK.

GAS-REGULATOR.

No. 182,898. Patented Oct. 3, 1876.

FIG. 1.



ATTEST:

Robert Burns.
H. Hutchins.

INVENTOR:

Isaac Cook
By Knight Bros
Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

2 Sheets—Sheet 2.

I. COOK.

GAS-REGULATOR.

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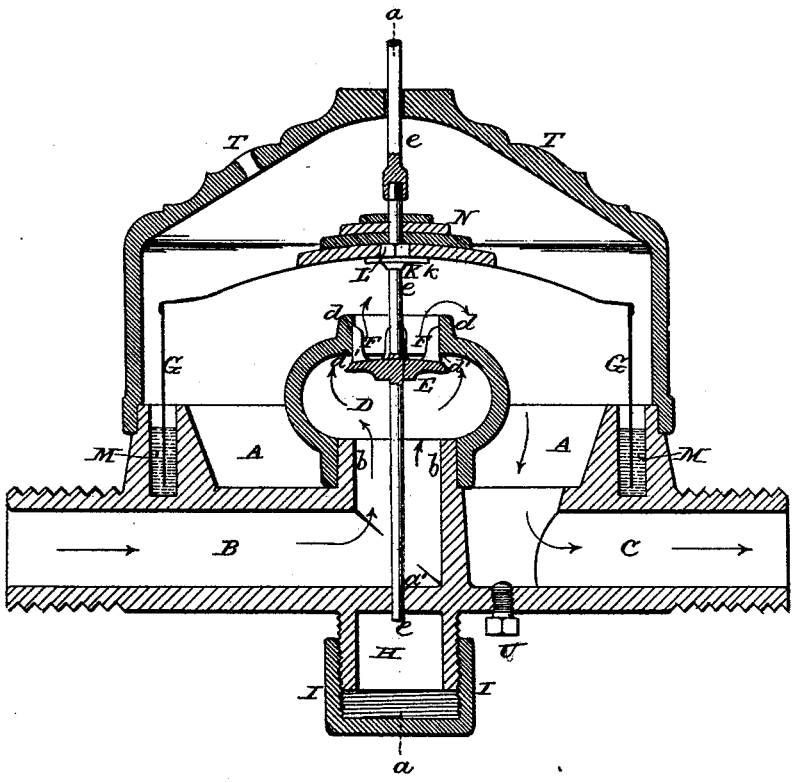
FIG. 2.



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UNITED STATES PATENT OFFICE.

ISAAC COOK, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF HIS RIGHT TO JACOB R. SPRAGUE, OF SAME PLACE.

IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **182,898**, dated October 3, 1876; application filed February 2, 1876.

To all whom it may concern:

Be it known that I, ISAAC COOK, of the city and county of St. Louis, and State of Missouri, have invented a new and useful Improvement in Gas-Regulators, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

My improvement consists in the combination of an inverted cup whose edge works in a mercury joint, and which is attached to the stem of the valve, the valve-stem being guided by fins above the valve by its lower end passing through a suitable guide-orifice in the bottom of the case, and its upper end passing through a guide-frame or bracket above.

My improvement also consists in combining such cup-valve and valve-stem with a valve-box fitted in the case with a ground slip-joint, so that the valve-joint may be lifted off with the valve-stem and inverted cup.

My improvement also relates to a means of adjusting the pressure of gas upon the burners according to circumstances; and consists in a bar supporting a sliding weight, one end of the bar being supported in the valve-stem, and the other hinged to a fixed frame or bracket.

Figure 1 is an axial section at *a a*, Fig. 2. Fig. 2 is an axial section at *b b*, Fig. 1.

A is the case, which is preferably made circular, and which has an induction-pipe, B, and discharge-pipe C. From the pipe B the gas enters the valve-box D, fitted onto the upper end or nipple *b'* of the pipe B by an air-tight slip-joint, so that it may be readily put on or taken off. The upper end of the valve-box ends in a nipple, *d*, and around the lower end of this nipple is the valve-seat *d'*. E is the valve, having guide-fins F, which fit snugly, but slide easily, against the inside of the neck or nipple *d*, so as to guide the valve-stem *e*, and consequently aid in guiding the inverted cup G. The lower end of the valve-stem *e* passes through a guide-hole, *a'*, in the bottom of the case A. The upper end of the stem is guided in the end of a bracket above the cap. It will be seen that by means of the said guides the stem is perfectly guided, and the cup prevented from binding against the sides of the annular trough, into which its edge descends. Extending downward from the center of the case A, and surrounding the hole *a'*, is a nipple, H, fitted and closed with a screw-cap, I. The valve-stem has near the upper end a collar, K, above which is a rubber gasket, *k*, and on the gasket rests the inverted cup G, through which the stem passes, and on which it is secured by a nut, L. The lower edge of the cup descends into the annular trough M, which contains quicksilver, to prevent the escape of gas from the cup. N is a weight placed on the top of the cup. The weight may be adjusted in size to regulate the gas-pressure as desired, for it will be seen that the tendency of the gas under pressure is to raise the cup and close the valve, and the tendency of the weight is to depress the cup and open the valve, and that when these forces are just equal in their action on the cup the valve remains at rest; but on an increase taking place of the amount of gas consumed the pressure beneath the cup decreases, and the valve-opening is increased, so as to allow the passage of more gas. The valve, of course, is partly closed on opposite conditions.

To regulate the opening of the valve at will by increasing or diminishing the weight on the stem, I provide a frame or bracket, O, whose lower end is secured to the case A, and which extends out to one side, and has an arm, *o*, extending over the regulator. The stem extends up through a guide-hole, *o'*, in the arm *o*, which thus forms its upper guide. To the arm *o* of the frame O is hinged at *p* one end of a curved bar, P, whose other end is connected by a link, Q, to the valve-stem *e*. Upon the bar P is a weight, R, which has endwise movement on the bar, so as to increase or diminish the effect of the weight on the stem, as aforesaid. The bar has a return bend at *p'*, so that the weight R can be carried beyond the hinge point *p*, so as not only to relieve the stem from the depressing influence of the weight, but actually to raise up the stem and close the valve. The bar P inclines downward toward the valve-stem, so that the weight when left to itself will travel

to the stem end of the bar, and this movement of the weight is facilitated by suspending it on a pulley, 1^2.

To adjust the weight upon the bar P, a cord or wire, S, is attached to the weight and extends to any part of the building from which it is desired to regulate the position of the weight, and this may be done by a movable handle or knob, combined with a scale, to indicate the position of the weight.

T is a cover fitting on the case A, and through which the stem passes. U is a screw-plug to allow the escape of liquid resulting from condensation from the inside of the regulator.

The cap I may be unscrewed to allow the emptying from said cap of any liquid deposit.

I claim—

1. The combination, with the vertically-moving cup G, of the valve E, and the stem *e* attached thereto, the stem being provided with guides *a'* F *o*, substantially as and for the purpose set forth.

2. The combination of cup G, stem *e*, valve E, and removable valve-box D within said cup, constructed substantially as set forth.

3. The combination of the inverted cup G, valve E, stem *e*, bar P, and adjustable weight R, substantially as and for the purpose set forth.

ISAAC COOK.

Witnesses:

SAML. KNIGHT,

ROBERT BURNS.