

A. SMITH.
Gas Regulator.

No. 36,306.

Patented Aug. 26, 1862.

Fig. 1.

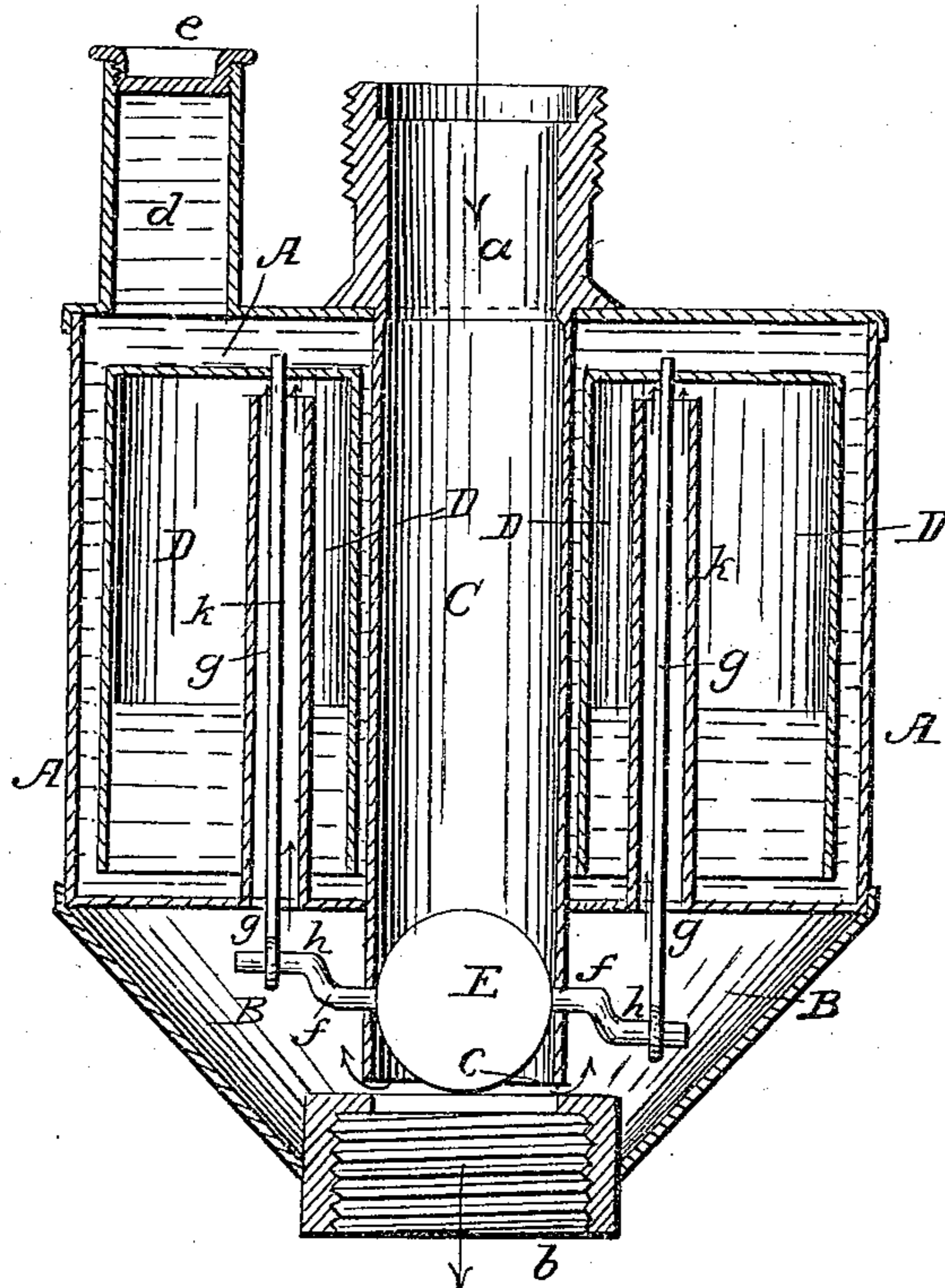
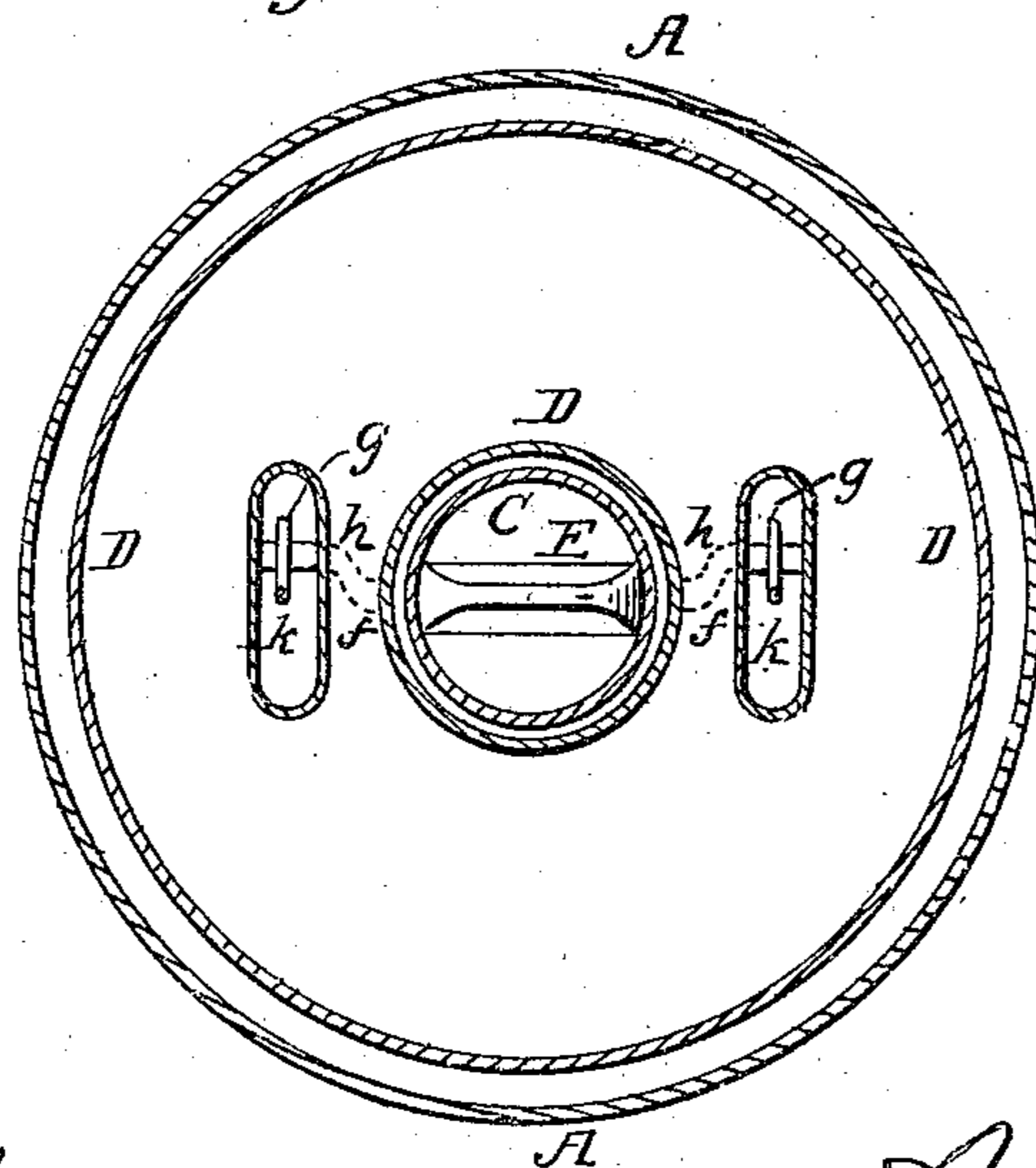


Fig. 2.



Witnesses:
James Land
G. W. Reed

Inventor.

Ararou Smith

UNITED STATES PATENT OFFICE.

AARON SMITH, OF BROOKLYN, NEW YORK.

IMPROVED GAS-REGULATOR.

Specification forming part of Letters Patent No. 36,306, dated August 26, 1862.

To all whom it may concern:

Be it known that I, AARON SMITH, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Gas-Regulators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of a gas-regulator with my improvement. Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in a certain arrangement of the passages provided between a throttle or other balanced valve employed to regulate the flow of gas and the interior of an inverted cup, within which the pressure of the gas acts with a tendency to close the valve, and arrangement of the connections between the said valve and cup, whereby I obtain a regulator of very simple construction and which is very effective in its operation.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

A B is a box, of iron or other metal, containing a chamber, A, of upright cylindrical form, and a smaller chamber, B, of any suitable form, below the said chamber A.

At the top of the chamber A is the inlet-opening *a* of the regulator, from whence a tube, C, descends right through the center of the said chamber without having any direct communication with its interior. This tube enters the chamber B, at the bottom of which is the outlet *b* of the regulator, but has a space or opening, *c*, left between its lower end and the outlet for the admission of gas into the latter chamber. The chamber A has at the top a feeding-tube, *d*, through which oil or other fluid is fed into the said chamber to float the inverted cup D, and the said tube is fitted with a stopper, *e*.

E is the regulating-valve, of the construction known as the "butterfly-valve," fitted into the lower part of the tube C, and having its spindle *f*, which passes through and works in bearings in opposite sides of the said tube, formed or provided with cranks *h h*, which are con-

nected by rods *g g* with the head of the floating inverted cup, the said cranks being arranged at right angles to each other, that one at least may always be in an effective position relatively to its respective rod *g*. The floating cup is made of annular form that it may surround the tube C. The rods *g g* pass through openings in the bottom of the chamber A, and in order to prevent the liquid in the said chamber from running into the chamber B the said openings are surrounded by tubes *k k*, which extend upward a height about equal to or greater than the depth of the cup, and the said tubes also serve as passages to conduct the gas to the interior of the cup.

The rods *g g* may be rigidly connected with the head of the cup, as, if made of wire, their flexibility will be sufficient to permit the necessary vibration to enable them to operate the cranks of the valve-spindle, and the said rods may be made to project a short distance through the top of the head of the cup to constitute stops to the cup to prevent the valve from being thrown over beyond a horizontal position.

I propose to apply this regulator between the main pipe and the meter to regulate and equalize the pressure of the gas before its entrance into the meter, and thereby insure a more accurate measurement of the gas; and the regulator, when thus applied, serves as well to regulate the burners as other regulators which are applied between the meter and the burners, and which will not operate well on the opposite side of the meter. To set the regulator in working order after it has been connected, the chamber A is filled with oil or other fluid to a suitable depth through the tube *d*, and the cap *e* is put on. Before the gas is turned on the valve is kept wide open, as shown in Fig. 2, by the weight of the cup D acting through the rods *g g* and cranks *h h*, the cup being stopped in position to keep the valve open by the head coming down on the tops of the tubes *k k*. When the gas is turned on, it passes through the tube C and outlet *b*, and also through the opening or space *c c*, and fills the chamber B, from which it passes up through the tubes *k k* into the upper part of the cup D, and by its pressure on the under side of the head of said cup tends to lift the cup so much that it will float in the liquid contained in the chamber A, and as the

pressure in the chamber B is caused to be greater or less, owing to an increase or diminution of pressure in the main, or owing to the shutting or opening of burners, or to the reduction or increase of their opening, the cup is more or less raised and the opening of the valve E more or less reduced, and the pressure on the burners is rendered uniform. As the pressure inside the chamber B and cup increases it depresses the level of the liquid within the cup and causes the liquid in the chamber A to rise therein till it counterbalances the pressure of the gas in the cup, and as the pressure of the gas in the cup diminishes a contrary effect is produced. By extending the feeding-tube *d* upward provision

is made for a column of liquid of the desired height to counterbalance the greatest pressure of gas without making the whole box A B of great height.

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

Combining the throttle or other balanced valve E and floating inverted cup D by the arrangement of passages C *c k k* and crank-connections *h h k k*, substantially as herein described.

AARON SMITH.

Witnesses:

JAMES LAIRD,
G. W. REED.