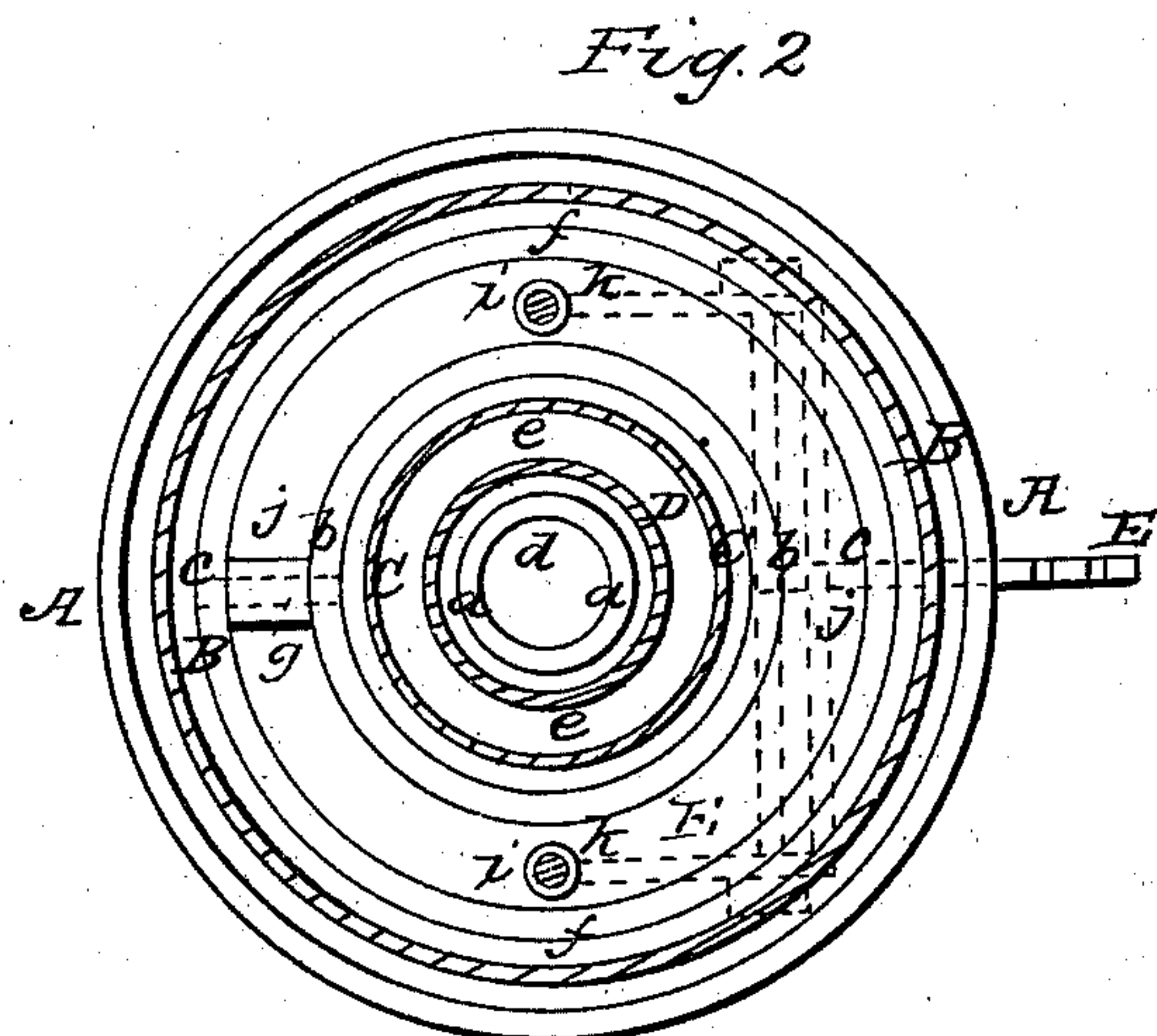
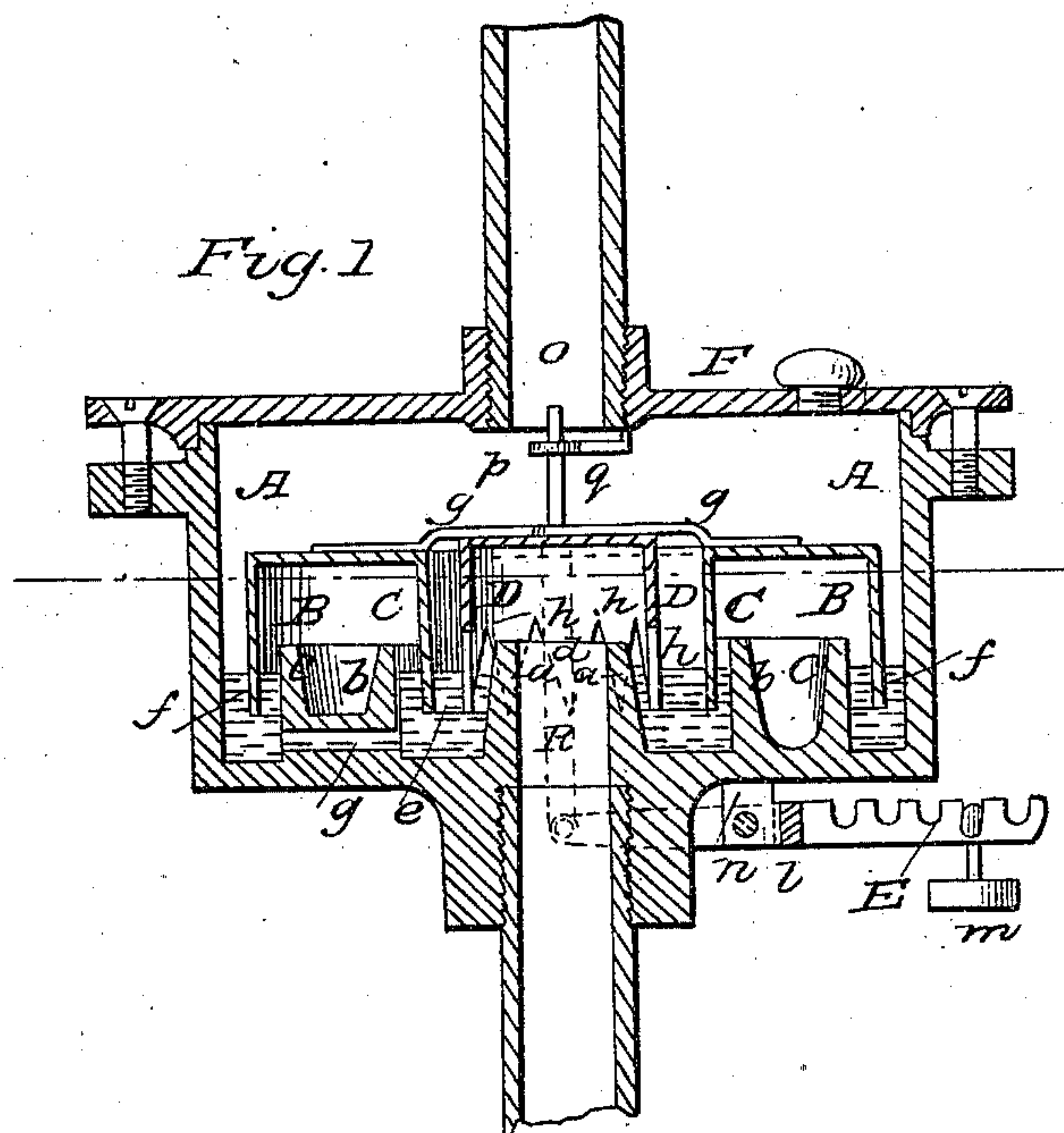


J. H. POWERS.

Gas Regulator.

No. 21,022.

Patented July 27, 1858.



UNITED STATES PATENT OFFICE.

J. H. POWERS, OF NEWARK, NEW JERSEY.

GAS-REGULATOR.

Specification of Letters Patent No. 21,022, dated July 27, 1858.

To all whom it may concern:

Be it known that I, JOHN H. POWERS, of Newark, in the county of Essex and State of New Jersey, 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, making part of this specification, in which—

Figure 1 is a central vertical section of a gas regulator constructed according to my invention. Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate like parts in both figures.

This invention relates to that kind of regulator whose valve is of the form of an inverted cup with notches in its sides and works in a seat of quicksilver, said valve having its opening controlled by the pressure of the gas upon an inverted cup floating in a basin of quicksilver. The said invention consists in a certain arrangement of the quicksilver basin, valve seat, inverted pressure cup, valve, and inlet passage, whereby great simplicity of construction and very effective operation is obtained.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A, is a cylindrical box, having three upward annular projections *a*, *b*, and *c*, from its bottom. Within the innermost projection *a*, is the inlet opening *d*. The annular space *e*, between the projections *a*, and *b*, communicates with the annular space *f*, between the projection *c*, and the sides of the box by means of a passage *g*, and by that means the two annular spaces are combined to form a double annular basin *e*, *f*, which is partly filled with quicksilver, which is shown in Fig. 1, in red color.

B, C, is the inverted pressure cup of annular form, having its edges immersed in the quicksilver in the two parts *e*, and *f*, of the annular basin, so that the said cup floats in the quicksilver. In the center of this cup, which is open, the inverted cup valve D, is secured by arms *g*, *g*. This valve covers the inlet opening, and its edges, in which are a number of inverted V-shaped notches *h*, *h*, dip into the part *e*, of the basin, which constitutes the seat for the said

valve; the said notches being of such depth that portions of them always remain open above the surface of the quicksilver to admit the gas from the inlet *d*, into the interior of the box A. The interior of the inverted cup has the gas shut out from it by the quicksilver, and communicates with the atmosphere through openings *i*, *i*, (see Fig. 2) in the bottom of the space *j*, between the projections *b*, and *c*, through which openings pass two rods *k*, *k*, which connects the cup with a forked lever E, which works on a fulcrum pin *l*, passing through two lugs *n*, *n*, on the exterior of the bottom of the box. The lever has applied to it a weight *m*, at a suitable distance from its fulcrum to counterbalance the cup B, C, and valve, and give the valve the requisite degree of buoyancy. The outlet *o*, is in the center of the cover F, of the box A.

p, is a fixed guide attached to the cover F, to receive a stem *q*, attached to the valve and serving to guide the valve in its operation.

r, is a plug in the cover F, which is removed to fill the basin *e*, *f*, with quicksilver, which flows between the parts *e*, and *f*, through the passage *g*.

The operation of the regulator is as follows: The gas entering at *d*, inside the valve, passes through the notches *h*, *h*, of the valve into the body of the box A, from whence it escapes through *o*, exerting a greater or less pressure upon the top of the cup B, C, and tending to cause its submersion to a greater or less extent in the quicksilver, according to the pressure in the main or supply pipe and the number of burners in use. When the pressure in the main or supply pipe is low or the number of open burners or aggregate amount of opening of the burners is great, the pressure on the cup is very slight and consequently the latter is not deeply submerged, and the notches *h*, *h*, present a large aggregate amount of opening; but if the street pressure is increased or some of the burners turned off or partly turned off, the pressure on the cup, B, C, is increased and the cup caused to be more deeply submerged and to present a smaller portion of its notches *h*, open above the surface of the quicksilver. The reduction of the pressure on the main or supply pipe, or the opening of more burners, or the

opening of the burners to a greater extent, will produce an opposite effect to that above described. By varying the weight m , the supply of gas may be varied without interfering with its regulation, an increased weight causing an increased supply, and vice versa.

I do not claim the inverted pressure cup, nor the grooved or notched inverted cup-shaped valve working in a seat of quicksilver, as the cup is specified in several patents and the valve is specified in combination with the cup in my patent of Sept. 1st, 1857. Nor do I claim any of the other parts of the regulator as separately considered. But

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

The arrangement of the annular pressure cup B, C, and regulating valve D, in the double annular quicksilver basin e , f , whose inner and outer channels e , and f , are arranged at a distance apart to form between them a passage j , through which a communication is established between the interior of the cup and the atmosphere, all substantially as herein described.

J. H. POWERS.

Witnesses:

W. HAUFF,
HENRY T. BROWN.