I. COOK.
Gas-Regulators.

No. 218,116. Patented Aug. 5, 1879.

Fig. 1.

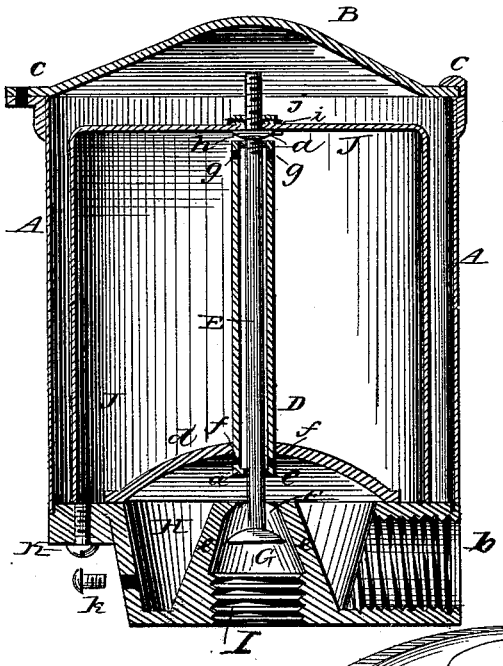



Fig. 3

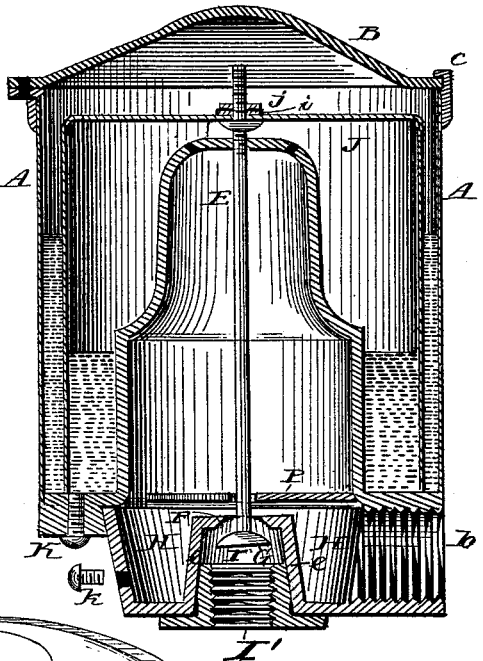
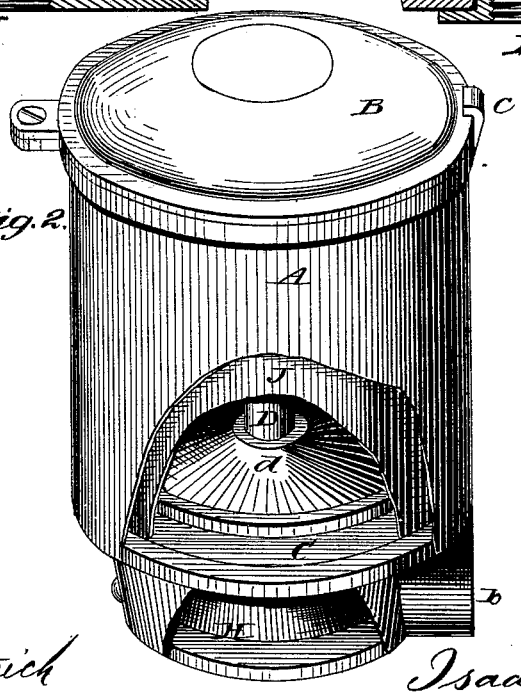



Fig. 2.




Witnesses
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# UNITED STATES PATENT OFFICE.

ISAAC COOK, OF ST. LOUIS, MISSOURI, ASSIGNOR TO CONRAD BATES AND LYMAN J. McCRACKEN, OF SAME PLACE.

## IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **218,116**, dated August 5, 1879; application filed July 2, 1879.

*To all whom it may concern:*

Be it known that I, ISAAC COOK, of St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Fluid Gas-Regulators; and I do hereby declare that the following is a full, clear, and exact description of the invention, 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, which form a part of this specification.

Figure 1 is an axial vertical section of my improved gas-regulator. Fig. 2 is a perspective view, parts of the case or shell being broken away to show the construction; and Fig. 3 is a sectional view, illustrating modifications.

Corresponding parts in the several figures are indicated by like letters of reference.

This invention relates to fluid gas-regulators of that class in which glycerine, oil, spirits, water, sirup, or other fluids, separately or in combination, are employed to form a seal for the gas; and it consists, essentially, in an improved construction and arrangement of parts, by which the gas, in its passage through the regulator, is prevented from coming in contact with such fluids, which otherwise, by absorbing impurities from the gas, in the course of short time become unfit for use.

I shall now proceed to describe the construction and operation of my invention with reference to the drawings hereto annexed, in which—

A is the outer shell or case, having a detachable cover, B, provided with a suitable fastening device, *c*. The bottom C of case A bulges upwardly in the center, as shown at *d*, and is provided with an upright (vertical) tube, D, extending some distance below the bulging portion *d*, as shown at *e*, and upwardly nearly to the top of the case. The ends of the tube D are closed by centrally-perforated buttons or metallic pieces *a a*, forming guides for a sliding stem, E.

Under the bottom C is arranged an annular chamber, H, opening into the space under the bulging portion *d*, and having upon the side an opening, *b*, for the eduction-pipe. The induction-pipe is screwed into the chamber I, surrounded by the annular chamber H, or into a threaded plug, I′, which may be secured in chamber I for this purpose, as represented in Fig. 3 of the drawings. The upper end of the wall *e* of chamber I is beveled inwardly, as shown, and ground on the under side to form a seat, F, for the valve G, which is affixed upon the lower end of the sliding stem E, as shown.

Directly under the bulging portion *d* the tube D is provided with one or more perforations, *f f*, and at its upper end, near the top, it has several similar perforations, *g g*. These openings are for the passage of gas through the tube D into the chamber or case A.

The portion of the stem E which projects above the upper end of tube D is provided with a shoulder, *h*, upon which rests an inverted cup, J, of sheet metal or other suitable material, fitting loosely inside the shell or case A, and held in place by a gasket, *i*, and nut *j*, forming a gas-tight joint.

The bottom of the case A is provided with a plug, K, through which the fluid may be drawn off should it become desirable to do so; and the bottom of the annular chamber H is provided with a similar plug, *k*, through which impurities deposited by the gas or accumulating from other sources may be removed.

In the case A, surrounding the inverted cup J, is placed a sufficient quantity of some suitable fluid of any of the kinds above mentioned, or any suitable substitute therefor.

In operation the gas enters between the valve G and its seat into the space under the bulging portion *d* of the bottom. It now passes through the perforations in tube D into the space under the inverted cup J, which, by the pressure thus exerted, is raised, thus also raising the stem E, upon which it is secured, and partially closing the valve. This regulates the main body of gas, which, instead of taking the course just given, simply enters by the valve into the space under the bulging portion *d*, from thence into the annular chamber H, and out through the exit-pipe.

It will thus be seen that only sufficient gas enters the case A proper to control the regulating-valve, while the gas which is actually consumed only passes through the valve and

the annular chamber, and cannot in any way come in contact with the fluids in the shell A.

My invention is susceptible of various modifications, one of which I have illustrated in Fig. 3 of the drawings. Instead of using the tube D as a guide for the valve-stem E, I have simply extended the bulging portion *d* of the bottom almost to the top of the case, and provided at its lower end a cross-piece, P, forming a guide for the valve-stem. The operation is unchanged.

Various other modifications may be made in the construction without changing the spirit or nature of my invention.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The case A, having bulging bottom C, and tube D, having bearings for the valve-stem E, and provided with openings *f f g g*, respectively above and below the bottom C, in combination with the inverted cup J, substantially as herein set forth, for the purpose shown and specified.

2. The improved fluid gas-regulator herein described, consisting, essentially, of the case A, having bottom C, with bulge *d*, tube D, having openings *f g*, valve-stem E, inverted cup J, chamber I, having seat F for the valve G, and annular chamber H, having exit *b*, all arranged and operating substantially as and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ISAAC COOK.

Witnesses:
CHAS. L. MOSS,
WM. T. MASON.