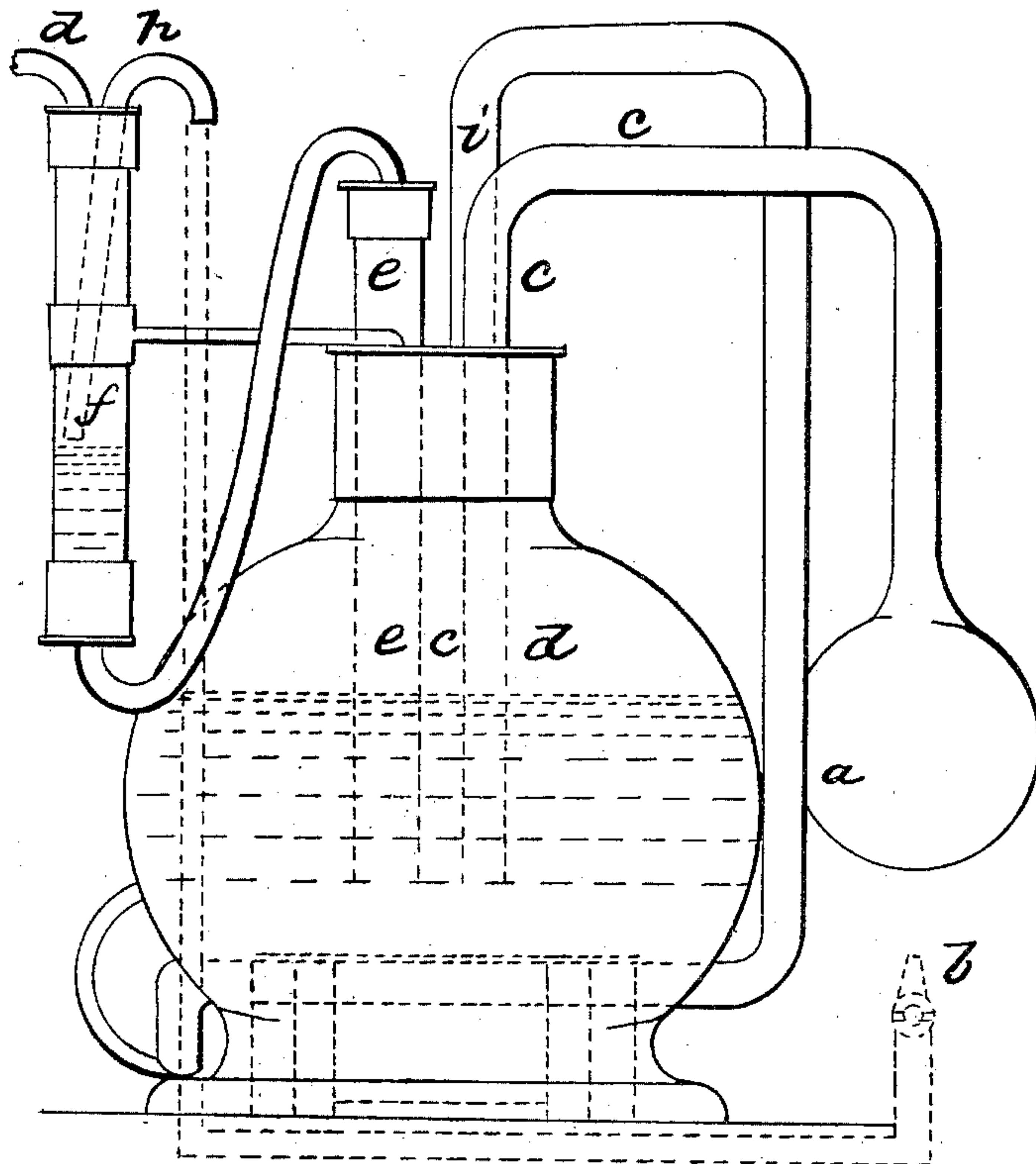


J. M. OSGOOD.
Automatic Regulator.

No. 44,884.

Patented Nov. 1, 1864.

Fig. 1



Witnesses
Francis Gould
S. B. Kidding

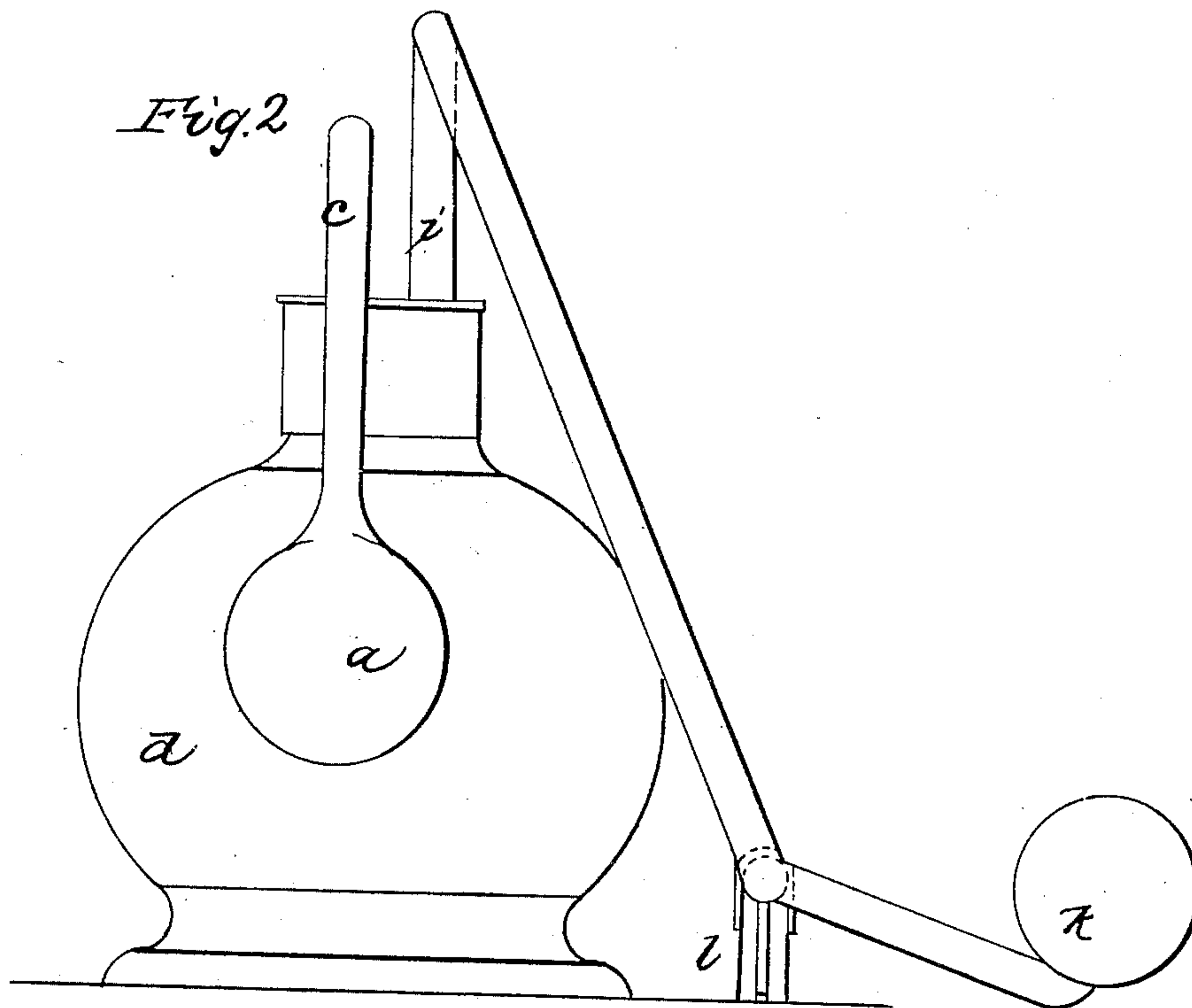
Inventor
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J. B. Crosby

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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JAMES M. OSGOOD, OF SOMERVILLE, MASSACHUSETTS.

IMPROVED AUTOMATIC REGULATOR.

Specification forming part of Letters Patent No. 44,884, dated November 1, 1864.

To all whom it may concern:

Be it known that I, JAMES M. OSGOOD, of Somerville, county of Middlesex, and State of Massachusetts, have invented an Improved Regulator; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates particularly to the regulation of the heat from a burning jet of gas by automatically controlling its combustion, while it is also applicable to the opening and closing of dampers of heating or steam apparatus, the invention consisting in so moving or displacing a column or body of water or other fluid in a tube by the pressure of steam, gas, or heated air upon the surface of a body of water or other fluid into which the tube extends as to actuate or control the valve or damper which regulates combustion.

The drawings illustrate my invention as applied to an apparatus for generating gas, Figure 1 denoting a front view, and Fig. 2 a side view, of the same.

a denotes a retort or flask placed over a gas-burner, *b*, and having its neck *c* leading down below the surface of water placed in a vessel or purifier, *d*. A tube, *e*, also extends into the water, said tube being connected at top to a fluid-valve or valve-chamber, *f*, into which the gas from the gas-pipe *g* enters and from which it flows through the outlet-pipe *h*, said outlet-pipe connecting with the burner *b* at one end, while its other end extends some distance down into the fluid-valve chamber *f*.

When the retort *a* is charged and the gas at the burner lighted, the vapor or gas evolved by distillation passes over the neck of the retort down into the body of water, and rising to the surface thereof is drawn off into any suitable receptacle, and the upper part of the vessel *d*, above the surface of the water, becomes a gasometer. As the body of the gas fills the gasometer, its pressure upon the surface of the water forces the water through the pipe or tube *e* and into the valve *f*, and as the heat from the burner increases, and the volume of gas and its pressure upon the water is thereby increased, the water is driven up into the valve, gradually rising toward the

outlet-pipe *h*, and diminishing the current of gas flowing through the same.

The valve *f* is made adjustable as to height, and it will be evident that it may be so placed as to regulate, by the pressure of the water within it, the amount of gas flowing through the same for the supply of combustion at the burner *b*. If the water is driven up into contact with the tube *h*, of course the gas is cut off, but by adjusting the valve as to height, when the distillation first commences, the process can be easily regulated so that the distillation will continue very evenly, any undue heat or supply of gas from the burner forcing the water up the valve *f* and diminishing the supply of gas, and any falling off of the heat or supply of gas letting the column of water down the valve and opening it or increasing the supply of gas.

The fluid-valve or valve-chamber *f* is shown as placed on one side of the water reservoir or purifier *d*, instead of which it may extend directly into the vessel *d* or form part of the tube *e*; but for convenience of adjustment in chemical processes I prefer to place it aside from the vessel *d*.

If we suppose the vessel *d* to represent a boiler, then the column of water, being forced by pressure of the steam into a pipe, *i*, and against a body of air in an air bulb or chamber, *k*, may be made to regulate a furnace-damper, *l*, the damper being closed by the weight of the water forced by pressure into the bulb *k*, as will be readily understood, and opening or returning to its normal position as the pressure diminishes and the air in the bulb forces back the water into the pipe *i*.

Various modifications of the apparatus might be suggested, but the description will enable the invention to be fully understood.

The invention has been very successfully used in the manufacture of what is well known as "nitrous oxide gas," placing the nitrate of ammonia in a glass flask over a gas-burner, and passing the gas evolved through a series of purifiers, one of which is connected with the adjustable fluid-valve and regulates, by the pressure of the generated gas, the height of the water in the valve, and consequently the supply of gas for combustion at the burner. It is very difficult to perfectly regulate the heat from the burner by hand, and in the com.

mon method of manufacturing this gas, besides the expense involved by the necessary attention of the chemist, flasks are constantly broken and much impure gas evolved, whereas by my invention the expense arising from this attention and breakage is saved and a much better gas is produced.

I claim—

The improved automatic regulator, operating by the pressure of air, gas, or vapor upon a column of fluid, substantially as described.

JAMES M. OSGOOD.

Witnesses:

C. EASTHAM,
J. N. BUTLER.