No. 846,680. PATENTED MAR. 12, 1907.

M. B. MASON & E. M. SINCLAIR.

GAS MACHINE.

APPLICATION FILED SEPT. 19, 1906.

3 SHEETS—SHEET 1.

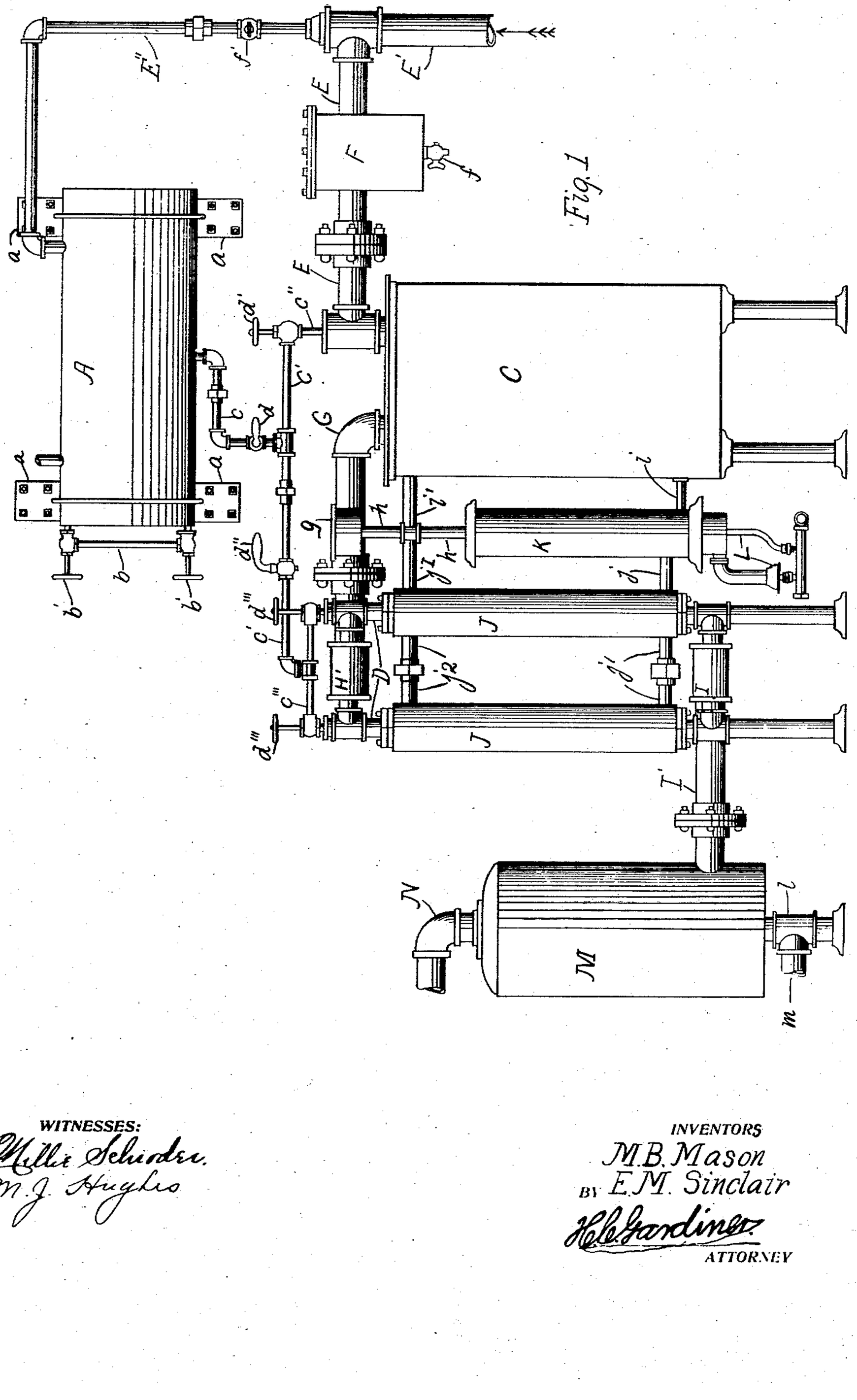

Fig. 1

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M. J. Hughes

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3 SHEETS—SHEET 2.

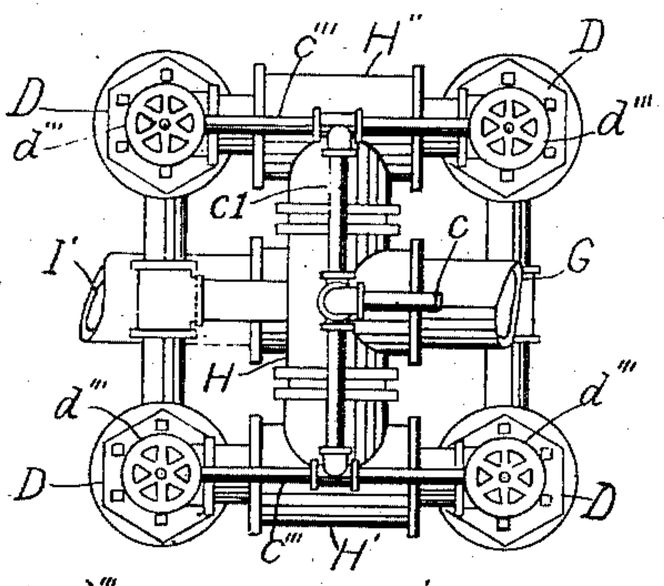


Fig. 4

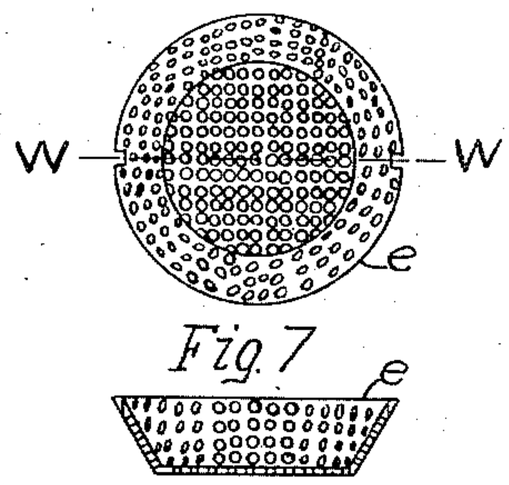


Fig. 7

Fig. 8

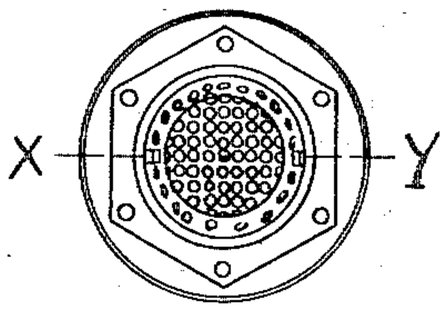


Fig. 5

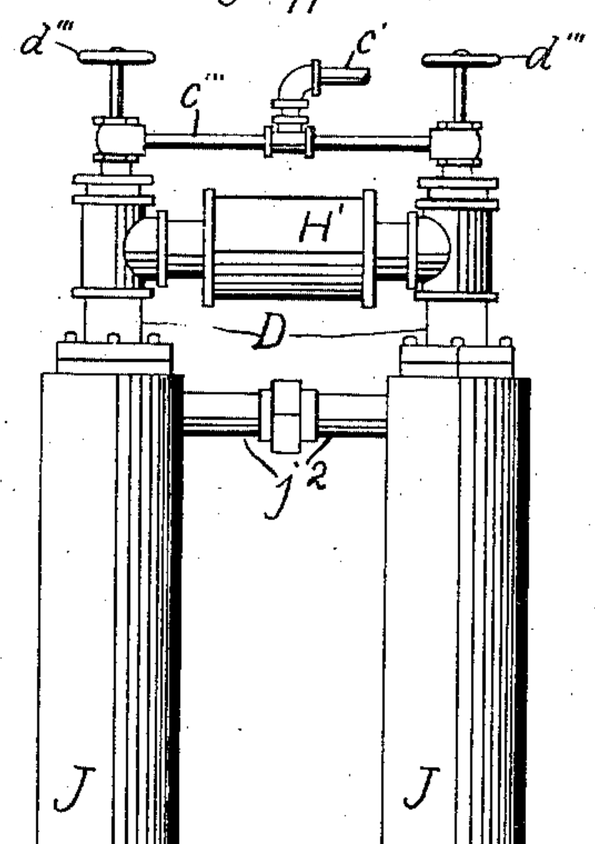


Fig. 2

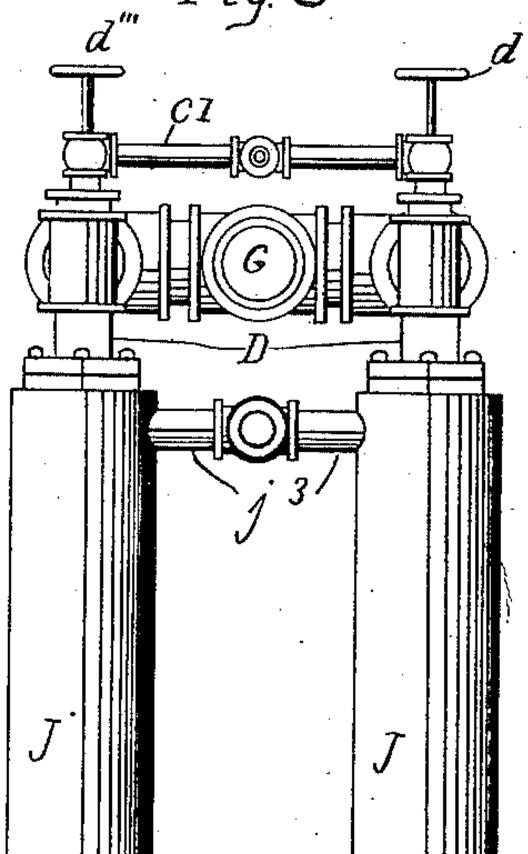


Fig. 3

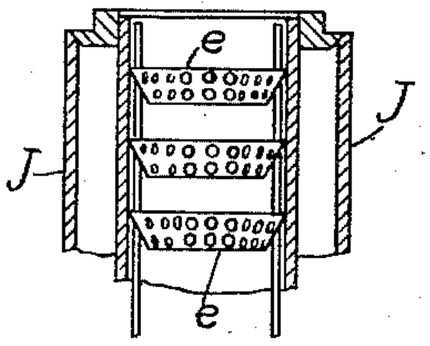
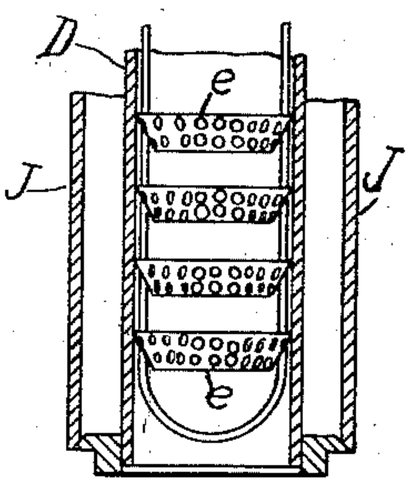


Fig. 6



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M. B. MASON & E. M. SINCLAIR.

GAS MACHINE.

APPLICATION FILED SEPT. 19, 1906.

3 SHEETS—SHEET 3.

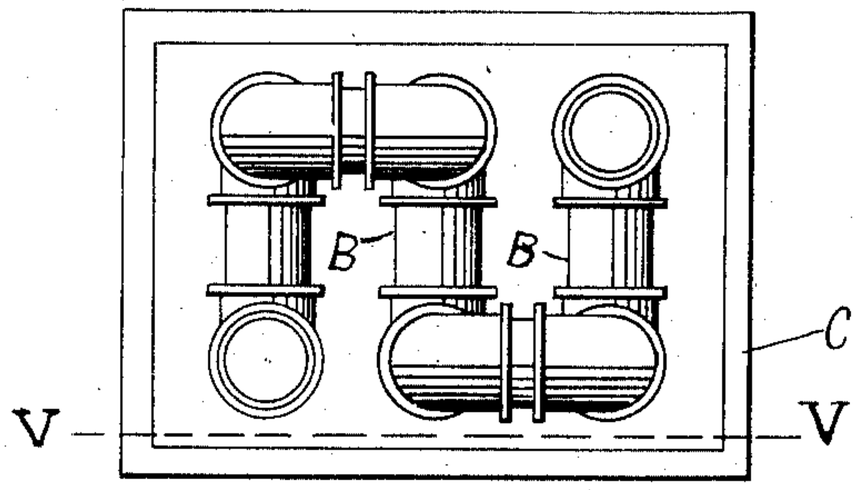

Fig. 9

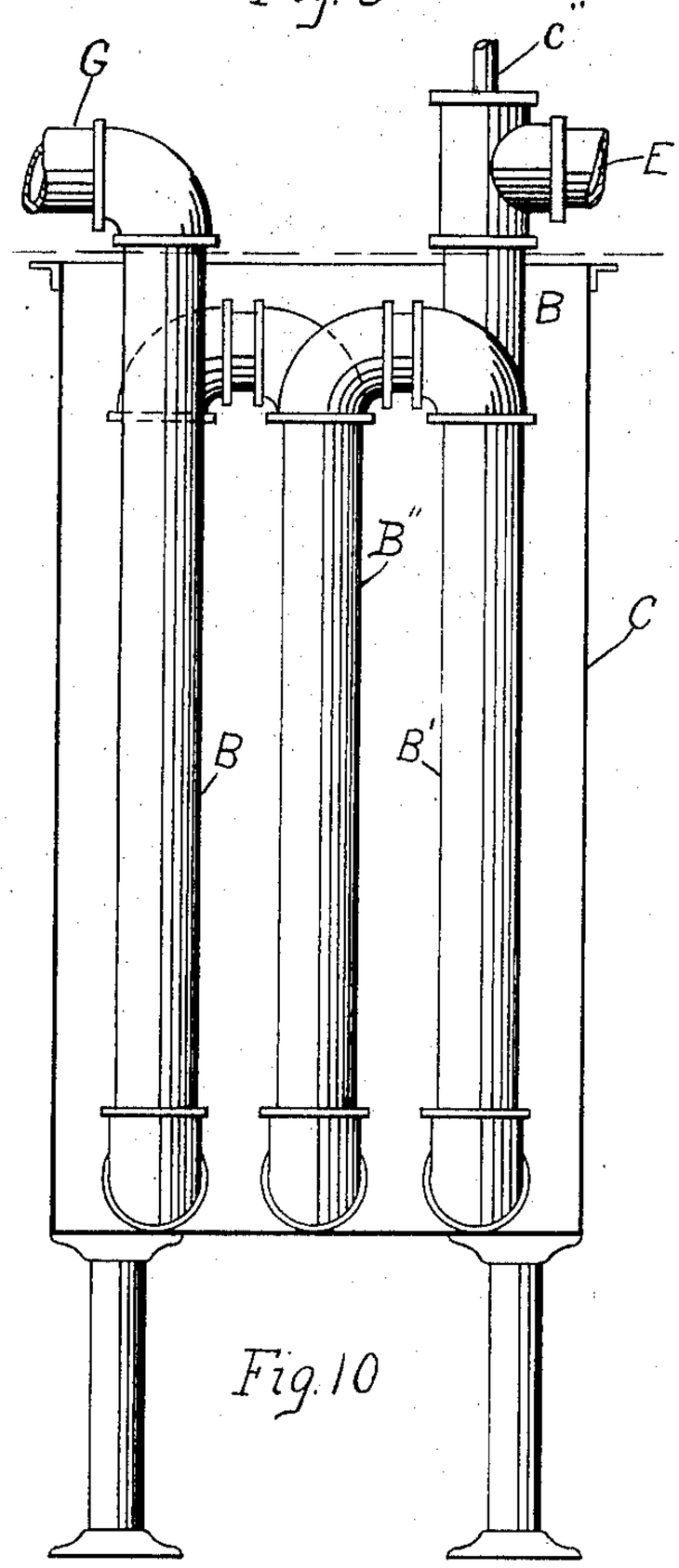

Fig. 10

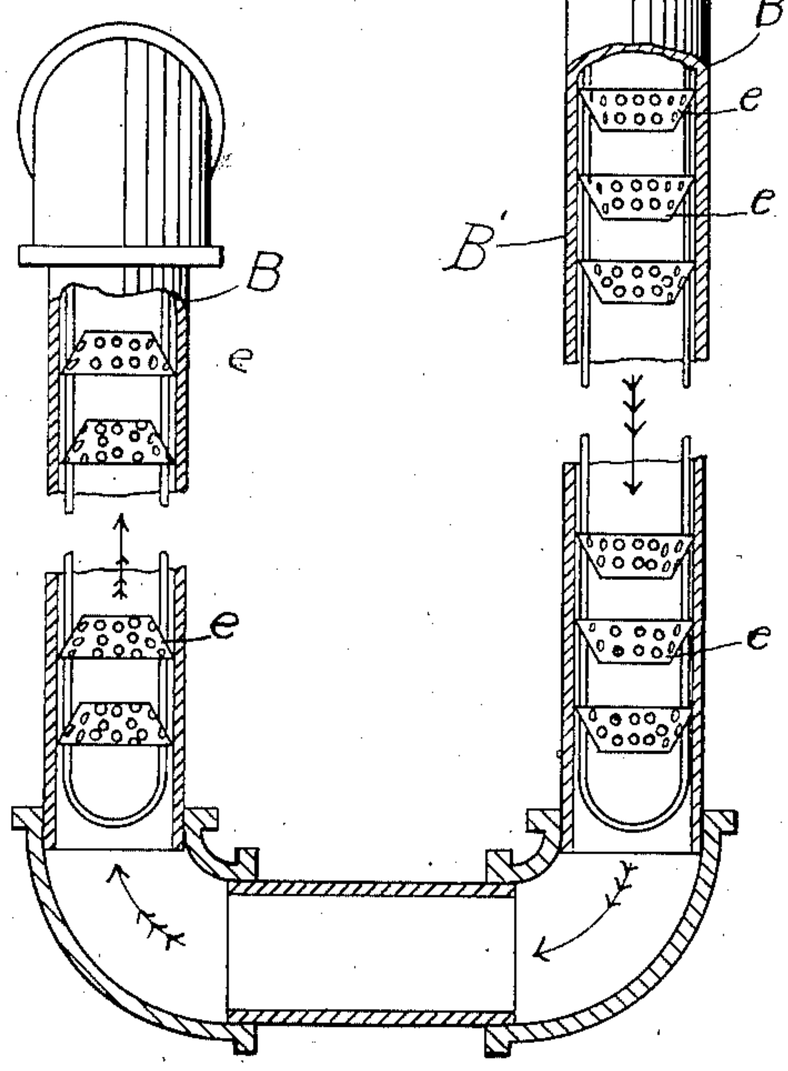

Fig. 11

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UNITED STATES PATENT OFFICE.

MORRIS B. MASON AND EDWARD M. SINCLAIR, OF SIOUX CITY, IOWA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO COLUMBIA GAS & CONSTRUCTION COMPANY, A CORPORATION OF SOUTH DAKOTA.

GAS-MACHINE.

No. 846,680. Specification of Letters Patent. Patented March 12, 1907.

Application filed September 19, 1906. Serial No. 335,309.

To all whom it may concern:

Be it known that we, MORRIS B. MASON and EDWARD M. SINCLAIR, citizens of the United States, and residing at Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Gas-Machines, of which the following is a specification.

Our invention relates to the construction of gas-machines; and the object of the invention is the production of gas from either gasolene or alcohol for the purposes of lighting, heating, and for motive power. We accomplish this object by means of the device shown in the accompanying drawings, in which—

Figure 1 is a view of our invention complete in side elevation. Fig. 2 is a view in side elevation of one of the atomizers or devices for converting the crude material into gas. Fig. 3 is an end elevation, and Fig. 4, a plan view, of Fig. 2. Fig. 5 is a plan view of one of the four tubes which compose said atomizers, the top being removed; and Fig. 6 is a cross-section on line *x y*, Fig. 5. Fig. 7 is a plan view of one of the baskets in one of the tubes; and Fig. 8 is a section of the same on line *w w*, Fig. 7. Fig. 9 is a plan view of hot-water tank containing one of the atomizers, the top being removed; and Fig. 10 is a side elevation of the same on line *v v*, Fig. 9, Fig. 11 is an enlarged detail view of the coil in said tank, composing one of the atomizers.

It will be seen that there are provided two forms of atomizers or devices for converting the liquid into gas, the object being to produce a better gas and to convert all the combustible material of the liquid into gas.

Like parts are designated by similar letters of reference.

A is a tank or reservoir for supplying gasolene or alcohol to the machine, and may be secured to the wall by screws through the plates *a a*.

A glass gage *b*, with valves *b' b'*, indicates the quantity of material in the tank. The latter communicates with the primary atomizer B, situated in the tank C, by means of the pipes *c*, *c'*, and *c''*, through which the gasolene or alcohol is introduced into the machine. A valve *d* in the pipe *c* and the valve *d'* at the junction of the pipe *c'*, and *c''* furnish means for shutting off or regulating the supply from the tank. The liquid may also be introduced direct into the secondary atomizers D D by means of the pipes *c*, *c'*, *c'''*, and I. This supply may be regulated or entirely cut off by means of the valve *d''* in the pipe *c'*, or it may be cut off from any one of the atomizers D by one of the valves *d'''*. In the ordinary operation of the machine the liquid is first conducted into the primary atomizer only and is introduced into the secondary atomizers only when the gas after passing through the primary carbureter is found to be of too low a degree of richness.

The primary atomizer is composed of a coil or series of vertical tubes B B, which are connected together at the ends and form a continuous passage for the liquid and air. In the coil are placed baskets *e e*, made of wire-gauze or other perforated or open material, the baskets being largest in circumference on the side from which the gasolene or alcohol is introduced, and tapering toward the opposite side, so that the liquid is forced to pass through as much of the open-work of the baskets as possible and be mixed with the air. The air enters the primary atomizer through the pipes E and E', the latter pipe being attached to a blower, if desired, in which the air may be heated to any desired temperature. The tank C, in which the atomizer is situated, is supplied with hot water from a heater presently described, and the liquid and air are thus heated, as it is well known that gasolene or alcohol is more easily vaporized or turned into gas when the air with which they are mixed is warm.

Attached to the pipe E is an air-expander or drip-tank F, into which any oil or grease in the air may be precipitated as it passes through and is drawn off through the cock *f*. From the upper end of the air-pipe E' extends a pipe E'', which enters the top of the tank A, and the air may be utilized in forcing the liquid from the tank by opening the valve *f'*.

After passing through the primary atomizer the gas is conducted into the secondary atomizer through the pipe G and the branch pipes H, H', and H''. Each of the secondary atomizers is provided with a series of the same form of baskets *e e* as the primary atomizer, and the tubes composing these are each surrounded with a jacket J, into which

hot water from the heater is conveyed. A water-tank K is provided and is filled through a cup *g* and pipe *h*. The water is heated by means of a gas-heater L, situated underneath the tank. A pipe *i* leads from the bottom of the tank K to the bottom of the tank C, and pipes *j*, *j'*, and *j''* connect the tank K with the bottoms of the jackets J around the secondary atomizers. Similar pipes *i'* and j^1, j^2, and j^3 lead from the pipe *h* above the tank K to the upper parts of the respective tanks C and J. A complete circulation of the warm or heated water is thus provided about both the primary and the secondary atomizers.

The gas passes from the secondary atomizers through the pipes I I and the pipe I' to the gas-expander M, where it is given opportunity to cool, and any moisture which may be precipitated is drawn off at the bottom through the pipes *l* and *m*. A pipe N conveys the gas from the expander to a holder or to any desired place.

In the conversion of alcohol into gas a much higher degree of heat is required in the air with which the liquid is mixed than in the case of gasolene, and provision is made for heating the air in the atomizers and may be made for heating it before its introduction to the machine through the blower or otherwise. By means of the primary and secondary atomizers the liquid and air are thoroughly mixed and a good quality of gas obtained, while the means for introducing the liquid direct into the secondary atomizers gives opportunity for regulating the degree of richness of the gas as required.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for the manufacture of gas, the combination with a primary atomizer consisting of a coil or series of tubes and perforated baskets suspended in said tubes, a source of liquid-supply from which the gas is made, means for introducing a supply or air into said tubes and means for regulating the supply of liquid and air and for forcing the liquid from said source of supply, of secondary atomizers consisting of vertical tubes communicating with the primary atomizer and perforated baskets in said tubes, means for supplying the liquid direct to said secondary atomizer and means for heating the liquid and air in said atomizer, substantially as described.

2. In a machine for the manufacture of gas, the combination with a source of liquid-supply from which the gas is made, a primary atomizer consisting of a series of tubes or coils inclosed in a heated tank or chamber, means for introducing a supply of air and for regulating the supply of liquid and air, perforated baskets suspended in said coils through which the liquid and air are required to pass, of secondary atomizers leading from the primary atomizer and consisting of vertical tubes inclosed in heated chambers, perforated baskets suspended in said tubes, means for introducing the liquid direct into said secondary atomizer for regulating the degree of richness of the gas, and a chamber for cooling said gas and drawing the moisture therefrom, substantially as described.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

MORRIS B. MASON.
EDWARD M. SINCLAIR.

Witnesses:
H. C. GARDINER,
J. S. NELSON.