

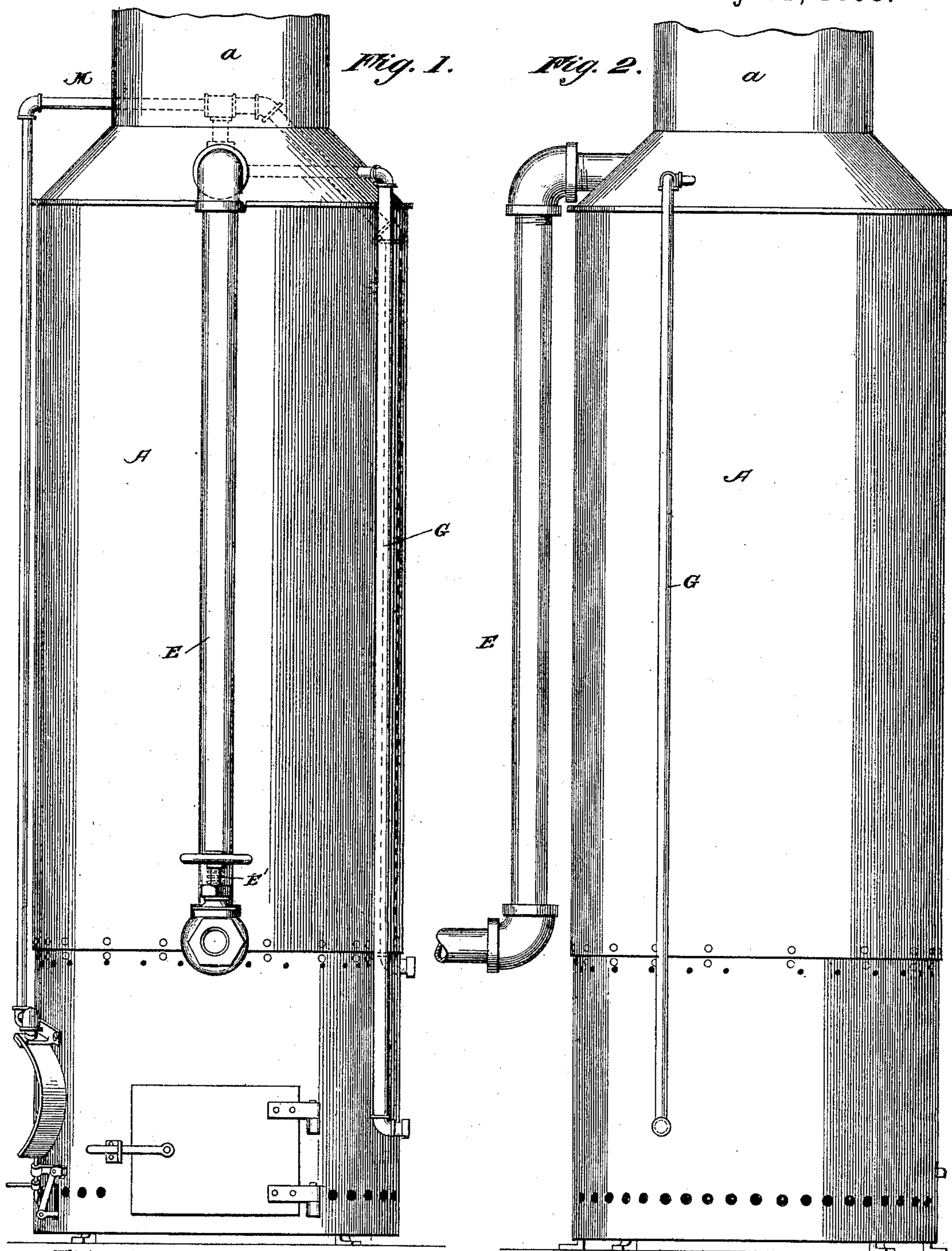
(No Model.)

3 Sheets—Sheet 1.

J. V. RICE, Jr.
NAPHTHA RETORT.

No. 604,841.

Patented May 31, 1898.



Attest.

Edw. S. Duwall, Jr.
B. S. Tiffany

Inventor:

John V. Rice, Jr.
per Fred O. Baker.
Atty.

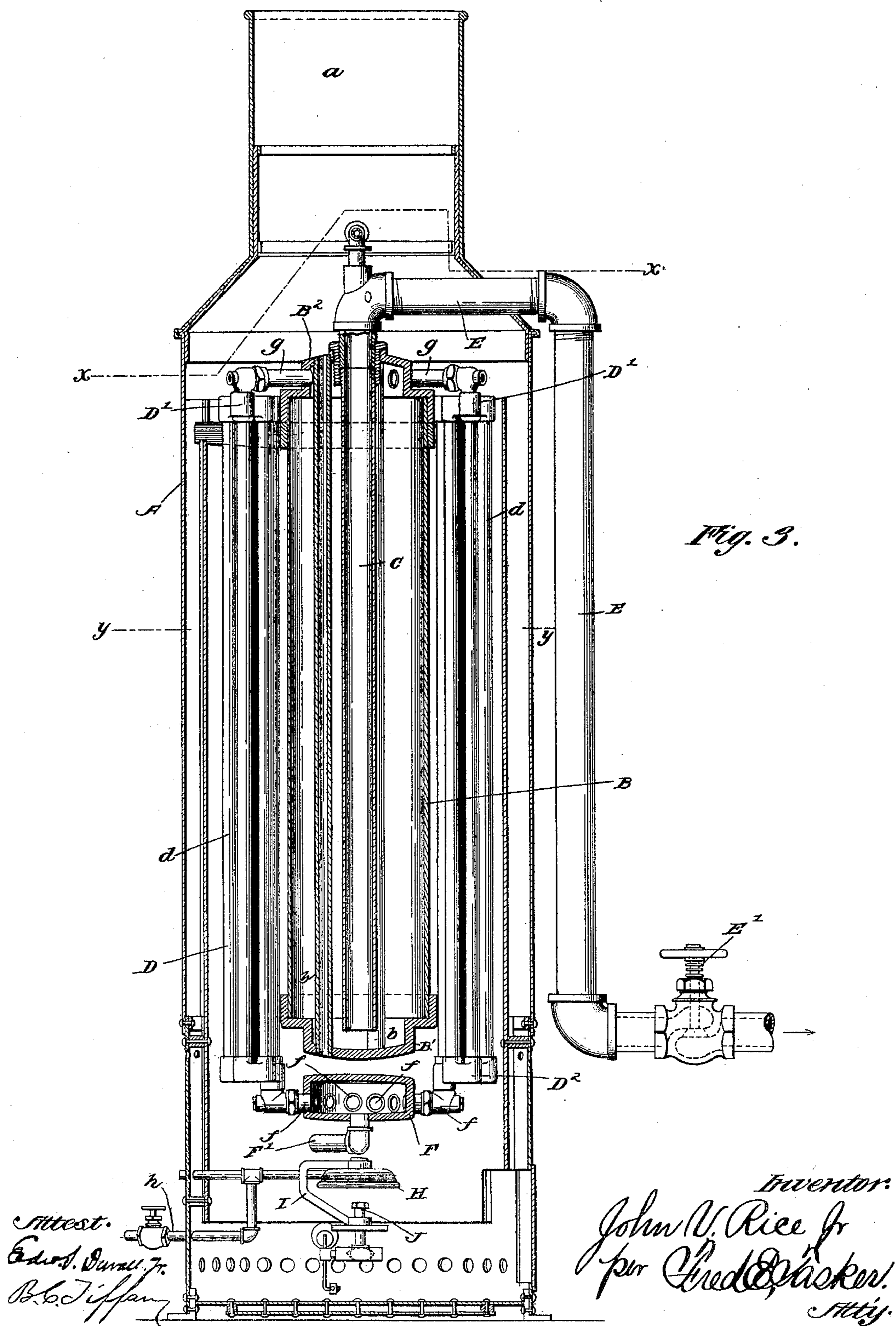
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3 Sheets—Sheet 2.

J. V. RICE, Jr.
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3 Sheets—Sheet 3.

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Fig. 4.

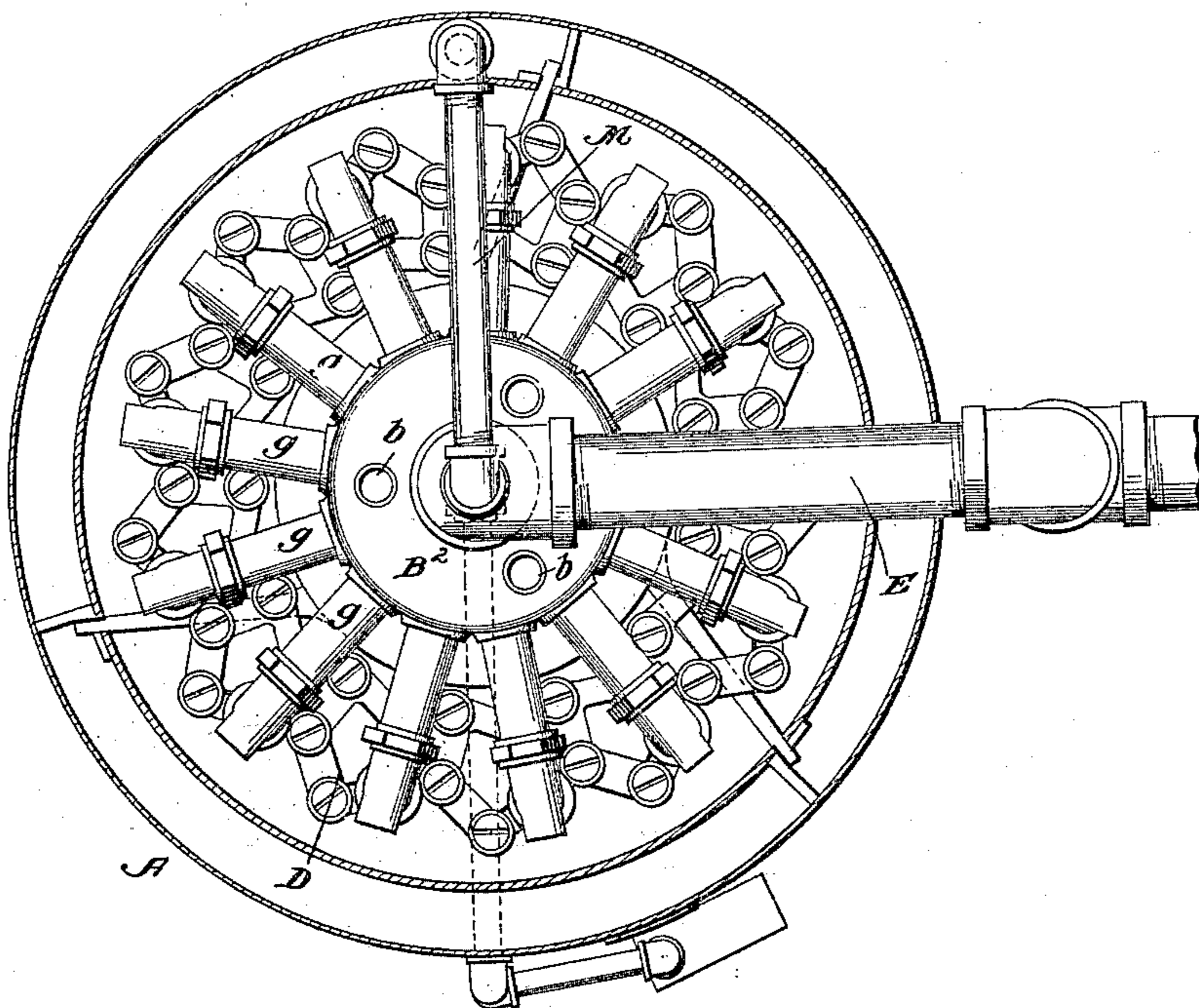
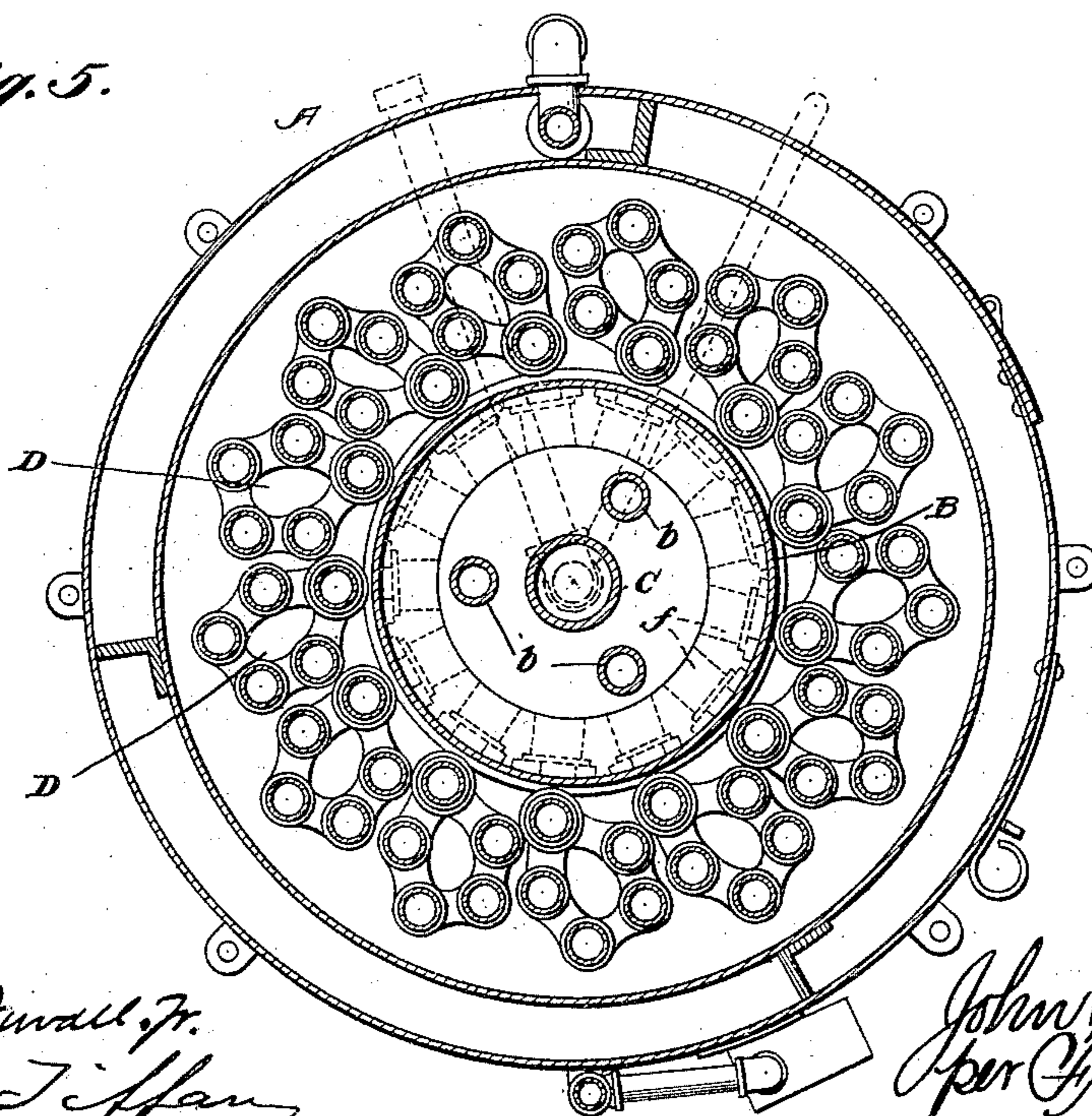


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN V. RICE, JR., OF EDGEWATER PARK, NEW JERSEY, ASSIGNOR TO THE
JOHN V. RICE, JR., COMPANY, OF SAME PLACE.

NAPHTHA-RETORT.

SPECIFICATION forming part of Letters Patent No. 604,841, dated May 31, 1898.

Application filed May 22, 1895. Renewed November 1, 1897. Serial No. 657,079. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. RICE, Jr., a citizen of the United States, residing at Edgewater Park, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Naphtha-Retorts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to an improved automatic hydrocarbon-generator in which a liquefiable gas is used expansively, then condensed, then returned, and by heating again converted into gas, and thus used over and over indefinitely in a cycle which is automatically completed without loss of the fluid, the fluid employed being, for instance, naphtha, sulfid of carbon, or some other similar substance. The present improvements relate more particularly to the construction of the retort and the arrangement of the burner therewith, the object being to simplify the same and make it more durable and efficient.

The invention therefore consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and then more particularly claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my improved gas-retort or pressure-generator. Fig. 2 is another side elevation taken at right angles to the view in Fig. 1. Fig. 3 is a vertical sectional elevation. Fig. 4 is a horizontal sectional plan view on the line *xx* of Fig. 3. Fig. 5 is a horizontal sectional view on the line *yy* of Fig. 3.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

A designates the combustion-chamber of my improved pressure-generator. This may be of any suitable size and shape and is preferably provided at its upper end with the smoke-outlet *a*. In the example shown in the drawings I have also preferably constructed the combustion-chamber with double walls.

This is not essential, however, and a single wall may be used instead, if desired. This

combustion-chamber is designed to have the retort proper and the burner arranged therein and to accommodate in connection therewith the necessary pipes or conduits for conveying the gas and naphtha or other fluid to the several places where they are needed.

Within the combustion-chamber A is situated the vertical cylindrical retort B, extending substantially from top to bottom of the combustion-chamber, there being sufficient space below the retort to accommodate the burner, as I shall presently specify. This retort B may be constructed in any desired manner. In the example shown in the drawings I have represented it as being of a cylinder form and having at its lower end a head B' and at its upper end a similar head B². From bottom to top through this retort B run smoke-flues *b b*, of which there may be any desired number, several being represented in the drawings, said flues consisting simply of tubes which are screw-threaded at each end, so as to enable them to be easily screwed into the retort-heads B' and B², as shown in Fig. 3. The smoke from the burner readily passes upward through these flues until it reaches the stack *a* and escapes through it. By situating the smoke-flues within the retort in the manner just described I economize space as well as promote efficiency.

In the center of the retort is a vertical tube C, which is attached to the head B² by means of a suitable screw-threaded connection, as shown, and which extends downward through the retort to a point at a short distance above the bottom of the head B', as shown in Fig. 3. The tube C may be termed a "chamber," inasmuch as it performs the function of a gas-receiver. Being located centrally within the retort B, it will be evident that there is an annular space between it and the wall of the retort and that consequently the tube C and the retort B are concentric with each other. The conduit or tube E, which leads to the engine or other mechanism where the gas is to be used, is connected to the retort-head B² by a screw-threaded connection or otherwise, as shown, in order that it may receive the gas directly from the tube C, and is, as it were, a continuation or extension of said tube C. The conduit E may be of any suitable size

and may be arranged in any desired manner. It will be necessary, of course, after it leaves the retort B for it to pass out through the wall of the combustion-chamber A, as shown in Fig. 3. Tube E is provided at a suitable point with a controlling-valve E'.

In the annular space between the retort B and the combustion-chamber A are arranged bunches or nests D of vertical tubes d . Each bunch or group D is composed of a suitable number of these tubes d —say five, for example, although, of course, there may be more or there may be less, and I do not wish to be restricted to any precise number. The tubes d of each group D are held together at the top by a casting D' and at the bottom by a casting D². From each of the upper castings D' a short horizontal branch pipe g extends to the retort-head B² and is attached thereto, as shown, being screwed into said head or otherwise fastened, so that the gas may readily pass from the pipes g into the retort.

Below the retort B and at only a short distance therefrom is a hollow annular casting F, which is of circular form and preferably small width, and this is entered by a series of horizontal pipes f , which extend to the pipes d , just described, and which are connected likewise with the lower heads D² at the bottom ends of the pipe groups D. This hollow circular casting F is entered at the central point of its bottom plate by a pipe or tube F', which supplies the naphtha or other liquid thereto and which is adapted to be connected to a force-pump or other suitable mechanism which will furnish the requisite amount of naphtha needed for the work to be performed.

Immediately below the hollow casting F is situated a suitable burner mechanism, by means of which an intense heat can be applied to the casting F. This burner may be of any suitable kind.

J designates one form of burner which I preferably employ, although it will be evident that other kinds may be substituted therefor. Above the burner J is a spreading device or shield H, which causes the flame to assume a circular form, and thereby spread itself out enough to enable it to have the proper action upon the casting F.

I denotes the connection between the burner J and the shield H, said connection I serving as a pipe for the oil which is consumed in the burner J.

h designates the oil-supply pipe, and it leads to the shield H, and the oil then passes down through the pipe d , as just stated. The oil-supply pipe h leads from any suitable source of supply, and it is not thought necessary to herein illustrate such source. Sufficient oil will be furnished, of course, to keep a steady hot flame, such as will be of ample strength to convert the gasolene or naphtha into vapor.

The gasolene or naphtha which is driven through the supply-pipe F' by means of a force-pump or other mechanism enters the hot

circular casting F, and being thereby brought into contact with the heat begins to expand or gasify, and the vapor received therefrom passes upwardly through the pipe groups D and enters through the pipes g the upper end of the retort B. Said retort soon becomes filled with the gas, and this will pass from the bottom of the retort into the central tube C, and thereby find its way into the pipe E, through which it will be conveyed for use. It will be observed that with a retort of this kind the liquid will be converted into a combustible vapor at a comparatively low temperature. It will also be observed that the vapor-generator retort is not situated in direct contact with the intense heat of the flame at the burner, but is located above it, there being interposed between it and the burner the independent hollow casting F, by the use of which the retort is saved from injury and also better results are achieved than when the flame is supplied directly to the base of the retort.

Suitable pipes or tubes may obviously be arranged in connection with my improved retort in addition to those already described for the purpose of conveying the gas to a condenser and then reconveying it to the retort and for other purposes.

M designates a pipe which connects with the pipe E at a point above the retort and which leads to a condensing mechanism which is not herein illustrated.

G denotes another pipe, which connects with the pipe E, and may be arranged to lead to a steam-supply or some other point.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pressure-generator of the class described, the combination with a retort and a burner below it, of an independent hollow casing situated between it and the burner, and connecting-pipes between said casing and the upper end of the retort, substantially as described.

2. In a pressure-generator of the class described, the combination of the combustion-chamber, the vapor-generating retort within the same, a tube or chamber encircled by the said retort, an independent hollow casing located below the retort, an oil-supply pipe connecting with said casing, suitable connecting-pipes between the casing and the upper end of the retort, and a burner located below the said casing, substantially as described.

3. In a pressure-generator, the combination of a combustion-chamber, a vapor-generating retort within the same, a burner below said retort having a burner supply-pipe, a tube or chamber centrally located within the retort and smoke-flues passing upward through the retort and arranged in a series around the central tube, substantially as described.

4. In a retort of the class described, the combination of the combustion-chamber, the

retort within the same, a hollow casting below the retort, groups of vertical pipes located around the retort and pipe connections at the upper end of said groups with the upper end of said retort and at the lower end of said groups with the casting below the retort, together with an oil-supply pipe entering said casting, substantially as described.

5. In a pressure-generator of the character described, the combination of a combustion-chamber, a retort within the same, a central tube or chamber within said retort, a hollow annular casting below the retort, groups of vertical pipes arranged around the retort and

having connections at their upper ends with the upper end of the retort and at their lower ends with the annular casting, a pipe leading from the upper end of the retort to the work to be performed by the gas and a burner located below the annular casting, all arranged substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN V. RICE, JR.

Witnesses:

CHAS. H. BANNARD,
A. A. EVANS.