

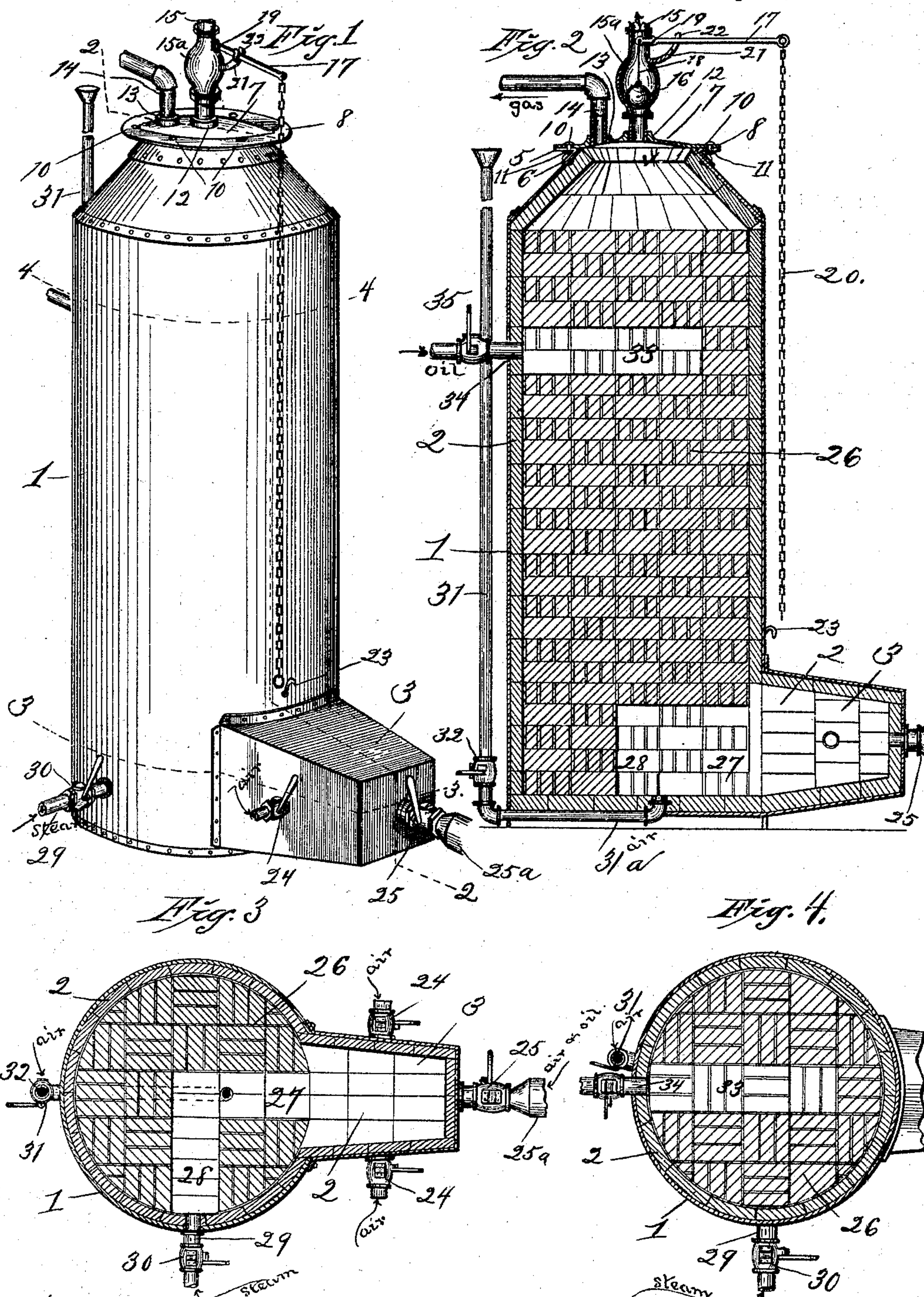
(No Model.)

C. E. WHITE.

APPARATUS FOR THE MANUFACTURE OF GAS.

No. 496,927.

Patented May 9, 1893.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CHARLES E. WHITE, OF KANSAS CITY, MISSOURI, ASSIGNOR OF SEVEN-TWENTIETHS TO JOHN C. STERLING, OF SAME PLACE, AND HARRY W. STERLING, OF CHETOPA, KANSAS.

## APPARATUS FOR THE MANUFACTURE OF GAS.

SPECIFICATION forming part of Letters Patent No. 496,927, dated May 9, 1893.

Application filed February 3, 1893. Serial No. 460,844. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. WHITE, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Apparatus for the Manufacture of Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to the manufacture of gas for illuminating and fuel purposes, and the objects of my invention are to provide an improved apparatus for transforming hydrocarbon oils and steam into illuminating or fuel gas, and to attain this end, I provide a retort or casing filled with a checker-work of refractory material, having a pocket or chamber for the oils and passages for the steam supply and for the products of combustion at the lower end of said refractory material. I also provide the retort or casing with a combustion chamber where the fuel is admitted under pressure and where a proportionate quantity of air is also admitted by valves for the purpose, to support combustion within said chamber, which then heats the refractory material to a high degree of temperature. The supply of air and oil from the atomizer is then cut off and the oil and steam supplied for the production of the gas, which is conducted to a holder or to service.

To the above purposes my invention consists in certain peculiar and novel features of construction as will be described and claimed hereinafter.

In order that my invention may be properly understood, I will proceed to describe it, reference being had to the accompanying drawings, in which—

Figure 1, represents a perspective view of my improved apparatus for the manufacture of gas. Fig. 2, is a vertical sectional view taken on the line 2—2 of Fig. 1. Fig. 3, is a horizontal sectional view taken on the line 3—3 of Fig. 1, and Fig. 4, is a horizontal sectional view taken on the line 4—4 of Fig. 1.

In the drawings, 1 designates the retort or casing of my apparatus, which is shown as of cylindrical form, but which may be of any other suitable form desired, and which is pro-

vided with a lining of fire-brick 2. The lower end of the retort or casing is provided with an opening in its front which communicates with a combustion chamber 3 which is also lined with fire-brick 2. The top of the casing is formed with an opening 4 and a ring comprising the horizontal flange 5 and the depending flange 6 is secured around said opening; the flange 6 being riveted to the outer side of the casing, as shown. A circular top-plate 7 is preferably of concavo-convex form and is provided with a marginal flange 8 provided at intervals with openings registering with similar openings in the horizontal flange 5 of the ring; bolts 10 being passed through said openings and engaged at their projecting ends by retaining nuts 11. This top-plate 7 is provided with openings and with annular shoulders 12 and 13 internally screw-threaded marginally surrounding said openings. The lower end of the gas-outlet pipe 14 is screwed into the opening shoulder 13, which pipe may lead to a suitable holder or to service if desired. The lower end of an air escape pipe 15, is screwed into the opening 12, and is provided with a ball-valve coupling 15<sup>a</sup> which is adapted to withstand the pressure of the gases within the retort or casing. The ball 16 of this valve is connected to the inner end of a lever 17 by a rod or chain 18, the said lever 17 being pivoted at 19 and having the upper end of a pendent chain 20 secured thereto. A brace and guide arm 21 is also formed or secured to the side of the pipe 15 and has its outer end bifurcated at 22 and fitting on opposite sides of the said lever. A hook 23 is secured to the outer side of the retort or casing 1 and is adapted to be engaged by the lowest link of the chain 20, when it is desired to hold the valve of the escape pipe 13 open for any length of time.

About midway of the length of the side wall of the combustion chamber, and at each side of the same are the air-inlet or supply openings, which are controlled by the quick opening valves 24 of the usual or any preferred construction, and a similar quick opening valve 25 controls the entrance to the front end of said combustion chamber. An atomizer 25<sup>a</sup> of any suitable construction, wherein the



hydro-carbon oil is mixed with air, communicates with the outer end of said quick opening valve 25, which thus provides an inlet to the combustion chamber, for the hydro-carbon oils and air, from the atomizer. The retort or casing is provided with a checker-work of brick or any other suitable material 26, which is formed at its lower end with the longitudinal and lateral passages 27 and 28; the longitudinal passage 27 communicating with the combustion chamber 3 and the lateral passage communicating with the inner end of a steam inlet or supply pipe 29 which passes through the casing 1, and communicates at its opposite end with a steam supply, not shown. This steam supply pipe 29 is provided adjacent to the retort or casing 1, with a quick opening valve 30, which controls the passage of steam through said pipe. A supply pipe for air 31 also communicates at its lower end through an elbow, a pipe 31<sup>a</sup> and elbow at the inner end of said pipe through the bottom of the retort or casing 1, with the passages formed in the lower end of the checker-work 26 and is provided with a quick opening valve 32 adjacent to the casing, and at its upper end communicates with the outer air. The checker-work is also provided at a suitable distance from the upper end thereof, with a chamber or pocket 33 for oil, which extends to the rear side of the retort or casing and communicates with the inner end of an oil-supply pipe 34, which passes through the end wall of the casing, and is provided adjacent thereto, with a quick opening valve 35, which controls the supply of oil through said pipe.

The operation of the device is as follows: The quick opening valve 25 is opened to admit the hydro-carbon oil and air under pressure from the atomizer and the valves 24 are opened sufficiently to supply a proportionate quantity of air, to support perfect combustion therein, the valve in the air-escape pipe 15 being opened meanwhile by pulling downward upon the chain 20, this having the effect to highly heat the checker-work of refractory material. If found necessary, the valve 32 of the air supply pipe 31 may be operated to admit air within the retort. The valves 24 and 25 are now operated to cut off entirely the supply of oil and air, and the valve of the escape pipe 15 is closed; the valve 32 is also closed if open; the valves 30 and 35 are now operated to supply steam and oil to the retort; the oil chamber or pocket being located in the upper portion of the checker-work, not needing such intense heat to decompose it as is needed by the steam, which is admitted adjacent to the combustion chamber 3. The steam is decomposed as it rises through the highly heated or incandescent checker-work, and the hydro-carbon oil is also decomposed thereby; thus producing the usual hydro-car-

bon gas, which is conducted through the gas-outlet pipe 14, through the usual water-seal and to holder or to service. To determine the quality of gas produced, a greater or less quantity of oil is admitted within the retort.

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

1. In an apparatus for producing illuminating and fuel gas, the combination of a retort, a combustion chamber communicating with said retort at its lower end, with an oil and an air supply communicating with said combustion chamber, inlet-valves for air, communicating with the sides of said combustion chamber, and a checker-work of refractory material having a longitudinal passage at its lower end communicating with said combustion chamber, and a lateral passage communicating with the longitudinal passage and a steam supply communicating with the lateral passage and controlled by a valve, substantially as set forth.

2. In an apparatus for producing illuminating and fuel gas, the combination with a retort, a combustion chamber communicating with said retort, of an oil and an air supply communicating with said combustion chamber inlet-valves for air, communicating with the sides of said chamber, and a checker-work of refractory material having passages 27 and 28 in its lower end, and an air and a steam supply communicating with said passages, and a top-plate or cap having openings at the upper end of the retort, and an air escape pipe and a gas outlet pipe communicating with said openings.

3. In an apparatus for producing illuminating or fuel gas, the combination with a retort and a combustion chamber communicating with said retort at its lower end, of a valve controlling an opening in the front end of said combustion chamber, an atomizer connected to an oil and an air supply, communicating with said valve, air inlet valves located at the sides of said combustion chamber, a checker-work of refractory material within the retort, having passages 27 and 28 at its lower end and an oil pocket near its upper end, an auxiliary air supply and a steam supply pipe communicating with the passages 27 and 28, and an oil supply pipe communicating with the pocket of said checker-work, a top-plate or cap having openings and an air-escape pipe and a gas outlet pipe communicating with said openings, and a valve adapted to close the air escape pipe, substantially as set forth.

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

CHARLES E. WHITE.

Witnesses:

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