

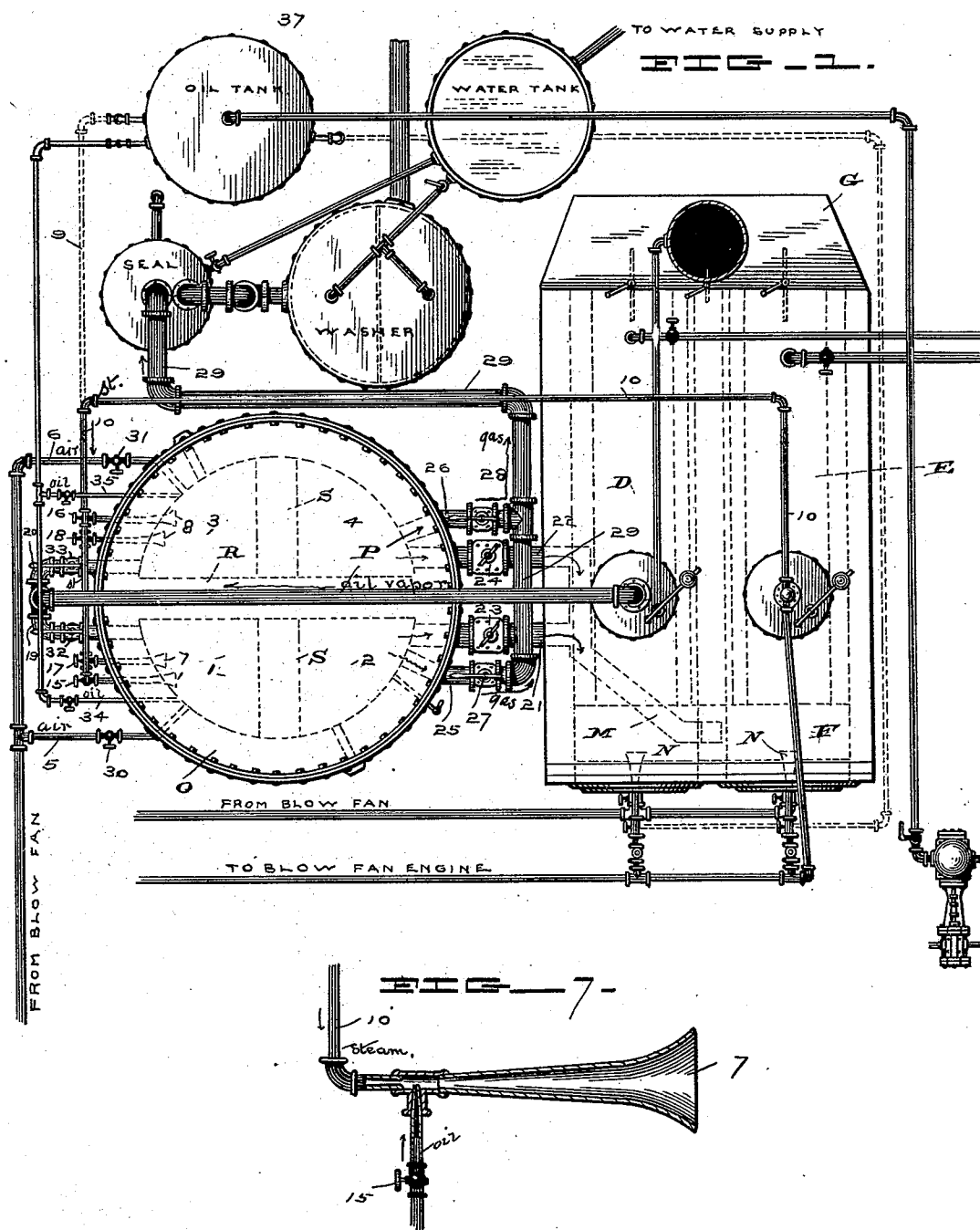
(No Model.)

4 Sheets—Sheet 1.

C. C. GILMORE.
GAS MAKING APPARATUS.

No. 514,185.

Patented Feb. 6, 1894.



Witnesses

H. S. Neely.
A. M. Hood.

Inventor

Charles C. Gilmore

(No Model.)

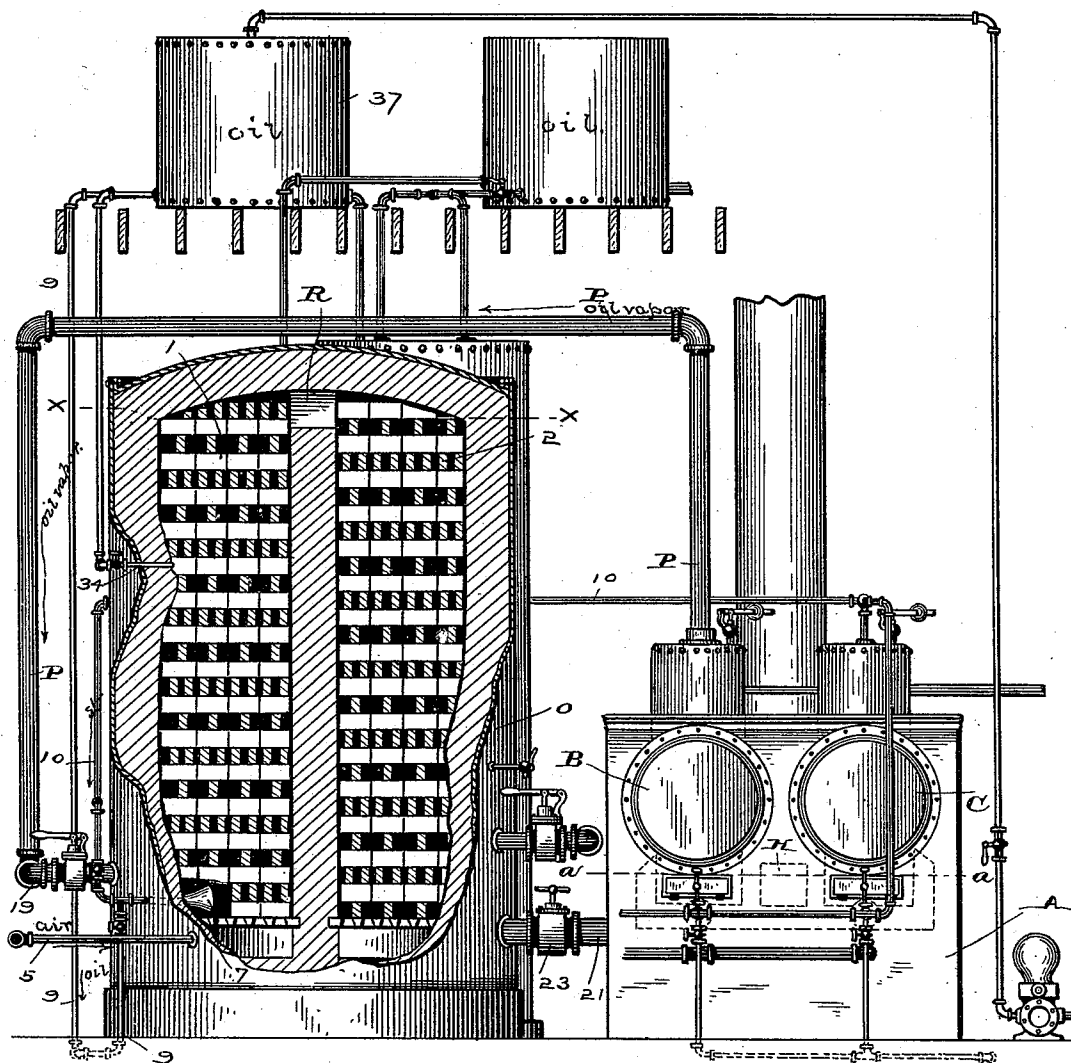
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FIG. 2.



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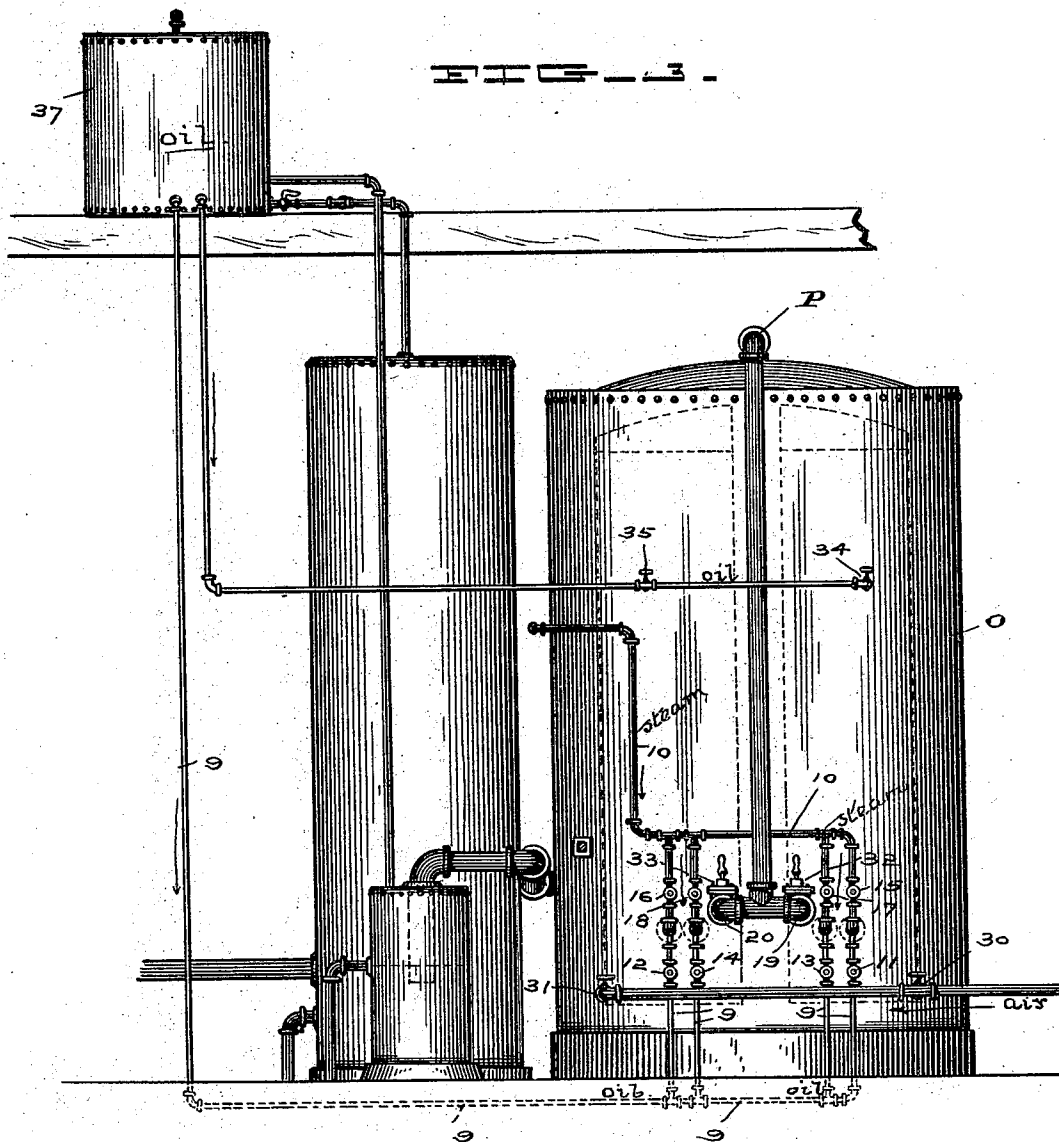
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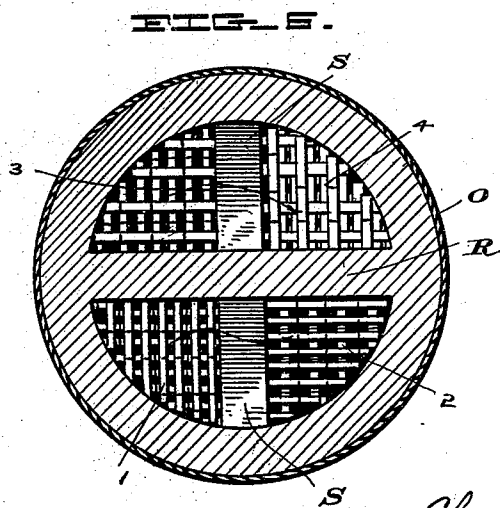
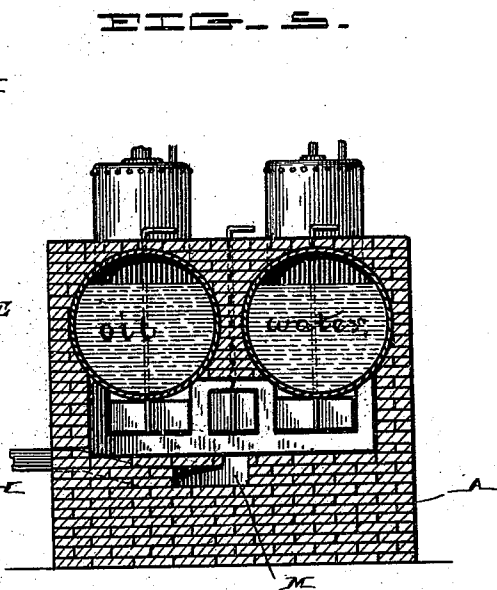
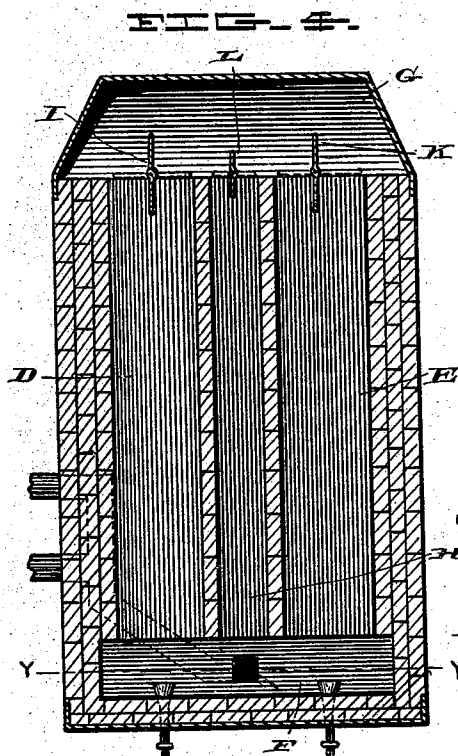
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Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

CHARLES C. GILMORE, OF INDIANAPOLIS, INDIANA.

GAS-MAKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 514,185, dated February 6, 1894.

Application filed May 12, 1893. Serial No. 473,907. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. GILMORE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Gas-Making Apparatus, of which the following is a specification.

My invention relates to an improvement in an apparatus for making a fixed gas from crude oil.

The objects of my invention are first; to provide means whereby the operation of the process may become continuous, second; to provide means for utilizing the heat generated to the greatest possible advantage.

The following drawings illustrate my invention.

Figure 1 is a plan of the whole plant. Fig. 2 is an end elevation with the converting chamber shown in section. Fig. 3 is a side elevation of the converting chamber together with the usual "seal," "washer," &c. Fig. 4 is a longitudinal section of the boiler setting, looking downward, at the line —a— Fig. 2. Fig. 5 is a vertical section at the line —Y— Fig. 4. Fig. 6 is a section of the converter chamber at the line —X— Fig. 2. Fig. 7 is a section of a form of oil burner which may be used in my apparatus.

In the drawings, A, indicates the boiler setting in which are mounted distilling retort, B, and water boiler, C. Running longitudinally beneath the retort B and boiler C respectively are passages, D, and E, which are connected at their forward ends by the fire box, F, and at their rear ends by the smoke box G, which communicates with a smoke stack or chimney not shown. Running parallel with and between the passages D and E is the passage, H, which connects the fire box F and smoke box G. Mounted at the rear ends of the passages D, E, and H, respectively are the dampers, I, K, and L, so arranged that the draft through each passage may be regulated separately and at will. Passage, M, connects the pipes 21 and 22 leading from the converter, O, with the fire box F. Heat may be supplied to the boilers by means of the oil burners, N, or in some other well known manner.

O, indicates the converting chamber which is located in close proximity to the oil retort

B and is connected to the dome thereof by means of the pipe, P. Converter O is lined with fire-brick and is divided into two separate compartments by means of the wall, R. Each of these two compartments is subdivided by the walls, S, which extend to within a short distance of the top of the chamber. The converter is thus subdivided into four compartments, 1, 2, 3, 4, which are filled with a fire-brick checker-work. Chambers 1 and 2 communicate over the top of wall S and chambers 3 and 4 communicate in a like manner, but the two sets have no communication with each other, the purpose being to utilize the heat absorbed by the wall R, when the compartments 1 and 2 are in operation, in heating compartments 3 and 4 and vice versa. At the bottoms of chambers 1 and 3 respectively are introduced the air-blast tubes, 5, and 6, which are connected with any suitable blast producer and are provided respectively with valves, 30, and 31. Immediately above said air tubes are respectively oil burners, 7, and 8, connected by pipes, 9, 9, to a suitable oil supply, as tank, 37, and by pipes, 10, 10, to the dome of the steam boiler. Between the burners and the oil supply are introduced valves, 11, 12, 13, and 14, and between said burners and the steam supply are the valves, 15, 16, 17, and 18. Leading from pipe respectively to the bottom of chambers 1 and 3, immediately above the burners in said chambers are the pipes, 19, and 20, provided with valves, 32, and 33. Leading respectively from the bottom of chambers 2 and 4, to the passage M, are the pipes, 21, and 22, which are provided respectively with valves, 23, and 24. Pipes, 25, and 26, also emanate respectively from the bottom of chambers 2 and 4 and, through valves, 27, and 28, are connected with pipe, 29, which leads to the usual "seal," "washer," and "receiver" used in gas-making plants. An arrangement (not shown) may be provided whereby all of the valves in the system may be operated by a single motion, the arrangement being such that when valves 11, 13, 15, 17, 23, 30, 28, and 33 are open, valves 12, 14, 16, 18, 24, 27, 31, and 32 will be closed. Introduced respectively into the upper portion of chambers 1 and 3 are pipes, 34, and 35, which are connected through suitable valves, with the oil-supply, the arrangement

being such that if the gas generated in the converter is lacking in carbon a stream of oil may be introduced into the converter.

It will be understood that for the further supply of hydrogen, the usual steam-jet may also be introduced into the converter.

The operation of my device is as follows;—
A fire being started in the fire-box F, dampers I and L are shut and damper K is opened thus causing all of the heat to traverse passage E. Steam having been raised in the boiler C and all of the valves being closed, damper I is opened, the heat is allowed to pass through passage D and under retort B and the oil is thus boiled and the vapor allowed to pass into the pipe P. Oil-valves 11, 13, 12, 14; steam-valves 15, 17, 16, 18; blast-valves 30, 31; and valves 23 and 24 are then opened and the oil and steam issuing from the burners 7 and 8 are ignited. The heated gases from said burners pass up through chambers 1 and 3, down through chambers 2 and 4 and from thence through pipes 21 and 22 and passage M to the fire box F, thus utilizing the hot waste gases from the converter for the purpose of heating the boilers. When the checker-work in chambers 1, 2, and 3, 4 have become heated to a white heat valves 11, 13, 15, 17, 30, and 23 are closed and valves 32 and 27 are opened. The vapor of oil from the retort B is admitted through valve 32 into the bottom of chamber 1 and is compelled to pass through the white-hot checker-work up through chamber 1, down through chamber 2, the vapor being converted during the passage into a fixed gas, and the gas from thence passes through pipe 29, the seal and other connected apparatus to a gasometer (not shown). When the checker-work in chambers 1 and 2 has become cooled nearly to the point where no more fixed gas would be formed, valves 11, 13, 15, 17, 23, 28, 30 and 33, are opened and valves 12, 14, 16, 18, 24, 27, 31 and 32, are closed. By this means the oil vapor from retort B is cut off from chambers 1 and 2 and is compelled to pass into and through chambers 3 and 4 and from thence through the seal, while at the same time oil and steam are supplied to the burners 7 the mixture being ignited by the still incandes-

cent bricks in chamber 1 and the chambers 1 and 2 are again heated up. When chambers 3 and 4 become cooled the process is again reversed and so on *ad infinitum*. As the process progresses the boiling point of the oil in retort B rises higher and higher. To provide the necessary heat therefor damper K is gradually closed until just enough heat is allowed to pass through passage E to supply the steam necessary. If too much heat is being supplied to the boilers damper L is opened and the surplus allowed to pass up the chimney. When the lighter products from the oil in retort B have passed over the heavy residue is removed and a fresh supply of oil is introduced.

I claim as my invention—

1. In a gas-making apparatus, the combination of the oil retort and the steam boiler arranged in a setting common to both, the furnace arranged at one end of said setting, the flue extending beneath the oil retort, the flue extending beneath the steam boiler, and the central flue arranged between said flues, said flues being connected with the furnace and thereby with each other, and provided with dampers whereby the products of combustion from the furnace may be directed beneath either the oil retort or the steam boiler or both or directed therefrom through the central flue all substantially as set forth.

2. In a gas-making apparatus, the converter consisting of a chamber having the partition wall R dividing the chamber into two separate independent compartments, and the partition walls, S, S, located in each of the separate compartments, arranged at right angles to said partition wall R, and extending nearly to the top thereof, thus forming the communicating sub-divisions 1 and 2, and the communicating sub-divisions 3 and 4, and means for introducing fuel and gaseous elements into the separate compartments, whereby the heat from one set of said communicating sub-divisions is imparted to the other set of communicating sub-divisions, all arranged substantially as and for the purpose set forth.

CHARLES C. GILMORE.

Witnesses:

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A. M. HOOD.