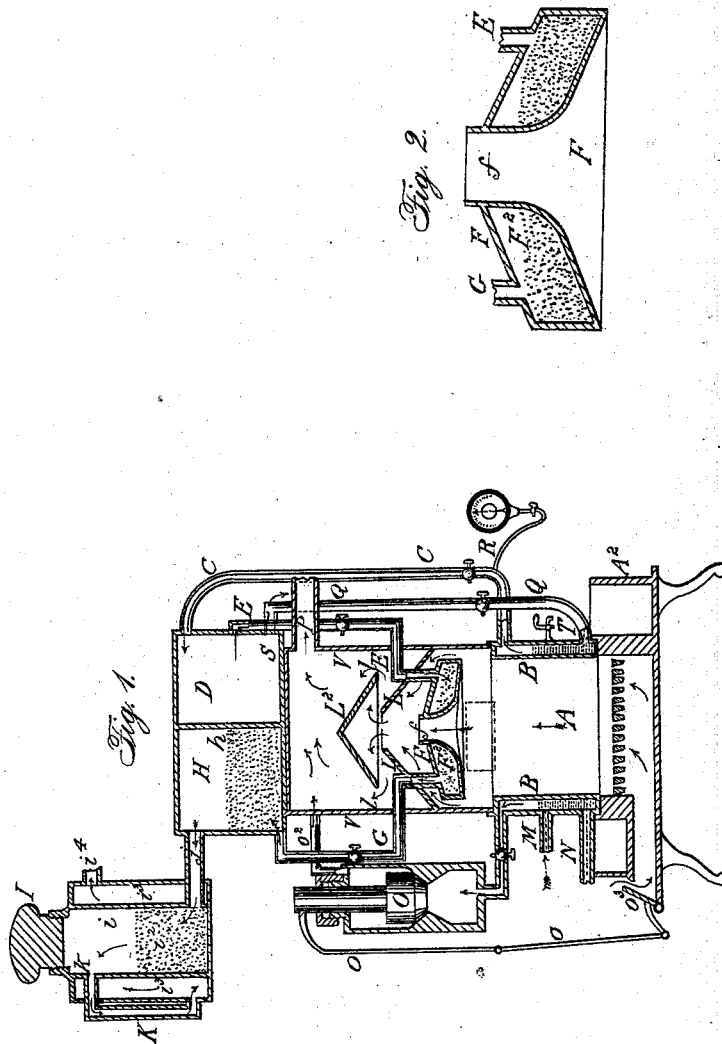


O. COLLINS.

Gas Retort.

No. 49,505.

Patented Aug. 22, 1865.



Witnesses:

Henry T. Brown
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Inventor:

Owen Collins

UNITED STATES PATENT OFFICE.

OWEN COLLINS, OF NEW YORK, N. Y.

IMPROVED APPARATUS FOR MAKING ILLUMINATING-GAS.

Specification forming part of Letters Patent No. 49,505, dated August 22, 1865.

To all whom it may concern:

Be it known that I, OWEN COLLINS, of No. 73 Mott street, in the city, county, and State of New York, have invented a new and Improved Apparatus for Making Illuminating-Gas from Coal-Oil and Liquid Hydrocarbons; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of an apparatus constructed according to my invention. Fig. 2 is a similar view of a part thereof enlarged.

Similar letters of reference indicate corresponding parts in each figure.

My invention consists in a novel apparatus for manufacturing carbureted hydrogen-gas from coal or rock oil, which is more particularly adapted for use in dwelling-houses, and which may also be used for warming purposes.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it with reference to the drawings.

A is a fire-box or furnace, like that of any cylinder-stove, provided with a grate, damper, ash-pan, &c., in the ordinary manner, and having erected above it a cylinder, V, like the upper part of a cylinder-stove. This fire-box is composed of two cylinder-shaped shells of wrought or cast metal, arranged one within the other and united at their top and bottom to form an evaporator or vapor-generator, B, of annular form, in its horizontal section for the reception of the oil or other liquid hydrocarbon and water. This evaporator is provided with the necessary pipes, valves, and gages, and is used to produce vapor, which is afterward decomposed in a retort, F, kept at a high red heat.

C is a steam-pipe, with stop-cock leading from the evaporator to a receiver, D, on the top of the stove.

E is another pipe provided with a stop-cock, used to conduct the vapor from the receiver D to the decomposing-retort F, which is situated over the furnace and within the cylinder V, and which, when in operation, is kept at a red

heat to decompose the steam and oil vapor into gas, which passes from it through a pipe, G, into a purifier, H, containing hydrate of potash *h* or other purifying material. From this purifier the gas passes into a second purifier, I, which is formed in two apartments, the inner one, *i*, containing soda, ash, or other purifying material, through which the gas passes by a pipe, J, from the receiver H, and from which it is conveyed up to a pipe, K, which passes outside of both apartments down toward the bottom of the purifier and enters the outer apartment, *i*², from which the gas is conveyed to its destination or into a gas-meter by another pipe, *i*⁴, near the top of the purifier.

The retort F is of annular form, with its upper and lower sides conical, the central opening, *f*, allowing the passage of the smoke and gaseous products of combustion from the furnace A up toward the chimney P, and also giving a greater heating-surface to the said retort. The retort may be filled with small fragments of iron turnings or borings F², to present within a greater heating-surface for the decomposition of the hydrocarbon vapors and to decompose the steam or aqueous vapor.

Above the retort, and within the cylinder V, is a concave annular deflector, L, for throwing the heat downward, at the same time allowing the smoke, &c., to pass freely out. Above this deflector is a second one, L², of a cone shape, closed at the center, but having passages *l* at its edges.

M is a pipe through which the evaporator B is supplied with petroleum and water.

N is a blow-off pipe to blow off any sediment or accumulations in the boiler when necessary.

O is a safety-valve attached to the evaporator B. The weight of the valve regulates the pressure of vapor in the evaporator. The stem of the said valve is connected by a rod, *o*, with the damper *o*³ which admits air to the furnace. When the pressure of vapor attains the limit intended it raises the valve, and the escaping vapor passes out through the pipe *o*² into the upper part of the stove and escapes through the chimney P. At the same time the damper is closed, and the fire does not burn so intensely until the valve again rests on its seat.

Q is a pipe connecting the water-space of the boiler with the lower part of the receiver D, provided with a stop-cock, and is used to convey back to the boiler any condensed vapor which may accumulate therein.

R is a steam-pressure gage to denote the pressure in the boiler.

S is a pipe used to blow out the receiver D, or cleanse it from dirt or sediment.

T is a gage-cock for denoting the water-level in the boiler.

The entire machine may be surrounded with a drum secured to the rim A², to make the apparatus serve as an air-heater for warming the house, in the lower part of which it is placed, by the air being conducted in at suitable openings at the bottom and becoming heated by passing over the heated exterior surfaces of the furnace, boiler, &c., and conducted out through suitable pipes arranged for that purpose. The direction which the gas takes is de-

noted by the red arrows, and that of the products of combustion from the furnace A by the blue arrows.

Having described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Constructing or providing an apparatus for making illuminating-gas from liquid substances with an annular evaporator, B, surrounding the furnace, substantially as herein specified.

2. The annular retort F, having a conical bottom and top, substantially as herein specified.

3. The combination and arrangement of the cylindrical annular evaporator B, the conical annular retort F, the deflectors L and L², and the cylinder V, substantially as herein specified.

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Witnesses:

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