2 Sheets—Sheet 1.

# C. HOLLAND.

## Hydrocarbon Vapor-Generator and Burner.

No. 203,827. Patented May 21, 1878.

*Fig. 1.*

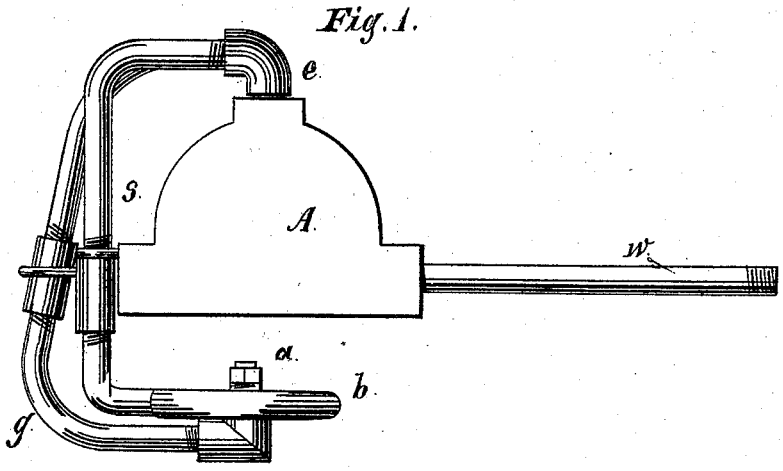
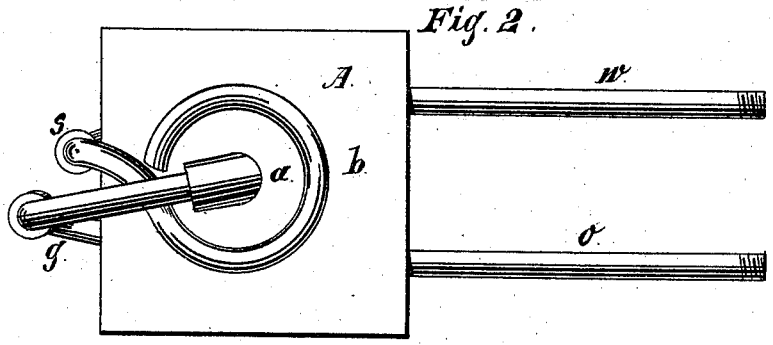



*Fig. 2.*




*Witnesses:*

L. L. Bond

C. W. Bond

*Inventor:*

Charles Holland

2 Sheets—Sheet 2.

# C. HOLLAND.

## Hydrocarbon Vapor-Generator and Burner.

No. 203,827. Patented May 21, 1878.

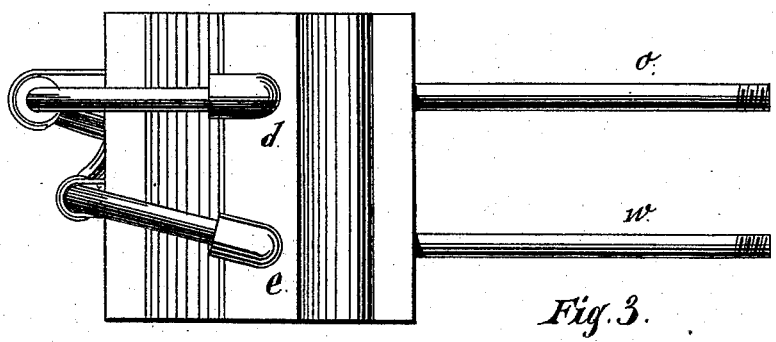



Fig. 3.

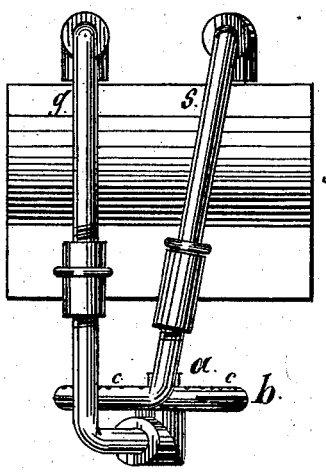



Fig. 4.

c Fig. 5

Witnesses:

L L Bond

C. W. Bond.

Inventor:

Charles Holland

# UNITED STATES PATENT OFFICE.

CHARLES HOLLAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO PARK HOLLAND, OF SAME PLACE.

## IMPROVEMENT IN HYDROCARBON-VAPOR GENERATOR AND BURNER.

Specification forming part of Letters Patent No. **203,827**, dated May 21, 1878; application filed April 3, 1878.

*To all whom it may concern:*

Be it known that I, CHARLES HOLLAND, of the city of Chicago, Cook county, State of Illinois, have invented a new and useful Improvement in Hydrocarbon-Vapor Generator and Burner, of which the following is a full description, reference being had to the accompanying drawing, in which—

Figure 1 is a side elevation; Fig. 2, a bottom view; Fig. 3, a top or plan view; Fig. 4, an end view; and Fig. 5; a pipe-section, showing an exit-hole.

The object of this invention is to improve the construction and operation of a hydrocarbon or oxyhydrocarbon burner, which generates the gases by which combustion is sustained; and its nature consists in bringing the superheated steam or water-gas down under the retort and around the jet or burner in a circle of less diameter than the width of the retort, so that any steam escaping from the first contact with the flame may be returned to the flame by the reaction from the bottom of the retort, and in perforating the circular portion of the steam-pipe at the top, so as to give a slight outwardly-oblique direction to the jets or streams of water-gas, and at the same time cause them to impinge against the bottom of the retort.

In the drawings, A represents the retort; *a*, the jet or burner; *b*, the circular perforated water-gas jet; *d e*, upper couplings of the retort; *g*, gas-pipe; *o*, oil-pipe; *s*, steam-pipe, and *w* water-pipe.

The retort A is made in the form shown, of cast-iron or other suitable metal, and its interior is divided into two compartments or chambers by a middle partition for water and oil. The oil-pipe *o* is connected by suitable extensions with an oil tank or reservoir located either within or without the building, and the water-pipe *w* is connected with a service-pipe where there is a regular water-supply, or with any suitable tank, cistern, or reservoir, and both pipes, at any suitable point along their length or extensions, will be furnished with valves or cut-offs to regulate their flow or shut them off. The gas-pipe *g* passes around to the burner *a*, located centrally underneath the retort. The steam or water-gas pipe *s* has its outer end closed, and is curved around the burner *a* on a circle less in diameter than the width of the retort, as shown at Fig. 2, and slightly below the tip of the burner, as shown at Fig. 1. The curved or circular portion is perforated with a series of small holes, *c*, as nearly uniform in size and distance as may be. These holes *c* are at the top, with a slight outward inclination, so that the currents or jets of steam will impinge against the retort, and assist in spreading the flame, and insure their complete combustion.

In operation, the device is started by any suitable starter that will heat the retort sufficiently to start the initial or primary oil-gas flame of the jet *a*. The retort soon becomes highly heated, when the oil is vaporized and the vapor converted into a gas, and the water is vaporized or converted into steam and superheated, in which condition it is projected or driven through the perforations of the coil *b* into the gas-flame, which flame it increases, and in which it is burned with an intense heat, each gas improving the combustion of the other, and generating a sufficient quantity of gas to make the operation continuous as long as the supply of material is maintained.

To partly regulate the supply and to prevent the introduction of any considerable quantity of water or oil into the retort at any stage of its operation, the pipes *o* and *w*, are filled, or partly filled, with wire cloth or gauze, rolled into cylindrical form.

It will be seen that the steam-exit circle is centrally located beneath the retort, and about equidistant from the center or burner *a* and the outer boundaries of the retort, as shown at Fig. 2, and the slight obliquity of the perforations *c* is shown at Fig. 5.

The circle *b* may be made angular, or of the form of the boundary of the retort.

What I claim as new, and desire to secure by Letters Patent, is—

The steam-exit circle *b*, located above the burner-pipe, having about one-half the diameter of the bottom of the retort and outwardly-inclined perforations *c*, in combination with the burner *a*, retort A, and pipes *o w*, substantially as and for the purpose set forth.

CHARLES HOLLAND.

Witnesses:

L. L. BOND,

O. W. BOND.