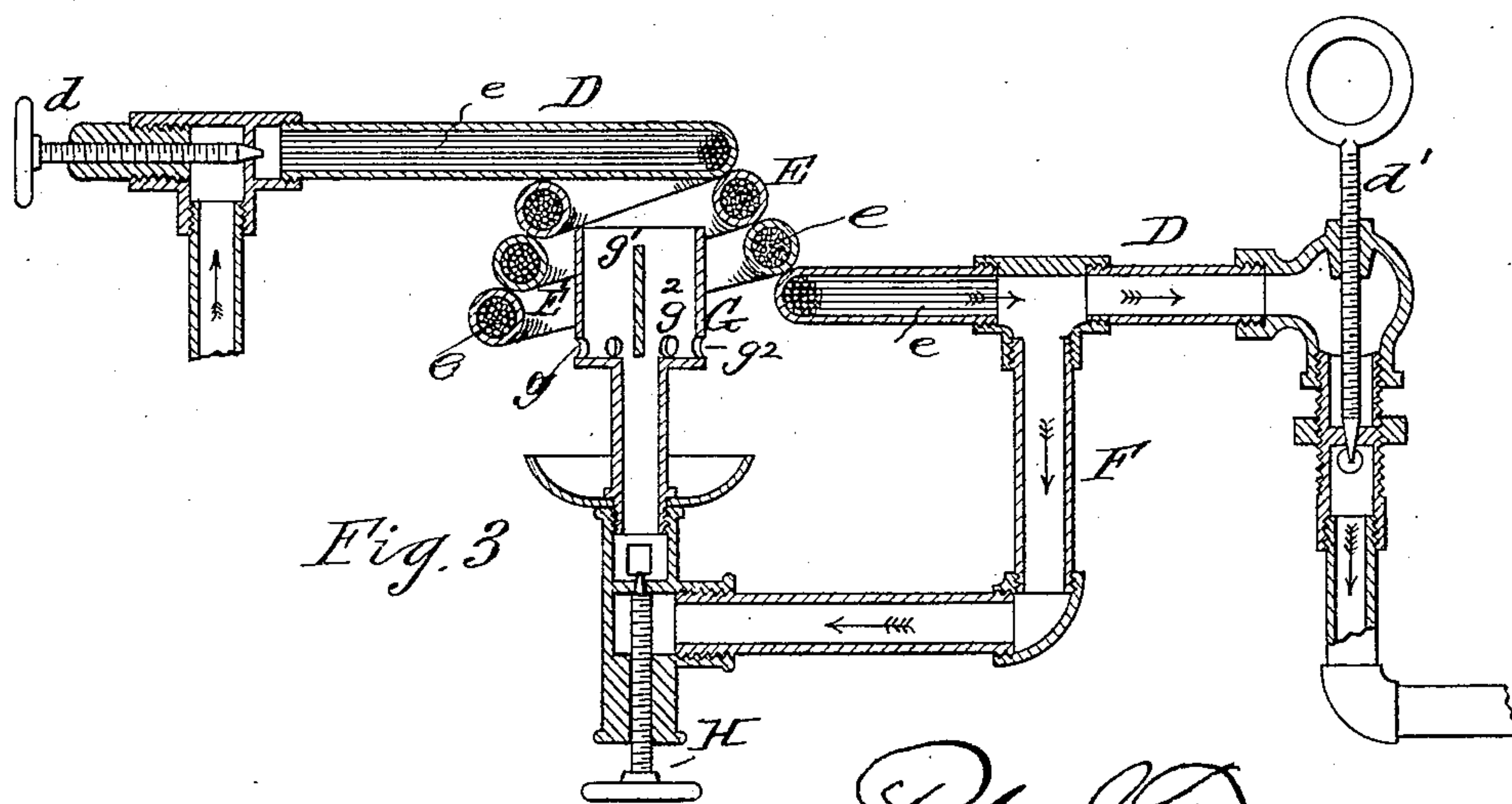
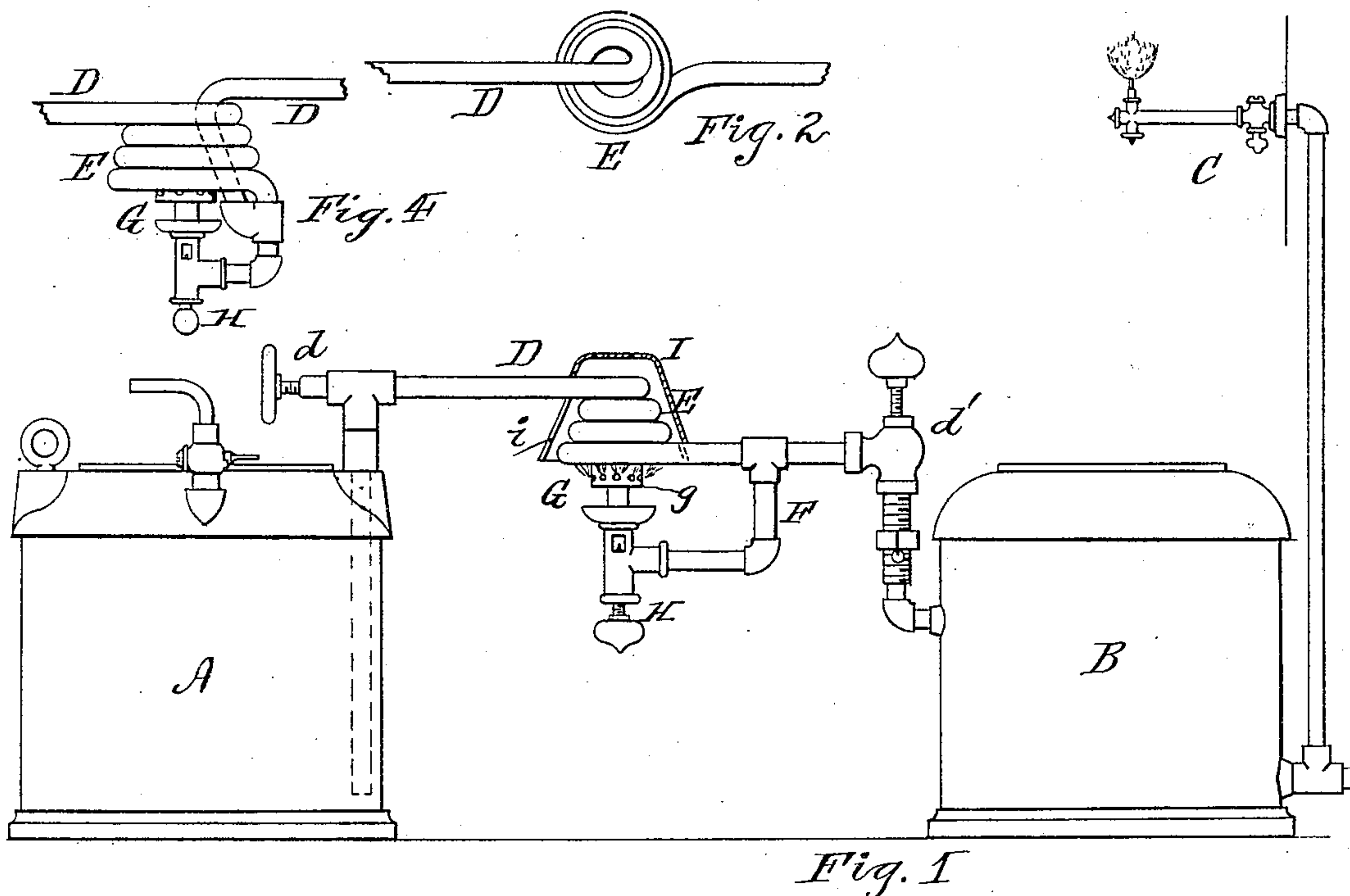


P. J. FITZGERALD.  
Hydrocarbon Gas Generator.

**Patented March 8, 1881.**



*WITNESSES:*

S. Van Stavoren  
M. Hornoch

*INVENTOR,*

INVENTOR,  
by *Cornelly Bros*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

PETER J. FITZGERALD, OF SHARON HILL, ASSIGNOR OF ONE-HALF TO C. F. ROBERTSON, OF PHILADELPHIA, PENNSYLVANIA.

## HYDROCARBON-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 238,668, dated March 8, 1881.

Application filed November 12, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, PETER J. FITZGERALD, a citizen of the United States, residing at Sharon Hill, in the county of Delaware, in the State of Pennsylvania, have invented certain new and useful Improvements in Hydrocarbon-Gas Generators, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is a side elevation. Fig. 2 is a plan of the coil-retort. Fig. 3 is a vertical longitudinal section of the burner. Fig. 4 is an elevation of a modification of the coil-retort, which is so arranged that the fixed gas will be superheated therein before entering the gas-holder.

My invention has for its object to provide means for generating hydrocarbon gas and burning the same; and my improvements consist in the peculiar construction of a burner and its combination with a heating-coil, whereby the hydrocarbon, on its way from the generator or reservoir to the gas-holder, is converted into a fixed gas, a portion of the gas so generated serving to communicate the required heat for the purposes of the operation.

Referring to the accompanying drawings, A designates the hydrocarbon-reservoir, and B the gas-holder. These two parts are of novel construction; but a detailed description of them is at this time reserved, as I contemplate making them the subject of another application, or other applications, for Letters Patent.

C represents an ordinary illuminating-gas burner, which receives its supply of gas from the holder B.

D represents a pipe which affords communication between the reservoir A and the gas-holder B. At or about either end it is furnished with needle-point valves  $d$  and  $d'$ , respectively, whereby the flow from the reservoir and to the holder is regulated. At any convenient point between these valves the pipe D is caused to form a coil, E, which is conical or conoidal, the apex of which is closed or crossed by the pipe itself, so as to retain the heat and to prevent the too free passage of the same through the chamber inside of the coils. The coil E is filled with fine me-

tallic wire strips  $e e e$ , &c., which are inserted in the pipe before it is bent to form the coil. The wires subserve a double purpose. They permit the pipe to be curved into the coil without angular bending or fracture, and they serve as a packing for the coil, such packing serving to retain the hydrocarbon sufficiently long in the coil to insure its conversion into a fixed gas and affording extensive heating-surfaces.

F represents a branch pipe leading from the pipe D and supporting a burner, G, the supply to which is through and controlled by a needle-point valve, H. The burner consists of an open-top cylinder,  $g$ , having jet-openings  $g^2 g^2$  through its walls, and a central partition,  $g'$ . The cylinder G is located, as shown, partly in the heating-chamber E' inside the coil E. The central flame from the burner G is, by reason of the partition  $g'$ , deflected outwardly toward the walls of the heating-chamber, and the top of the latter being closed or crossed by the pipe D, as shown in Fig. 2, a downward pressure is exerted, which causes the gas to issue through the jet-openings  $g^2$  and play upon the lower convolution and outside of the coil E; hence the coil is heated both on its inside and its outside, permitting a high temperature.

The operation is as follows: The hydrocarbon in the reservoir is forced, in a vaporous condition, from the reservoir A into the pipe D and through the coil E. In passing through said coil it is subjected to heat from the burner G, or from another source, as a torch, until the burner, in course of operation, becomes supplied with gas. The vapor, in its passage through the coil, owing to the heat to which it is there subjected, becomes converted into a fixed gas having excellent illuminating and heating properties. Such, by the means of the burner G, serves to furnish the source of heat for the retorting operation, and also to supply the gas-tank. In this latter it is subjected to a purifying or drying operation, which enhances its qualities as an illuminator, and from the tank it is conducted in the usual manner to and is consumed at the burner C.

A conoidal cap or cowl, I, (shown also in Fig. 1,) is fitted over the coil E, having slits or openings  $i i$ , which permit it to slide down over the pipe D, and serves to retain the ex-

ternal heat from the burner G and impart the same to the retort.

In lieu of making the cap I with the slits *i* for the passage of the pipe D, it may be formed  
5 in two sections, each section having an opening for the passage of said pipe, and said sections, being flanged, bolted together.

The advantage of the modification shown in Fig. 4 is that, the pipe D returning through  
10 the coil E, the gas is in a manner superheated, being thereby rendered more fixed and stable in character and improved in quality.

I wish it to be understood that I do not claim the constructions shown in Figs. 2 and  
15 4 as interchangeable. The return or superheating section of pipe D, I intend using in connection with the coil having the inlet portion crossing its apex.

What I claim as my invention is as follows:

1. The burner G, having an unobstructed 20 open top, and having the central diaphragm, *g'*, and jet-openings *g*<sup>2</sup>, substantially as shown and described.

2. In combination with a heating-burner, G, having open unobstructed top and lateral issuance-passages for the gas or flame, a conical or conoidal heating-retort composed of a coil of pipe forming a chamber into which said burner rises, substantially as shown and described.  
25 30

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of November, 1880.

PETER J. FITZGERALD.

Witnesses:

S. J. VAN STAVOREN,  
CHAS. F. VAN HORN.