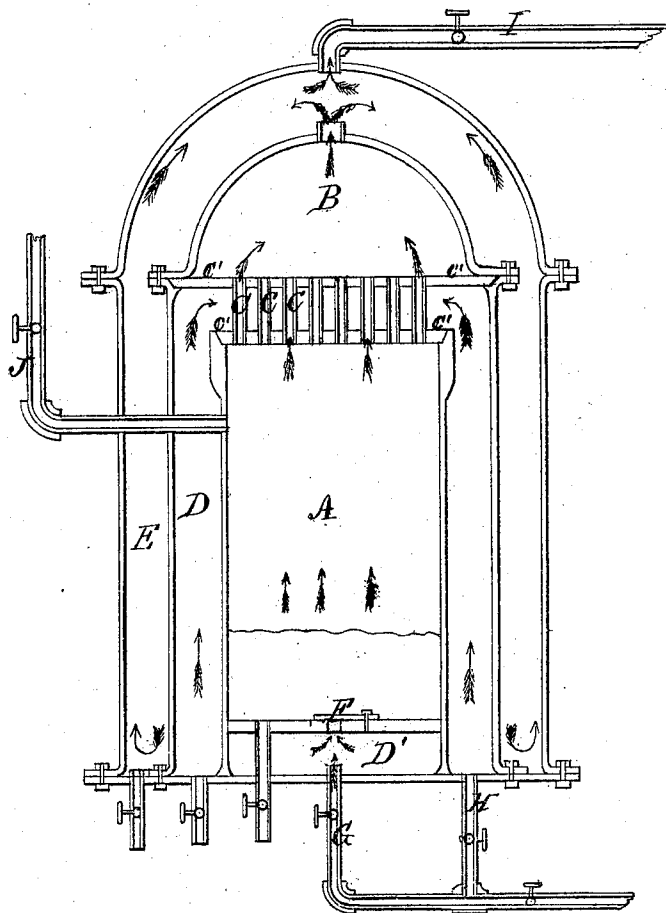


A. I. AMBLER.

Improvement in Apparatus for Generating Gas from Petroleum.

No. 131,240.

Patented Sep. 10, 1872.



Witnesses  
Henry N. Miller  
Jno. W. Ellis

Inventor  
A. I. Ambler

# UNITED STATES PATENT OFFICE.

AUGUSTIN I. AMBLER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
OF ONE-HALF HIS RIGHT TO JOHN BUTLER, OF NEW YORK CITY.

## IMPROVEMENT IN APPARATUS FOR GENERATING GAS FROM PETROLEUM.

Specification forming part of Letters Patent No. 131,240, dated September 10, 1872.

### SPECIFICATION.

I, AUGUSTIN I. AMBLER, of the city of Washington, in the District of Columbia, have invented certain Improvements in the Construction of Machines or Apparatus for Generating Gas or Vapor from Petroleum, &c., which I call A. I. Ambler's Hydrocarbureter, and of which the following is specification:

#### *Nature and Objects of my Invention.*

The first part of my invention consists in the mechanical construction of an apparatus for generating gas or vapor from hydrocarbon oils, and of utilizing the same in flame and heat, by the use of steam at ordinary working temperatures.

To secure a practical operation of the machine and effect these results I use the steam-space D, so constructed in the combination as to form a steam-chamber above the oil-chamber and below the gas-dome, as a part thereof. Passing through this chamber, between the plates C' and C', are tubes C C, as conduits for the passage of the gas from the oil-chamber to the dome. The communication between the steam-space D around the oil-chamber, and the chamber between the plates C' and C', enables me to obtain a free circulation of the steam around and through the cluster of tubes C C. By this means I am enabled to heat and rarefy the gas or vapor in its passage from the oil-chamber through the tubes C C to the gas-dome for use. This chamber between the plates C' and C' affords a heating-surface to the lower part of the gas-dome, and thus prevents the condensation of the vapors by retaining a more uniform temperature upon the gas or vapor in the dome, and is of great practical value to the successful operation of the machine.

#### *Description of the Accompanying Drawing.*

Figure 1 is a section of the machine showing the internal arrangement of parts and the attachments thereto.

#### *General Description.*

A is an oil-chamber for containing the oil or hydrocarbon material for the purpose of supply to the hydrocarbureter. B is a gas or

vapor dome. C C are tubes connecting plates C' C' at the top of the oil-chamber A and bottom of gas-dome B, and through which the gas or vapor ascends from the chamber A to dome B, and around which the steam by means of the chamber D has a free circulation. C' C' are the plates forming the bottom of gas-dome B and top of the oil-chamber A, forming steam-space D at the top of chamber A, through which pass the tubes C C. D is a steam-space around the oil-chamber A, and through which the tubes C C pass and are heated, thus heating the oil around and above the chamber A. D is a steam-chamber at the bottom of the oil-chamber A. E is an outside chamber formed by an outside casing and the outside walls of the steam-chamber D' and passing over and around the dome B. This chamber is a gas or vapor receiver, from which the gas is taken off in the pipe I for use and for the purposes of condensation. F is a small hole with a valve covering it on top through the partition above the steam-chamber D'. This hole is to permit the steam to pass through (lifting up the valve) directly into the oil, so as to combine with the same and generate or liberate the gas for use in flame and heat, when the steam is not flowing into the oil, the valve being intended to prevent the oil from passing down into the steam-chamber D'. G is a steam-pipe communicating with the steam-chamber D' and through which the steam passes into and through the hole F and into the oil-chamber A. H is a branch steam-pipe for conveying steam into the chamber D, for heating the walls of the chamber A and tubes C C. I is a pipe for the purpose of conveying the gas or vapor from the top of the outside chamber E to the burners, for use. The attachments are suitable exhausts or draw-off pipes, gages, valves, and stop-cocks for use. J is a supply-pipe for oil or material used to the chamber A.

The mode of operation is as follows: The chamber A, being supplied with oil or any suitable hydrocarbon substance, steam is let on by means of the branch steam-pipe H, and the oil is heated for a few moments so as to raise the temperature and take off the chill, (a high heat not being necessary.) The steam in the pipe G is let on, filling the chamber D',

until the pressure is sufficient to raise the valve on the top of the hole F, when it is admitted into the oil direct in the chamber A, when, in a few minutes, the gas or vapor is sufficiently generated or liberated for use, when it may, by opening the valve in the pipe, be carried forward for use, thus bringing to bear steam-heat and steam-force direct upon the oil or hydrocarbon employed, the steam and gas following the direction of the arrows in the several parts of the machine, as indicated. The amount of oil or hydrocarbon employed for practical use is shown by the waved line in the lower part of the chamber A. This may be increased or diminished as may be required, always leaving a sufficient room in the chamber A for gas or vapor to form and accumulate.

I am aware that steam-space around the oil-chamber of a gas-generator has been used to heat and vaporize the oil by the induction of steam therein; I therefore disclaim a steam space, as such, to heat and vaporize the oil, merely. I am also aware that an air-chamber has been used between an oil-chamber and gas-dome, and I disclaim a mere chamber so located. I am also aware that plain cylinders have been used to generate gas by means of the induction of steam therein, and I do not claim a plain cylinder. My improvement consists, first, in connecting the steam-space D at the top of the oil-chamber and beneath the dome by means of the chamber between the plates C' and C', to obtain a free circulation of steam around and above the oil-chamber and beneath the dome, and around and through the cluster of tubes C C; and second, in changing the air-chamber without tubes to a steam-chamber with tubes as conduits for the passage of the gas or vapor from the oil-chamber to the dome, for use, thereby affording great additional heating-surface to the ascending gas and vapors, and by means of the steam-heat in the chamber between the plates C' and C', I maintain the temperature of the gas or vapor in the dome while in operation. By means of this chamber between the plates C' and C' I secure a free and unobstructed circulation of steam around and through the cluster of tubes C C above the oil and below the dome, as shown in the drawing, and by this additional heating-surface to the ascending vapors and gas I secure great advantages in the practical operation of the machine.

I do not in this application claim the process worked by the apparatus, nor broadly for the combination of a close chamber to con-

tain the petroleum and the vapors evolved, and an induction steam-pipe and an eduction-pipe for conveying away the vapors evolved, and a pipe for drawing off the heavy residuum, with means for holding the mingled steam and petroleum vapor under the pressure and temperature due to the steam employed, such claims being involved in another application filed by me on the 4th day of May, 1870, and now in interference in a pending case between my said application and one filed by another party. I intend to claim herein certain distinctive features in the construction of the apparatus set forth, by which it is distinguished from the apparatus set forth in said interfering applications, and all others heretofore known, and nothing more.

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

1. The tubes C C, the plates C' C', used in combination with an oil-chamber A and gas-dome B, substantially as shown, and for the purpose set forth.

2. The oil-chamber A, tubes C C, dome B, and steam-space D, said steam-space being united at the top by a steam-chamber formed by plates C' C', and through which pass tubes C C, substantially as shown, and for the purpose set forth.

3. The steam-space D, formed in part by means of plates C' and C', uniting and communicating with steam-space D at the top of the oil-chamber A, and through which pass tubes C C, and the tubes C C used in combination with oil-chamber A, gas-dome B, and gas-chamber E, substantially as shown, and for the purposes set forth.

4. The gas-chamber E arranged to envelop the apparatus, substantially in the manner set forth.

5. The steam-chamber D' used in combination with steam-pipe G, hole F, and oil-chamber A, substantially as shown, and for the purpose set forth.

6. The steam-pipe G, chamber D', hole F, used in combination with oil and gas chamber A, tubes C C, and dome B, substantially as shown, and for the purpose set forth.

7. The steam-pipe H and chamber D, combined with tubes C C and plates C' C', substantially as shown, and for the purpose set forth.

A. I. AMBLER.

Witnesses:

JAMES S. GRINNELL,  
W. R. AMBLER.