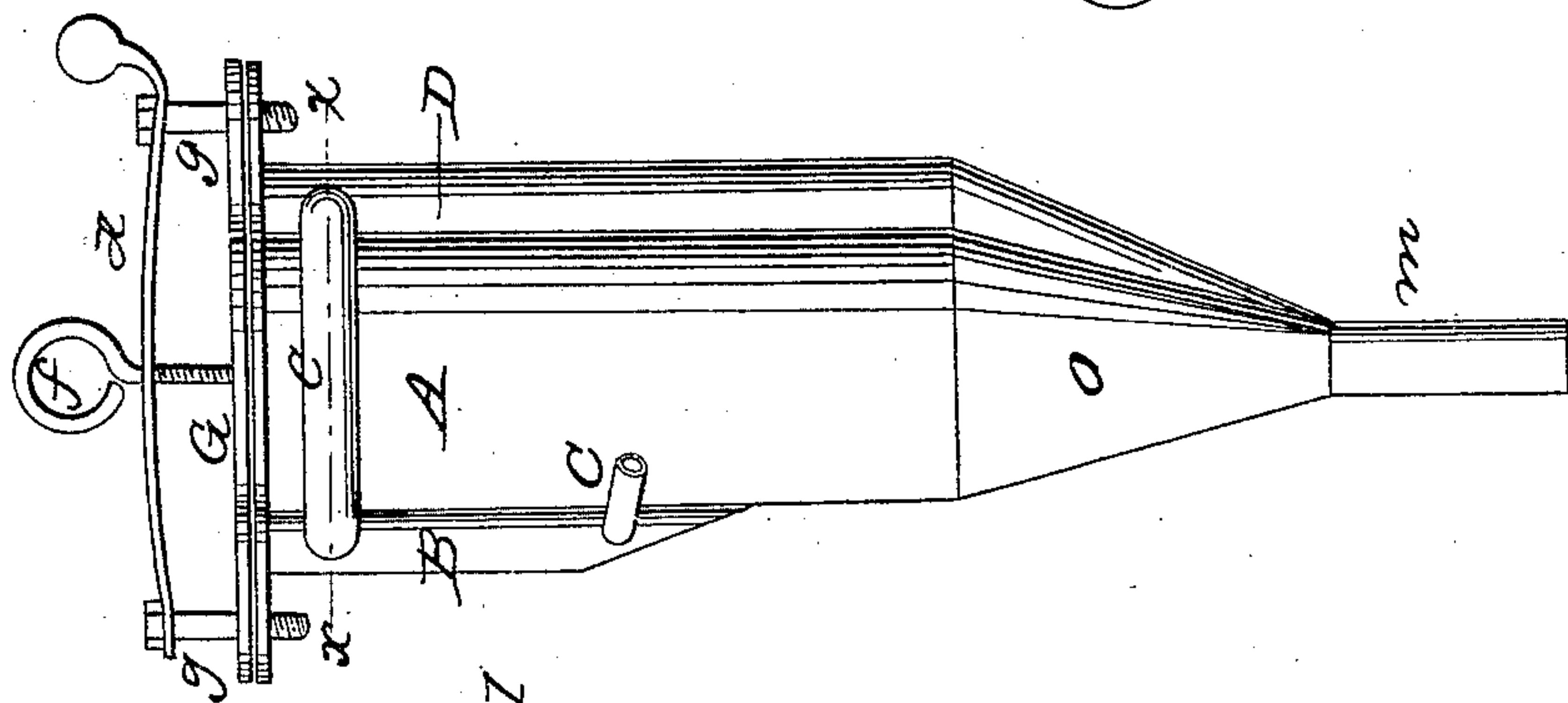
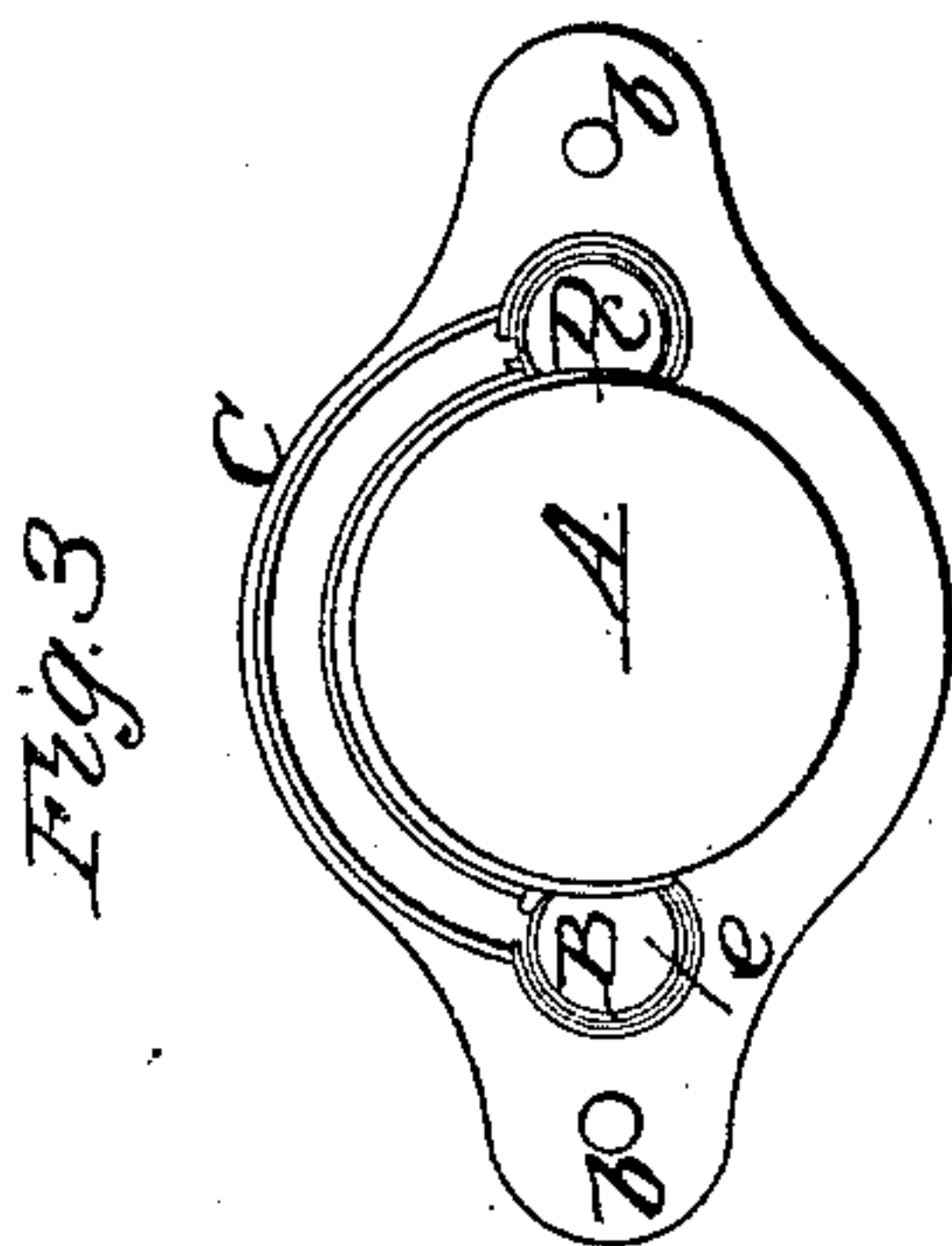
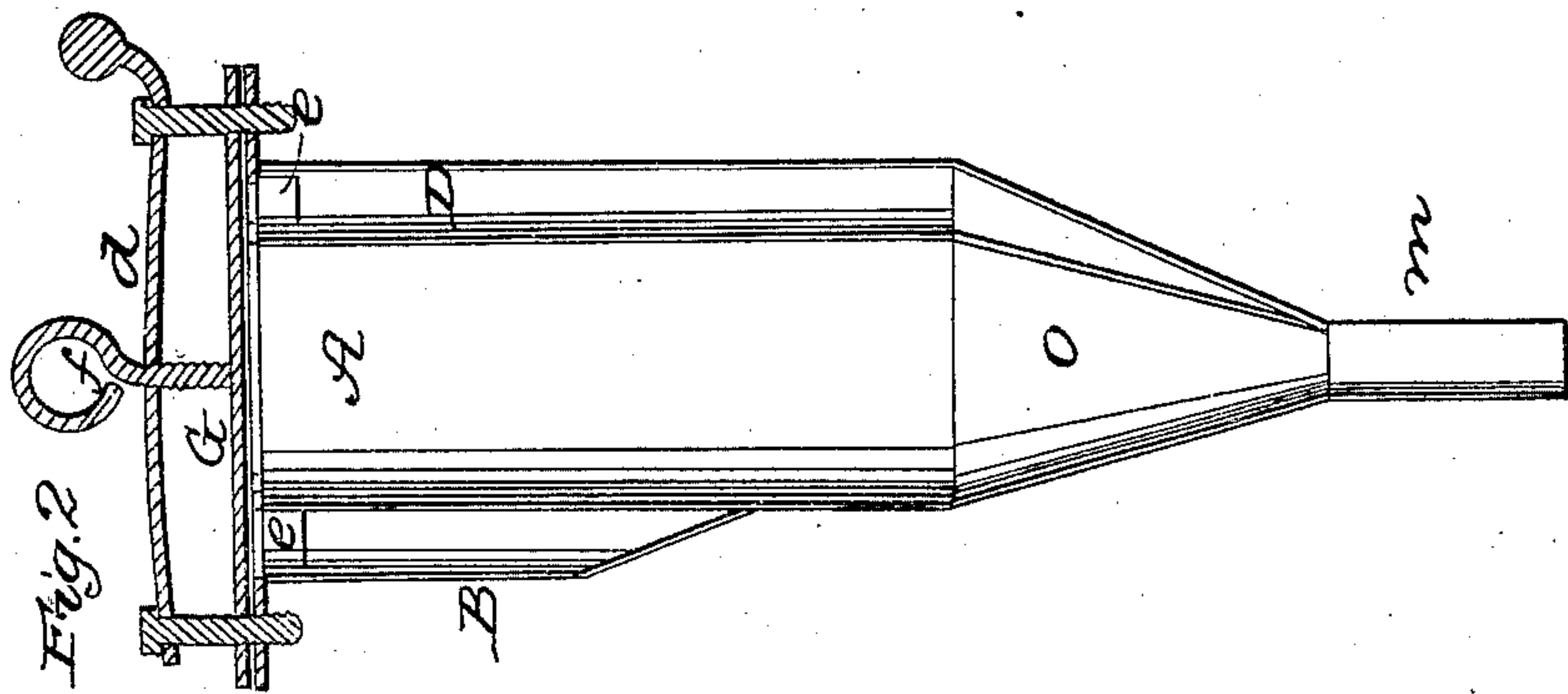


C. N. TYLER.

Apparatus for Generating Illuminating Gas.

No. 22,463.

Patented Dec. 28. 1858.



Witnesses
J. Hannay
W. M. Bryant.

Fig. 1

Inventor.
Chas. N. Tyler

UNITED STATES PATENT OFFICE.

C. N. TYLER, OF WASHINGTON, DISTRICT OF COLUMBIA.

APPARATUS FOR GENERATING ILLUMINATING-GAS.

Specification of Letters Patent No. 22,463, dated December 28, 1858.

To all whom it may concern:

Be it known that I, CHARLES N. TYLER, of the city of Washington, in the District of Columbia, have invented a certain new and
5 useful Improvement in Apparatus for Generating Illuminating-Gas, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 represents a plan of my improved apparatus; Fig. 2 a horizontal section of the same; and Fig. 3 a vertical transverse section of the same taken through the
15 line $x x$ of Fig. 1 and looking toward the door end of the retort.

My improvement relates more particularly to that class of gas generating apparatus in which the gaseous products evolved
20 from the dry distillation of the gasiferous material is combined with hydrogen gas for the purpose of manufacturing a better quality of gas in larger quantities than is produced by the common mode of manufacturing
25 illuminating gas.

My improvement consists first in a peculiar and effective arrangement and combination of retorts for generating the hydrogen gas simultaneously with, and with the same
30 furnace used for the generation of the carbureted hydrogen, in the retort used for that purpose by the dry distillation of coal, oil, tar, rosin, and all other such substances having a high equivalent of carbon in a condition suitable for the manufacture of illuminating
35 gas; and secondly it consists in forming the rear end of the retort from which the gas escapes as it is evolved, of a conical, or contracted and elongated shape as compared with the body of the retort by means
40 of which the escape of the gas as it is generated is retarded and kept at a high degree of heat for a time sufficient to effect its transformation into a permanent gas; and thirdly
45 it consists in leading the hydrogen gas into the narrow and contracted part or throat of the retort previous to the passage of either from the retort, whereby the union of the two is not only expedited, but effected at
50 such a degree of heat as to insure the formation of a permanent gas between them, previous to its passage into the receiver thereby preventing the future formation of pyroligneous acid, tar, and other kindred substances.

55 To enable others skilled in the art to make construct and use my invention I will now

proceed to describe its construction and operation in detail.

In the accompanying drawing the three retorts used in this instance are represented
60 as being cast in one piece, but they may all be done separately and afterward fitted and secured together in any suitable manner.

In the main retort (A) the material from which the carbureted hydrogen or illuminating gas is to be evolved is placed, while the water from which the hydrogen gas is to be generated is passed into the small retort or boiler (B) through the pipe (C), which for this purpose may be connected
70 with a tank or reservoir of water. The water thus passed into the boiler (B) is generated into steam and passes over the main retort (A) through a pipe (C) leading into the retort (D) where it is brought into contact with red hot iron or other suitable material for decomposing the steam into its
75 constituent parts, to wit, oxygen and hydrogen gas, the red hot iron taking up the oxygen forming an oxid of iron, and setting free the hydrogen, which passes off along with the undecomposed steam at the rear end of the
80 retort, and is led into the contracted part of the main retort through an opening (a) in its side where it mixes with the gaseous products of the wood, coal, or other material being distilled in the main retort (A). The
85 hydrogen being thus mixed with the gaseous products before mentioned previous to its exit from the main retort; and the passage of the combined gases being retarded by the
90 elongated and contracted form of the main retort, and that while under a high degree of heat (about a cherry red heat inasmuch as their union is effected at a point under
95 the direct action of the furnace, the combination of the gases is effected under the most favorable circumstances as well to effect their union as the formation of a permanent
100 gas.

In the use of course of hydrogen the quantity used will be governed by the redundancy of the carbonaceous matter contained in the materials being used for the generation of the illuminating gas.
105

If deemed advisable iron or other substances used for the generation of the hydrogen gas may also be placed in the boiler, but as a rule it is unnecessary, although at
110 times it may be advantageously adopted, or the boiler (B) itself may be dispensed with and the water allowed to drop directly in

the retort (D) containing the iron, but the former mode is deemed preferable.

In order to render the supplementary retorts, both water, steam, and gas tight, small caps (e) are fitted into each, and then a plate of metal (G) closely fitting over the mouth of each retort that is to say the main (A) and supplementary retorts secured over their mouths, and forced tightly against them by means of a screw (f) having its bearing in a cross piece (d) securely attached to the retorts by means of a screw (g) at either end passing through a flange (h) formed on or otherwise secured to the retorts. Thus secured the joints if deemed necessary for the purpose of preventing the escape of the gas at that end while being generated, may be luted with any suitable material applied in the usual manner.

From the foregoing description it will be apparent that the elongation and contraction of the rear end of the retort for the purpose of more effectually forming a permanent gas, thereby avoiding the formation of tar and other such substances may be ben-

eficially applied to other retorts besides those in which it is combined with retorts for the generation of hydrogen gas.

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

1. The peculiar arrangement and combination of the retort for generating the hydrogen gas with the main retort for the generation of the illuminating gas substantially as set forth.

2. Elongating and contracting the rear end of the main retort in the manner and for the purposes substantially as set forth.

3. Connecting the rear end of the hydrogen retort with the contracted end of the main retort in the manner and for the purposes substantially as set forth.

In testimony whereof, I hereunto set my hand to this specification.

C. N. TYLER.

Witnesses:

I. HANNAY,
W. M. BRYANT.