

(No Model.)

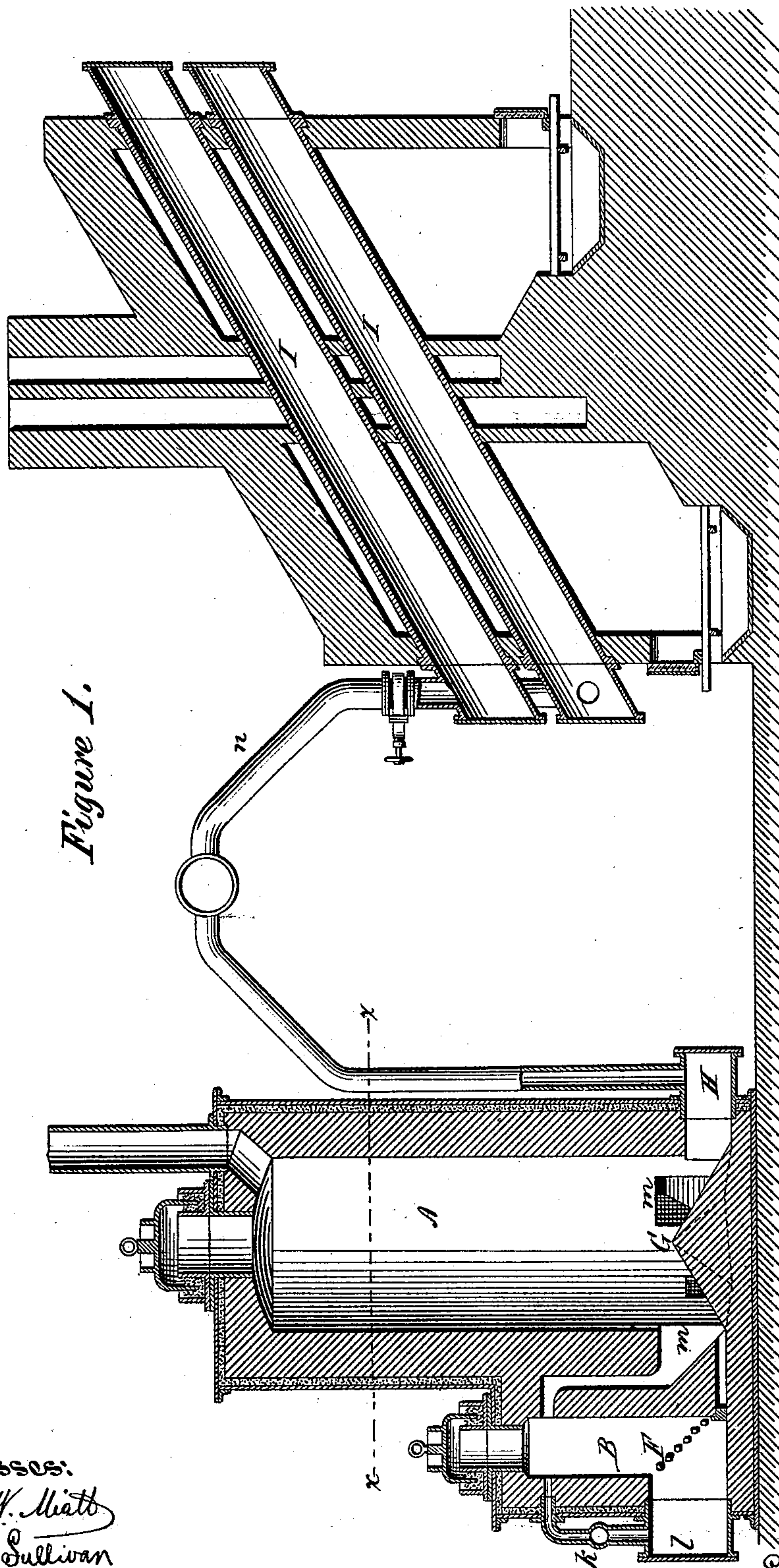
2 Sheets—Sheet 1.

E. J. JERZMANOWSKI.

Process of and Apparatus for Making  
Illuminating Gas.

No. 233,862.

Patented Nov. 2, 1880.



Witnesses:

Geo. W. Mott  
P. J. Sullivan

Inventors:  
E. J. Jerzmanowski  
By his attorney

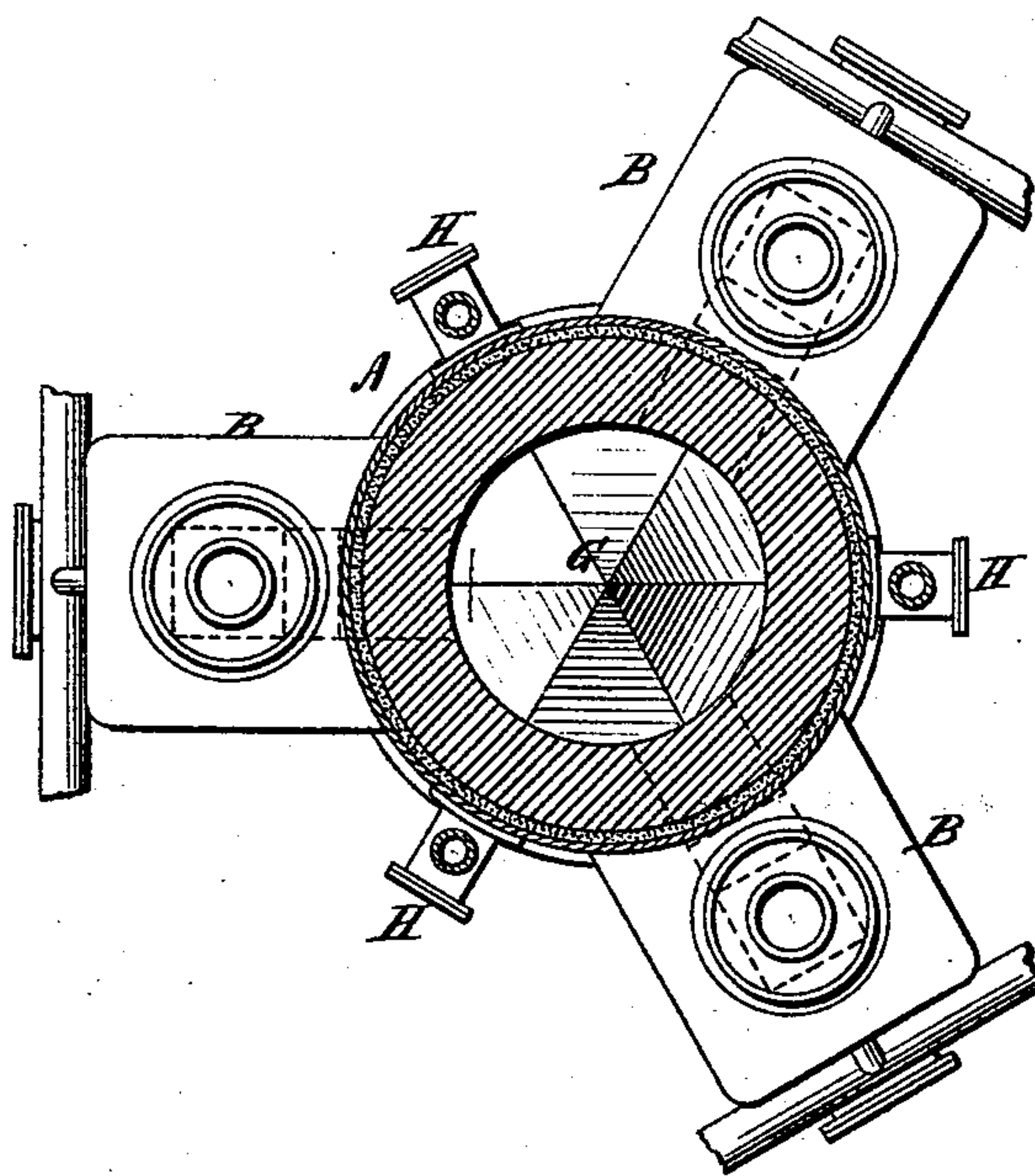
E. N. Drakerson

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2 Sheets—Sheet 2.

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*Figure 2.*



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# UNITED STATES PATENT OFFICE.

ERAZM J. JERZMANOWSKI, OF NEW YORK, N. Y.

## PROCESS OF AND APPARATUS FOR MAKING ILLUMINATING-GAS.

SPECIFICATION forming part of Letters Patent No. 233,862, dated November 2, 1880.

Application filed May 28, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, E. J. JERZMANOWSKI, of the city, county, and State of New York, have invented a new and useful Improvement in Processes for Making Illuminating-Gas and Apparatus for Carrying the Same into Effect, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

10 In the method usually employed for forming that class of illuminating-gases which are broadly known by the name of "water-gas" it has been customary to employ a generator containing a certain amount of combustible  
15 material, preferably anthracite coal, and by alternately injecting into said body of coal air and steam to render said body of combustible material incandescent by its own combustion, and subsequently to use this highly-heated  
20 carbonaceous body to convert steam into water-gas. A large consumption of valuable fuel is rendered necessary by this process, and as the principle of the conversion of the steam or water bearing gas into water-gas is not depend-  
25 ent upon the combustion of the heated body of converting material, but simply upon its highly-heated condition, I have devised a method of heating said converting material independent of its own combustion.

30 In the form shown in the drawings accompanying this specification an auxiliary furnace or generator is employed in which a cheap fuel is used to produce a heating-gas, which, being supplied with a sufficient amount of air, is  
35 burned in the converting-generator, thereby highly heating the carbon contained therein without destroying it. When the carbon has been sufficiently heated steam or water carrying gas is admitted and is converted by this  
40 carbon into the gas known as "water-gas." It will be readily seen, therefore, that the entire benefit of the carbon in the generator is derived in the conversion of the water into water-gas, and said carbon is not wasted by  
45 independent combustion. Different materials may be used in this generator—as, for instance, anthracite coal, charcoal, coke, or other materials rich in carbon.

My invention will be readily understood  
50 from the accompanying drawings, in which Figure 1 represents a vertical longitudinal

section of my apparatus as especially arranged for producing combustible gas from wood or peat or similar materials. Fig. 2 represents a cross-section through the generator, Fig. 1, on the line *x x*.

My generator, which is somewhat peculiar in construction, is shown at A. Its bottom is arranged with a pyramidal hearth, (shown at G.) As arranged, there are several doors, H, situated at different points of the circumference of the bottom of the generator, for the removal of the ash. These doors are preferably arranged opposite the inclined flat sides of the pyramidal part; but this construction may be varied to suit circumstances. Connected with this generator is the auxiliary furnace B, which is connected with the generator A in such a way that the combustible gas produced in it is caused to enter the bottom of said generator. Any cheap fuel may be used in this, or, if desired, the same fuel as is used in the generator; but where fuel is expensive it will be preferable to use some inexpensive material readily obtained in the locality. Three generators or heaters are shown; but, of course, one or more might be employed to suit the exigencies of the case. As shown, the grate-bars are arranged inclined, so as to allow of the ready cleaning of the furnace and to give a large area for the passage of the air through the fire, and the formation of clinkers is prevented by this arrangement.

The generator A being properly supplied and the auxiliary generator B filled, air may be allowed to enter either through the door *l*, which may be opened, or, said door being closed, by means of the pipe K, which is connected with a blower or other air-supply. The air so forced in by the pipe, if the pipe *k* is used, causes combustion by passing up through the bottom of the fire and causing the conversion of the fuel into carbonic-oxide and other gases. The air above, entering through the upper tube, causes a rapid and very hot combustion of the gas so produced, which enters the generator through the opening *m*, and passes upward and out of the top of said generator, in the usual way, to the atmosphere through an opening which is closed when the gas to be converted enters the generator.

Where the generator is high, different open-



ings might be employed at different heights in the generator. An artificial draft might also be used to facilitate combustion in furnace B.

5 One or more of said auxiliary generators may be used, or they may be used alternately, if desired.

At I is shown a generator arranged for the distillation of wood or other carbonaceous material containing hydrogen. It is shown inclined, but might be arranged vertically, and it is suitably heated by furnaces beneath. The products of distillation of this wood, which is preferably moist, pass through the pipe *n* to generator A, passing in through the opening H, and are converted by the heated carbon into a gas resembling water-gas—that is to say, it is a water-gas containing additional hydrocarbon, all the water of the wood-gas being converted into water-gas.

Where wood is used for the distillation in generators I, it may afterward be cast into the generator A and used for the conversion of the wood-gas produced in the retorts I. Instead of this wood-gas, an independent steam-supply might be used, or a certain amount of steam might be mingled with the gas result-

ing from the distillation of wood, where sufficient water was not produced by such distillation.

In order to maintain a continuous production of gas, a double generator and system of retorts should be employed.

A distinctive feature of my invention is, that any kind of combustible may be used to heat the carbon in the retort A, through which alone the gas to be decomposed passes.

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

1. The process of producing gas herein described, which consists in heating a body of carbon by the direct contact of hot gases and passing in contact with said carbon the gas produced by the distillation of carbonaceous material, together with steam or water, substantially as set forth.

2. The combination of a wood-gas retort, a water-gas generator, and an independent furnace for heating said water-gas generator, substantially as and for the purposes described.

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Witnesses:

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