

(No Model.)

4 Sheets—Sheet 1.

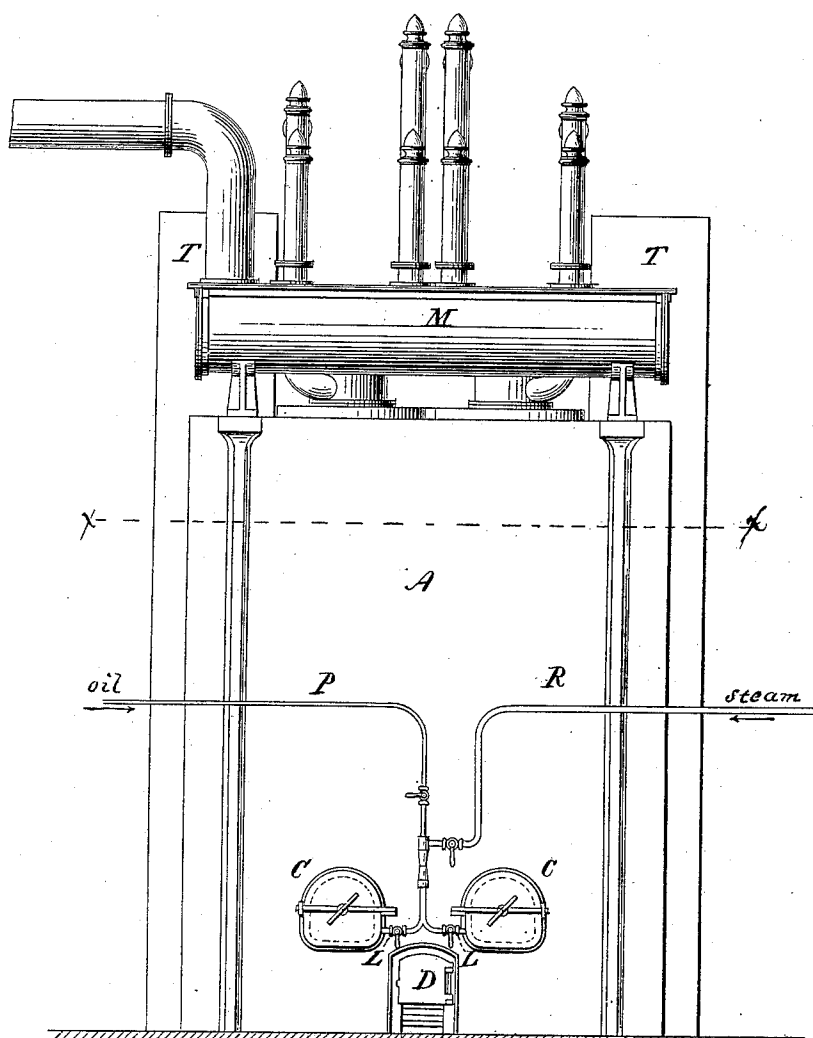
E. J. JERZMANOWSKI.

PROCESS OF AND APPARATUS FOR PRODUCING GAS.

No. 333,859.

Patented Jan. 5, 1886.

Figure 1.



Witnesses:

O. C. Hansmann.
C. A. Cooper.

Inventor:

E. J. Jerzmanowski,
By his Attorneys
Foster & Freeman

E. J. JERZMANOWSKI.

PROCESS OF AND APPARATUS FOR PRODUCING GAS.

No. 333,859.

Patented Jan. 5, 1886.

Figure 2.

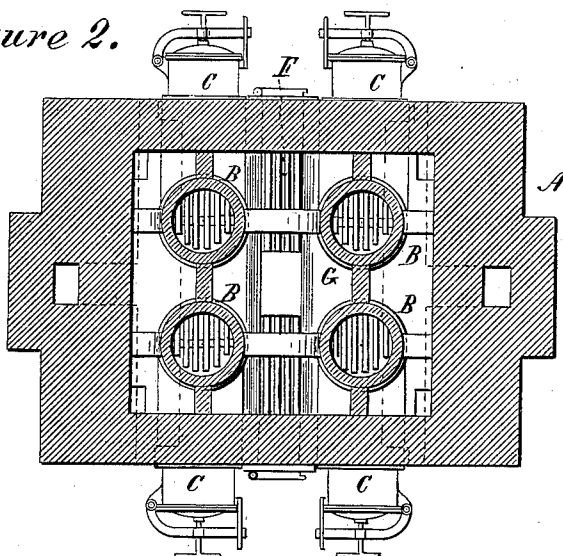
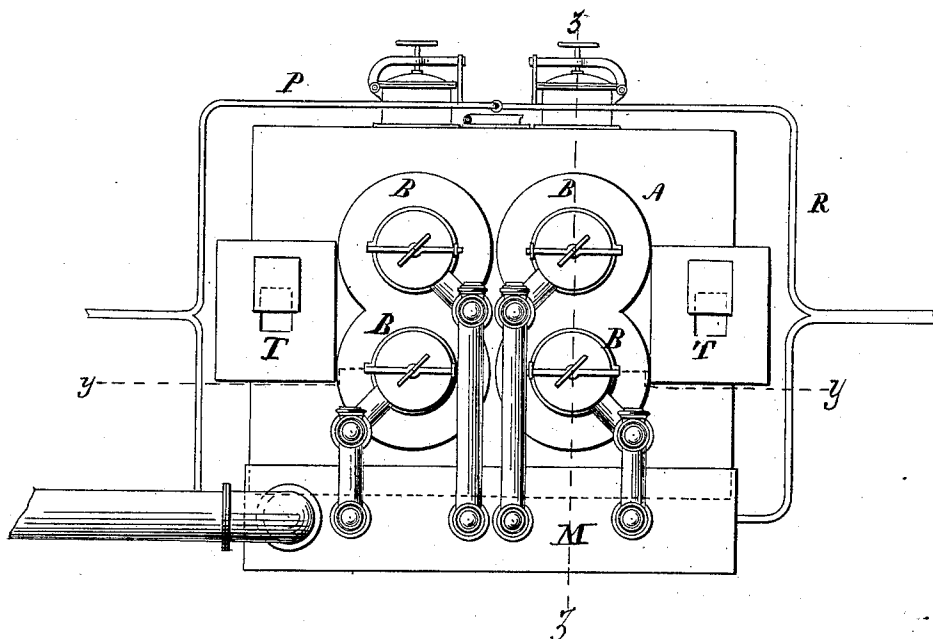


Figure 3.



Witnesses:

H. C. Stansmann.
C. A. Cooper.

Inventor:

E. J. Jerzmanowski.
By his Attorneys,
Forster & Freeman.

(No Model.)

4 Sheets—Sheet 3.

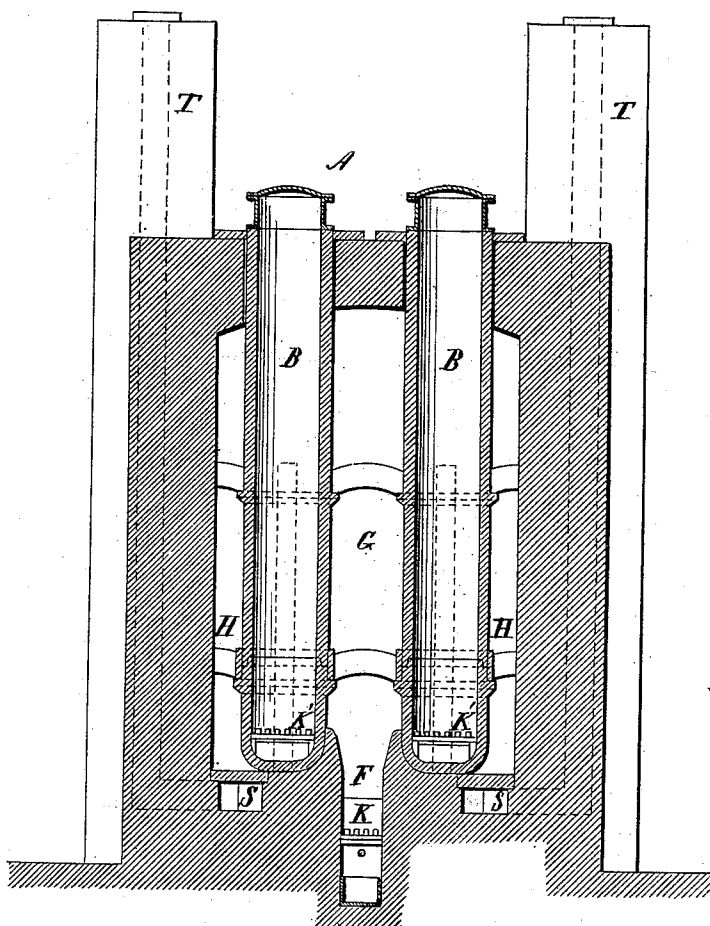
E. J. JERZMANOWSKI.

PROCESS OF AND APPARATUS FOR PRODUCING GAS.

No. 333,859.

Patented Jan. 5, 1886.

Figure 4.



Witnesses:

H. C. Hansmann.

Ant. A. Cooper.

Inventor:

Eugen J. Jerzmanowski,
By his Attorneys
Foster & Freeman

(No Model.)

4 Sheets—Sheet 4.

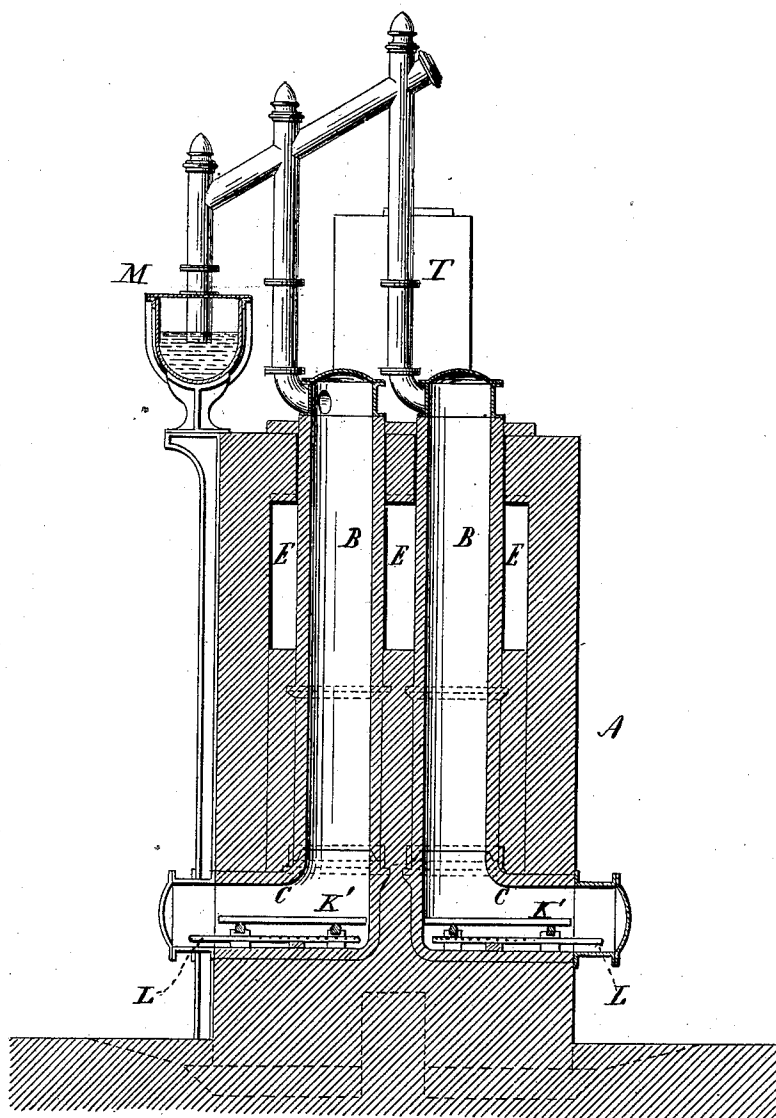
E. J. JERZMANOWSKI.

PROCESS OF AND APPARATUS FOR PRODUCING GAS.

No. 333,859.

Patented Jan. 5, 1886.

Figure 5.



Witnesses:

A. E. Stanmann.
C. A. Cooper.

Inventor.

Erazm J. Jerzmanowski,
By his attorneys
Foster & Freeman

UNITED STATES PATENT OFFICE.

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

PROCESS OF AND APPARATUS FOR PRODUCING GAS.

SPECIFICATION forming part of Letters Patent No. 333,859, dated January 5, 1886.

Application filed July 19, 1883. Serial No. 101,318. (No model.)

To all whom it may concern:

Be it known that I, ERAZM. J. JERZMANOWSKI, of the city, county, and State of New York, have invented a new and useful Improvement in Process of and Apparatus for Producing Gas for Illuminating and other Purposes, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

My invention is based upon the discovery of the conversion by highly-heated lime of steam and hydrocarbon into a mixture of hydrogen, carbonic acid, and certain other impurities, and upon the additional discovery that by increasing the amount of hydrocarbon supplied the same apparatus may be used to effect the conversion and the carburation of the gas, so that in one operation an illuminating-gas is produced needing only subsequent purification before delivery to the consumer. In order to make this operation a continuous one, I preferably heat the converting-lime by an external heat, thereby maintaining the temperature sufficient for continuous conversion.

My apparatus will be readily understood from the accompanying drawings, in which—
Figure 1 represents a vertical elevation; Fig. 2, a cross-section through Fig. 1 on the line xx ; Fig. 3, a plan view; Fig. 4, a section through Fig. 3 on the line yy , and Fig. 5 a section through Fig. 3 on the line zz .

In the form shown my apparatus consists of an inclosing-casing, A, containing gas-generating mechanism. Within this casing are supported by suitable braces four generators, B B B B. At the base of the apparatus is shown the fire-chamber F, Fig. 4. The chamber G, above the fire-chamber F, is separated from the chambers H by the partition shown in Fig. 5, but communicates with the chambers H by the openings E E E. The chambers H communicate at their bases by the openings S with the chimneys T. The fire-chamber F is provided with grate-bars K, as shown. The generators B are L-shaped in section, as shown in Fig. 5, and provided with the horizontal extensions C C, each having a grate, K', beneath which an injector-pipe, L, is placed connecting with the steam and hydrocarbon pipes R P. These generators communicate by proper connections with the hydraulic main M. The operation of my apparatus can now be

readily understood. The chambers B are suitably filled with pieces of hard-burned lime. A fire is made in the fire-chamber F on the bars K, the hot products of combustion from which pass upward through the chamber G, thence through the opening E, down through chambers H to the openings S, and thence upward by the chimneys T. By this operation the generators are thoroughly heated by the products of combustion, and their temperature may be maintained uniform. A temperature of about a bright cherry-red will be sufficient. The lime having been thoroughly heated, steam and liquid hydrocarbon are injected through the pipes R and P, and thence escape onto the chambers beneath the lime through the perforated pipes L. The steam may be superheated before injection, if desired. The pipes L are not essential, but I prefer them. The steam and liquid hydrocarbon so injected into the lime are primarily acted upon so as to convert the steam and a certain amount of the hydrocarbon into hydrogen and carbonic acid and certain additional impurities, then the additional hydrocarbon carried in this gas is converted or fixed into a permanent illuminating-gas by its contact with the hot lime in the upper part of the chamber. As a result of this operation a fixed illuminating-gas is produced, and this gas is produced with the consumption of a less amount of hydrocarbon than has been possible when one apparatus was used for the conversion and another apparatus was used for the carburation, the nascent hydrogen seeming to require less illuminant than hydrogen after it has been produced and has been passed into a subsequent apparatus. The free carbonic acid in this gas may be removed by lime purifiers, or in other suitable ways.

It will be obvious that the apparatus here shown may be varied in many ways without interfering with the principle of my process, but the one here shown is readily constructed and readily repaired.

The L-extension is advantageous as giving an opportunity for the spread of the steam and hydrocarbon beneath the lime.

Instead of burning coal in the fire-box F, I may produce my heat by burning a hydrocarbon in connection with steam.

It is important that the lime should not be

heated to such a temperature as to burn the surplus hydrocarbon.

My invention is distinguished from processes in which it has been proposed to use heated brick by the fact that brick can only be employed to effect decomposition at a very high temperature, which is rapidly reduced as the steam and hydrocarbon are introduced, while lime effects the decomposition at a comparatively low temperature, which is practically maintained during the operation. Moreover, the lime acts continuously to effect the decomposition without itself being decomposed.

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

1. The process of producing illuminating-gas, which consists in externally heating a body of lime to about a cherry-red, injecting steam and such a surplus of liquid hydrocarbon into the lime as will primarily produce hydrogen and carbonic acid and then carburet the same and convert it into a permanent illuminating-gas in one operation, substantially as described.

2. The process of continuously producing illuminating-gas at one operation which con-

sists in heating a body of lime to about cherry-red by continuously-applied external heat, injecting steam and a surplus of liquid hydrocarbon into the bottom of the body of lime, and thereby primarily producing hydrogen and carbonic acid, and then fixing the same and producing a permanent gas by combining the surplus hydrocarbon, nascent hydrogen, and carbonic acid in the upper part of the body of heated lime, substantially as described.

3. The mode of continuously producing a combustible gas by passing steam and hydrocarbon through a body of lime maintained in a heated condition by external heat, substantially as set forth.

4. The gas-generator herein described, which consists of an L-shaped lime chamber provided with a grate to support the lime, and a perforated injection-pipe beneath the lime-support, in combination with an external furnace or other suitable contrivance for continuously heating the same, substantially as described.

ERAZM. J. JERZMANOWSKI.

Witnesses:

GEO. H. EVANS,
WM. POLLOCK.