

(No Model.)

E. J. JERZMANOWSKI.

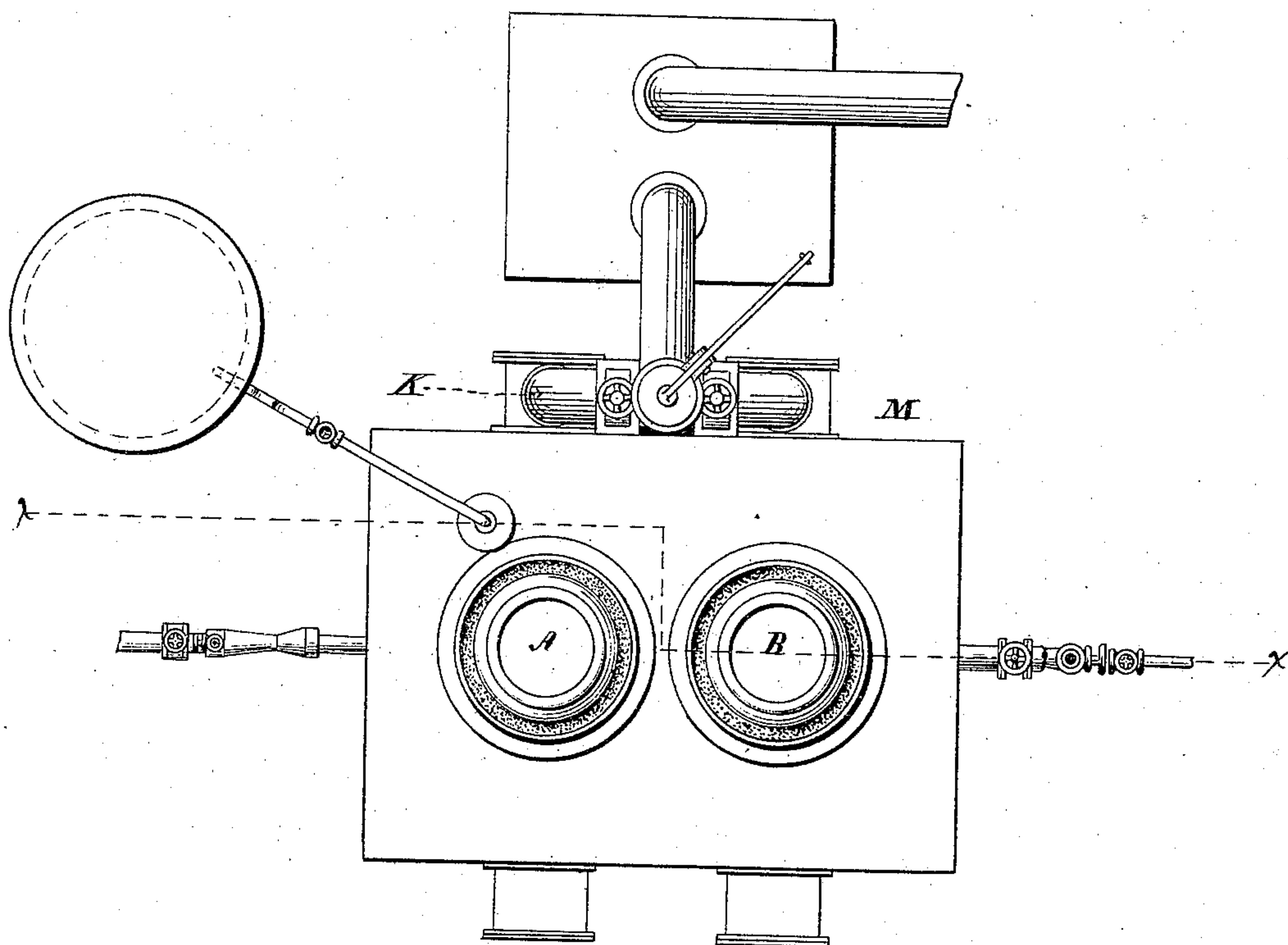
3 Sheets—Sheet 1.

PROCESS OF PRODUCING ILLUMINATING GAS.

No. 343,996.

Patented June 22, 1886.

*Figure 1.*



Witnesses:

*H. E. Lammann.*  
*Court A. Cooper.*

Inventor:

*Erazim J. Jerzmanowski*  
*By his attorneys*  
*Foster + Freeman*

(No Model.)

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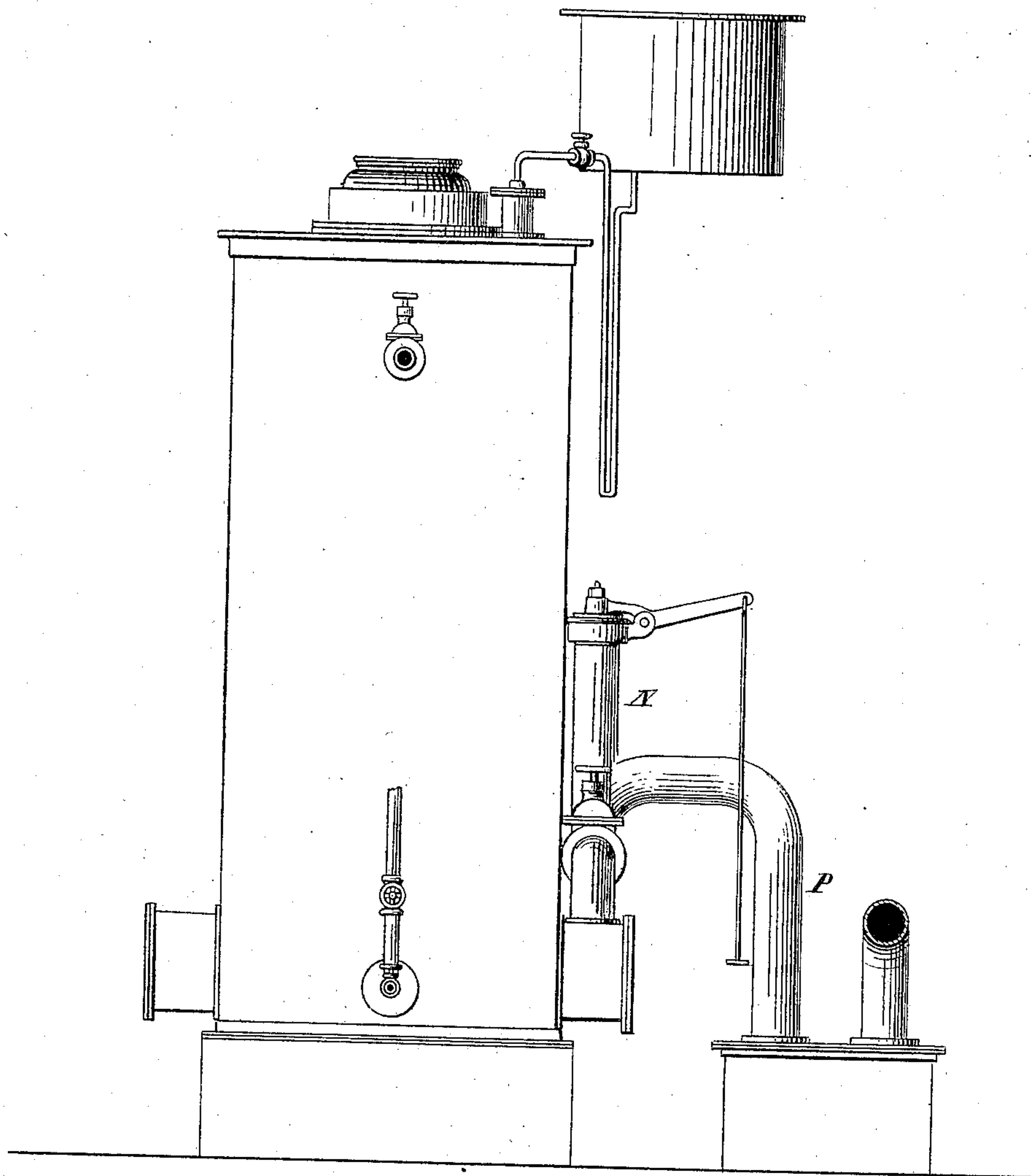
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PROCESS OF PRODUCING ILLUMINATING GAS.

No. 343,996.

Patented June 22, 1886.

*Figure 2.*



Witnesses:

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(No Model.)

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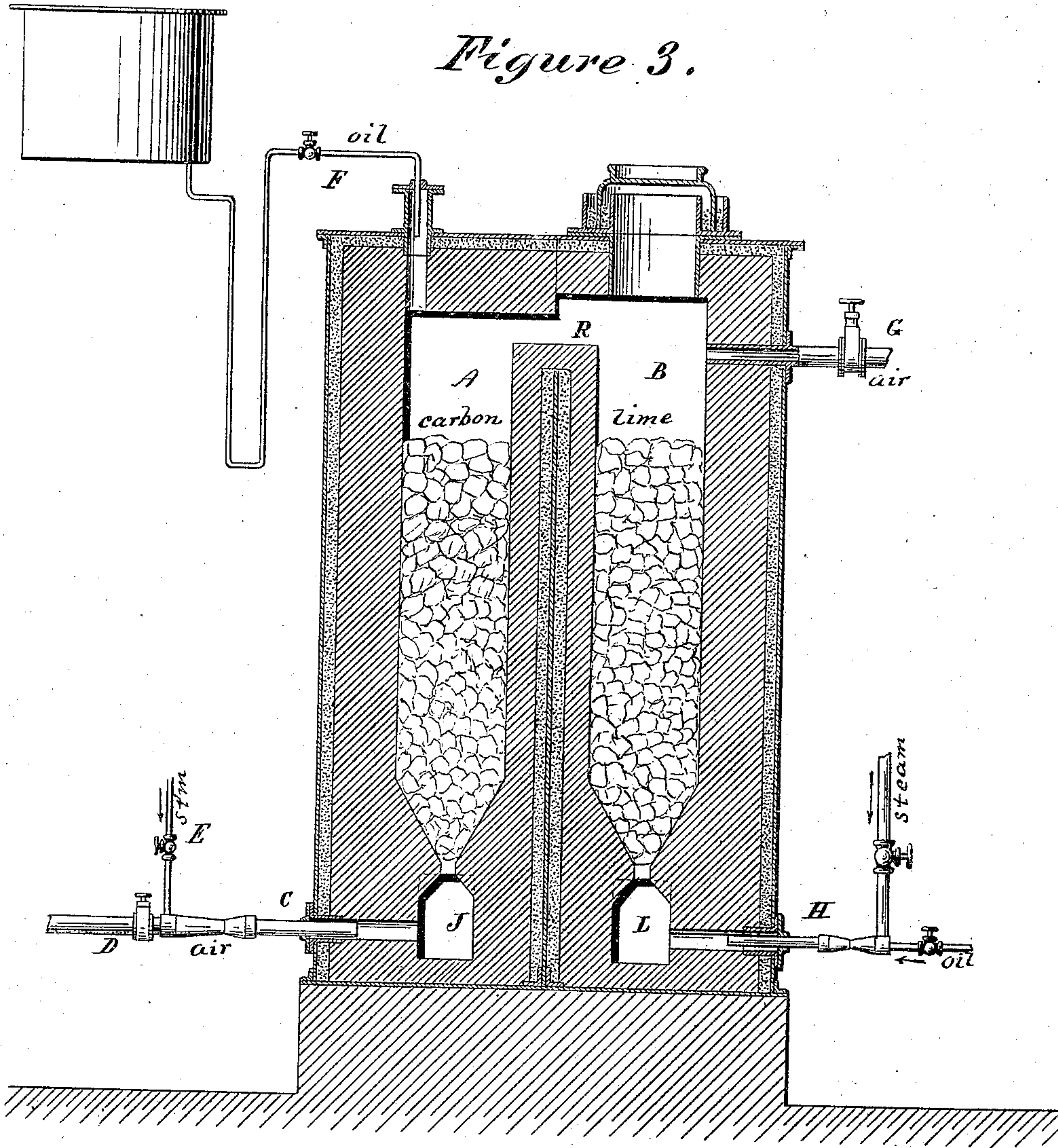
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PROCESS OF PRODUCING ILLUMINATING GAS.

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Figure 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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

## PROCESS OF PRODUCING ILLUMINATING-GAS.

SPECIFICATION forming part of Letters Patent No. 343,996, dated June 22, 1886.

Application filed July 19, 1883. Serial No. 101,320. (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 Processes of Producing Illuminating-Gas, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to an apparatus for producing illuminating-gas in one operation, which gas consists of a carbureted mixture of hydrogen and carbonic oxide; and the process may be said to be a combination of the lime process with the well-known water-gas process in such a way as to utilize the waste heat produced in generation.

My apparatus will be readily understood from the accompanying drawings, in which Figure 1 is a plan view; Fig. 2, a vertical elevation; Fig. 3, a vertical section through Fig. 1 on the line *x x*.

My apparatus contains two chambers, A and B, of which A is filled with a suitable hard carbonaceous body, and B with blocks or pieces of burnt lime. These chambers are separated by a partition, which has a passage, R, across its upper end, as shown in Fig. 3.

The chamber A is provided with the connection C, through which air may be injected from the pipe D, and steam through the pipe E, if desired, although steam is not essential in all cases. By the communication F a carbureting hydrocarbon may be supplied.

The chamber B is provided with the air-connection G, and with the joint hydrocarbon and steam connection H, although separate communications might be used, if desired. I prefer, however, to use the steam-jet as an injector for the hydrocarbon.

The chamber A communicates through the opening J with the connection K. The chamber B communicates through the chamber L with the connection M. The pipes K and M unite, and are provided with a purge-valve connection, N, and also with a connection, P, to the hydraulic main. They are also provided with suitable valves, as shown, by which either may be opened or closed.

The operation of my apparatus can be now readily understood. The chamber A is filled with a hard carbonaceous body, as previously

described, and the coal having been kindled, steam and air are injected into the chamber J, the valve in the pipe K being closed. Thereby the coal is partially burned, producing heat, and the products of combustion pass over by the passage R into the chamber B, where they meet an additional supply of air injected through the pipe G, producing a complete combustion, thereby thoroughly heating the lime in the chamber B. Thence the products of combustion pass downward through the chamber L and pipe M, through the open valve therein, and escape by the purge-connection N. In this operation I prefer that the coal should not be heated above a bright cherry-red, and I therefore use sufficient steam to moderate the temperature. The coal and lime being now sufficiently heated, I close the connections in the pipe C, and close the valve in pipe M and open that in pipe K, and I also close the valve in the air-pipe G. I then inject steam and liquid hydrocarbon into the chamber L. This compound is converted by the lime in the chamber B into hydrogen and carbonic acid, with some slight additional impurities. These gases, passing over the partition by the passage R, meet an additional supply of carbureting liquid hydrocarbon entering by the pipe F. This hydrocarbon, together with the gases, passes downward through the coal in the chamber A, and the carbonic acid is thereby converted into carbonic oxide, and the hydrogen and carbonic oxide become mingled with the liquid hydrocarbon, which is subsequently fixed by the hot coal, and a fixed illuminating-gas escapes downward through the chamber J and pipe K to the hydraulic main by connection P, as shown.

My application filed March 27, 1883, and numbered 89,721, embraces some features in common with this application; but I do not herein claim any feature claimed in that case.

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

1. The herein-described process of producing illuminating-gas, which consists in first heating a quantity of lime within a closed receptacle, then bringing combined steam and hydrocarbon into contact with such heated lime, then passing the resulting hydrogen and carbonic acid through a body of heated car-



bon, and simultaneously adding thereto a carbureting material to convert the carbonic acid into carbonic oxide and carburet and fix the produced gas, substantially as described.

5 2. The herein-described process of producing illuminating-gas, consisting of the following steps, viz: first, in supplying the requisite quantity of air to a body of coal in combustion within a closed receptacle, and passing  
10 the products of such combustion to and through a body of lime within a second closed receptacle, to heat the same, then passing a jet of combined steam and liquid hydrocarbon into contact with the heated lime, to produce  
15 carbonic acid and hydrogen, then passing said carbonic acid and hydrogen to and through the body of incandescent coal in the first-named receptacle, and adding thereto while in transit a suitable carbureting material, substantially  
20 as described.

3. The herein-described process of producing illuminating-gas, consisting, essentially, in passing the products of combustion from a body of combustible carbonaceous material to and through a body of non-combustible calcareous material, to heat the latter, then passing  
25 a jet of combined steam and liquid hydrocarbon through said heated non-combustible calcareous material and passing the resulting gases through the combustible carbonaceous  
30 material while the latter is incandescent, for the purpose of converting the carbonic acid into carbonic oxide, substantially as described.

ERAZM J. JERZMANOWSKI.

Witnesses:

GEO. H. EVANS,  
WM. POLLOCK.