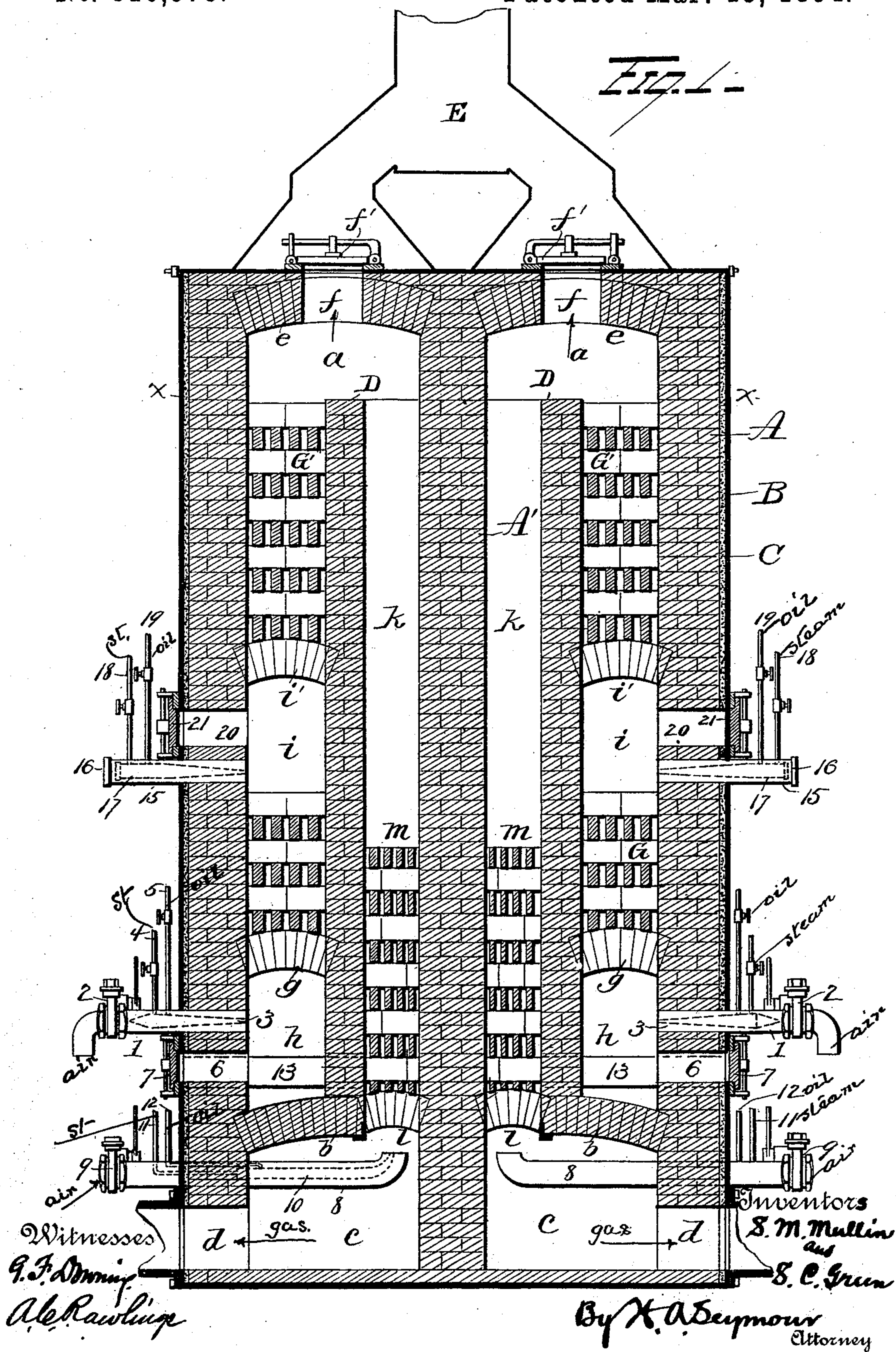


2 Sheets—Sheet 1.

No. 516,573.

Patented Mar. 13, 1894.



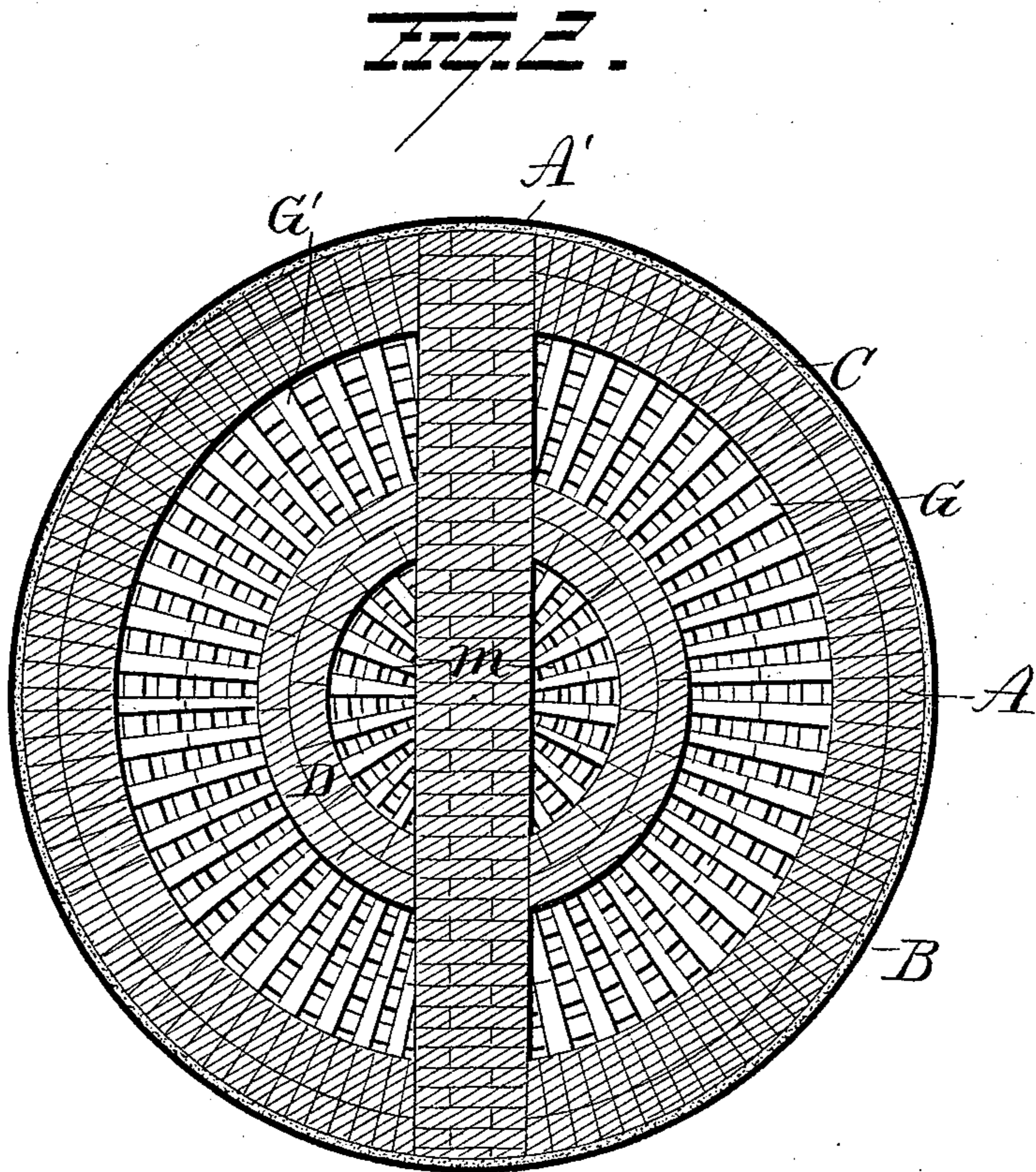
(No Model.)

2 Sheets—Sheet 2

S. M. MULLIN & S. C. GREEN.
GAS APPARATUS.

No. 516,573.

Patented Mar. 13, 1894.



Witnesses

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UNITED STATES PATENT OFFICE.

SCOTT M. MULLIN AND STEPHEN C. GREEN, OF LIBERTY, INDIANA.

GAS APPARATUS.

SPECIFICATION forming part of Letters Patent No. 516,573, dated March 13, 1894.

Application filed July 1, 1893. Serial No. 479,356. (No model.)

To all whom it may concern:

Be it known that we, SCOTT M. MULLIN and STEPHEN C. GREEN, of Liberty, in the county of Union and State of Indiana, have invented certain new and useful Improvements in Gas Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in gas generators, and more particularly to such as are employed for producing a fixed gas,—the object of the invention being to produce a simple apparatus for producing a fixed gas and one which shall be effectual in the performance of its functions.

With this object in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings: Figure 1 is a vertical sectional view of our improved apparatus. Fig. 2 is a cross section on the line $x-x$ of Fig. 1.

A represents a, preferably annular, structure of brick, preferably inclosed by a metallic sheathing B, between which and the wall of structure A, filling material C is inserted. The annular structure A is divided into two compartments a, a , by a wall A' and in each of said compartments a semi-circular wall D is located, said semi-circular walls resting at their lower ends on arches b near the bottom of the apparatus and terminating at their upper ends at points in proximity to the top of the compartments a . The spaces beneath the arches b constitute chambers c for the reception of gas as hereinafter explained, and with these chambers pipes d communicate for conducting the gas from the apparatus.

At the top of each compartment a , an arch e is located and made with an opening f adapted to communicate, when the apparatus is being heated, with the smoke stack E, said openings being closed when the apparatus is in use for the production of gas, by means of suitable covers f' . The arches b are adapted to close the lower end of the spaces between

the outer wall and the inner semi-circular walls, and above the arches b , open arches g are located, thus producing generating chambers h . Above the arches g , between the walls A and D, checker or open brick-work G is located, and above the checker or open brick-work G, other generating chambers i are formed by means of arches i' . Above the arches i' , checker or open brick-work G' is located, the latter extending to the tops of the walls D. The spaces k, k , between the walls A and A' constitute fixing chambers, as will be seen farther on. At the lower ends of the fixing chambers k, k , arches l are located, a series of these arches being preferably provided at the lower end of each fixing chamber and the space between the arches of each series being adapted to communicate with the fixing chambers and the gas chambers c . In the fixing chambers k, k , checker or open brick-work m is located, said checker or open brick-work extending from the arches l upwardly about one fourth the length of said fixing chambers, more or less. Communicating with each generating chamber h , is a pipe 1 adapted to conduct air to said chambers, and each pipe 1, is provided with a quick-acting valve 2. Located within each pipe 1 and communicating with the chambers h , is an injector burner 3, with which two pipes 4, 5, communicate, the pipe 4 being adapted to conduct steam to the injector burner, and the pipe 5 being adapted to conduct petroleum or other hydro-carbon oil thereto. Beneath each of these burners a peep hole 6 is located and normally covered by means of a suitable cover 7. A pipe 8 extends into each gas chamber c and terminates immediately under the arches l , each pipe 8 being adapted to conduct air and each being provided with a quick-acting valve 9. Located within each pipe 8 is an injector burner 10, with which pipes 11, 12 communicate for conducting steam and oil thereto. Above the pipes 8, peep holes 13 are located and provided with suitable covers. With each generating chamber i , a pipe 15 communicates and these pipes are provided with closed ends 16. Within each pipe 16 an injector 17 is located and with each injector 17, pipes 18, 19 communicate for conducting steam and oil to

the injector. In proximity to these injectors peep holes 20 are located and provided with suitable covers 21.

In heating the apparatus, the covers f' of the openings f are removed, and also the covers of the peep holes. The steam and oil are then permitted to enter the injector burners 3 and 10, and air is permitted to enter the pipes 1 and 8. The injector burners 3 and 10 are then lighted and the generating and fixing chambers are thus heated, the smoke and products of combustion escaping through the stack. When the apparatus shall have been heated to a sufficient extent, the injector burners 3 and 10 will be extinguished, the air inlet pipes closed, the peep holes closed and the covers placed on the openings f . Steam and air will then be permitted to pass through the injectors 17 and into the generating chambers i , the steam and oil thus admitted being sprayed on the checker work G, G' , and thus will be converted into gas, which will pass over the walls D and into the fixing chambers k , and, after passing through the checker or open brickwork m , will enter the chambers c as a fixed gas, and from said chambers the fixed gas will escape through the outlets or pipes d .

Each half of our apparatus is adapted to operate independently of the other, and can be operated alternately or one side alone.

Our improvements are very simple in construction, easy to manage and are effectual in the performance of their functions.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a gas apparatus, the combination with an outer and an inner wall for dividing the apparatus into two compartments, and a chamber between said walls at the bottom thereof, of a wall located intermediate of the outer and inner walls, and shorter than the same, whereby to produce generating and fixing chambers at the respective sides of the intermediate wall, means for heating the apparatus and means for injecting steam and oil into the generating chamber, substantially as set forth.

2. In a gas apparatus, the combination with an outer and an inner wall, of an intermediate wall located between said outer and inner walls, chambers and checker work in the space between the outer and intermediate walls, checker work between the inner and inter-

mediate walls, means at the lower ends for heating both the compartments produced by the intermediate wall, and means for injecting oil and steam in the space between the outer and intermediate walls, gas chambers at the lower end into which the intermediate chambers lead, and discharge pipes leading out of the gas chambers substantially as set forth.

3. In a gas apparatus, the combination with an inner and an outer wall and an intermediate wall adapted to produce two communicating compartments, of a chamber at the lower end of the outer compartment, an injector burner adapted to communicate with said chamber, an injector burner terminating at the bottom of the inner compartment, a gas receiving chamber between the inner and outer walls of the apparatus and communicating with said inner compartment, a generating chamber located in the outer compartment, checker work above and below said generating chamber, an injector communicating with said generating chamber, peep holes in proximity to said injectors and injector burners, covers for said peep holes, an opening in the top of the apparatus communicating with a stack and a cover for normally closing said opening, substantially as set forth.

4. In a gas apparatus, the combination with an outer annular wall or structure and a wall dividing said annular structure into two parts or compartments, of a semi-circular wall in each compartment, generating chambers between said semi-circular walls and the outer wall of the apparatus, checker work above each of said chambers, injector burners communicating with the lower chambers and injectors communicating with the upper chambers, checker work in the compartment between the semi-circular walls and the dividing wall, an injector burner for heating said last-mentioned compartment, and a gas receiving chamber communicating with said last-mentioned compartment, substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

SCOTT M. MULLIN.
STEPHEN C. GREEN.

Witnesses:

THOMAS T. PIERCE,
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