

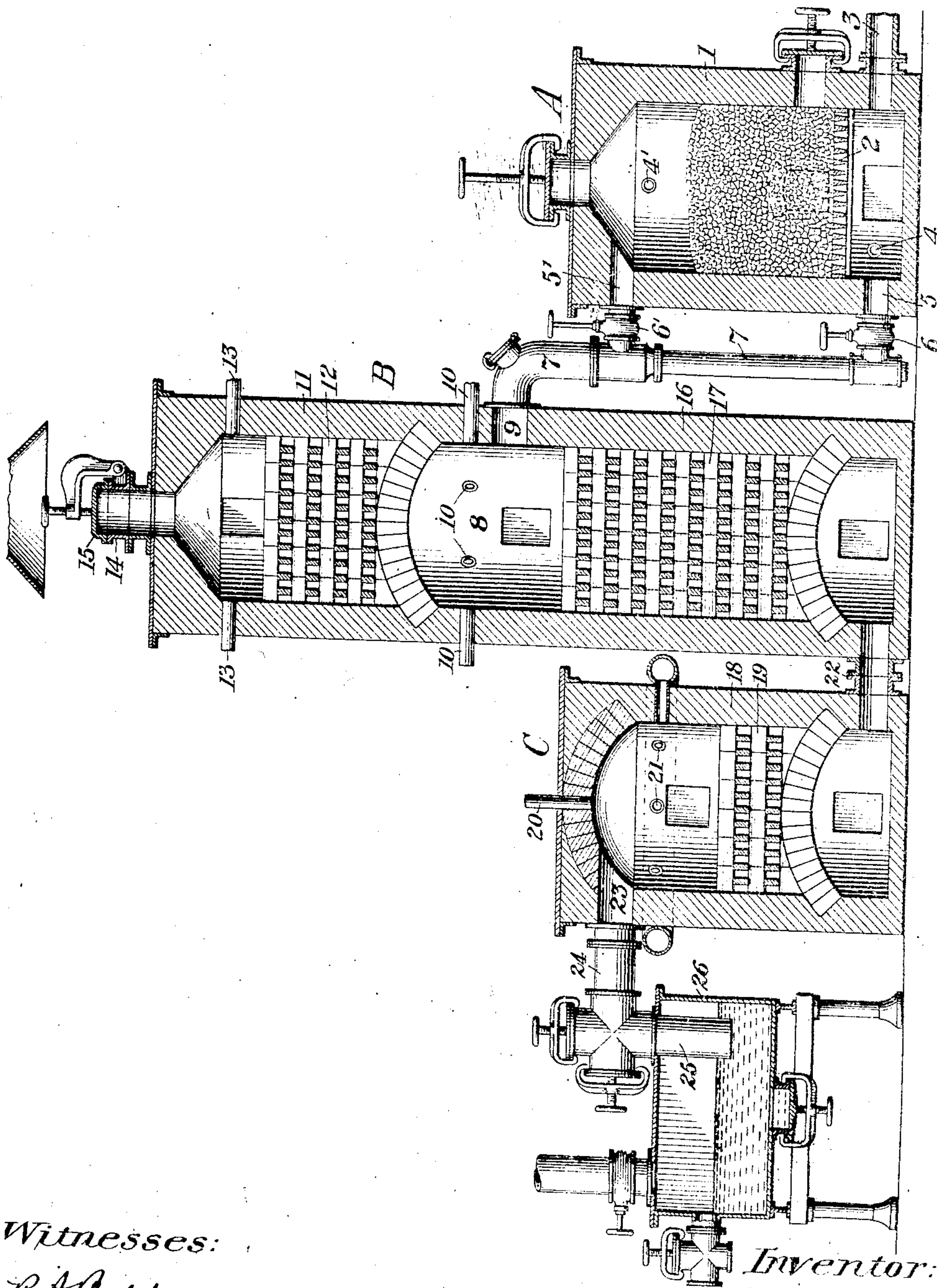
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F. J. FOVEAUX.

APPARATUS FOR GENERATING ILLUMINATING GAS.

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR GENERATING ILLUMINATING-GAS.

SPECIFICATION forming part of Letters Patent No. 779,842, dated January 10, 1905.

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*To all whom it may concern:*

Be it known that I, FRANK JOSEF FOVEAUX, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented certain new and useful Improvements in Apparatus for Generating Illuminating-Gas, of which the following is a specification.

According to this invention carbureted water-gas is generated by introducing oil and steam into a hot chamber, and water-gas is simultaneously generated by blasting a bed of solid fuel to incandescence and forcing steam through it. The oil and water-gas are mixed and the mixture is passed through one or more superheaters or fixers. Two fixers are preferably employed, one of which is preheated to a high temperature by burning oil or other fuel therein, the products of combustion being then passed through the other fixer.

The apparatus comprises a water-gas generator of the usual type, a tower or other structure having an upper steam-superheater, an intermediate chamber with inlets for water-gas, oil, and steam, and a lower initial fixer, and a combined supplemental heater and final fixer, the two fixers being connected at their lower ends.

The accompanying drawing is a longitudinal section of the apparatus on a vertical plane passing through the axes of the generator, tower, and supplemental heater.

The water-gas generator A is of the usual type, comprising a structure 1, having a fuel-grate 2, an air-inlet 3 below the grate, steam-inlets 4 4' below and above the grate, respectively, and lower and upper gas-outlets 5 5', controlled by valves 6 6', which open into the gas-main 7.

The tower B has at its middle portion a chamber 8, in the side of which is an opening 9 communicating with the water-gas main 7. Pipes 10 serve for the introduction of oil and steam. Above the chamber 8 is a steam-superheating chamber 11, which is nearly filled with checker-work 12 and has upper inlets 13 for steam. At the upper end of this chamber is a waste-gas outlet 14, controlled by a cover 15. Below the chamber 8 is an initial fixer 16, containing checker-work 17.

The supplemental heater and final fixer C is a structure 18, the lower portion of which is filled with checker-work 19. A pipe 20, opening into the upper end of the preheater, serves for the introduction of liquid or gaseous fuel, usually oil atomized by a jet of steam or air. A horizontal circumferential series of ports 21 serves for the introduction of air to burn the oil. The two fixers are connected at their lower ends by a passage 22, and the fixer C has an outlet 23 at its upper end, which delivers the finished gas through a pipe 24 to the dip-pipe 25 of the sealed box 26.

In use oil or other fuel is first introduced into and burned in the upper part of the chamber C, and the products of combustion pass down through the checker-work 19 and are delivered by the passage 22 into the lower end of the initial fixer 16. They then pass upward through the checker-work 17 of this fixer, through the chamber 8, through the checker-work 12 of the steam-preheater 11, and finally escape through the outlet 14, the cover 15 being removed. During this period the fuel in the water-gas generator 1 is being blasted to incandescence, the hot products of combustion passing into chamber 8 through the checker-work 12 and out at the top. The two fixers and the superheater thus having been preheated to the requisite temperature, steam is introduced alternately below and above the fuel in the generator A and the water-gas is passed into the chamber 8, where it is mixed with oil blown in through the pipes 10 by jets of steam. Steam is also introduced through the pipes 13 at the upper end of the tower, passed downward through the checker-work 12, which raises it to a high temperature, and introduced into the chamber 8, where it assists in gasifying the oil. The mixture of water-gas, gasified oil, and steam is passed down through the hot checker-work 17 of the initial fixer and through the bottom passage 22 into the lower end of the final fixer, wherein it rises through the highly-heated checker-work 19, the finished gas escaping through the outlet 23.

The arrangement of the apparatus enables the final and initial fixers to be heated to different regulated temperatures, while the re-



sidual heat in the escaping products is absorbed by the checker-work of the steam-superheater. This superheater is raised to a high temperature by the products of combustion from the water-gas generator. The oil introduced into the hot mixing-chamber 8 is gasified by the superheated steam, and the mixture of oil-gas and water-gas is effectively fixed without decomposition by passing it through the checker-work of the two fixers, wherein it is submitted to a progressively-increasing temperature.

The term "supplemental heater," as used in the claims, refers to means supplemental to the water-gas generator for heating the initial fixer.

I claim—

1. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureter, a fixer, and a supplemental heater, said generator and supplemental heater opening into opposite ends of said fixer, as set forth.

2. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureter, two connected fixers, and a supplemental heater for passing hot products of combustion through said fixers in a direction opposite to that in which the carbureted gas travels, as set forth.

3. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureter, an initial fixer, a supplemental heater and final fixer, said initial fixer connected at one end to said generator and at the other end to said final fixer, a source of heat in said final fixer, and an outlet for waste products from said initial fixer, as set forth.

4. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureter having inlets for oil and water-gas and an outlet for waste products, and a fixer having at one end an inlet for hot products of combustion and communicating at the other end with said carbureter, as set forth.

5. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureting-chamber having inlets for oil and water-gas and an outlet for waste products, an initial fixer, and a supplemental heater and final fixer, said initial fixer communicating at one end with said carbureting-chamber and at the other end with said final fixer, as set forth.

6. An apparatus for generating illuminating-gas, comprising a water-gas generator, a carbureter, an initial fixer, and a supplemental heater and final fixer, said carbureter having a water-gas inlet and opening into the upper end of said initial fixer, said initial and final fixers connected at their lower ends, and said

final fixer having at its upper end a fuel-inlet and a finished-gas outlet, as set forth.

7. An apparatus for generating illuminating-gas, comprising a water-gas generator, a steam-superheater, a carbureting-chamber with inlets for oil, water-gas and superheated steam, a fixer, and a supplemental heater, said fixer communicating at one end with said carbureting-chamber and at the other end with said supplemental heater, as set forth.

8. An apparatus for generating illuminating-gas, comprising a water-gas generator, a steam-superheater having a waste-gas outlet, a carbureting-chamber communicating with said superheater and having inlets for oil and water-gas, an initial fixer, and a supplemental heater and final fixer, said initial fixer communicating at one end with said carbureting-chamber and at the other end with said final fixer, as set forth.

9. An apparatus for generating illuminating-gas, comprising a water-gas generator, and a tower having an upper steam-superheater, an intermediate carbureting-chamber with inlets for oil, water-gas and superheated steam, and a lower fixer, as set forth.

10. An apparatus for generating illuminating-gas, comprising a water-gas generator, a tower having an upper steam-superheater with a waste-gas outlet, an intermediate carbureting-chamber with inlets for oil and water-gas, a lower fixer, and a supplemental heater, said fixer communicating at one end with said carbureting-chamber and at the other end with said supplemental heater, and means for passing hot products of combustion upward through said fixer, chamber and superheater, as set forth.

11. An apparatus for generating illuminating-gas, comprising a water-gas generator, a tower having an upper steam-superheater with a water-gas outlet, an intermediate carbureting-chamber with inlets for oil and water-gas, and a lower initial fixer, and a supplemental heater and final fixer opening into the lower end of said initial fixer, as set forth.

12. An apparatus for generating illuminating-gas, comprising a water-gas generator, a tower having an upper steam-superheater with a waste-gas outlet, an intermediate carbureting-chamber with inlets for oil and water-gas, and a lower initial fixer, and a final fixer having at its upper end a fuel-inlet and a finished-gas outlet and at its lower end a passage opening into said initial fixer, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK JOSEF FOVEAUX.

Witnesses:

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