(No Model.)

C. L. FITCH.

PROCESS OF MANUFACTURING GAS.

No. 489,472. Patented Jan. 10, 1893.

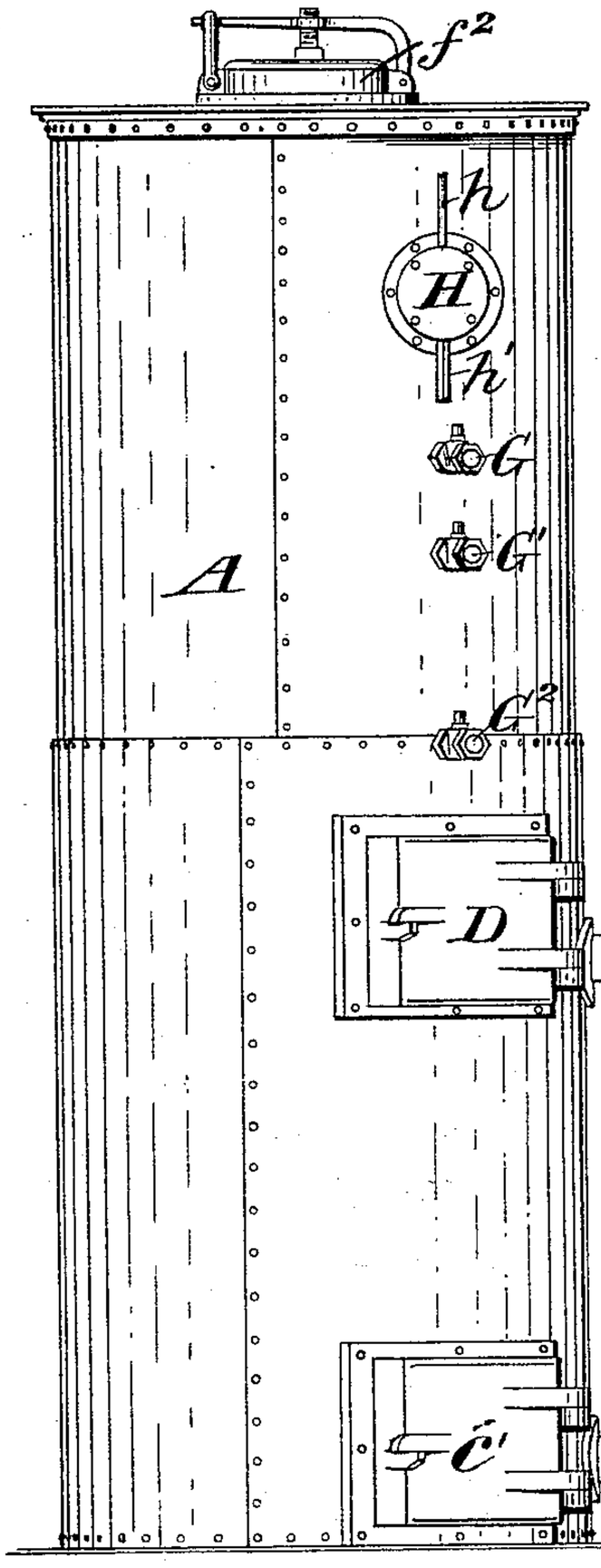

FIG-1

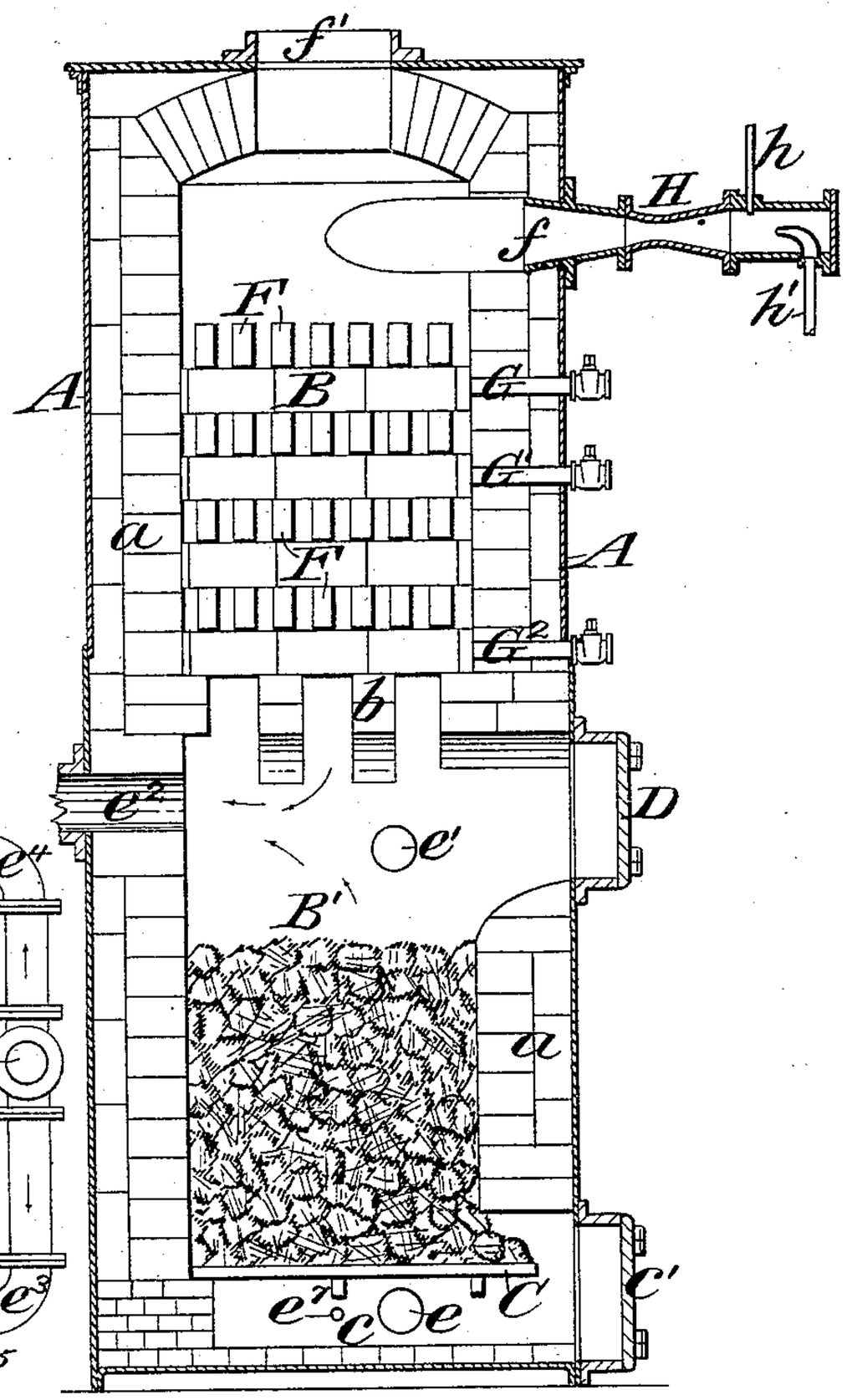

FIG-2

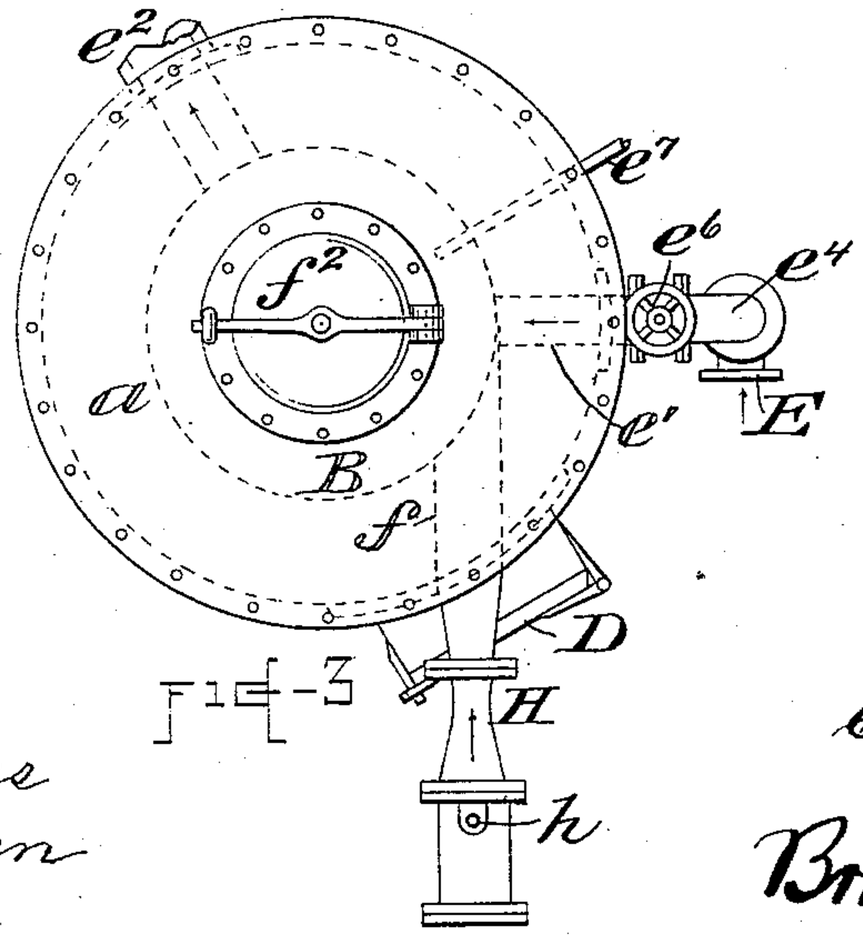

FIG-3

Witnesses.
Fred Haynes
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UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 489,472, dated January 10, 1893.

Application filed June 8, 1892. Serial No. 435,961. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. FITCH, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Processes of Manufacturing Gas, of which the following is a specification.

My invention relates to an improvement in the process of manufacturing gas in which a supply of water gas is enriched by the combination therewith of a supply of hydrocarbon gas. A practical apparatus adapted to the carrying out of this process is represented in the accompanying drawings in which,

Figure 1 is a view of the apparatus in elevation, Fig. 2 is a vertical central section, and Fig. 3 is a top plan view.

A represents an exterior casing, here shown as formed of metal and of a vertically elongated cylindrical form. The casing is provided with a lining *a* and comprises an upper compartment B and a lower compartment B′ which freely communicate with one another through a skeleton dome *b* which forms the ceiling of the lower compartment and a supporting base for the material in the upper compartment. The lower compartment is provided with a grate C, ash pit *c* and door *c′* opening thereto. It is also provided with a door D for the entrance of the fuel, an opening *e* beneath the grate for the entrance of air, another opening *e′* above the fuel for the entrance of air and a gas outlet opening e^2 above the fuel. Branches e^3 and e^4 of a common air supply pipe E connect with the openings *e* and *e′* and are provided with cocks or valves e^5 and e^6 for regulating the flow of air to either the lower or upper portion of the compartment B′, as may be desired. Steam may be applied beneath the grate through an opening e^7. The upper compartment B is partially filled with refractory material F and has an opening *f* in its upper portion for the reception of the hydrocarbon. The said upper compartment is further provided with an opening *f′* at the top for the escape of the smoke and gases in "blowing up;" the said opening having a cover f^2 for closing it air tight when the manufacture of the gas takes place, and sight tubes G, G′, G^2 are located at different heights throughout the upper chamber and extended from its exterior to the outside of the casing.

The tube for spraying the hydrocarbon into the chamber B is represented by H, the hydrocarbon being admitted thereto through a pipe *h* and a steam jet pipe *h′* being arranged to inject the hydrocarbon into the chamber in the form of spray.

The process may be particularly described as follows:—A fire having been started in the lower chamber B′ and a supply of coal having been placed therein, the cover f^2 is opened, the cock e^6 closed, the supply of hydrocarbon and steam shut off from the sprayer and a blast of air admitted beneath the grate through the opening *e*. After the fire is started, the cock e^6 may be opened to admit air to confine the gases in the fire chamber and expedite the heating. This "blowing up" process will heat the refractory material in the upper chamber to a glow and when the latter is sufficiently heated, the cover f^2 is closed, the blast of air cut off or reduced to a slight amount, steam admitted beneath the grate through the opening e^7 and the supply of hydrocarbon and steam opened to the sprayer. The steam from beneath the grate is converted into gas and forms with the products of combustion a supply of water gas in the lower chamber above the fuel. The hydrocarbon spray passing down through the hot refractory material is converted into a fixed rich illuminating gas and, as such, mixes with the water gas in the upper portion of the lower chamber and becomes thereby reduced to a commercial gas of great brilliancy, which, after passing through the outlet opening e^2, may be washed and stored as is usual. It will be observed that by the above process, the hydrocarbon gas is fixed before it mixes with the water gas, and its candle power may be regulated with great precision, while the amount of nitrogen may be kept at a minimum. When the refractory material becomes cooled to a degree too low for effective results, it may be again raised to the required temperature by again "blowing up."

What I claim is:

The process of forming a fixed illuminating gas consisting in heating a converting cham-

ber by passing the products of combustion through it from a bed of incandescent fuel, introducing a fine spray of hydrocarbon and steam into and passing it through said converting chamber in a direction opposite to that in which the products of combustion pass through it thereby forming a fixed hydrocarbon gas, and simultaneously with the passage of the hydrocarbon spray through the converting chamber, passing steam through the bed of incandescent fuel employed in heating the converting chamber, thereby forming a water gas which mingles at the surface of the incandescent fuel with the hot hydrocarbon gas as it escapes from the converting chamber to form an illuminating gas without further fixing, substantially as set forth.

CHAS. L. FITCH.

Witnesses:
FREDK. HAYNES,
ROBERT BACON SEWARD.