

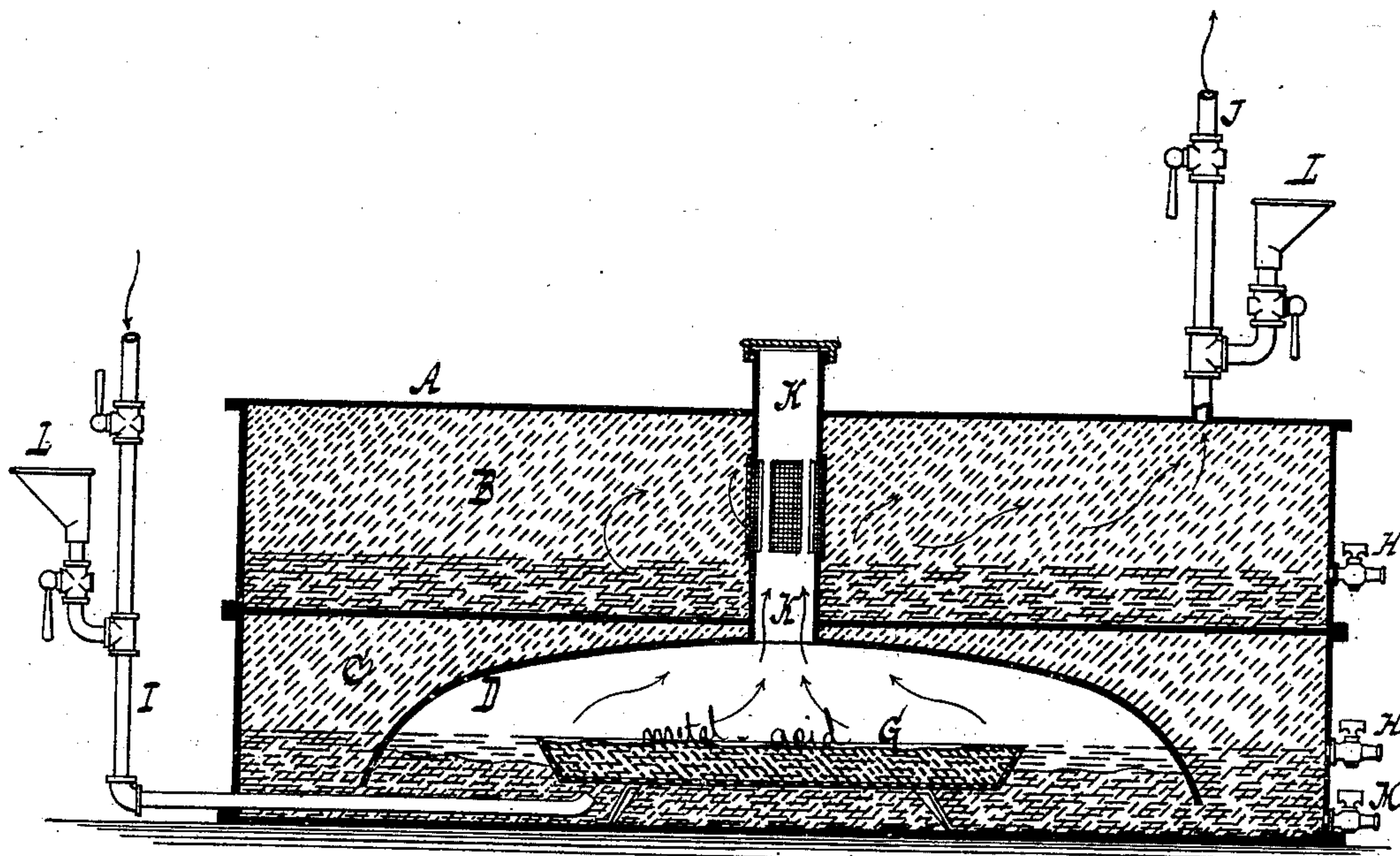
(No Model.)

S. HANFORD.

MANUFACTURE OF ILLUMINATING GAS.

No. 273,068.

Patented Feb. 27, 1883.



WITNESSES:

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MANUFACTURE OF ILLUMINATING-GAS.

SPECIFICATION forming part of Letters Patent No. 273,068, dated February 27, 1883.

Application filed November 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HANFORD, a citizen of the United States, residing at Binghamton, in the county of Broome and State of New York, have invented new and useful Improvements in the Manufacture of Illuminating-Gas, of which the following is a specification.

The present invention relates to that class of carburetors in which atmospheric air or ordinary coal-gas is mixed with hydrogen gas and passed through carbureting materials.

The invention consists in a carburetor and hydrogen-gas generator which possesses a lower chamber or compartment having an inlet-pipe for air or gas and containing a packing of absorbent material, also means for generating hydrogen gas, and a hood or tube for conducting the partly-carbureted gas into an upper chamber filled with an absorbent substance saturated with a carbureting-liquid, and provided with an escape-tube for the carbureted gas.

The drawing shows a vertical transverse section of an apparatus constructed according to my invention.

In the drawing, the letter A indicates a metallic receiver, consisting of a case made of copper or other suitable material and divided by a partition into two compartments, B C. In the lower compartment, near its center, is a dome or bell, D, of similar material as the case A, said dome or bell being suspended from a tube, K, so as to leave a space between its lower edge and the bottom of compartment C. The tube K extends through the upper compartment, and has suitable gauze-covered openings at a proper distance from the floor of the upper compartment, which openings establish a communication between the space below the dome D and the upper compartment, B. The two compartments B C are otherwise completely separated from one another by the dividing-partition. Under the dome D is placed a leaden basket or receiver, G. This receiver G is perforated at the sides and bottom, and is placed on a stand or pedestal, so as to be elevated above the bottom of compartment C.

In the basket or receiver G are placed iron turnings or other mineral substances, while the remaining space in the compartment C is entirely filled with powdered carbon or other

absorbent material; but a space in the upper part of the dome D is left free. A mixture of methyl, naphtha, or any of the liquid hydrocarbons usually employed for carbureting purposes is passed into the compartment C to the extent of filling it to about the height of the top of the receiver G—that is, about one-third of the height of the compartment C. A sight-tube similar to the water-glass on steam-boilers may be provided for indicating the height to which the mixture is to be poured in. A gage valve or cock, H, may also serve the purpose of the sight-tube.

The inlet-tube I, through which the air or gas is caused to flow, carries the same under the dome D, whence it flows through the saturated bed and into the dome D, where it is impregnated with the gas there generated. From the dome D the impregnated gas passes through the tube K into the upper compartment, B. This compartment B is also filled with powdered carbon or other absorbent material, and a mixture of methyl and naphtha or any suitable liquid hydrocarbon is poured in to the height of the bottom of the gas-outlet openings in the pipe K. The impregnated gas from the dome D, permeating through the mass in the compartment B, becomes still further charged and enriched by coming into contact with the mixture of methyl and naphtha or other volatile oil with which the powdered-carbon filling is saturated. From the compartment B the gas passes off through the exit-tube J, either to be utilized at once or stored in a holder for future use. The gas, before being used, may be passed through chloride of calcium or other deliquescent substance to dry the same.

The inlet-tube I is in communication with a pump or other device for forcing air or gas through it into the dome D. A governor or regulator may be provided at the outlet-tube to regulate the outflow of the gas to be supplied to the burners. The inlet and outlet tubes are also provided with funnels L, to allow the introduction into the two compartments C and B of the liquid hydrocarbons or carbureting agents to be absorbed by the carbon or other absorbent filling contained in said compartments. The tube K extends a certain distance above the receiver A, and is tightly

closed by a cover, which can be removed for the purpose of cleaning or introducing additional material. The apparatus may be buried in the ground or kept in any convenient place for use, and is always ready to be used, and is perfectly safe and harmless. The gas is burned the same as ordinary coal-gas, and is equally safe to use.

The generator being automatic in its action, the gas is produced no faster than it is required for immediate use. As soon as the outlet is closed the generator ceases to act.

I have found an advantageous mixture to be about seventy-five per cent. of naphtha, about twenty per cent. of methyl, and about five per cent. of muriatic or other mineral acid; but of course I do not confine myself to exactly these proportions, as a slight variation therefrom will still yield satisfactory results. It is also to be noted that the acid which enters into the mixture contained in the lower chamber is introduced through the tube K directly onto the iron turnings or other mineral substance in the receiver G. The purpose of the acid is to effect the generation of gas in the lower compartment. When the exit-tube J is closed the pressure generated by the accumulation of gas in the dome D depresses the liquid and forces the liquid out at the bottom of the dome D and causes the liquid to drop below the mineral substances in the receiver G, thus causing the generation of gas to cease. On opening the outlet the pressure diminishes, the fluid rises in the dome D and again comes into contact with the mineral substances in the receiver G, and gas is again generated. The

action of the apparatus, as is thus seen, is automatic, the gas being generated as used, thus avoiding any loss.

A cock, M, may be applied at or near the bottom of compartment C, to draw off any refuse or waste matter.

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

1. In a carburetor, the combination of the lower carbureting-chamber and hydrogen-gas generator, the air or gas inlet pipe leading into the same, the bell or dome suspended in said chamber, and the upper chamber, having a gas-outlet pipe, and a perforated gas-inlet pipe connected with the hood in the lower chamber, substantially as described.

2. In a carburetor, the combination of a shell or body having an upper compartment filled with an absorbent material charged with a carbureting agent, and provided with a gas-exit pipe in its top, and a vertical central tube having gas-outlet openings, and a bottom chamber containing means for generating hydrogen gas, and an absorbent filling saturated with a carbureting agent, and provided with an air-inlet pipe, and a hood or bell connected with the central tube of the upper compartment, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

SAMUEL HANFORD. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.