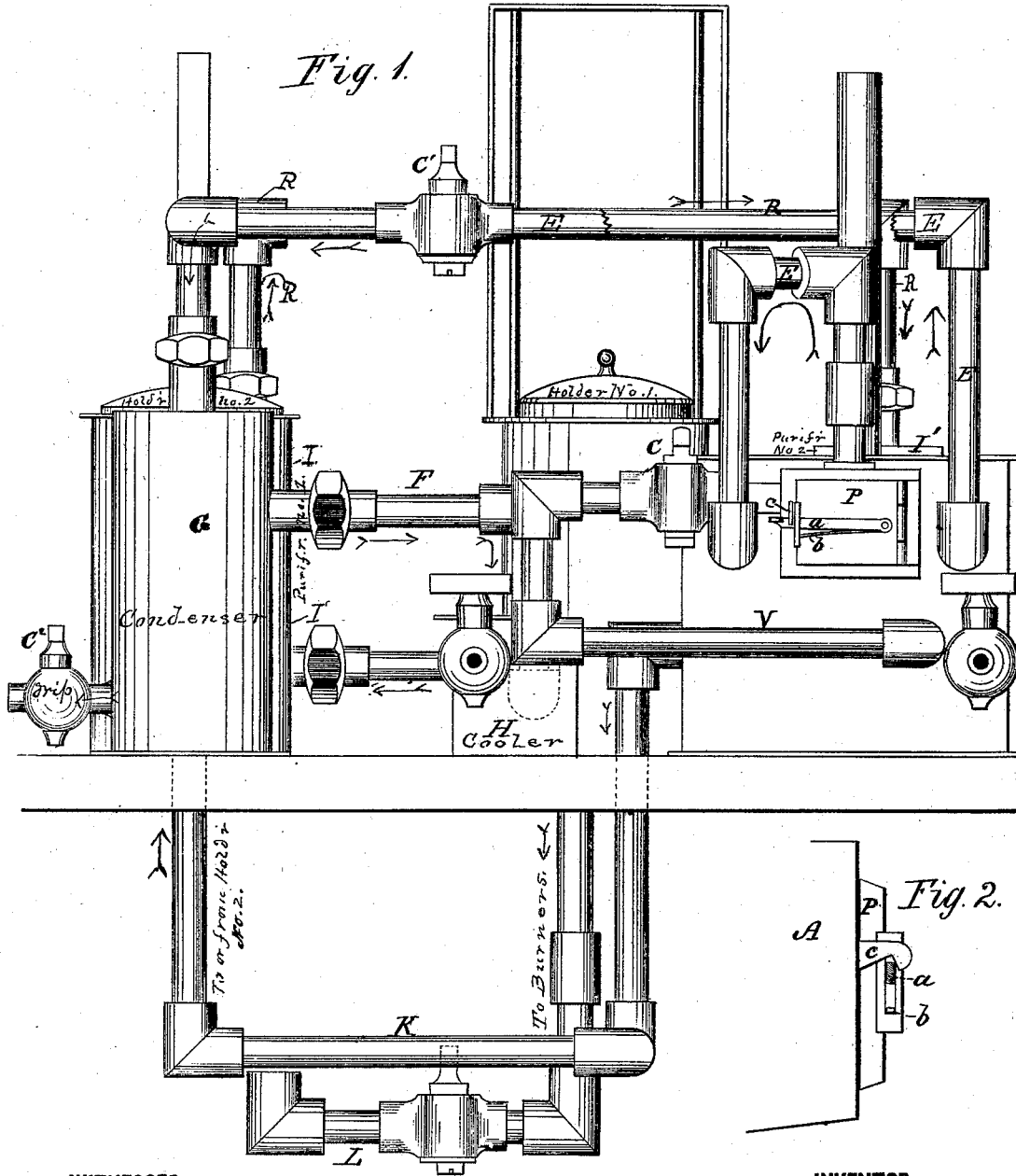


J. C. MITCHELL. Gas-Generator.

No. 166,288.

Patented Aug. 3, 1875.



WITNESSES:

W. W. Hollingsworth
John A. Kemou

INVENTOR:

Jas. C. Mitchell
 BY *Kenn & Co.*

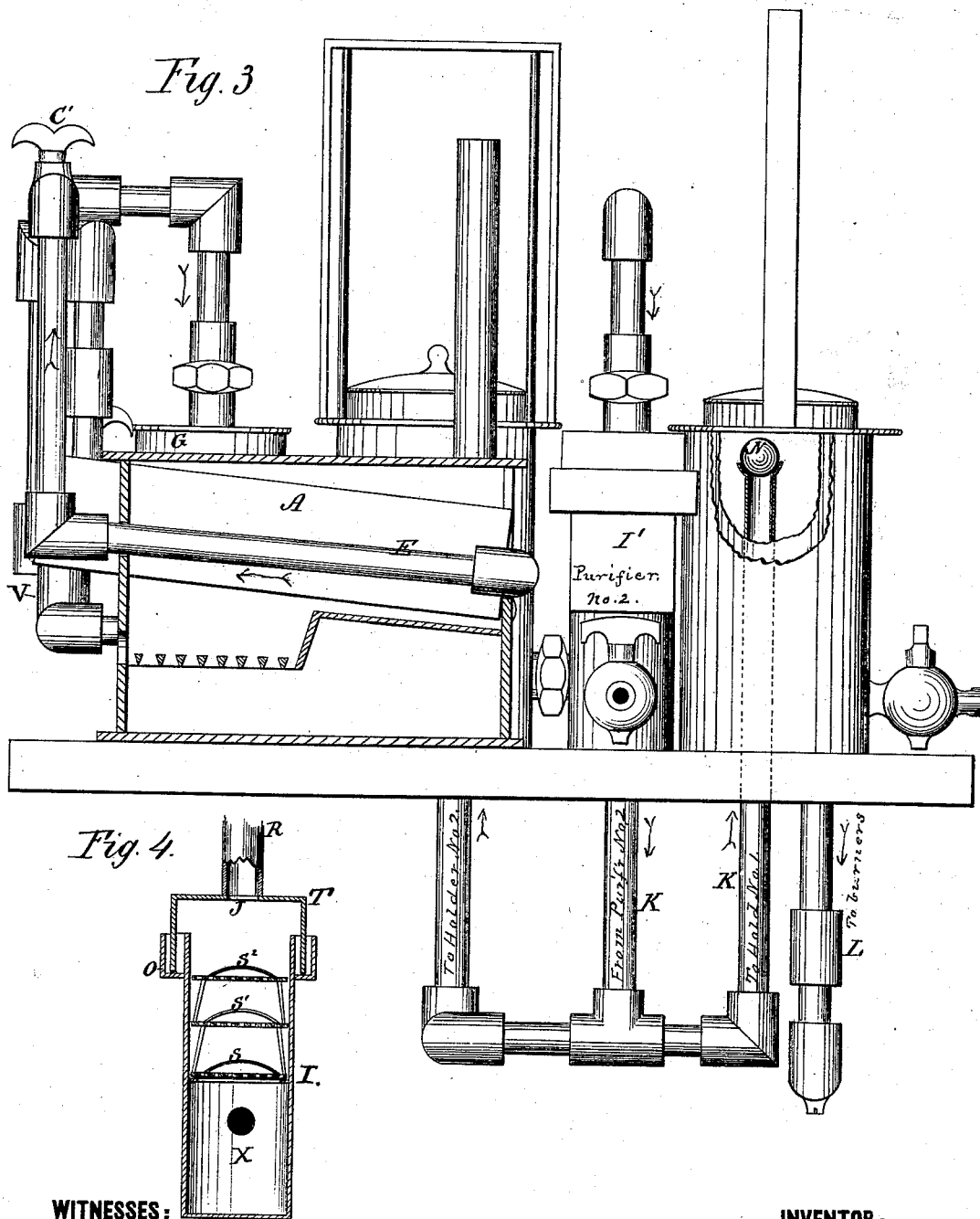
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UNITED STATES PATENT OFFICE.

JAMES C. MITCHELL, OF LANCASTER, NEW HAMPSHIRE.

IMPROVEMENT IN GAS-GENERATORS.

Specification forming part of Letters Patent No. **166,288**, dated August 3, 1875; application filed May 28, 1875.

To all whom it may concern:

Be it known that I, JAMES C. MITCHELL, of Lancaster, in the county of Coos and State of New Hampshire, have invented a new and Improved Gas-Generator; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a vertical front elevation; Fig. 2, a detail of the air-tight furnace-door; Fig. 3, a sectional side elevation; Fig. 4, a sectional detail of one of the purifiers.

This invention relates to certain improvements in the manufacture of illuminating-gas, designed to utilize any kind of fuel for the production of the gas, and applicable to limited manufacture, as for private families, &c. It consists in a retort placed within a furnace, or a common stove, if desired, and having an air-tight door of peculiar construction, and a communication direct with the furnace, by means of which construction the gaseous contents of the retort may be drawn into the furnace and burned when the air-tight door is to be opened for drawing and recharging the retort. It also consists in the peculiar construction and arrangement of the tops of the purifiers and an air-tight door to the retort, and the combination with the feed-pipe to the gas-holder of a ball-valve to prevent back pressure, as hereinafter more fully described.

In the drawing, A represents the retort, which is made of cast-iron or other suitable material, and contains the wood, coal, fats, or other material from which the gas is to be made. The front of said retort is made perfectly smooth, and is provided with an air-tight door, P, which also has a smooth face. The said door is provided with a latch, *a*, and a spring, *b*, and the retort has a catch, *c*, the front side of said catch, against which the latch binds to prevent the opening of the door, being made inclined inwardly from the bottom to the top, so that when the spring forces up the latch the latter engages the said incline to hold the door tightly to the face of the retort. V is a pipe, having a stop-cock, C, which leads from the retort A directly into the furnace B. Whenever the retort is to be recharged, or opened for any cause whatever,

the stop-cock C is turned. The gaseous contents of the retort then pass, by expansion and the draft of the furnace, directly into the latter, and are consumed, and the door P of the retort may then be opened, the back pressure of gas from the holder and condenser being prevented by valves and stop-cock. E is the outlet-pipe from the retort for the gas. This pipe passes all around the retort in the furnace to insure the thorough decomposition of the undecomposed products of distillation, and communicates through a stop-cock, C¹, with the condenser G. The latter vessel has near its bottom a stop-cock, C², through which the distilled and condensed liquids are drawn off, and has a pipe, F, that passes the gas through the cooler H to the purifiers, which said cooler consists simply of a tank or trough filled with water and provided with a suitable outlet. As the gas passes from the said cooler it enters one of two purifiers, I I', which are of a similar construction. These purifiers consist of upright chambers, having vats X in the bottom, and detachable tables S S' S², resting one above the other, which are constructed of metal, with perforated tops, upon each of which lime is placed, and through which said perforations the gas passes, going up through one purifier and down the other. R is a detachable connecting-pipe, which conducts the gas from one purifier to the other, and terminates at each end in a downwardly-opening detachable cover, J, for the purifiers, which rests in a trough, O, at the top of said purifiers, which is filled with water, the connection between the two purifiers being thus a water-sealed detachable one, so that the purifiers may be readily inspected and the lime renewed whenever desirable. K is a pipe leading from one of the purifiers to the gas-holder J, which consists in the usual tank filled with water, and an inverted cylindrical vessel resting therein and moving in guideways. N is a ball-valve, which rests in the top of pipe K, and which, while it allows the passage of the gas to the holder, prevents the back pressure. L is the pipe that feeds the gas from the holder to the burners.

With respect to my method of disposing of the contents of the gas-retort, I am aware of the fact that the outpouring gases from the

opened retort-door have been gathered into an overhanging hood and conducted through a pipe into the furnace; but in this case the gases come into contact with the air and produce an explosive compound, which, being ignited in the furnace, is liable to strike back and result in an explosion, and consequent injury to the workmen. I therefore limit my invention to the terms of the claim, in which the gas is conducted directly to the furnace without admixture of air, and before the opening of the retort-door.

Having thus described my invention, what I claim as new is—

1. The combination, with retort B, having a smooth face, of a door, P, having a corresponding smooth face, the latch *a*, spring *b*, and catch *c*, for the purpose of maintaining the door closed with an air-tight connection, substantially as described.

2. The combination, with the purifiers I I', having water-troughs O, of the detachable tube R and the covers T, as and for the purpose set forth.

3. The combination, in a gas-generator, with the pipe K, terminating in the gas-holder, of a ball-valve, N, resting in the end of said pipe, for the purpose of preventing back pressure, as described.

4. The method of freeing air-tight gas-retorts of their gaseous contents before opening the retort-door, and of disposing of such contents by conducting the same, without admixture of air, directly from the closed gas-retort into the furnace to be burned, substantially as herein described.

JAMES C. MITCHELL.

Witnesses:

HORACE R. PORTER,
AMOS F. ROWELL.