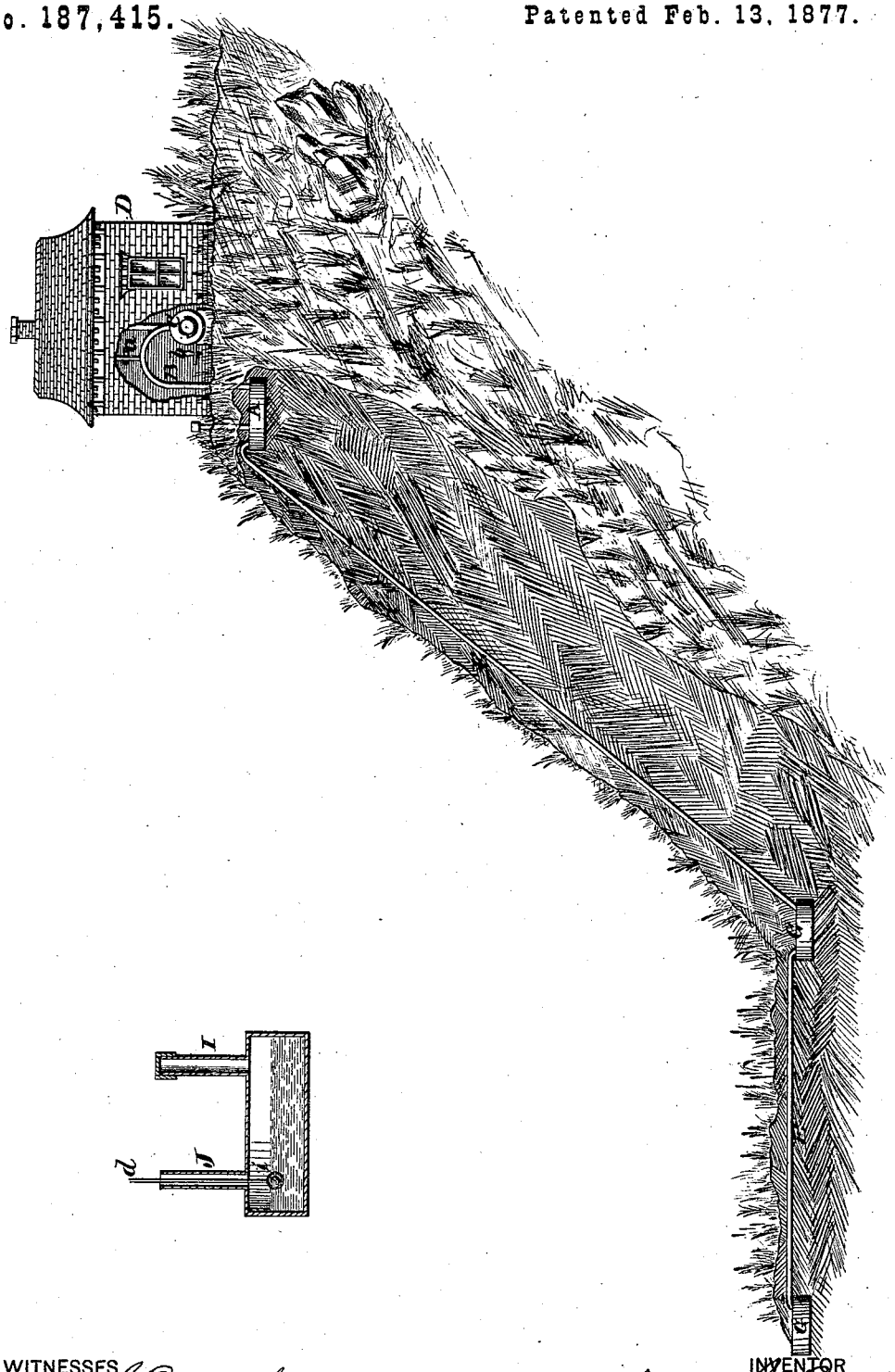
A. C. RAND.

APPARATUS FOR CARBURETING AIR.

No. 187,415. Patented Feb. 13, 1877.



WITNESSES

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IMPROVEMENT IN APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. **187,415**, dated February 13, 1877; application filed November 28, 1876.

To all whom it may concern:

Be it known that I, ALONZO C. RAND, of city of Minneapolis, in the county of Hennepin and in the State of Minnesota, have invented certain new and useful Improvements in Gas Apparatus for Lighting Cities, &c., with Gasoline-Gas; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a gas-machine for lighting up towns with gasoline-gas or carbureted air, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, which fully illustrates my invention.

A represents a carbureter, of any suitable construction. It is in the form of a tank, provided with evaporating passage-ways, and is intended to hold, for a town of five thousand people, one hundred barrels of carbureting-liquid, so that at least a car-load may be put into it at one charge. For smaller towns, hamlets, &c., it will be made smaller. This tank is placed upon a hill-side, and should have an altitude sufficient to furnish pressure equal to two to three inch gas-pressure.

It is found to be a fact that carbureted air of sixteen-candle power has a specific gravity over the weight of the air, which, when a column of the gas is sixty feet high, will raise a column of water one inch, so that one hundred and twenty feet will raise it two inches, &c.

B is the inlet-pipe for supplying air to the carbureter, and said pipe is connected to the air-heating cylinder C. This pipe is also provided with an air-valve, *a*, which is attached to the pipe before it reaches the heating-cylinder, for the purpose of furnishing air not warmed when the gasoline is fresh and the most volatile parts are not evaporated. When the gasoline shall have parted with its more volatile portion, then the valve *b* on the end of the heater C is opened, a fire made in said heater, and the thus heated air passes out of the upper end of the heater or cylinder into the carbureter. A building, D, is placed over the heating-cylinder and valves to shelter the same, and also afford shelter for the operator. The outlet-pipe E from the carbureter A is laid in a trench under ground, below frost and solar heat, and the carbureter is also so situated, as shown in the drawing. Any condensation in the outlet-pipe will be caught in a tank, G, which is a drip-tank and carbureter combined, by which arrangement carbureted air may be carried a long distance, and have its illuminating power unimpaired when it reaches the consumers. In a long stretch of pipe a series of these drip-tanks and carbureters may be introduced and the candle power maintained. It will thus be seen that without any machinery in the way of air-pumps and air-forcing devices, a continuous and equable pressure of gas is obtained. The only manual labor connected with the manufacture of gas by this invention is simply putting the gasoline in the tank in the hill-side, and it automatically carburets the air without any machinery, and delivers it unimpaired to the consumers, of an equable quality and pressure. The carbureter A is provided with upwardly-extending pipes I and J. I is the filling-pipe, and J is the vent-pipe. This vent-pipe has an interior rod, *d*, connected with a float, *i*, in the carbureter. In filling the carbureter, the rod *d* will be raised by the float *i*, and indicate the quantity of gasoline in the tank.

If the quality of the gas at any time should indicate that the air was either too warm or too cold, the valves delivering the air may be both partially open, more or less, so that hot and cold air, mixed or separate, may be furnished the carbureter, according to the quality of the gas desired to be manufactured.

If the carbureter is filled with fresh light-gravity gasoline, and the air becomes saturated with vapor, condensation will always ensue under such circumstances, and the excess of vapor—that is, the amount of gasoline that the air could not carry—is deposited in the drip-carbureter G, and not picked up until the gravity of the gasoline is reduced by evaporation. Then the imperfectly-carbureted air from the main carbureter A passes down-

ward and onward into the drip-carbureters G, and picks up or carries along the gasoline that had been deposited by condensation.

By this means, and the use of the warm air-heater, the quality of the gas is kept uniform, and may be carried very long distances.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The gas apparatus, substantially as described, consisting of a main elevated carbureter, provided with the air-heater and valves, in combination with the devices for carrying the gas at long distances and preserving its illuminating power, as herein set forth.

2. In combination with the heater C, with valve *b*, air-pipe B, with valve *a*, the elevated main carbureter A and delivery-pipe E, one or more combined drip-tanks and carbureters G, arranged in connection with said pipe, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of November, 1876.

ALONZO C. RAND.

Witnesses:
HARVEY W. BROWN,
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