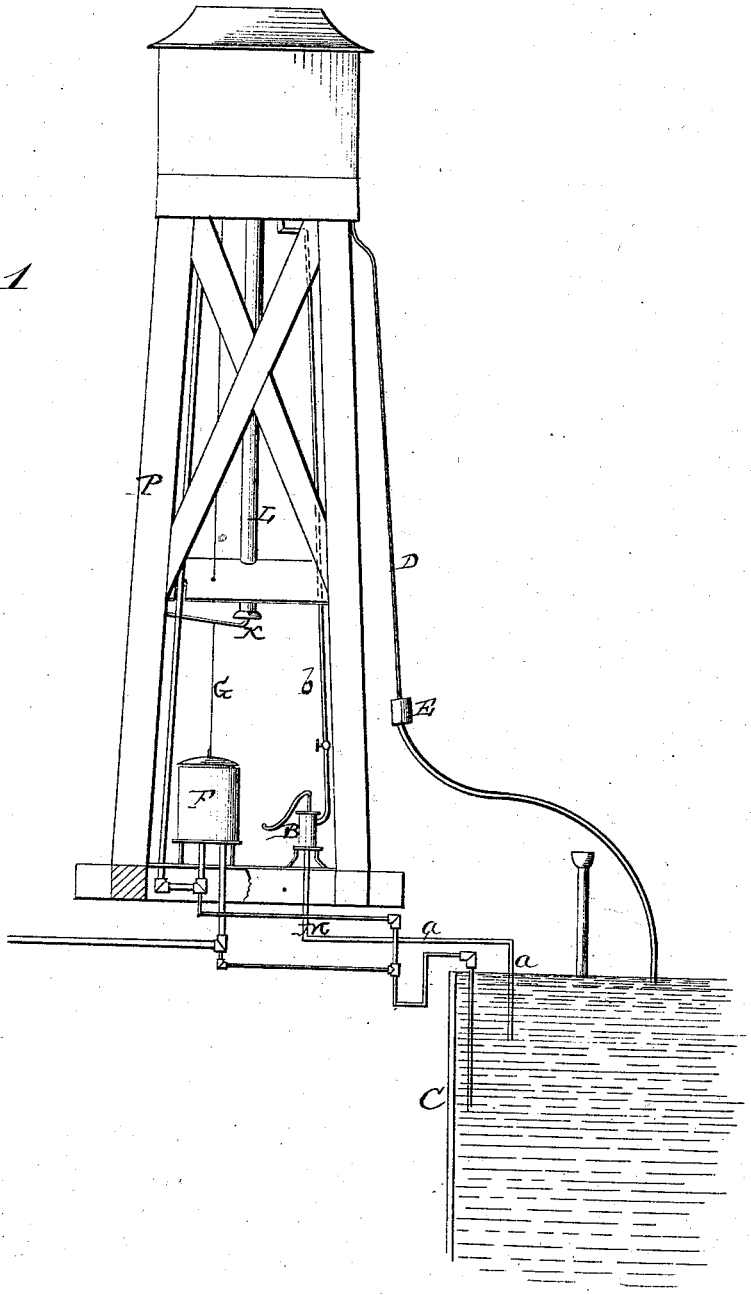
3 Sheets—Sheet 1.

A. C. RAND.

CARBURETING APPARATUS.

No. 169,843. Patented Nov. 9, 1875.

Fig 1



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3 Sheets—Sheet 2.

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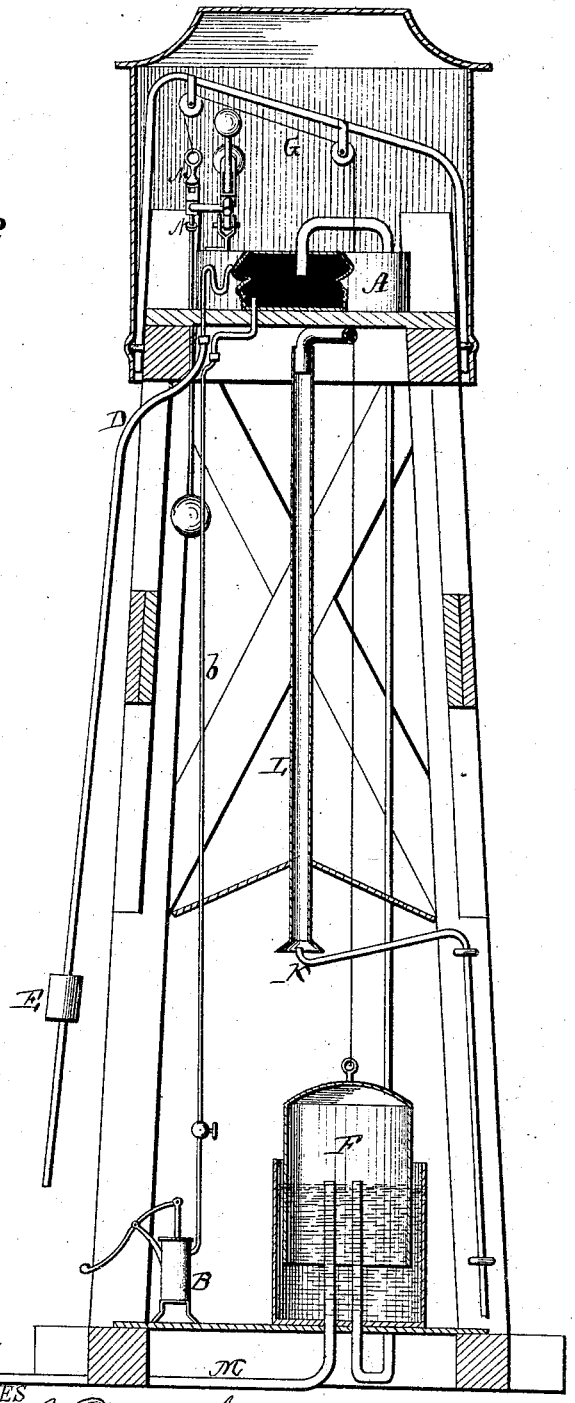
Fig 2



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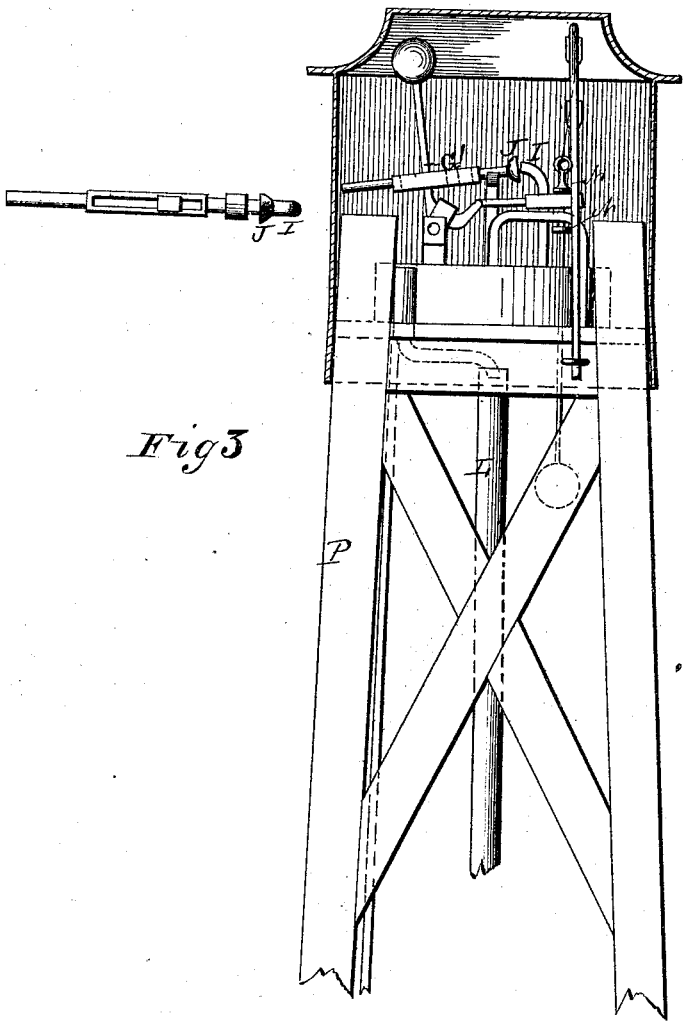

Fig 3

WITNESSES

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UNITED STATES PATENT OFFICE.

ALONZO C. RAND, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN CARBURETING APPARATUS.

Specification forming part of Letters Patent No. **169,843**, dated November 9, 1875; application filed October 4, 1875.

To all whom it may concern:

Be it known that I, ALONZO C. RAND, of Minneapolis, in the county of Hennepin and in the State of Minnesota, have invented certain new and useful Improvements in Gas-Machines; 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.

My invention relates to that class of gas-machines known as carbureters; and it consists in the construction and novel arrangement of a derrick, carbureter, gas-holder, pump, and store-tank, an automatic arrangement for air-inlet, and hot-air tube for controlling the temperature of gasoline in the carbureter, 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 drawings, in which—

Figure 1 is a side elevation of my gas-machine. Figs. 2 and 3 are vertical sections of the same.

A represents the carbureter, supported upon a derrick, P. B is a pump located in the lower portion of the derrick, and connected by pipe *a* with the tank C, and by a pipe, *b*, with the carbureter. From the carbureter an overflow-pipe, D, passes downward to the tank C, and in this pipe is formed an enlargement, E. F is an ordinary gas-holder, from which a cord or chain, G, extends upward over suitable pulleys in the top of the derrick, and having a weight, H, attached to its other end. I is the air-inlet pipe to the carbureter. J is a horizontally-operating valve for opening and closing the air-inlet pipe I. L is a hot-air pipe, with gas-jet K at its lower end.

The object in placing the carbureter in the top of the derrick is to utilize the difference in the specific gravity of the gasoline vapor mixed with atmospheric air, and a column equal in height of air unmixed with vapor. A gas-manufacturing apparatus might be constructed to work for a short time without the use of a gas-holder; but as the temperature of the gasoline is so greatly reduced by evaporation, and as the quantity of vapor mixed with the air depends upon the temperature of both the gasoline and air, it, of course, becomes apparent that the temperature must be kept as equable as possible, in order to insure uniformity in quality of the gas. This I accomplish by having the holder so connected with the carbureter as to stop up the air-inlet to the carbureter when the holder is filled, and not opening it until the holder is nearly empty, so the heat lost by evaporation in filling the holder may be restored by the surrounding air, or may be given back by the pipe extending from the room below up to the carbureter in the top of the derrick, the heat being furnished by the gas-jets shown, the interval of time being sufficient to restore the lost heat.

By this process the quality of gas is uniform, being made in batches, and no machinery is used to force the air. The gas, being the heavier, passes downward and draws the air into the carbureter.

The quantity of gas that can be made by an apparatus of this kind will be very great, and it is the purpose of this invention to supply a large number of buildings, or towns, with gas of a reliable quality, and with no manual labor save that required occasionally to pump up the gasoline into the carbureter.

The pipe M, under ground, connected to the outlet for gas, is the drip or condensation pipe. All the condensation returns to the store-tank through this pipe.

The operation of the apparatus is as follows: The carbureter A having been supplied with gasoline by the pump B from the tank C, the quantity supplied being a known quantity—that is, it is pumped into the carbureter until the overflow-pipe D indicates, by the passage of the gasoline back into the tank, that it is filled, (this is determined by the noise made by the running of the gasoline into the enlargement E,)—the gas at once passes downward into the holder F, which is counterbalanced by the cord or chain G and weight H, and hence the weight or gravity of the gas will raise the holder, which, when it has attained the desired height, will close the air-inlet I with the valve J, and thus arrest the production of gas. The removal of the valve is accomplished by the holder reaching its

minimum depth. Then the process of manufacturing the gas recommences, and so it intermits while the gas is being consumed.

If the gas becomes poor through the lack of an adequate supply of gasoline, or if the loss of heat by evaporation of the material is greater than the supply of heat during the intermission, then the gas-jets K may be ignited under the hot-air pipe L, and the heat will ascend the pipe and warm the carbureter, or at least supply the heat lost. The outlet-pipe from the gas-holder grades to the tank, so that any condensation may return to the supply-tank.

It is believed that the cheapness of this contrivance will enable many to use this gas where the great expense of the older contrivances prevents their use.

The great capacity for making gas by this apparatus will enable clubs to build these works for a supply to all, and thus make the individual expense a merely nominal amount.

The lower part of the derrick as well as the upper part may be inclosed, if desired.

The pipe L is to be provided with a damper, so that the heat from the lower part or room may be prevented from passing upward or not. This pipe may be double, with an air-space between the pipes that may, in cold weather, be closed, so that the heat will not radiate in its upward passage; or in warm weather the space may be opened and a circulation established to cool the carbureter, if required.

For opening and closing the valve J I use two buttons, N N, attached to the cord or chain G, and operating on a weighted elbow-lever, G′, passing through the slotted arm, to which the valve J is fastened. The distance the buttons N are placed apart is the measure of the rise and fall of the holder. As the holder falls the upper button carries the lever downward, and the weighted end of the lever, after passing by the center, tilts forward and against the valve handle or arm in the slot, and closes the valve. The lever remains in that condition until the holder settles to the fixed point, when the lower button draws the lever back and past the center, when it strikes the valve-handle back, and thus opens the valve.

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

1. The combination of the portable derrick P, provided with a carbureter, A, on its top, the gas-holder F, and pump B on the bottom of the derrick, all constructed and arranged substantially as set forth.

2. In combination with the carbureter A on top of the derrick P, the overflow-pipe D, provided with the enlargement E, and connected with the tank C, whereby the desired quantity of gasoline pumped into the carbureter is indicated, substantially as set forth.

3. The combination of the carbureter A, elevated upon derrick P, pump B, tank, C, holder F, pipes *a*, *b*, and D′, lever G′, valve J, air-pipe I, and cord G and weight, all constructed and arranged to operate substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of September, 1875.

ALONZO C. RAND.

Witnesses:
W. W. RAND,
LUELLA S. RAND.