

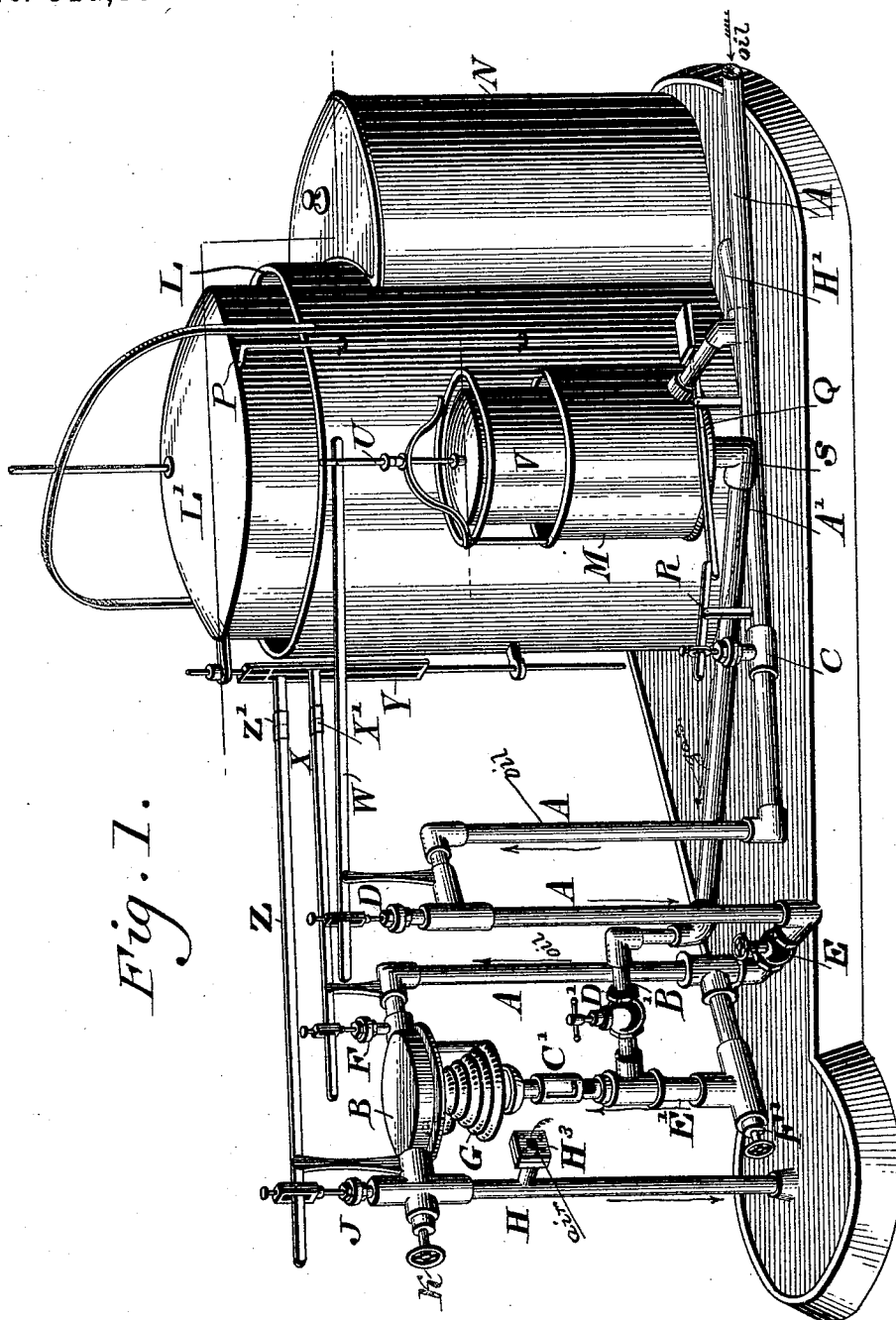
(No Model.)

2 Sheets—Sheet 1.

H. F. SMITH.
GAS GENERATOR.

No. 517,398.

Patented Mar. 27, 1894.



WITNESSES :

Q. F. Nagle.
L. Douville.

INVENTOR
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ATTORNEY.

(No Model.)

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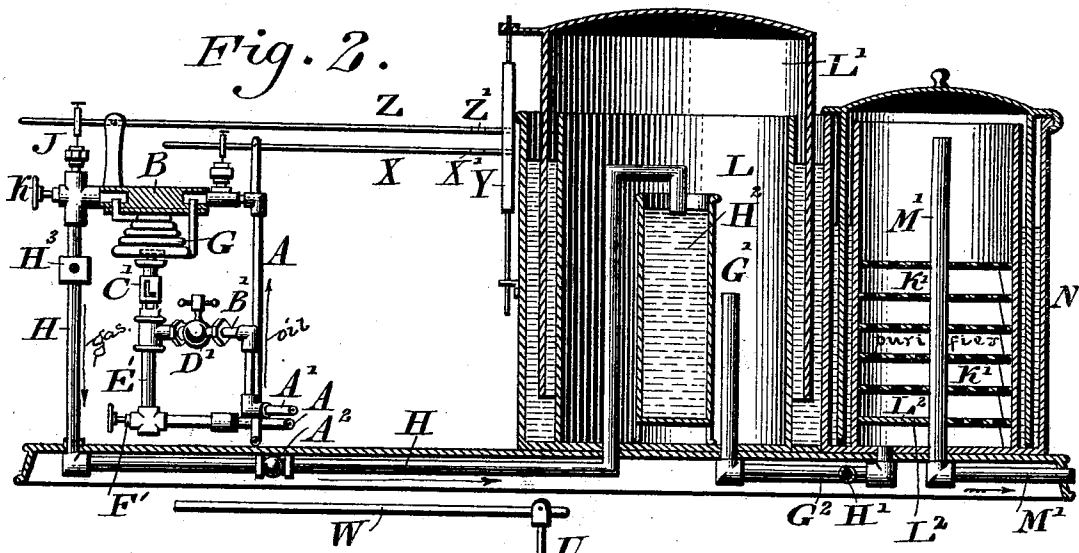


Fig. 7.

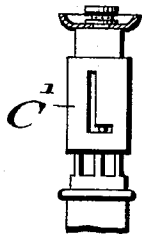


Fig. 8.

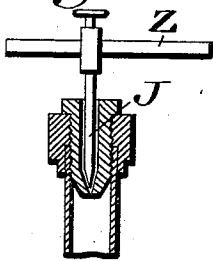


Fig. 3 Fig. 6.

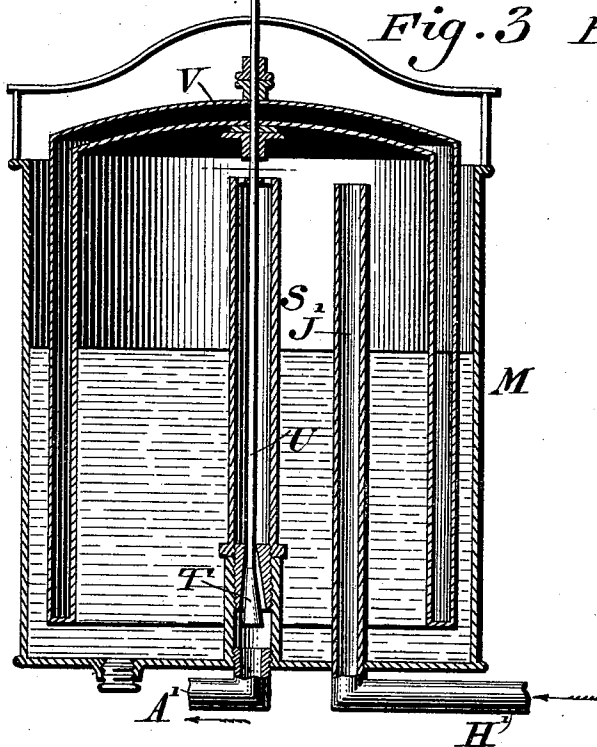


Fig. 5.



WITNESSES:

O. F. Tagle.
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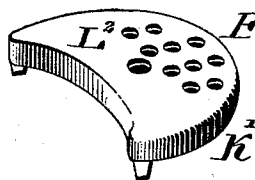


Fig. 4.

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UNITED STATES PATENT OFFICE.

HARPER F. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF FIVE-EIGHTHS TO WILLIAM F. McCULLY AND GEORGE McGOWAN, OF SAME PLACE.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 517,398, dated March 27, 1894.

Application filed May 5, 1892. Serial No. 431,920. (No model.)

To all whom it may concern:

Be it known that I, HARPER F. SMITH, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Gas-Generators, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a gas generator formed of parts of novel construction and operation, as will be hereinafter set forth.

Figure 1 represents a perspective view of a gas generator embodying my invention. Fig. 2 represents a longitudinal vertical section on a reduced scale. Fig. 3 represents a vertical section of the gas governor on an enlarged scale. Fig. 4 represents a perspective view of one of the trays or diaphragms of the purifier. Fig. 5 represents a side elevation of an attachment to the float of the gasometer. Fig. 6 represents a top view of a tube or pipe within the governor. Fig. 7 represents a view of the burner for heating the vaporizer of the apparatus. Fig. 8 represents a vertical section of one of the valves, preferably a needle valve.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates a pipe leading from the place of supply of oil as employed for the generation of the gas, the same being connected with a retort B, and being in communication therewith, said pipe having in the length thereof the valves C, D, E, and F. Connected with opposite ends of the retort B is a coil G, the discharge end of said retort being connected with a gas-conveying pipe H, said pipe being provided with valves J and K. The pipe H is continued below the base of the generator and passed into the gasometer L.

M designates the gas governor and N designates the gas purifier, said parts being properly arranged in relation to each other and to the gasometer. Connected with the side of the float of the gasometer is a depending arm P which is guided in ways on the outer side of the gasometer, and whose lower end is adapted to abut in its downward movement against the lighter end of a pivoted lever Q, which engages with a lever R, one limb of which is connected with the valve C.

Within the governor M is a pipe S, and at or near the base thereof is a valve T, whose seat is within said pipe, said valve having a stem U which is secured to a float V of the governor and having its upper end connected with a lever W which is properly fulcrumed and connected with the valve D.

X designates a lever which is properly fulcrumed on the apparatus and has one end connected with the slotted frame Y which is attached to the float L' of the gasometer L.

Z designates a lever which is connected to said frame Y and fulcrumed on the apparatus and engages the valve J.

Leading from the governor M is a pipe A' which is connected with a branch B' of the pipe of a burner C', whereby the coil G may be heated by means of gas, said branch B' having a valve D' for regulating the supply of gas to said burner. Connected with the base of said burner is a pipe E' which is connected with the pipe A, whereby oil may be supplied to said burner, said pipe E' having a valve F' for regulating the supply of oil to the burner, it now being evident that either oil or gas, may be supplied to said burner. When using oil, valve D' is closed and F' is opened. When using gas, valve F' is closed and valve D' is opened.

Within the gasometer L is a pipe G' which is in communication by a pipe G² with the purifier N. Connected with said pipe G² is a branch H' which is connected with a pipe J', which enters and communicates with the governor M. Within the purifier N is a series of perforated trays or diaphragms K', the lower diaphragm having its perforations at one side thereof so as to leave a solid wall L² as will be seen in Fig. 4, said solid part being above the discharge end of the pipe G² at the base of the purifier N.

M' designates a pipe within the purifier, said pipe passing outside of the same, and serving to direct the gas when in proper condition to the place of service.

The levers X and Z are formed in sections connected by the couplings X', Z', so as to permit the ready removal and application of said levers.

The operation is as follows: Oil of a nature suitable to be converted into gas is directed into the pipe A, and it reaches the receiving

end of the retort B, from whence it passes through the coil G and enters the discharge end of said retort. As the coil and retort are subjected to the heat of the burner C', the oil is vaporized or converted into gas which is directed into the pipe H and conveyed into the gasometer L, the discharge end of said pipe dipping into the cooler and washer or scrubber H² in said gasometer. The gas then enters the pipe G' and reaches the purifier N, where it is subjected to the action of iron-sponge lime or other suitable purifying material or substances therein, after which it is discharged by the pipe M' and directed to the place of service. When the gas enters the purifier, it is impacted against the solid part L² of the lower diaphragm K', and thus deflected laterally toward the openings in said diaphragm. The sections of the casing of the purifier N are sealed with water and oil or other liquid to prevent evaporation of the water. Some of the gas before entering the purifier enters the pipe H' and so reaches the governor M, the float of which rises and falls, due to the variations of the pressure of the gas. This action is communicated by the lever W to the valve D, whereby the latter is operated to adjust the flow of oil through the pipe A, or entirely cut-off the same when the pressure is great. The gas that enters the pipe A' reaches the burner through the branch B', while the oil that leaves the pipe A and enters the pipe E, reaches said burner for purposes of combustion, in order to heat the coil G and retort, as has been stated. Should the pressure in the gasometer L increase to a material extent, the frame Y which is carried by the float of the same, operates the levers X and Z, whereby the valves F and J are operated and the supply of oil to the retort B and flow of gas from the same are cut off, said valves however, rising and falling with the motions of the float of the gasometer, thus adjusting the supply of oil, and flow of gas to and from the retort. The arm P also follows the motions of the float of the gasometer and thus the levers Q and R cause the operation of the valve C to stop the flow of oil through the pipe A or to cut off the same as may be occasioned by the dropping of the gasometer, should the flame of the burner cease. The lower part of the pipe H has a check valve A² therein for preventing the return of gas from the gasometer or back pressure. The upper part of said pipe H is provided with an inlet H³ for admission of air to the gas as generated. The valve E in the pipe A admits of cutting off the supply of oil by hand. The valve K intermediate of the retort B and pipe H admits of the cutting off of the gas by hand. The valves D' and F' permit gas and oil respectively to be cut off by hand from the burner. It is noticed that the supply of oil to the retort may be automatically shut off or regulated by either the valves C or D, as governed by the action of the floats of the gasometer and governor respectively, and the

supply of gas to the burner controlled by the valve D', and the supply of oil to the said burner by the valve F' thus readily permitting the heating of the retort by either the oil or gas, as may be necessary.

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

1. In a gas generator, a vaporizing retort a gasometer, an arm connected with the float thereof, in combination with the oil-supply pipe, a valve on said supply pipe, a governor, a lever connected with said governor and valve, and an additional valve on said supply pipe which is adapted to be operated by said arm when the float drops, substantially as described.

2. In a gas generator, a gasometer, a retort, an oil supply pipe leading to said retort and having a valve therein, a vapor pipe leading from said retort to said gasometer, a governor communicating with said gasometer, and provided with a float, and a lever connected with and operated by the movements of the float of the said governor, said lever being connected with and operating said oil supply valve, said parts being combined substantially as described.

3. In a gas generator, a gasometer, a retort, an oil supply pipe for said retort, a vapor pipe leading from said retort to said gasometer, controlling valves in said oil and vapor pipes respectively, a slotted frame connected with the float of said gasometer and rising and falling with the same, and levers pivoted to supports on said oil and vapor pipes, and connected with the said oil and vapor pipe valves and having ends moving in said slotted frame, said parts being combined substantially as described.

4. In a gas generator, a gasometer, a retort, an oil supply pipe leading into said retort, and having a controlling valve therein, a vapor pipe leading from said retort to said gasometer, and having a controlling valve therein a governor communicating with said gasometer, a slotted frame connected with the float of the gasometer, levers connected with the said controlling valves of the oil and vapor pipes, and having ends in the slots of said frame, a burner, an oil branch pipe from said oil supply pipe leading to said burner, a gas pipe leading from said governor to said branch pipe, and valves in said branch pipe and said gas pipe, said parts being combined substantially as described.

5. In a gas generator, a vaporizing retort an oil-supply pipe, a valve on said pipe, and a governor in combination with an additional valve on said supply pipe, and means on the float of the gasometer for operating said additional valve when said float drops, substantially as described.

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Witnesses:

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A. P. JENNINGS.