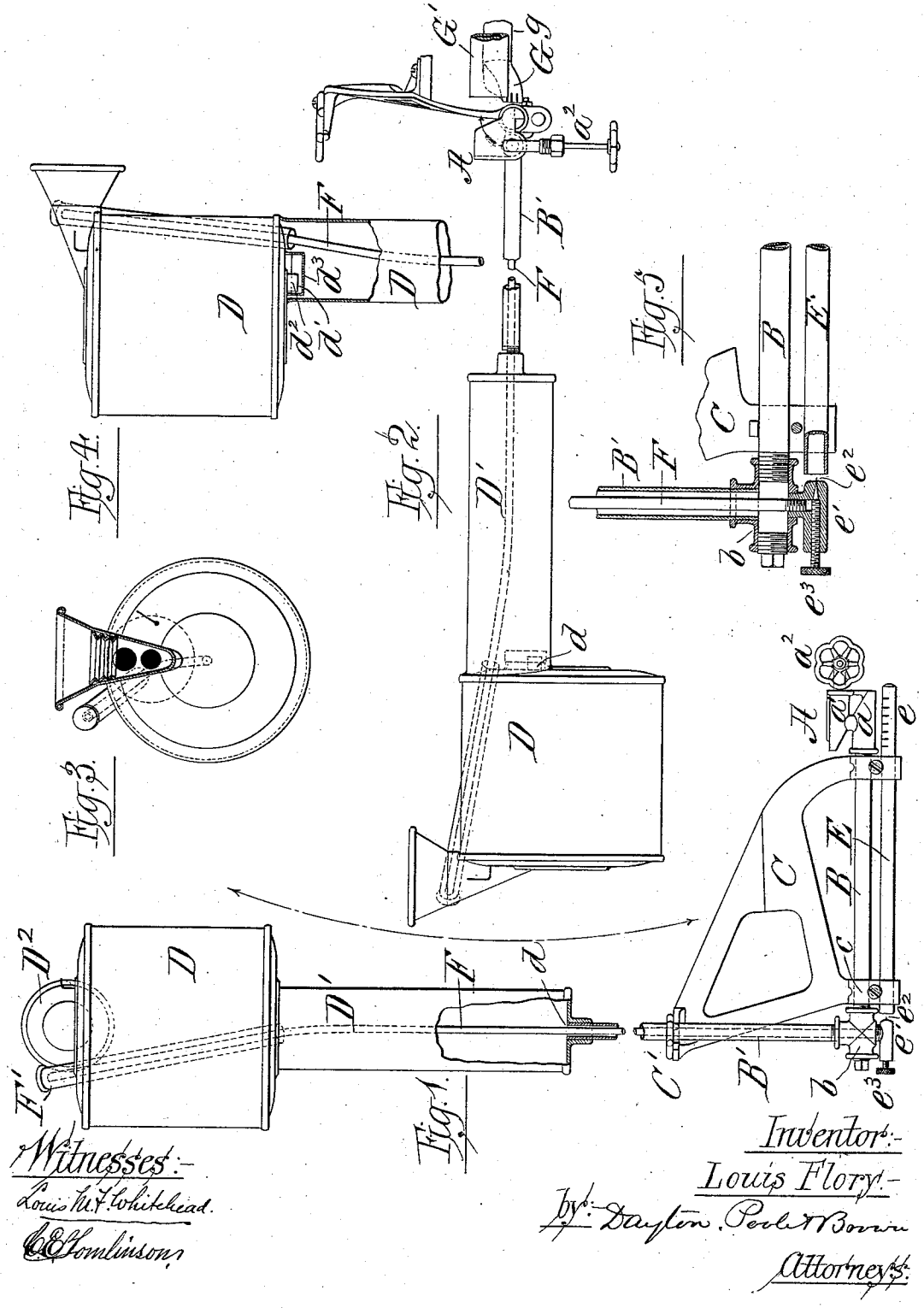
(No Model.)

L. FLORY.

INITIAL HEATER FOR VAPOR GENERATORS.

No. 532,148. Patented Jan. 8, 1895.



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UNITED STATES PATENT OFFICE.

LOUIS FLORY, OF CHICAGO, ILLINOIS.

INITIAL HEATER FOR VAPOR-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 532,148, dated January 8, 1895.

Application filed March 26, 1894. Serial No. 505,115. (No model.)

To all whom it may concern:

Be it known that I, LOUIS FLORY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Initial Heaters for Vapor-Generators; and I 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, which form a part of this specification.

This invention relates to means for initially heating vapor generators of hydrocarbon vapor stoves and other vapor burning apparatus, and has more especial reference to that class of initial generator-heaters in which carbureted air is employed as the heating agent.

A primary object of the invention is to provide a simple construction by which a definite and sufficient amount of carbureted air may be furnished for the purpose with certainty and safety, and a further object of the invention is to combine the carbureting device with a "lay-down" liquid tank in such manner that the depression and subsequent elevation of the tank will insure the production of the carbureted air.

In the accompanying drawings which illustrate one form of the invention in connection with a lay-down liquid supply tank, Figure 1 is an elevation, embracing a vapor generator, liquid supply tank and pipe, and carbureted air pipe and burner, the supply tank being shown in its raised position and a portion of the carbureting chamber and of the liquid pipe being broken away to show a desirable arrangement of the carbureted air pipe. Fig. 2 is a side view of the parts shown in Fig. 1, the liquid supply tank being depressed. Fig. 3 is a top view of the liquid tank in its lowered position, showing the relative position of the air pipe. Fig. 4 is a side view of the liquid tank and its connected carbureting chamber, showing, by removal of part of the latter, the dripping device by which the former discharges thereinto and the arrangement and direction of the air pipe and its shield. Fig. 5 is an axial section of the fittings by which the liquid and air pipes are connected.

A represents a vapor generator which may be of any approved form. As it is here shown it consists of two communicating chambers a and a', the lower one a being connected with the horizontal portion, B, of the liquid pipe, and the upper one a' having an outlet controlled by the needle valve a^2. The liquid pipe is composed of said horizontal part B and a vertical portion B′, the former being supported rotatively in bearings c c of a suitable frame C which also has a latch C′ engaging with the vertical part B′ to hold the latter upright. To the upper end of the liquid pipe and communicating therewith is the liquid tank, composed of the two communicating chambers D and D′, the former being above the latter when elevated, and principally below the latter when lowered, as seen in Fig. 2. The chamber D is provided with a feed funnel D^2 in the usual position. The lowermost chamber D′ of the supply tank connects at its bottom with the top of the liquid pipe, as shown at d, and the two chambers D and D′ communicate through an opening at d' so situated as to allow the contents of the chamber D′ to flow into the chamber D when they are lowered. The opening d' is through a short, depending pipe d^2 the lower end of which opens in a shallow overflow cup d^3 so that when the chambers are raised and the liquid flows back from the chamber D into the chamber D′ the opening d' will be sealed and air cannot pass from D′ to D.

E is an air pipe arranged beneath or adjacent to the liquid pipe B and terminating in any suitable burner e from which the flame may impinge upon the generator A. As here shown the burner e is formed of the pipe E itself by closing its end and cutting a series of transverse slits in the pipe to emit the flame jets. The opposite end of the pipe E is open to the atmosphere near the elbow b into which the members B and B′ of the liquid pipe are tapped, and with said elbow is connected a fitting e' provided with an orifice e^2 directed toward the adjacent open end of the air pipe E, as indicated in Figs. 1 and 5. Said orifice may advantageously be provided with a valve e^3, as also shown in said Figs. 1 and 5, but said valve is not absolutely necessary. Communicating with the orifice e^2 is a carbureted air pipe F which descends through the liquid pipe B′ and the elbow b and is screwed tightly into the nipple which

connects the fitting e' with said elbow so that liquid is excluded from the air passage. The pipe F extends to a point above the highest level of liquid in the supply tank whether said tank is raised or lowered, and the upper open end of said pipe is in communication with the top of the chamber D′ of said tank. For this purpose it is inclosed in a larger pipe or tube F′ which has its upper extremity tightly capped above the extremity of the pipe F and its lower end open within said chamber D′, as shown in Fig. 4, the tube F′ being inclined properly to bring its outer end at a safe elevation above the level of the liquid in the tank both when the tank is in its elevated position and when it is depressed. As here indicated the tube F′ passes through both the side and bottom of the upper chamber D, but this particular arrangement, while convenient and secure, is obviously not necessary.

From the above description it will be understood that upon the lowering of the liquid pipe B′ and the supply chambers which it supports, the chamber D′, if previously full of liquid, will discharge its contents into the chamber D, leaving the chamber D′ full of air. Upon the elevation of the pipe B′ and the chambers D D′, the liquid will tend to flow from the upper chamber D into the chamber D′ but will be opposed by the presence of air in said chamber D′. This air being prevented escape through the passage d' by the seal cap d^3 has outlet only through the pipe F and the orifice e^2 whence it passes into the air pipe E and to the burner e. As the liquid drips into the chamber D′ it gives off its vapor to the air in said chamber, carbureting the latter, and as said carbureted air passes from the orifice e^2 into the open end of the pipe E, it carries atmospheric air with it, making a suitable inflammable mixture for emission at the burner e. When the air is exhausted from the chamber D′ the burner e is of course self-extinguished and can be put in operation again only by repeating the operation of lowering and raising the liquid pipe and leaving it down long enough to allow the chamber D′ to discharge into the chamber D. The size of the chamber D′ may be made suitable for the supply of any desired quantity of carbureted air, and therefore of enough to insure the initial heating of the generator A. The generator, after being initially heated, is supposed to be kept hot by any of the usual devices for that purpose, an auxiliary burner G being shown in Fig. 2, taking vapor from a pipe g which may be supposed to lead from a pipe G′ into which vapor is sent from the generator A through the needle valve a^2.

It is apparent that the liquid chambers D and D′ may be employed in connection with an initial heating burner without also employing them as a source of liquid supply, and it is the intention to so broadly secure the invention by the appended claims that it may be covered whether used with or without the connection of the said chambers, or their equivalent, with a liquid pipe delivering to the generator. Many formal variations and mechanical changes may also be made without departure from the invention.

I claim as my invention—

1. In combination with a vapor generator and a burner adjacent thereto, a liquid tank comprising two communicating chambers and adapted to be moved to bring said chambers to different relative elevations whereby the liquid may be caused to flow from either chamber to the other, and an air duct leading from the air space of one of the chambers to the burner and means for preventing free back flow of air from said air space to the other chamber.

2. In combination with a vapor generator and a burner adjacent thereto, a liquid tank comprising two communicating chambers adapted to be practically reversed in position whereby the liquid may be caused to flow alternately from one to the other, the passage giving communication between the chambers having a liquid seal whereby back flow of air is prevented in one direction, and an air duct leading to the burner from the air space of the chamber from which back flow of air is thus prevented.

3. In combination with a vapor generator and a burner adjacent thereto, a "lay-down" liquid tank comprising two communicating chambers one of which is above the other when the tank is in its elevated position and practically below the other when the tank is in its lowered position, a liquid pipe leading to the generator from the bottom of the chamber which is lowermost when the tank is raised, and an air duct leading from the air space of said last mentioned chamber to the burner, means being provided for preventing free back flow of air from said chamber to the other.

4. In combination with a generator having a horizontal portion B of a liquid pipe leading thereto, and a burner adjacent to the generator having an open pipe E leading thereto, a liquid tank comprising two communicating chambers D D′ arranged one above the other when elevated and adapted to permit the flow of liquid from D′ to D when lowered, a vibrating portion B′ of the liquid pipe connected with the bottom of the chamber D′ and with the horizontal portion of said liquid pipe, a tube F′ opening at its lower end into the top of the chamber D′ and extending at its upper closed end above the liquid level, and an air pipe F having its upper open end projected into the said tube and its lower end terminating at an orifice which is opposite the opening of the burner pipe E when the liquid tank is elevated.

5. In combination with a vapor generator A provided with an inlet pipe B and an initial heating burner provided with an inlet E, a vibrating liquid pipe B′ coupled with the

pipe B by means of an elbow b, an apertured fitting e' attached to the elbow and provided with a valve, e^3, a liquid tank composed of the communicating chambers D and D′ of which the chamber D is connected at its lower end with the liquid pipe B′, an air pipe F passing from the aperture of the fitting e' through the pipe B′ and through the chamber D′ and a tube F′ closed at top and opening at its lower end into the top of said chamber D′ and embracing the upper open end of said pipe F, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

LOUIS FLORY.

Witnesses:
M. E. DAYTON,
ALBERT H. GRAVES.