(No Model.)

O. W. BENNETT.

CARBURETING APPARATUS.

No. 362,197. Patented May 3, 1887.

FIG. 1.

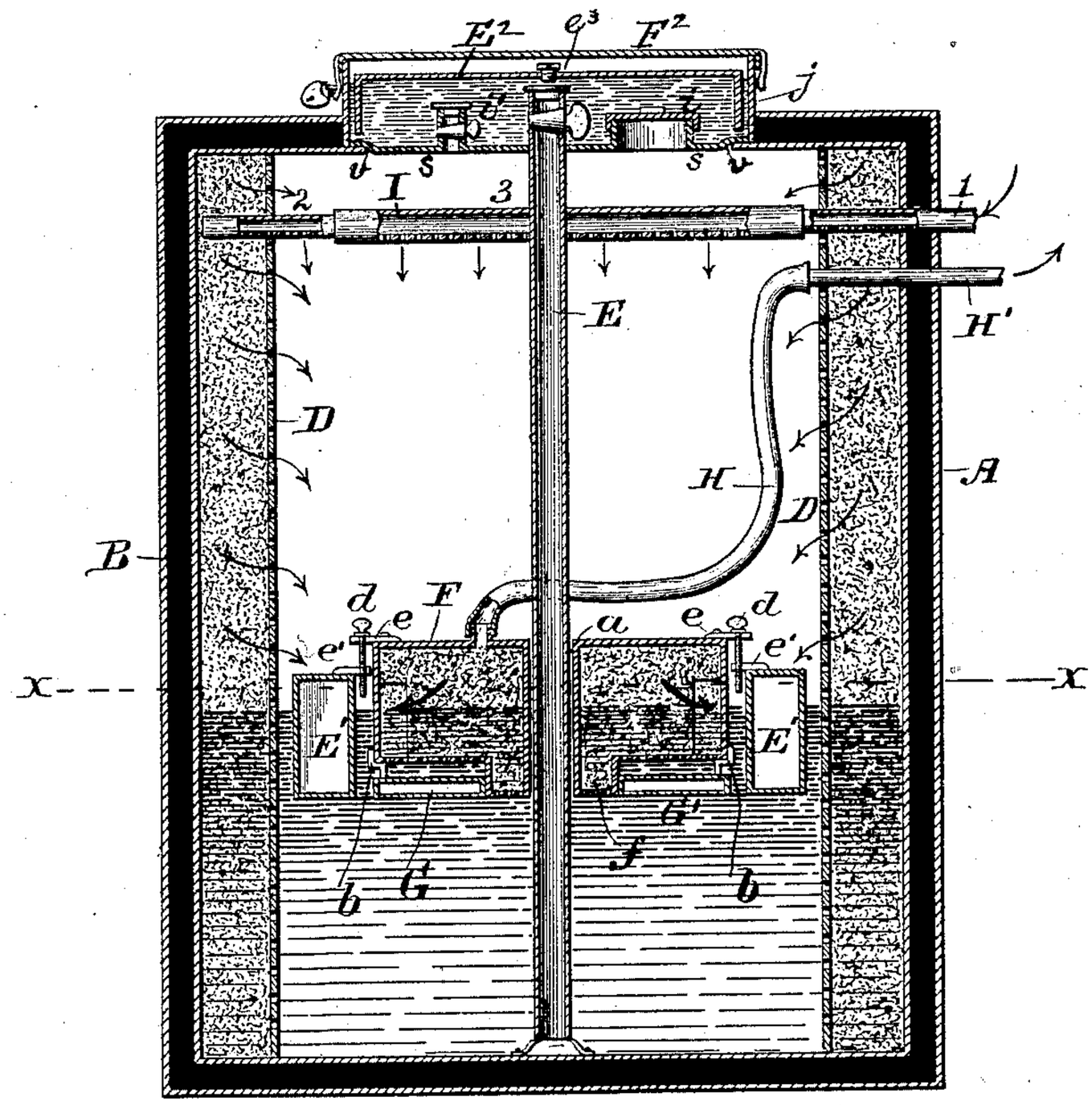
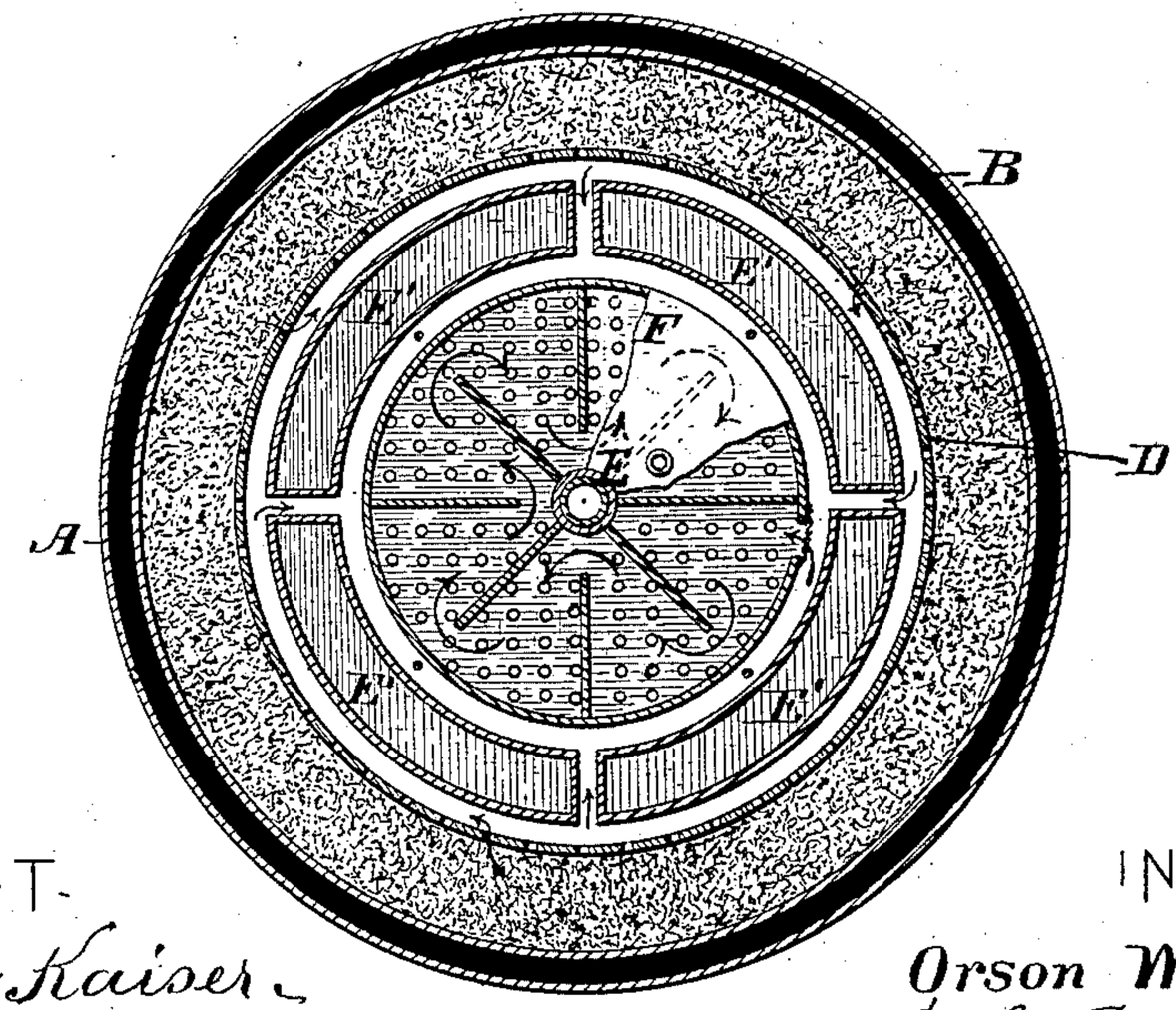


FIG. 2.



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ORSON W. BENNETT, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE STANDARD GAS MACHINE AND PORTABLE GAS LAMP COMPANY, OF SAME PLACE.

CARBURETING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 362,197, dated May 3, 1887.

Application filed March 1, 1886. Serial No. 193,549. (No model.)

To all whom it may concern:

Be it known that I, ORSON W. BENNETT, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Carbureting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to apparatus for generating and enriching illuminating-gas, and particularly to that class in which there is a floating generating or enriching chamber through which the air or gas must pass in the process of admixture.

The object of my invention is to produce an apparatus of this character which will be of simple, inexpensive, and durable construction, effective and complete in its operation, and safe and reliable in use; and the improvements which I have made for carrying out these objects will be specifically embraced in separate and distinct clauses of claim.

I will now proceed to describe my invention in connection with the accompanying drawings, in which—

Figure 1 is a vertical central section showing the interior construction and arrangement of a carbureting apparatus embracing my improvements. Fig. 2 is a horizontal section taken on a plane denoted by the line *x x*, Fig. 1, the absorbent being removed from the floating generating-chamber F.

Like letters of reference, wherever they occur, designate corresponding parts in the different figures.

The letter A designates the main chamber or vessel, which is composed of an inner and an outer casing, the inner being of copper and the outer preferably of galvanized iron and having an intermediate packing, B, of a suitable non-conductor of heat—for example, ashes or asbestus, or a mixture of both.

D designates another and interior perforated cylinder or wall, also preferably of galvanized iron or wire-gauze. Between this last-named cylinder and the main vessel A is interposed a packing of absorbent material—for example, asbestus and excelsior. The perforations permit the access of oil to the absorbent material, which becomes wholly saturated by capillary attraction. These perforations also permit the free evolution of vapor of hydrocarbon into the upper or open portion of the chamber. I secure on the head of the main vessel (preferably by means of soldering) a suitable water-seal receptacle. This seal is formed centrally upon the top of the case by means of a raised water-tight cap, which incloses the upper end of the valved feed-tube, the valved vent-tube, and a closed opening which affords access to the machine, so that the water in the cap will cover these open parts. The sealing-cap is protected by a hinged cover secured by a lock. By attaching the seal-holding receptacle to the head of the cylinder A, by means of a "solder-joint," the same can be readily removed by melting such joint when access is desired to the interior parts for their removal, renewal, or repair.

E designates the feed-tube or that through which hydrocarbon is supplied to the apparatus. This tube is arranged to extend the entire depth of the vessel, and its lower end is open to permit the hydrocarbon to flow into the chamber. It is preferably located centrally in the chamber and has its lower end secured in a suitable frame or socket to prevent lateral movement, and its upper end projecting into the water-seal, where it is provided with a suitable stop-cock.

The floating generating-chamber F is made of a suitable sheet of metal divided internally, with vertical partitions extending radially from the central tube to the outer wall, and having openings occurring alternately at the central tube and outer wall, one of said partitions being solid, so that the gas is compelled to take a circuitous route (as indicated by the arrows) in passing from the inlet to the outlet, which are made upon opposite sides of the solid partition. The bottom of the chamber is made of perforated sheet metal or wire-gauze to permit the free flow of oil to the absorbent material with which the chamber is filled, and is provided on its bottom with the extension *f*, which is filled with absorbent and extends

downward through the central opening of the float G, its bottom being perforated and on a level with the under side of said float. The floating-chamber is provided with a central tube, *a*, through which the feed-tube E passes, the latter serving as a guide and means to retain the chamber in proper position. The chamber is supported upon the liquid oil by means of floats, consisting, first, of a hollow liquid-tight sheet-metal disk, G′, having a central opening to allow it to move upon the central tube, E, and to permit of the passing through it of the extension *f* formed on the under side of the generating-chamber F, and, secondly, of hollow tight sheet-metal segmental portions E′, arranged around and adjustably secured to the generating or admixing chamber. The upper edge of the under float, G, is provided with a suitable number of studs or projections, *b*, upon which the generating or admixing chamber rests and which serve the double purpose of keeping the bottom of said chamber a little above the upper surface of said float, to permit the free flow of oil between the two, and of preventing lateral movement of the generating-chamber on the float and their consequent dislodgment from their proper position.

By means of the extension *f*, formed on the under side of the floating generating-chamber F and extending downward through the central opening in the float G, I am enabled to bring the perforated bottom of said extension *f* in contact with the bottom of the main chamber or vessel A, and thus absorb into said extension, and from it by capillary attraction up into the main generating-chamber F, the oil that would otherwise not be used, owing to the distance between the bottom of the float G and the under side of the chamber F. I have also found that a considerable portion, if not all, of the residuum which settles upon the bottom of the vessel A is sucked up into the extension *f*, and I thus save the enriching properties remaining in said residuum and the labor of its removal through the central tube, E.

The segmental floats are shown to be four in number; but it is obvious that any other suitable number may be employed, and they are secured to the sides of the generating-chamber F by means of adjusting-screws *d*, passing through lugs *e* and *e′*, secured upon the generating-chamber and floats, respectively, as shown, so that the floats are adjustable with relation to the generating-chamber, and the latter may be raised or lowered to extend the desired distance into the oil according to the gravity of the same. The adjusting-screw may be fixed as to its longitudinal movement in either of the lugs, so that the turning of the screw will move one with relation to the other.

The outlet of the generating-chamber is connected by means of a flexible or jointed tube or pipe, H, with a short tube, H′, passing through the walls constituting the main chamber.

The air or gas inlet to the main vessel consists of the perforated tube I, made of three telescoping sections, 1, 2, and 3. One of the shorter sections, 1, is fitted permanently in and passing through the wall at one side of the main chamber, and the other shorter section, which is movable upon the intermediate section, 3, projects into a socket or rest in the opposite side of the wall. By this arrangement the short section 2 may be slid upon the intermediate section, 3, and then said sections removed from the end of section 1, which will enable it to be removed for repair, cleaning, or for operations upon the other interior parts.

In the use of my apparatus the oil is fed through the central tube, E, until the required amount is supplied. By capillary attraction this will thoroughly saturate the absorbent packing in the walls of the main vessel and in the generating-chamber. The pipe 1 is then connected with a suitable source of supply of air or gas, which enters the upper open space above the oil, and is there partially admixed or enriched by the vapor from the walls and the surface of the oil itself. It then descends to the surface of the oil and finds its way through the spaces between the segmental floats and the generating-chamber, enters said chamber at the inlet at one side of the solid partition, passing entirely around and through the same in the circuitous path to the exit and into the flexible tube, from whence it is led through the tube H′ to the point of consumption.

The flexible tube may have an internal coiled-wire distending-tube to prevent it from accidentally bending at any point, and thus prevent the passing of the gas.

When desired, the residuum may be removed from the main vessel by connecting a suitable hose and exhaust-pump with the upper end of the feed-tube E.

The purpose of inclosing the carbureting-chamber in a wall of non-conducting material is to render it, in connection with the top water-seal, perfectly secure against fire; to increase the capillary attraction of the oil upward through the absorbent in the wall-compartment by maintaining the temperature within said compartment uniform with that in the chamber of the vessel, and thereby render the absorption of the oil by the absorbent uniform, while at the same time maintaining a uniform temperature within the entire closure and increasing the evaporating-surface. The introduction of the air or gas into the case-walls at the top causes it to pass down through the absorbent, all around the inner perforated cylinder, and out through its perforations into the chamber, giving a large evaporating-surface in addition to the air or gas entering the chamber direct at the top.

I have stated that the water-seal for the opening at the top of the case is made removable by melting the solder-joint, and it will be seen in Fig. 1 of the drawings that the center plate, *s*, contains said openings, and that the soldered joint is in this plate, where its edges

v are seen as lapping over and upon the edges of the center opening in the top plate of the vessel, through which center opening access to the interior of the vessel is effected. The seal itself is shown as being formed by the vertical ring-band *j*, rising from the top of the vessel around its top opening, and incloses the tubes *i* and *i'* and the upper end of the center tube, E, which passes through the soldered plate *s*, and, like the tubes *i* and *i'*, are closed by water tight caps. This inclosed space has a float-cover, E^2, provided with a vent, e^3, which permits the escape of the air which may be within the sealing-space when filled with liquid. This construction prevents the admission of air or the escape of gas from the vessel. A locked cover, F^2, is provided for the seal.

I know that vessels have been constructed in various ways for generating illuminating-vapor by the evaporation of volatile oils, in which the evaporating-chamber has an interior perforated wall and an absorbent material interposed between it and the inclosing-casing; that such vessels have been provided with interior mixing-chambers supported by floats upon the surface of the oil to be evaporated and connected with the gas-supply or service-pipe by flexible or yielding tube-connections, and that such a vessel has been provided with a central supply-tube and a liquid-sealing reservoir submerging the valve end of said supply-pipe and valved openings in said reservoir, and as to such matters I do not make any broad claim; but my improvements are directed to a construction by which the vessel is perfectly protected from danger of explosion; by which the supply-pipe is caused to supply directly both the vapor-generating chamber and the wall absorbent; by which the oil-supply, the air or gas supplying tubes, and the floating mixing-chamber are all made removable for cleaning, and by which the floating mixing-chamber is caused to maintain a central relation to the oil-supply pipe, and thereby kept at all times free of the inner perforated walls of the vessel; and, so far as I know and can find, the advantages incident to my improvements are not obtainable in any similar apparatus hitherto proposed and in use.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a carbureting-vessel and the central supply-tube, E, for the volatile liquid, seated upon a fixed bottom skeleton step or foot, of the chamber surrounding said tube, provided with absorbent material and having the perforated bottom center ring-extension and the float, as and for the purpose specified.

2. In a carbureting-vessel, the perforated inlet-pipe consisting of the sections 1, 2, and 3, the section 1 being fixed in and passing through the walls of the main vessel at one side and the sections 2 and 3 movable upon each other, the section 2 projecting into a socket or rest at the opposite side of the wall, substantially as described.

3. In combination, the central supply-tube, E, for the volatile liquid, seated upon a bottom skeleton step or float, a supply-pipe for air or gas having telescoping sections, a top water-seal having an inclosed solder-connection with the top plate of the vessel, and a floating mixing-chamber, the said pipes, mixing-chamber, float, and seal being constructed and adapted for removal from the casing of the apparatus, as described, for the purpose specified.

4. The combination of a gas or air enriching vessel having its walls formed of an outer double casing containing a non-conducting filling, an inner perforated cylinder, and an absorbent material placed between the non-conducting and the perforated walls, with a tube supplying hydrocarbon to the chamber of said vessel and a horizontal perforated pipe extending through said chamber and into the absorbent-containing compartments, whereby air or gas is introduced into said chamber at its top and into the surrounding absorbent-filled compartment, through the vertical walls of which it passes into said chamber, substantially as described.

5. In a gas and air enriching apparatus, substantially as described, the combination of the vapor-generating chamber F, having the extension *f* formed upon its bottom, and the float G, having a central opening to admit of the passage through it of the said extension, whereby its perforated bottom may be brought in contact with the bottom of the main chamber A, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ORSON W. BENNETT.

Witnesses:
F. L. BROWNE,
CARRIE M. SWETT.