(No Model.)

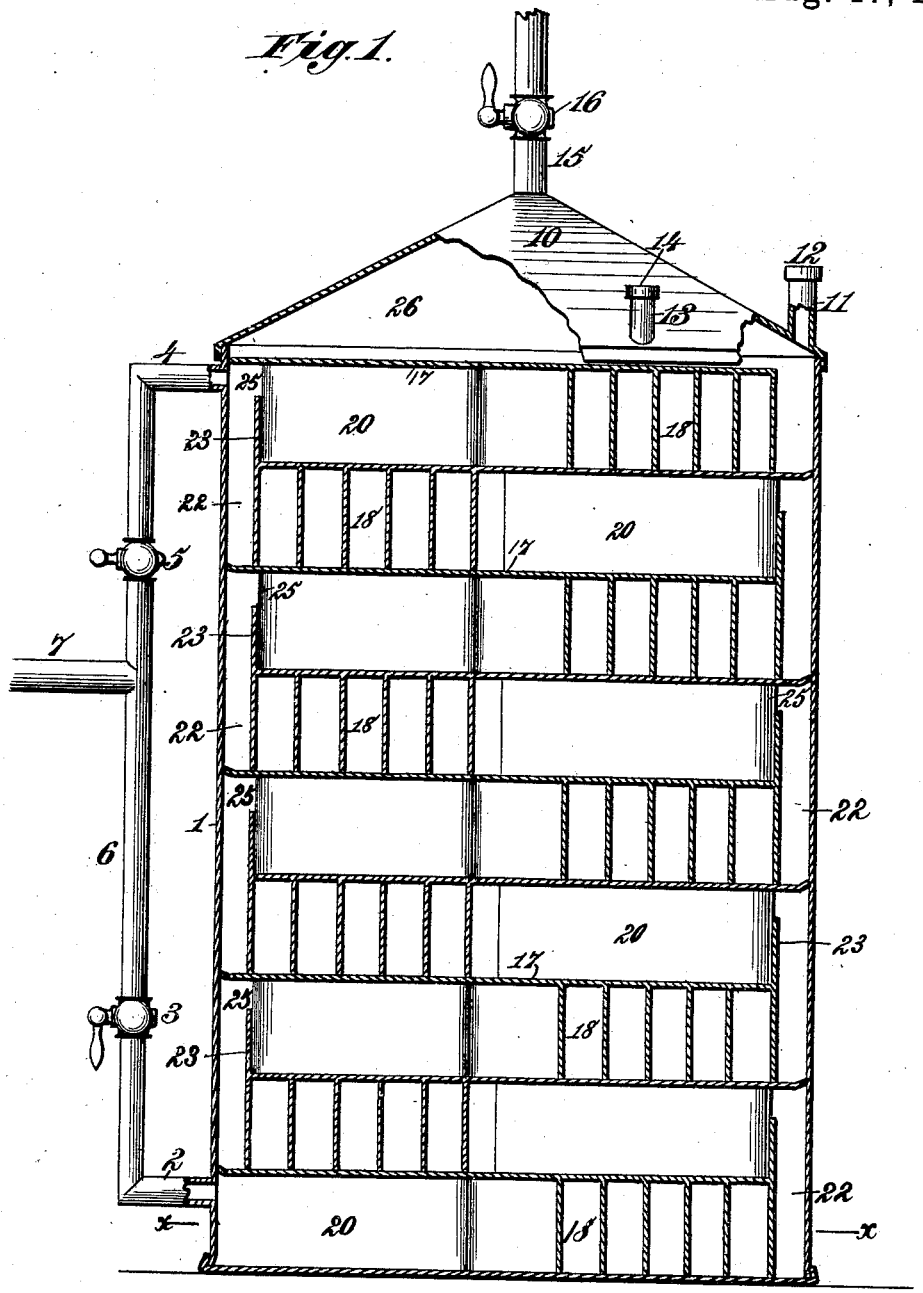
2 Sheets—Sheet 1.

J. S. TIBBETS.

APPARATUS FOR CARBURETING GAS.

No. 347,663. Patented Aug. 17, 1886.

Fig. 1.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

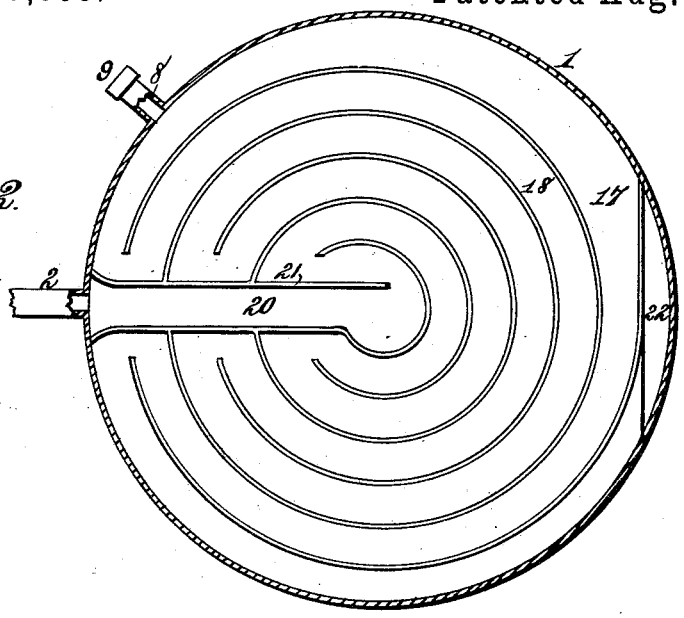


Fig. 3.

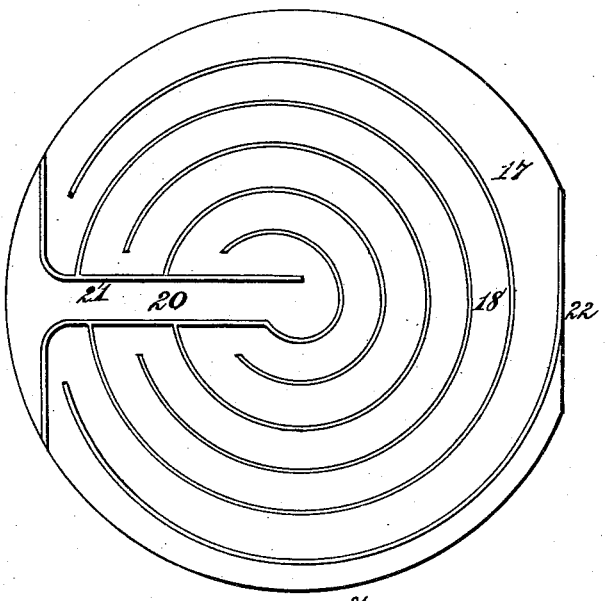
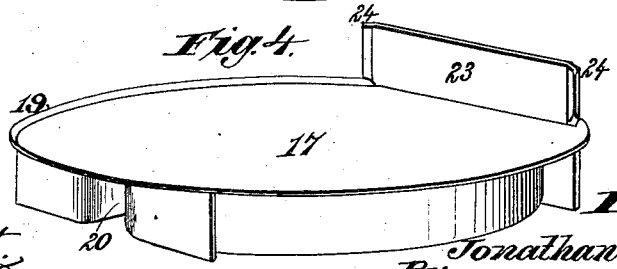


Fig. 4.



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UNITED STATES PATENT OFFICE.

JONATHAN S. TIBBETS, OF JEFFERSONVILLE, INDIANA.

APPARATUS FOR CARBURETING GAS.

SPECIFICATION forming part of Letters Patent No. 347,663, dated August 17, 1886.

Application filed February 6, 1886. Serial No. 191,062. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN S. TIBBETS, a citizen of the United States, residing at Jeffersonville, in the county of Clarke and State of Indiana, have invented new and useful Improvements in Apparatus for Carbureting Gas, of which the following is a specification.

This invention relates to a gas-machine, or an apparatus for carbureting air or gas for heating and illuminating purposes, or for use as a motive power; and it consists in the construction and combination of parts, as hereinafter set forth, and pointed out in the claims.

The invention is illustrated in the annexed drawings, in which Figure 1 is a vertical central section of my improved gas generator or carburetor. Fig. 2 is a section on the line *x x* of Fig. 1, viewed from the under side of the apparatus, and showing a plan of the convoluted passage in the lowest carbureting-chamber. Fig. 3 is a bottom plan view of one of the upper horizontal partitions forming the floor and roof of two adjacent chambers. Fig. 4 is a perspective showing the upper surface of one of said partitions.

Referring to these drawings, the numeral 1 designates a tank, preferably cylindrical in form, and composed of copper, galvanized iron, or other suitable material. Near the bottom of this tank is an air-inlet, 2, having a cock, 3, and near the top is another air-inlet, 4, having a cock, 5. These air-inlets consist of horizontal pieces of pipe, preferably connected by a vertical pipe, 6, having a branch, 7, that leads to a pump or other apparatus for forcing air or gas into the carburetor. Near the bottom of the tank 1 is also located a vent-tube, 8, provided with a cap, 9, or other stopper.

The tank 1 is provided with a close-fitting conical cover, 10, having a filling-tube, 11, located near one edge. This filling-tube may have a cap, 12, or other stopper. At another point near the edge of the cover is located a vent-tube, 13, provided with a cap, 14, and from the center of the cover a gas-delivery tube, 15, rises, by which the carbureted gas can be conducted to a suitable reservoir or to the place of consumption. This gas-delivery tube 15 may be provided with a cock, 16, at any desired point.

Within the tank 1 is arranged a series of horizontal partitions, 17, cut away alternately on opposite sides, thereby forming a series of circuitously communicating compartments or chambers for reception of the carbureting-liquid, and in these chambers are formed convoluted passages 18 for the air or gas to be carbureted, whereby the course of the air or gas through the carbureting apparatus will be somewhat retarded, so as to cause it to remain in contact with the carbureting material for a sufficient period to produce a good quality of gas. The horizontal partitions 17 are each circular in form, except that they are cut away or reduced in diameter on one side, as shown in Figs. 2, 3, and 4, and their curved edges are formed with a slight upwardly-bent rim, 19, which affords a hold for the solder, rivets, or other fastenings by which they are secured to the wall of the tank. These horizontal partitions 17 thus form a series of communicating carbureting-chambers, in each of which, as before observed, is arranged a convoluted passage, 18, for the air or gas to be carbureted. Each carbureting-chamber is also provided with a radial passage, 20, and these radial and convoluted passages are preferably made by attaching depending metallic plates 21 of proper form to the under side of each partition 17, as shown in Fig. 1.

In the bottom carbureting-chamber the outer end of the radial passage 20 has its sides flared slightly, as shown in Fig. 2, and terminates at the lower inlet, 2, the slightly-flared outer end of said radial passage being secured to the wall of the tank on each side of said inlet. In the upper carbureting-chambers the outer ends of the radial passages have their sides flared to a greater extent, as shown in Fig. 3. The upper surface of each horizontal partition 17, except the top one, is provided at the edge of its cut-away portion 22 with a vertical lip, 23, the ends of which are slightly flared or bent, as shown at 24 in Fig. 4, to facilitate attachment to the tank-wall, and also to close the ends of the spaces between said flaring lips and the adjacent flaring ends of the radial passages. These vertical lips 23 are each of less height than the carbureting-chambers, and consequently there is formed above each lip a horizontally-elongated opening, 25, through which the several chambers communicate.

It will be observed by reference to Fig. 1 that

the partitions 17 and lips 23 are so arranged that the several carbureting-chambers communicate alternately on opposite sides of the tank, thus affording a continuous circuituous passage from bottom to top. The top horizontal partition is removable, and has no upwardly-bent rim and no lip. It is, however, cut away at one side, like the other horizontal partitions, and this cut-away portion of said top partition is arranged immediately beneath the filling-tube 11, through which the apparatus is supplied with gasoline or other carbureting-liquid. The carbureting-liquid introduced into the tank 1, through the filling-tube 11, enters the upper carbureting-chamber by way of the opening 22 at the side of the top partition, 17. It then passes through the convoluted passage 18 toward the lip 23. When the carbureting-chamber is filled to the level of the lip 23, the liquid overflows through the openings 25 and 22, and thus gains access successively to the chambers below. In this way all the carbureting-chambers are supplied with gasoline or other hydrocarbon liquid, which liquid rises in the lowest chamber to the level of the vent 8, which is then closed. After the carburetor has thus been charged and made ready for use, gas will be generated by admitting atmospheric air through the lower inlet, 2, said inlet being in communication with any suitable air-forcing apparatus. On commencing to force air into the carbureter, the upper vent, 13, must be closed. The air forced into the carburetor flows through the circuitous passages of the several chambers over the surface of the gasoline or hydrocarbon liquid contained therein. In each chamber the course of the air is inward through the radial passage 20, thence outward through the convoluted passage 18, and then upward by way of the openings 22 and 25 to the radial passage of the next chamber above.

The space between the top horizontal partition, 17, and the conical tank-cover 10 forms a receiving-chamber, 26, in which the gas accumulates before passing to the delivery-tube 15, the vent 13 and filling-tube 11 being closed.

As before remarked, the air-inlets and the gas-delivery tube may be provided with cocks for confining the gas within the carburetor, and preventing waste when the gas is not in use.

It will be observed that the circuitous passage-way or air-conduit is partly formed by the walls of the tank, within which the several partitions are closely fitted in such a manner as to avoid leakage from one chamber to another. The air or gas admitted to the carburetor is thus compelled to pass in a finely-divided current over the entire surface of the hydrocarbon or other carbureting-fluid contained in the several carbureting-chambers. By this means the air or gas under treatment soon becomes thoroughly charged with hydrocarbon material, thus producing a rich and highly-valuable quantity of gas, suitable for all ordinary purposes.

In some cases, where the gas contains too much carbon, it is desirable to mix with it an increased supply of oxygen before it is delivered from the carburetor. For this purpose I have provided the upper air-inlet, 4, which communicates directly with the radial passage 20 of the upper carbureting-chamber. This upper air-inlet, 4, is preferably a branch of the main supply-pipe, as shown, and has a cock, 5, which should be closed while the apparatus is being filled with gasoline, and also when it is desired to introduce air through the lower inlet exclusively.

It is apparent that by means of the upper and lower air-inlets the quality of the gas can be readily controlled.

This gas generating and carbureting apparatus combines the advantages of simplicity, efficiency, and economy with compactness of form, and there being no waste spaces in its structure it affords a large carbureting surface, while at the same time it occupies but little room.

What I claim as my invention is—

1. In a gas generator and carburetor, the combination, with a tank having an air or gas inlet, a filling-tube, and a gas-delivery tube, of a series of horizontal partitions, 17, each reduced in diameter on one side, and formed with a slight upwardly-bent rim, 19, for attachment within the tank, said partitions being provided on their upper sides with vertical lips 23, having flaring ends 24, and on their lower sides with vertical plates 21, forming convoluted passages 18 and radial passages 20, substantially as described.

2. A gas generator and carburetor consisting of a tank having at the bottom an air or gas inlet and a vent and at the top an air or gas inlet, vent, filling-tube, and gas-delivery tube, and a series of horizontal partitions alternately reduced in diameter or cut away on opposite sides, and provided on their upper sides with vertical lips located at said cut-away portions, and on their lower sides with vertical convoluted plates forming convoluted and radial passages, said plates being secured within the tank to form a vertical series of carbureting-chambers communicating alternately on opposite sides, substantially as described.

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

JONATHAN S. TIBBETS.

Witnesses:

ARTEMUS F. MCNAUGHTON,

GEORGE H. VOIGT.