No. 876,678. PATENTED JAN. 14, 1908.

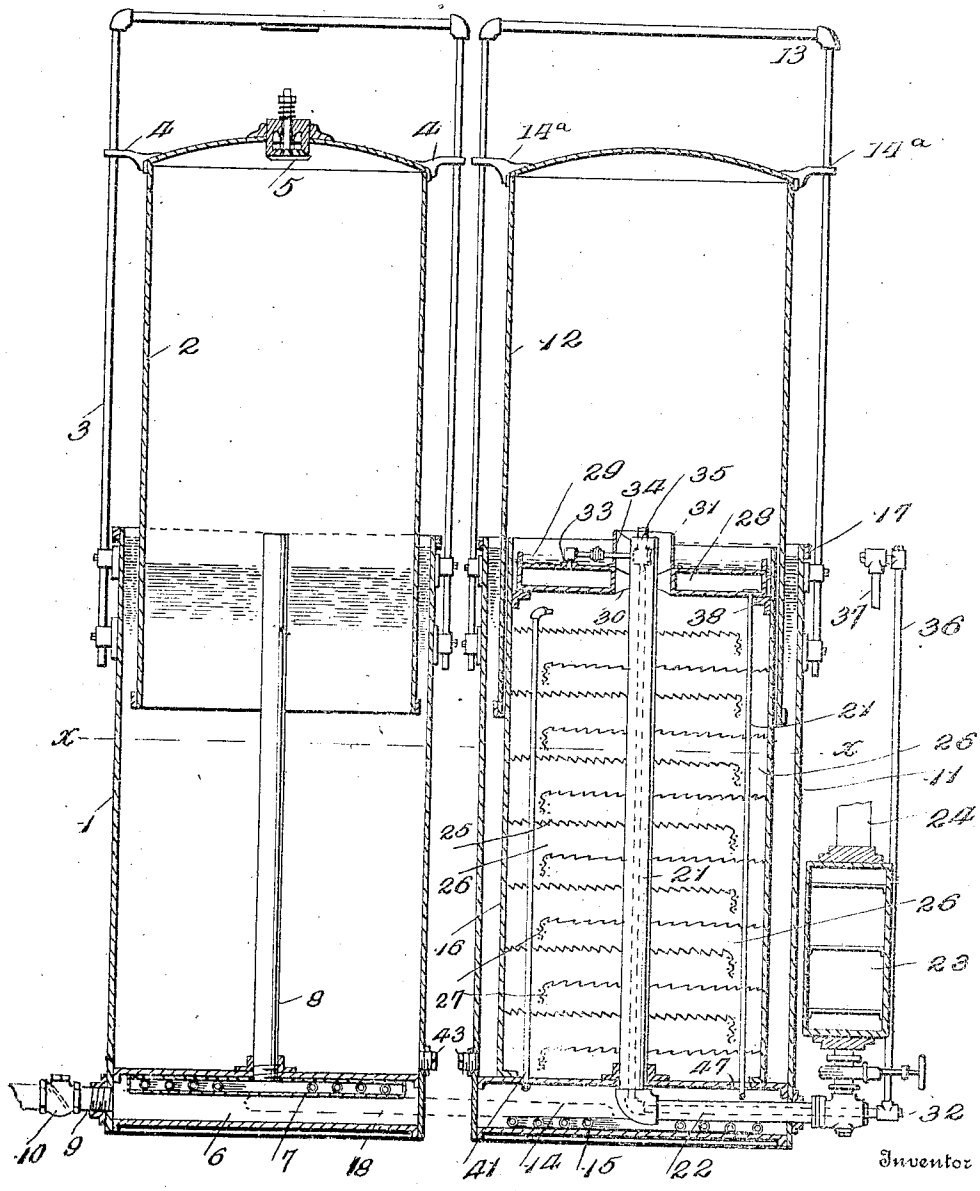
J. F. ANDRES.

CARBURETER.

APPLICATION FILED JULY 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

W. N. Woodson

Inventor

J. F. Andres

By R. A. B. Lacey, Attorneys

No. 876,678. PATENTED JAN. 14, 1908.

J. F. ANDRES.

CARBURETER.

APPLICATION FILED JULY 11, 1907.

2 SHEETS—SHEET 2.

Fig. 3.

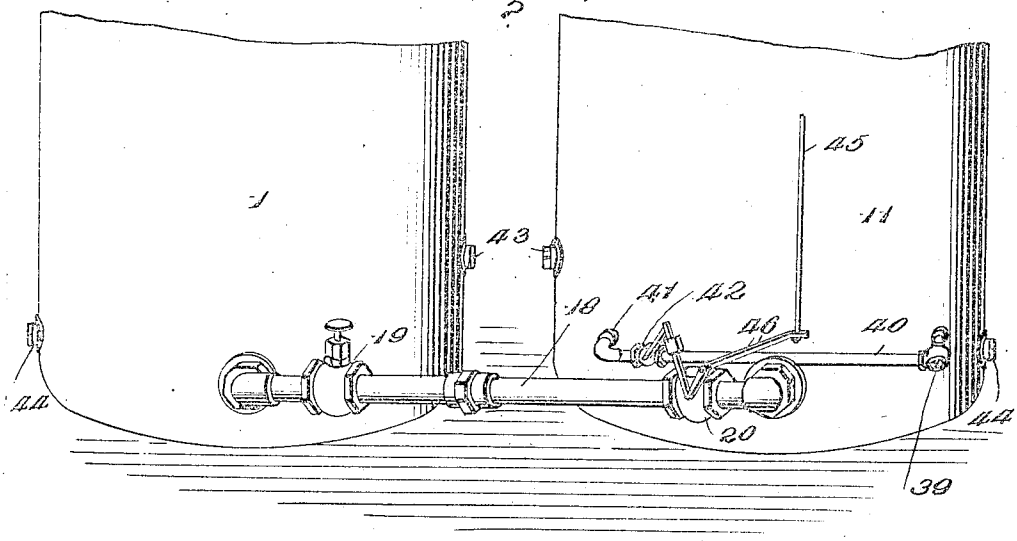
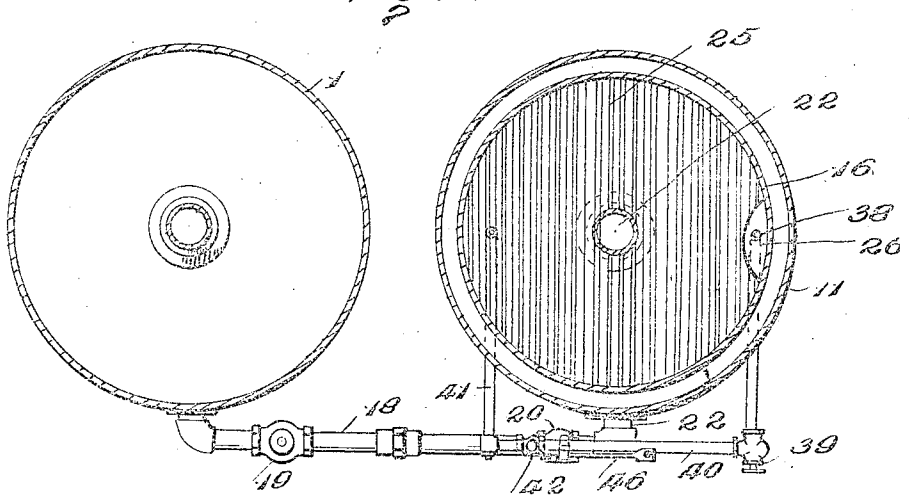


Fig. 2.



Inventor

J. F. Andres.

Witnesses

W. T. Woodson.

By Ramsey, Attorneys

UNITED STATES PATENT OFFICE.

J FRANK ANDRES, OF ST. LOUIS, MISSOURI.

CARBURETER.

No. 876,678. Specification of Letters Patent. Patented Jan. 14, 1908.

Application filed July 11, 1907. Serial No. 383,282.

To all whom it may concern:

Be it known that I, J FRANK ANDRES, a citizen of the United States, residing at St. Louis, in the county of St. Louis City and State of Missouri, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

The invention relates to the production of a practical gas adapted for manufacturing and domestic purposes by combining air with carbonaceous vapors in a more certain manner and under such conditions as to positively and continuously create the quality of gas desired, be it a rich smoky gas, or a thin blue flame gas, or any intermediate quality and by means provided to use different grades of hydro-carbon oils, or if desired alcohol in the manufacture of the gas.

The object of the invention is to construct a gas generating apparatus that automatically insures an unvarying quality of gas. That automatically mixes the hydrocarbon vapor producing oil, and air, in the proper proportions continuously, to thoroughly mix the vapor of the hydro-carbon oils and air in the proper proportionate quantities, one to the other to insure a thorough impregnation of the air with the vapor, producing a non-condensable gas, possessing great heating qualities and high illuminating power when consumed in any modern power burner, and of the exact quality predetermined or desired by the operator.

The object of this invention is further attained by constructing a gas generating apparatus in which the initial pressure on the gas and on the feed for the hydro-carbon or vapor producing oil is the same, and is controlled by the unvarying and equal pressure produced from the weight of the gasometer bell. The gasometer is also caused to regulate or control automatically the feed for the oil and simultaneously control the amount of air admitted with the oil, and also automatically govern and regulate the amount of gas made to the demand up to the designed full capacity of the generator.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a vertical central section of a carbureter embodying the invention. Fig. 2 is a horizontal section on the line *x*—*x* of Fig. 1. Fig. 3 is a detail perspective view of the lower portion of the carbureter.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

In its organization the machine comprises two tanks, each of similar construction, the one adapted to receive air and the other to contain a supply of gas.

The tank for containing air comprises a cylinder 1 and an inverted bell 2, the latter being mounted to rise and fall and having a water seal with the cylinder to prevent escape of the confined air. A guide frame 3 is adjustably connected with opposite sides of the cylinder 1 and the bell 2 is provided with guide brackets 4 which receive vertical members of the guide frame 3 so as to direct the bell 2 in its vertical movements. A relief valve 5 is provided in the crown or upper end of the bell 2 and is arranged to open inward and is normally held closed by means of a spring and by the internal pressure of the air. When the bell 2 rises to the limit of its upward movement, its stem strikes a horizontal portion of the guide frame 3 and the valve is automatically opened, thereby relieving the tank or airometer of abnormal pressure. A chamber 6 is formed in the bottom portion of the tank and receives a heating coil 7, which may be connected with any source of heat supply, such as steam or hot water. A pipe 8 communicates at its lower end with the upper portion of the chamber 6 and extends vertically through the cylinder 1 to a point above the water contained therein so as to provide an unobstructed passage for the air between the chamber 6 and the space inclosed by the bell 2. A pipe 9 communicates with the chamber 6 and supplies air thereto from a suitable source, such for instance as a fan blower or a tank containing compressed air. A check valve 10 located in the length of the supply pipe 9 prevents back pressure.

The tank for containing a quantity of

gaseous mixture or carbureted air and designated as the gasometer, consists of a cylinder 11 and bell 12, the latter being adapted to rise and fall and directed in its movements by means of a guide frame 13 and guide brackets 14ª similar in construction and arrangement to the corresponding parts 3 and 4 of the airometer. A chamber 14 is provided in the lower portion of the cylinder 11 and receives a heating coil 15 adapted to be supplied with steam, hot water or other heating medium. An inner cylinder 16 rises from the top of the chamber 14 and is spaced from the cylinder 11, the space between the two cylinders 11 and 16 being supplied with liquid 17 forming a seal between the upper and lower members of the gasometer. A pipe 18 connects the chambers 6 and 14 and is provided in its length with a valve 19 adapted to be regulated by hand and a valve 20 automatically controlled according to the consumption and carburization of the air. The valve 20 is adapted to be operated by the action of the bell 12, being closed when the bell 12 is at the limit of its movement and opened when the bell 12 is below a given level. A pipe 21 extends through the lower member of the gasometer and its upper end is in communication with the space of the gas bell 12, whereas its lower end connects with a horizontal branch 22 located in the chamber 14 and extending through a side thereof and connected with fittings at the lower end of a gage 23 and from which the service pipe 24 leads to convey the gas to the required point of use.

The cylinder 16 constitutes the shell or casing of the generator and receives a series of horizontal partitions 25 which are fluted, corrugated or stepped, the corrugations having an inclined wall and a vertical or abrupt wall forming riffled channels which receive and hold a small quantity of the hydrocarbon or other liquid fuel for carbureting the air in its passage through the machine. The partitions 25 are located at different elevations in the height of the cylinder 16 and are arranged so that the vertical or abrupt walls of the corrugations of the alternate partitions face in an opposite direction to the corresponding parts of the intermediate partitions, the arrangement being in inverse position to the direction of flow of the hydrocarbon. The partitions extend entirely across the space inclosed by the walls of the cylinder 16 and each partition has an oblong opening 26 at one end to provide for the passage of the hydrocarbon from one partition to the other and to admit of the air passing from the space inclosed between adjacent partitions to the space next above in its circulation through the generator. The openings 26 are arranged at opposite ends or edges of the partitions, thereby compelling both the hydrocarbon and the air to make a circuitous or zigzag travel in their passage through the generator. A baffle 27 is pendent from the inner edge of each opening 26 and consists of wire gauze, the same being soldered or otherwise firmly attached to the partition. The baffle 27 has its lower edge approaching close to the partition next below so as to leave a small space only for the passage of air and hydrocarbon. The baffles 27 insure contact of the air with the hydrocarbon and prevent the air containing large particles of the hydrocarbon either resulting from condensation or from other cause. The pipe 21 passes through all of the partitions 25 and has a close fit therewith.

An oil tank 28 is arranged at the upper end of the generator or cylinder 16 and is covered by a layer of water 29. The tank 28 is comparatively shallow and is provided with a central opening 30 through which the upper end of the pipe 21 passes. A collar 31 rises vertically from the tank 28 in line with the opening 30 and the carbureted air from the generator has unobstructed passage therethrough. An oil pipe 32 connected with a pump or other source of supply, passes through the horizontal branch 22, thence upward through the vertical pipe 21 and laterally through the upper portion of said pipe 21 and through the collar 31 and communicates with the upper portion of the tank 28, as indicated at 33. The pipe 32 extends above the horizontal branch 34, as indicated at 35, and is open to admit of establishing equilibrium between the gasometer and tank 28, which is essential to proper feed of the hydrocarbon. An overflow pipe 36 connects with the supply pipe 32 and extends to a height about equal to the level of the tank 28, so that any excessive supply of oil instead of flooding the machine will return by means of a branch 37 either to the supply tank or to any receptacle conveniently placed to receive the same. A pipe 38 leads from the bottom of the tank 28 downward through the generator into the chamber 14, thence outward through a side thereof and provided with a valve 39 adapted to be operated by hand to regulate the flow of the oil. A pipe 40 connects the lower end of the pipe 38 with the lower end of the pipe 41 and is provided with a valve 42 adapted to be automatically controlled by the rising and falling action of the gas bell 12. The pipe 41 passes vertically through the generator and is arranged to deliver hydrocarbon to the topmost partition 25 at a point diametrically opposite to the discharge opening 26 thereof. The oil from the tank 28 passes downward through pipe 38, thence horizontally through pipe 40 and again vertically through pipe 41, and in its travel is regulated by the manually operable valve 39 and the automatically controlled valve 42. Any residue accumulating

in the bottom of the tanks may be removed through suitable plug controlled openings 43. Any accumulation in the chambers 6 or 14 may be removed through suitable plug controlled openings 44.

A rod 45 connected at its upper end with the gas bell 12 so as to rise and fall therewith or to be actuated thereby in any manner, is connected at its lower end with an arm 46 which is counterbalanced, and through suitable connections said arm is made to operate the valves 20 and 42 so as to regulate the proportionate amount of air and hydrocarbon to be admitted in the generator. To vary the proportionate amount of hydrocarbon to be taken up by a given amount of air either or both of the valves 39 or 19 may be adjustable by hand and when once set a like quantity of each is supplied to a given amount of gaseous mixture.

In the operation of the invention air from a suitable source of supply enters the chamber 6 of the airometer through the pipe 9 and passes into the air bell 2 through the pipe 8 and is stored therein. When the valve 19 is opened, the air passes from the chamber 6 into the chamber 14 of the gasometer and may be drawn either from the air bell 2 or directly from the chamber 6, and from the pipe 9 permitting said air to pass into the air bell. The air from the chamber 14 passes into the generator through an opening 47, and thence around the partitions 25 in a zigzag or tortuous path, taking up a quantity of the vapor in its circuitous travel. It is observed that the air travels upward, whereas the hydrocarbon circulates downward, the two moving in opposite directions with the result that the air becomes thoroughly impregnated or saturated with the vapor of the hydrocarbon or liquid fuel that may be used for carburization of the air. The air in its final escape from the generator is received in the gas bell 12 and is adapted to pass through, thence downward through the pipe 21, thence through the horizontal pipe 22 and through the gage 23 to the service pipe for use in any desired way. Inasmuch as the consumption of the gas fluctuates, the gas bell 12 will have a corresponding movement which is utilized for operating the rod 45 and thence the supply valves 20 and 42, whereby the feed of air and hydrocarbon is regulated. It is noted that the air may be heated or carburized at normal temperature, as may be required. By heating the air, it may take up a gradual quantity of vapor, as will be understood, and may be of advantage under some conditions.

Having thus described the invention, what is claimed as new is:

1. In a carbureter, the combination of a series of horizontal partitions arranged one above the other and spaced apart and having openings at alternate opposite ends, baffles pendent from the inner edges of the openings and formed of wire gauze, said baffles having their lower edges terminating a short distance from the partitions next below, and means for circulating the hydrocarbon and air through the generator in opposite directions.

2. In a carbureter, the combination of a gasometer comprising a lower fixed cylinder and an upper movable gas bell, a generator arranged within said lower cylinder, an oil tank located within the upper portion of said lower cylinder and adapted to supply oil to the generator, and an oil pipe for supplying hydrocarbon to the oil tank and having an extension in communication with the space of the movable gas bell, and having an overflow extended to about the level of the oil in the said oil tank.

3. In a carbureter, the combination of a gasometer comprising a lower cylinder and an upper gas bell, a generator arranged within said lower cylinder, an oil tank located within the upper portion of said lower cylinder and adapted to supply oil to the generator, and an oil pipe for supplying hydrocarbon to the oil tank and overflow extended to approximately the level of said oil tank to prevent flooding of the machine.

4. In a carbureter, the combination of a gasometer comprising upper and lower members, a generator arranged with said lower member of the gasometer, an oil tank located within the upper portion of the aforesaid lower member of the gasometer, means for supplying liquid fuel to the oil tank, a pipe leading downwardly through the generator from the bottom of the oil tank, an approximately horizontal pipe exterior to the gasometer and provided with a manually operable and automatically actuated valve, and a vertical pipe having connection with said horizontal pipe and extending within the generator to supply hydrocarbon thereto from the aforesaid oil tank.

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

J FRANK ANDRES. [L. S.]

Witnesses:

SAM SCHUESTZBERG,

A. LICHTENSTEIN.