

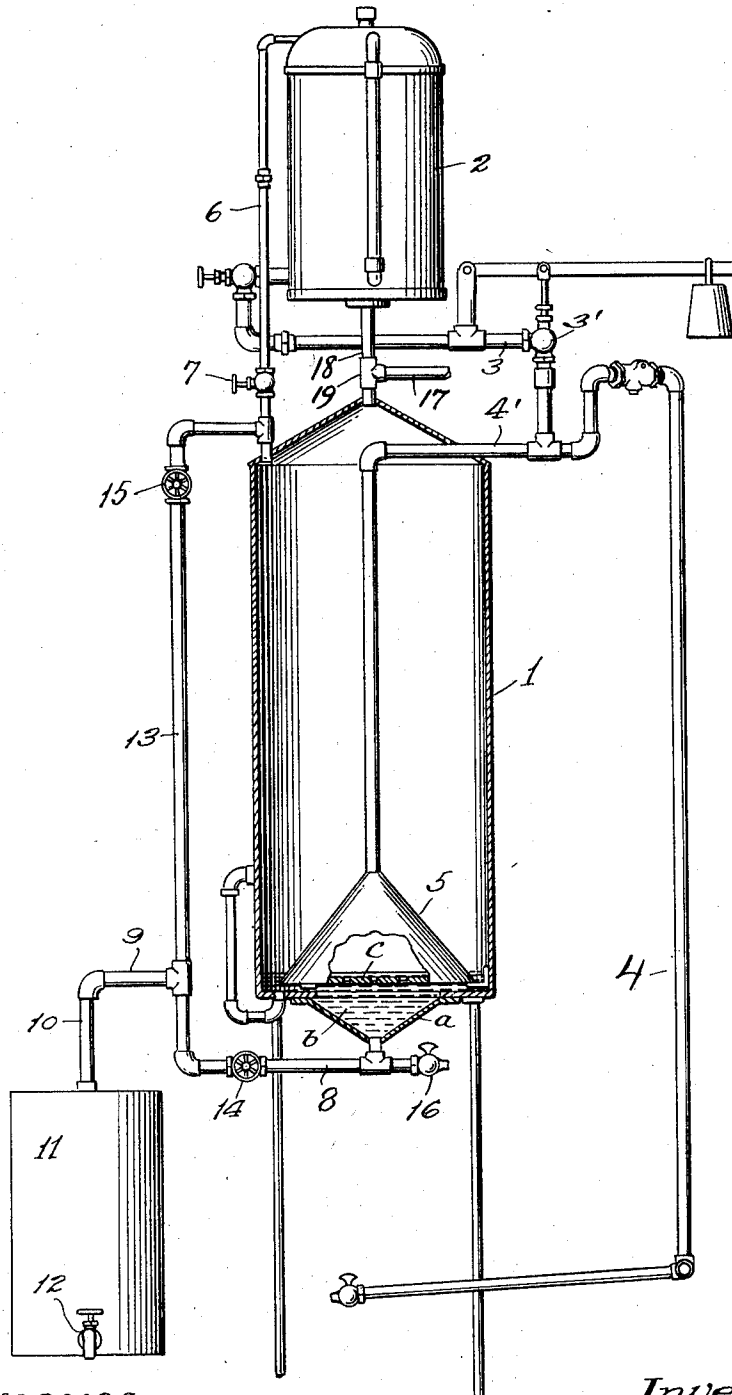
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CARBURETER.

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1,043,691.

Patented Nov. 5, 1912.



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# UNITED STATES PATENT OFFICE.

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## CARBURETER.

1,043,691.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed December 20, 1910. Serial No. 598,438.

*To all whom it may concern:*

Be it known that I, ARTHUR GRANDJEAN, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a new and useful Improvement in Carbureters, of which the following is a specification.

This invention relates to improvements of a carbureting apparatus described in Letters-Patent of the United States, No. 912,468, granted to me Feb. 16, 1909 and No. 953,606, granted to me March 29, 1910.

An object of this invention is to provide means whereby a practically uniform combustible carbureting air can be produced from atmospheric air and hydrocarbons or carbohydrates or other highly inflammable liquids, such as gasoline, alcohol, etc. In order to accomplish such object I have provided means whereby the outlet from the carbureting device such as the inverted funnel-shaped rose or sprinkler shown in Patent No. 953,606 may be kept constantly submerged at a determined depth by the deposits accumulated from the liquid blown into the carbureting chamber in the carbureting process and whereby the deposits can be removed without interrupting such process.

An object of the invention is to provide means for practically discharging from the carbureting chamber the said deposits so as to get rid of the heavy and undesirable hydrocarbons or other liquids that may accumulate at the bottom of the carbureting chamber, and to perform the operation of discharging such material without disturbing the operation of producing and using the product.

An object of the invention is to produce from gasoline a combustible product which is not a vapor but is a dry carbureted air. Such gas is produced by forcing air by compression through a small body of gasoline; it requiring approximately 4,500 cubic feet of air by meter test to absorb one cubic foot of gasoline; and in making such product the heavy hydrocarbon and other material which cannot be absorbed by the air drops to the base of the carbureting chamber. By the means provided by this invention such material is made to flow out by gravity to

a drainage tank through a trap thereby always maintaining the hydrocarbon deposit in the carbureting chamber at a certain height above the outlet from the carbureting device, so that the resistance to be overcome by the inflowing air and combustible fluid will always be practically the same thus making the quality of gas uniform.

An object of the invention is to provide means whereby the production of the gas may be carried on at average temperatures without the use of artificial heat and with a liquid hydrocarbon of as low quality as gasoline of 60° gravity, Baumé.

It is an object of the invention to produce by what is known as cold generation, from gasoline of as low gravity as 60° Baumé and with minimum waste, a gas equal in quality to that which could not be produced with cold generation by former gas making apparatus except by using gasoline of a quality not lower than from 72° to 86° Baumé.

The accompanying drawing illustrates the invention.

The carbureting chamber 1 receives its supply of inflammable liquid from the supply tank 2 mounted thereabove and discharging through the liquid supply pipe 3 and valve 3' into the air supply pipe 4 whence it passes through the mixing pipe 4' into the carbureting device 5 which is preferably a rose sprinkler that opens downwardly toward the bottom *a* of the carbureting chamber 1, which is of an inverted conical form and adapted to receive accumulations *b* of those portions of the liquid which are not absorbed by the air that passes into the carbureting chamber from the mixing pipe 4'. Said accumulations *b* form a resisting bed or mattress onto and through which a portion of the hydrocarbon laden air is forced from the carbureting device 5.

An equalizing pipe 6 controlled by a cut-off valve 7 connects the top of the supply tank 2 and the carbureting chamber 1 so as to equalize the air pressure in said tank and chamber to allow the liquid to flow freely through the pipe 3 whenever the valve 3' is opened by the mechanism of the air pump, not shown herein, and which supplies air

to the air pipe 4 as is customary with gas apparatuses of the carbureting type.

The carbureting chamber is connected through a trap formed by pipes 8 and 9 with a pipe 10 opening downward into the top of a waste discharging tank 11 that is provided with a cock 12 through which the contents of the tank 11 may be from time to time drawn off. The horizontal outlet pipe 9 of the trap is arranged at such a height that the bottom of the passage therethrough is just above the level of the perforated outlet *c* of the carbureting device 5, so that when the accumulations *b* of the unabsorbed liquid submerge the perforated outlet of the carbureting device 5, the excess of such liquid deposits thereafter occurring will be drawn off through the trap 8, 9, so that thereafter the outlet of the carbureting device 5 will be constantly submerged to a determined extent, and the air forced through the carbureting device 5 will meet constant resistance from the deposits of inflammable liquid, which, though being added to by new liquid from pipe 4' will remain at the same depth in the carbureting chamber. The cock 12 constitutes means to close communication between the external air and the outlet 10 to form the trap during the normal operation of the carbureter.

An equalizing pipe 13 communicates between the trap 8, 9 and the top of the carbureting chamber 1 through the lower portion of equalizing tube 6 and below the valve 7 thereof. Valves 14 in the trap and 15 in the equalizing pipe, are provided to cut off the waste discharging tank 11 from the bottom and top respectively of the carbureting chamber 1, and also from communication with the supply tank. A draw off cock 16 opening from the receiver pipe 8 of the trap is provided to draw off accumulations of water which may occur from time to time at the bottom of the carbureting chamber 1.

The gas is led off from the carbureting chamber 1 through the gas pipe 17 to the service pipes or to a gasometer, not shown. The standard 18 which assists in supporting the supply tank 2 is carried by a T 19 of the gas pipe 17 which is supported by the carbureting chamber 1.

In practical operation, atmospheric air is forced by the usual air pump, not shown, through the pipes 4, 4', carbureting device 5 and inflammable liquid deposit *b*, into the carbureting chamber 1 at each action of the pump, not shown, and the resulting gas is drawn off through the pipe 17 until the gasometer, not shown, is filled, or so long as the service pipes, not shown, are open. When the accumulations *b* of hydrocarbon have reached the level of the lower portion of the outlet through pipe 9, further additions to the deposit will cause liquid to flow off through the pipe 9 and the open valve 14,

between the impulses of the air pump. The open pipe 13 equalizes the pressure in the chamber 1 and tank 11, thus allowing the liquid to overflow freely into the tank 11. It is necessary during the operation of the machine that the valves 7, 14 and 15 shall all be open and the cock 12 be closed. When the valves 7, 14 and 15 are open and the air pressures in tanks 2 and 11 and the chamber 1 are equalized, the overflow through 9 may occur. When the tank 11 has become filled the valve 14 may be closed and then the cock 12 may be opened and the liquid in the tank 11 may be drawn off without disturbing the accumulations *b*. When the tank 11 has been emptied the cock 12 will be closed and then the valve 14 will be opened, thus allowing the deposits to again flow off.

In case it is desired to remove the tank 11 for any purpose the valves 14 and 15 will both be closed before such removal, otherwise the accumulations *b* would be blown out through the pipes 9 and 10 and gas would escape through the carbureting chamber. Such removal of tank 11 and closing of valves 14, 15 will not retard or suppress the operation of the gas making apparatus but such apparatus will require attention to draw off any excessive accumulations occurring while the tank 11 is removed and the valves 14, 15 are closed. If the accumulations are allowed to increase in depth in the carbureting chamber the resistance to inflow of air will be increased and the gas making operation will become irregular.

I claim:—

1. The combination with a carbureting chamber, of a carbureting device provided with an outlet in said chamber, means to supply inflammable liquid to said device, means to force air through said carbureting device into the chamber, a trap leading from the bottom of the carbureting chamber and arranged to maintain the level of hydrocarbon accumulations in said chamber above the outlet from the carbureting device, a discharge tank to receive the discharge through said trap, and an equalizing pipe communicating between the trap and the carbureting chamber above the level of the trap.

2. The combination with a carbureting chamber, of a trap connected with the bottom of the chamber and arranged to maintain a determined level of hydrocarbon accumulations in the chamber, an equalizing pipe communicating between the trap and the chamber above the level of said trap, means to force air and hydrocarbon into the chamber, and means to close the outlet of the trap from the external air.

3. The combination with a carbureting chamber, of a trap connected with the bottom of the chamber and arranged to maintain a determined level of hydrocarbon ac-

cumulations in the chamber, an equalizing  
pipe communicating between the pipe and  
the chamber above the level of said trap,  
means to force air and hydrocarbon into the  
§ chamber below such level, and means to  
close the outlet of the trap from the ex-  
ternal air.

In testimony whereof, I have hereunto set  
my hand at Los Angeles, California, this  
10th day of December, 1910.

ARTHUR GRANDJEAN.

In presence of—

JAMES R. TOWNSEND,  
L. BELLE RICE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."