E. H. WOODWORTH.

CARBURETER.

APPLICATION FILED DEC. 7, 1910. RENEWED JUNE 11, 1912.

1,050,322.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

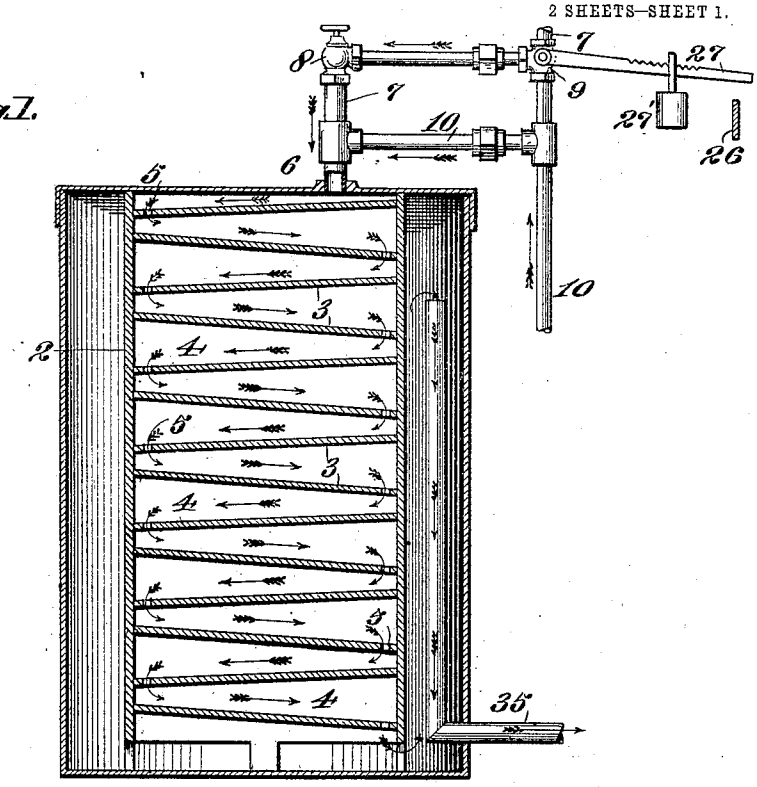
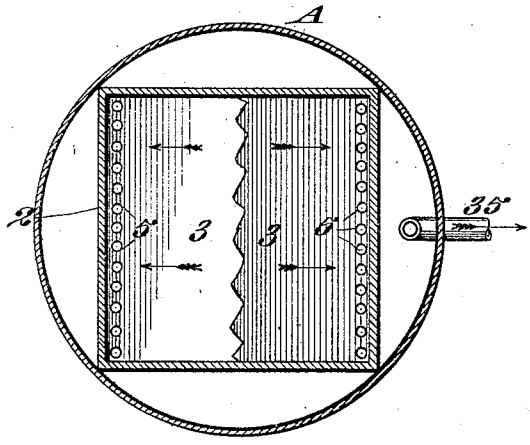


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 5.

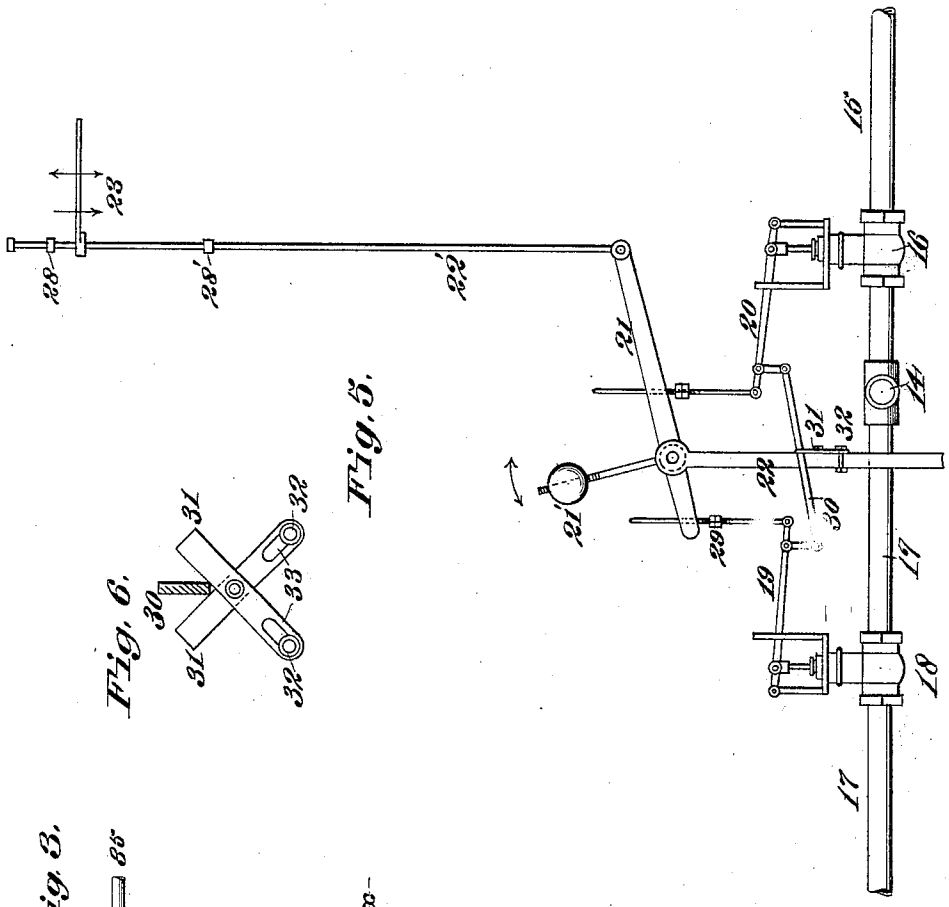


Fig. 6.

Fig. 3.

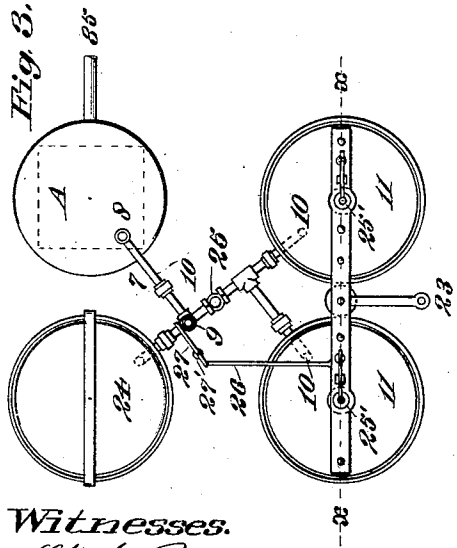
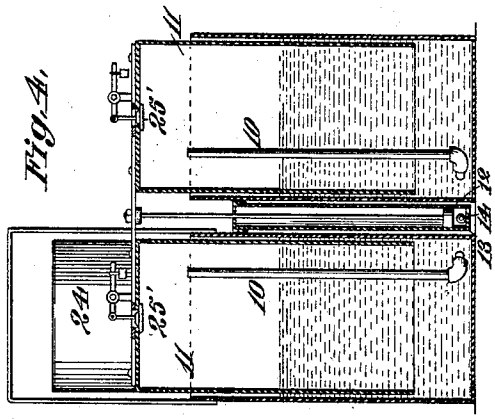


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,050,322. Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed December 7, 1910, Serial No. 596,027. Renewed June 11, 1912. Serial No. 703,101.

To all whom it may concern:

Be it known that I, ELIJAH H. WOODWORTH, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to an apparatus for carbureting and automatically delivering fuel gas, and particularly pertains to a carbureter for converting low-grade gasolene denatured alcohol and the like into combustible gases.

It is the object of this invention to provide an automatic carbureting apparatus for home use which will furnish gas of high grade for illuminating, heating and cooking purposes, that is simple in construction, absolutely safe, not liable to get out of order and which will carburet gas only as it is used, thus doing away with storage tanks.

A further object is to provide simple means in a carbureter of this character for evaporating the liquid and mixing it in proper proportions with air under pressure, to produce a gas without the use of heat and at low cost.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a vertical section of the carbureter. Fig. 2 is a cross section of same. Fig. 3 is a plan view. Fig. 4 is a vertical section on the line X—X, Fig. 3. Fig. 5 is a detail of the automatic valve operating mechanism. Fig. 6 is a detail of a device for adjusting the equalizing lever.

In the drawings A represents a cylindrical carbureter tank in which is mounted a rectangular structure 2, the top of which is closed by the head of the tank A and the bottom of which is open to the interior of the tank A. This structure 2 is designed to inclose a number of shelves or partitions 3, which are disposed in a slightly inclined position and extend in both directions entirely across the structure 2, forming a series of separate compartments or chambers 4 between the partitions or floors 3. These chambers 4 are connected together by forming a series of perforations 5 in the partitions 3 at a point near their lower ends. The partitions 3 being alternately inclined in opposite arrangement the perforations 5 in one partition are on the opposite side of the structure 2 than those in the adjacent partitions so that fluids passing from one compartment 4 to the next will flow the length of each partition or floor 3. The structure 2 and partitions 3 are preferably formed of wood or similar semiabsorbent material.

Air under pressure and gasolene or the like are admitted to the upper compartment 4 through an inlet opening 6 in the cover of the tank A. This inlet opening 6 connects with a suitable source of gasolene supply through a pipe 7—7 which is fitted with a needle valve 8 and a cutoff cock 9. The air supply is connected to the pipe 7 between the needle valve 8 and the inlet opening 6 by means of a pipe 10 which leads to a pair of ordinary water sealed compressor tanks 11. These tanks are joined together so as to move in unison and are adapted to be moved upward by a piston 12 in a cylinder 13 which is operated by hydraulic pressure from a pipe 14 connected to a water main 15, or branch therefrom, which connects with any suitable source of water supply under pressure.

A cutoff valve 16 is interposed between the pipes 14—15 to cut off or admit water to the former, as later described. An exhaust pipe 17 leads from the pipe 14 and is provided with a cutoff valve 18 which is designed to be operated alternately with the valve 16. The valves 16—18 are adapted to be actuated by the rise and fall of the compressor tanks 11 through the levers 19 and 20 which are reached by means of a weighed rocking lever 21 pivoted on a standard 22. The lever 21 is provided with an upwardly extending rod 22′ at one end, which is slidably engaged by an arm 23 on the tanks 11, in such manner that as the tanks rise or fall the lever 21 will be rocked in either direction to open one valve 16 or 18, and close the other at the uppermost or lowermost limit of the movement of the tanks 11, as later described. An auxiliary air tank 24 connects with the pipe 10 in the usual manner; a check valve 25 being interposed between the tank 24 and the tanks 11, so as to prevent air in the former passing back to the latter.

The operation of the invention is now as follows:—Assuming the air tanks 11 moving upward and at the upper end of their stroke. In their travel upward air is drawn to the interior of the tanks 11 through valves 25′

in the usual manner. As the tanks 11 reach their uppermost position an arm 26 thereon operates a lever 27, to open the cutoff valve 9 to admit a charge of gasolene or the like, passing through the needle valve 8 and inlet opening 6, to the uppermost compartment 4, and at the same time the arm 23 contacts a collar 28 on the rod 22 to lift the outer end of the lever 21 so as to throw the weight 21′ thereon over the center, which causes the inner end of the lever 21 to move downward rapidly so as to strike a nut 29 on a threaded stem mounted on the outer end of the lever 19, thereby moving the latter downward so as to open the valve 18 and permit the water in the pipe 14 and cylinder 13 below the piston 12, to escape. As the lever 19 moves downward it rocks a lever 30 adjustably mounted on the standard 22 so as to lift the lever 30 upward and close the valve 20. This lever 30 is fulcrumed at its center on adjustable cross arms 31, supported on bolts 32 extending through slots 33 on the arms 31, and through the standard 22. By loosening the bolts 32 the cross arms may be raised or lowered thereon so as to adjust the height of the lever 30 and thereby regulating the area of the opening in the valves 16—18 by varying the lift of the valve from the seat thereof. The pressure being released from below the piston 12, the drums 11 drop downward to compress the air therein; the downward movement of the tanks 11 releasing the lever 27 so as to allow a weight 27′ thereon to close the valve 9 and cut off the flow of gasolene to the carbureting tank A. The gasolene admitted to the uppermost compartment 4 flows downward over the partition 3 and passes from one compartment to another through the perforations 5. The amount of gasolene admitted to the tank is so regulated by the needle valve 8 that it will become entirely evaporated by the time it reaches the lowermost compartment 4. The pressure of air in the tanks 11 is communicated to the carbureter A through the pipe 10 and check valve 25 passing into the upper compartment 4 through the inlet opening 6 and through the perforations 5 from one compartment to another, until it is discharged below the bottom partition 3 into the interior of the cylinder A from whence it is drawn off through a distributing pipe 35, as required, by opening the fixture or burner for consuming the gas thus formed. The long passage of the air through the mixing compartments before entering the cylinder A insures a thorough and uniform mixture of the evaporated gasolene and air. As the gas is drawn off from the tank A, the tanks 11 move downward until a point is reached where the arm 23 will strike a collar 28′ on the rod 22′ so as to throw the lever 21 over and reverse the valves 16—18, thereby closing the exhaust from the pipe 14 and admitting water under pressure below the piston 12 so as to move the latter upward in the cylinder 13 and return the tanks 11 to their uppermost position, to repeat the operation just described. The auxiliary tank 24 is provided in order to obtain a constant supply of air to the carbureting tank, while the tanks 11 are moving upward; this tank being filled from the tanks 11 through the check valve 25 by reason of the greater pressure of air in the latter tanks occurring when the former is practically empty and in its lowermost position. The moment the tanks 11 start downward, the pressure of air therein passes through the check valve 25 into the tank 24 until a balance or equilibrium is obtained, which will raise the tank 24 to a greater height than that assumed by the tanks 11, thereby leaving a supply of air under pressure in the tank 24 when the tanks 11 are on their upward movement. By this construction a constant and uniform pressure is obtained, and gas will be generated only as it is drawn off from the cylinder A.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A carbureter comprising a rectangular shell having wooden shelves inclined alternately in opposite directions within the shell, and each having a transverse line of perforations across its lower edge and above the upper edge of the next lower shelf, a surrounding cylindrical shell, a top to which both shells are hermetically fixed, openings connecting the lower part of the inner shell with an intermediate space between the shells, and a discharge pipe from the upper part of said intermediate space.

2. A carbureter comprising a rectangular shell having wooden shelves inclined alternately in opposite directions within the shell, and each having a transverse line of perforations across its lower edge and above the upper edge of the next lower shelf, a surrounding cylindrical shell, a top to which both shells are hermetically fixed, openings connecting the lower part of the inner shell with an intermediate space between the shells, a discharge pipe from the upper part of said intermediate space, means to deliver a liquid to be vaporized upon the upper shelf, and means to mingle air therewith under pressure.

3. A carbureter comprising a rectangular shell having wooden shelves inclined alternately in opposite directions within the shell, and each having a transverse line of perforations across its lower edge and above the upper edge of the next lower shelf, a surrounding cylindrical shell, a top to which both shells are hermetically fixed, openings connecting the lower part of the inner shell with an intermediate space between the

shells, a discharge pipe from the upper part of said intermediate space, automatically controlled means to deliver liquid to be vaporized upon the upper shelf, and an automatically controlled air forcing mechanism and connections to mingle air with the liquid and pass it through the apparatus with it.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ELIJAH H. WOODWORTH.

Witnesses:

PAUL ROSSIER,

M. D. ARMS.