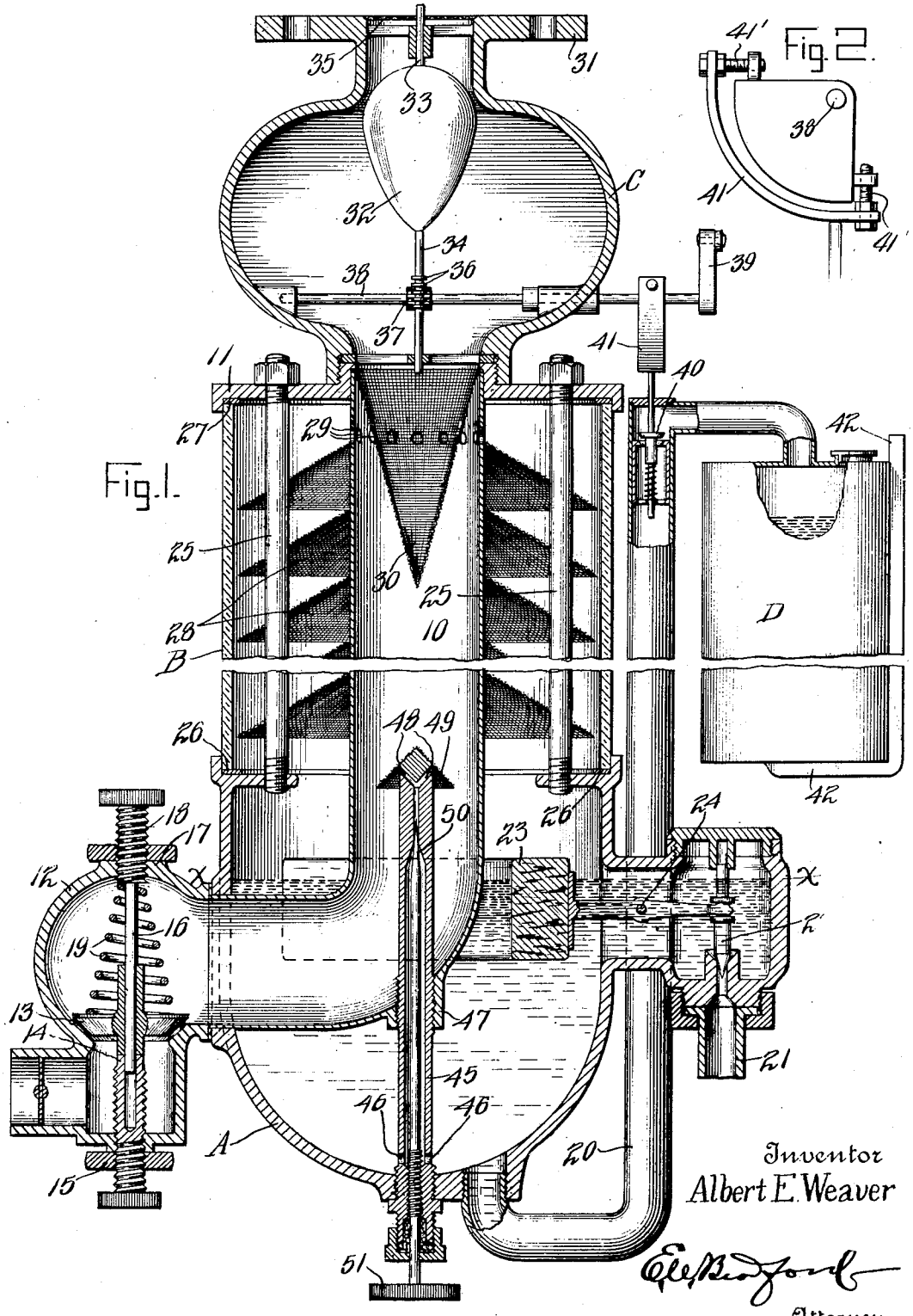
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CARBURETOR

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CARBURETOR.

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My said invention relates to an apparatus and process for producing a combustible fuel from hydro-carbon liquids by vaporization and the mixture therewith of air and it has for a purpose to provide means whereby such fuel may be produced in a manner to the best advantage and lowest possible cost and by which all of the fuel value of the hydro-carbon liquids employed will be utilized including the vapors or fixed gas given off by any body of hydro-carbon liquid, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a vertical sectional view through an apparatus for carrying out my said invention, and

Figure 2 a detail elevation of the adjustable valve-operating cam.

Said apparatus in some respects resembles in its construction and operation a carburetor or carbureting apparatus and, in fact, the apparatus shown is adapted and intended for use as a carburetor for automobiles, or in supplying an explosive mixture for the operation of internal combustion engines.

In said drawings, the portions marked A represent a bowl or liquid fuel containing chamber, B a gas or vaporizing chamber, C a gas dome, and D a water tank.

The body or bowl A is preferably a hollow casting of appropriate size and shape and has an auxiliary air tube 10 connected with an aperture in one side thereof and extending from said aperture in a horizontal direction to the center of the chamber and then in a vertical direction through to the top of vaporizing chamber B, its upper end being seated in a central perforation in the top plate 11. Attached to the outer end of tube 10 is a valve chamber 12 provided with an adjustable valve 13 for controlling the inflow of the air through said auxiliary pipe. Said valve 13 rests on a stem 14 which in turn is mounted in a nut threaded opening in the lower end of the casing forming the chamber 12 and a lock nut 15 is provided for securing the stem 14 in fixed position. The valve 13 is perforated and slides over a stem 16 mounted in a screw-threaded boss 17 in the upper end of the casing. The upper end 18 of said stem 16 is screw-threaded and a coiled spring 19 is interposed between the valve 13 and a shoulder upon the upper end of stem 16. The adjustment of said stem 16 through the medium of its screw-threaded portion 18 serves to regulate the tension of said spring 19 and thus control the resistance to the suction of the engine. By the other adjustment the normal low speed position of the valve may be fixed.

An air inlet pipe 20 leads from the upper end of tank D to communicate with the lower portion of bowl or chamber A.

A liquid fuel supply pipe 21 leading from any supply tank appropriately located is adapted to supply the fuel to said chamber or bowl A. The inflow of fuel from pipe 21 is controlled by a needle valve 22 operated by a float 23 pivoted at 24 and connected with said needle valve in a usual manner.

The chamber B is preferably a glass cylinder mounted on the upper end of bowl A and provided with a top plate 11, the parts being secured together by clamping bolts 25 as shown. Gaskets 26 and 27 are interposed in the joints at the respective ends of said cylinder B to insure against any gas leakage through said joints.

A series of frusta 28 formed of wire gauze, preferably copper, or other reticulated material are mounted in chamber B superimposed one above another. A series of perforations 29 are formed in the upper end of tube 10 through which gases from chamber B may pass into said tube. A wire gauze cone 30 is mounted in the upper end of said tube 10, the pointed end depending for a considerable distance into said tube.

The dome is appropriately mounted on a collar surrounding the central aperture in plate 11 and its upper end is formed with a collar or plate 31 by which it may be connected to the intake manifold of the engine or to any pipe for leading the gas to the point where it is to be used. A valve 32 which may be "egg-shaped", or of a "streamline" form, as shown, or of any appropriate form, is mounted in the aperture leading from said dome C to the exit. I prefer the form of valve shown, and it has a stem 33 on its upper end and a stem 34 on its lower end, each of which is adapted to slide in an aperture in a spider-like support provided one at the lower end of the dome and the

other at its upper end. A wire gauze screen 35 is also preferably mounted over the exit above valve 32 to guard against back-firing from the engine.

The lower stem 34 has a section formed with teeth 36 which are adapted to mesh with a pinion 37 on a shaft 38 appropriately journaled in the frame and provided with the connection 39 on its outer end which runs to a controlling lever, whereby said valve 32 may be adjusted up or down to increase, diminish or close the passage around said valve.

A valve 40 is provided in the upper end of air pipe 20 for controlling the inflow of air through said pipe and said valve is adapted to be adjusted by means of a cam 41 which is also mounted on shaft 38 and adapted to be operated thereby. The operative face of said cam is adjustable by the set-screws 41′ and the top of the valve stem rests against said surface so that the normal position of the valve may be regulated as desired.

The water tank D may or may not be used, as preferred, but I find by its use improved results may be obtained and therefore regard it as an important feature of the apparatus, although realizing that it is not absolutely essential to its successful operation. Said tank is preferably mounted as indicated and has an air pipe 42 leading into the bottom thereof. Said tank may be filled with water to any appropriate level so that the air utilized will be bubbled through said water and will carry with it into the mixture a large supply of moisture.

In an apparatus such as described it will be understood that when the engine is in operation the more volatile portion of the fuel will be continually taken out as fresh fuel is added, thereby leaving the heavier and less volatile portion for discharge through the perforations 46 into the tube 45. In order to insure the utilization of all portions of the liquid hydro-carbon, I provide a central tube 45 having perforations 46 within its lower end in chamber A which tube extends through a boss 47 at the elbow in tube 10 and for a considerable distance upwardly inside said tube 10 terminating in an atomizing head formed with atomizing perforations 48 and covered by a fine wire gauze cone 49. A needle valve 50 controlled by a hand-wheel 51 is provided to adjust the outlet by said needle valve through said atomizing perforations.

The apparatus being assembled and connected with an internal combustion engine and arranged as shown, the operation is as follows:

The bowl A being filled to substantially the level indicated with fuel, the fixed gases in the form of vapor rise from the surface of the upper and more volatile portion of said fuel filling the chamber B with such fixed gases. The aperture leading into auxiliary valve chamber 12 is preferably closed by the usual butterfly choke valve when starting the engine and the gases contained in the dome C and chamber B and the additional gases augmented by the entrance of air through the pipe 20 are sufficient to enable the engine to be started. After the engine has started the aperature leading into valve chamber 12 is opened and the suction of the engine operates to draw the air through said auxiliary chamber and pipe 10 and also through pipe 20 and the body of fuel contained in chamber A. The air coming through pipe 20 first passes through the water in tank D and is humidified. The valve 40 is adjusted before the operation begins to insure the quantity of air desired and as the valve 32 is adjusted for high speed or low speed valve 40 will be correspondingly adjusted to insure greater or less incoming air. The greater quantity is required when the valve is open for high speed purposes in order to create a more active agitation of the liquid fuel in chamber A and a more rapid vaporization and conversion thereof into fixed gases commingling and combining with the humidified air sucked in through said pipe 20. At the same time the air under control of valve 13 coming through auxiliary pipe 10 draws the heavier or less volatile portion of the liquid fuel through perforations 46 into tube 45 and out through the jet openings 48 in the atomizer head at the upper end of said tube 45, the flow of said heavier fuel being controlled by the adjustment of needle valve 50. The product formed by the mixture coming through said atomizer head and the auxiliary tube 10 commingle with the gases coming through the apertures 29 from the upper end of chamber B and pass through the fine wire mesh of cone 30 and become throughly commingled, forming a combustible gas. The frusta 28 in chamber B serve to more readily break up the vapor and cause all particles thereof to thoroughly mix and commingle with incoming air so that when the resulting gases reach the upper end and pass through perforations 29 the various constituent elements are thoroughly commingled and combined.

By this means and through the various adjustments described, an apparatus is provided by which the liquid fuel is kept thoroughly agitated and by such agitation is converted into a mist which mingled with the incoming air used for the purpose of the agitation, forms a rich mixture and not only the more volatile portions of the liquid, which vaporize easily, are employed but, by reason of the auxiliary tube 45 leading from the bottom of the chamber A into the auxiliary air inlet 10, the less volatile portions of the fuel are likewise brought into the mix-

ture and all portions of the fuel are thus completely utilized.

If preferred, the air supplied to the auxiliary air chamber 12 may be first heated in any appropriate manner and the heat thus provided further utilized to insure the perfect vaporization of the heavier portions of the liquid.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for forming a combustible gas from liquid hydro-carbon fuel comprising a fuel containing chamber, a fuel supply, a float controlled valve for regulating and maintaining a predetermined level in said fuel containing chamber, a vaporizing chamber above said fuel containing chamber, a valve controlling the outlet, an air supply leading to the lower portion of said fuel containing chamber, a valve for regulating the air passing through said air supply, and means for controlling the valve leading from the gas dome and the valve for controlling the supply of air, whereby both valves are operated simultaneously, substantially as set forth.

2. An apparatus for forming combustible gas from liquid hydro-carbon comprising a liquid fuel containing chamber, means for supplying said chamber with liquid fuel, an air supply leading to the lower portion of said chamber, a valve for regulating the air supply, vaporizing chamber, a valve for regulating the exit from said vaporizing chamber, means for adjusting said valve, and a connection between the same means and the air controlling means whereby the air is regulated so that its supply will be properly proportioned to the consumption of gas, substantially as set forth.

3. An apparatus for forming combustible gas comprising a liquid fuel chamber, an air supply pipe leading into the lower part of said chamber, a vaporizing chamber above the fuel, a tube leading from the lower part of said fuel chamber into an auxiliary air tube, an atomizing head on said tube within said auxiliary air tube, a gauze cone covering said atomizing head, an auxiliary air valve controlling the flow of air through said auxiliary air tube, a mixing chamber, and means for controlling the outflow of gas, substantially as set forth.

4. An apparatus for forming combustible gas from liquid hydro-carbon comprising a fuel chamber, an air pipe communicating with the lower part of said chamber, a vaporizing chamber above the fuel, a central auxiliary air pipe communicating at its upper end with said vaporizing chamber, a screen cone of comparatively large surface mounted therein for preventing the passage of anything but vapor or gas, means for controlling the flow of air through said auxiliary air tube, and means for controlling the flow of gas from said apparatus, substantially as set forth.

5. A carburetor comprising a fuel chamber, an air passage leading through said fuel chamber and having passages forming communication with the fuel chamber above the normal level of the fuel, a spray nozzle extending into said air passage and having communication with the fuel in the fuel chamber adjacent the bottom of the same, means for admitting air into the fuel chamber beneath the level of the fuel said air passage and passages forming communication with the fuel chamber above the level of the fuel being open at all times to the suction of the engine, and a valve movable axially of the air passage for controlling the discharge of fuel from said carburetor, substantially as set forth.

6. A carburetor comprising a fuel chamber, an air passage leading through said fuel chamber and having passages forming communication with the fuel chamber above the normal level of the fuel, a spray nozzle extending into said air passage and having communication with the fuel in the fuel chamber adjacent the bottom of the same, means for admitting air into the fuel chamber beneath the level of the fuel said air passage and passages forming communication with the fuel chamber above the level of the fuel being open at all times to the suction of the engine, a valve movable axially of the air passage for controlling the discharge of fuel from said carburetor, a rack on said valve, and a pinion engaging said rack for moving the valve to permit a larger or smaller amount of fuel to pass by the same, substantially as set forth.

In witness whereof, I have hereunto set my hand at Indianapolis, Indiana, this 3rd day of June, A. D. nineteen hundred and twenty.

ALBERT E. WEAVER.