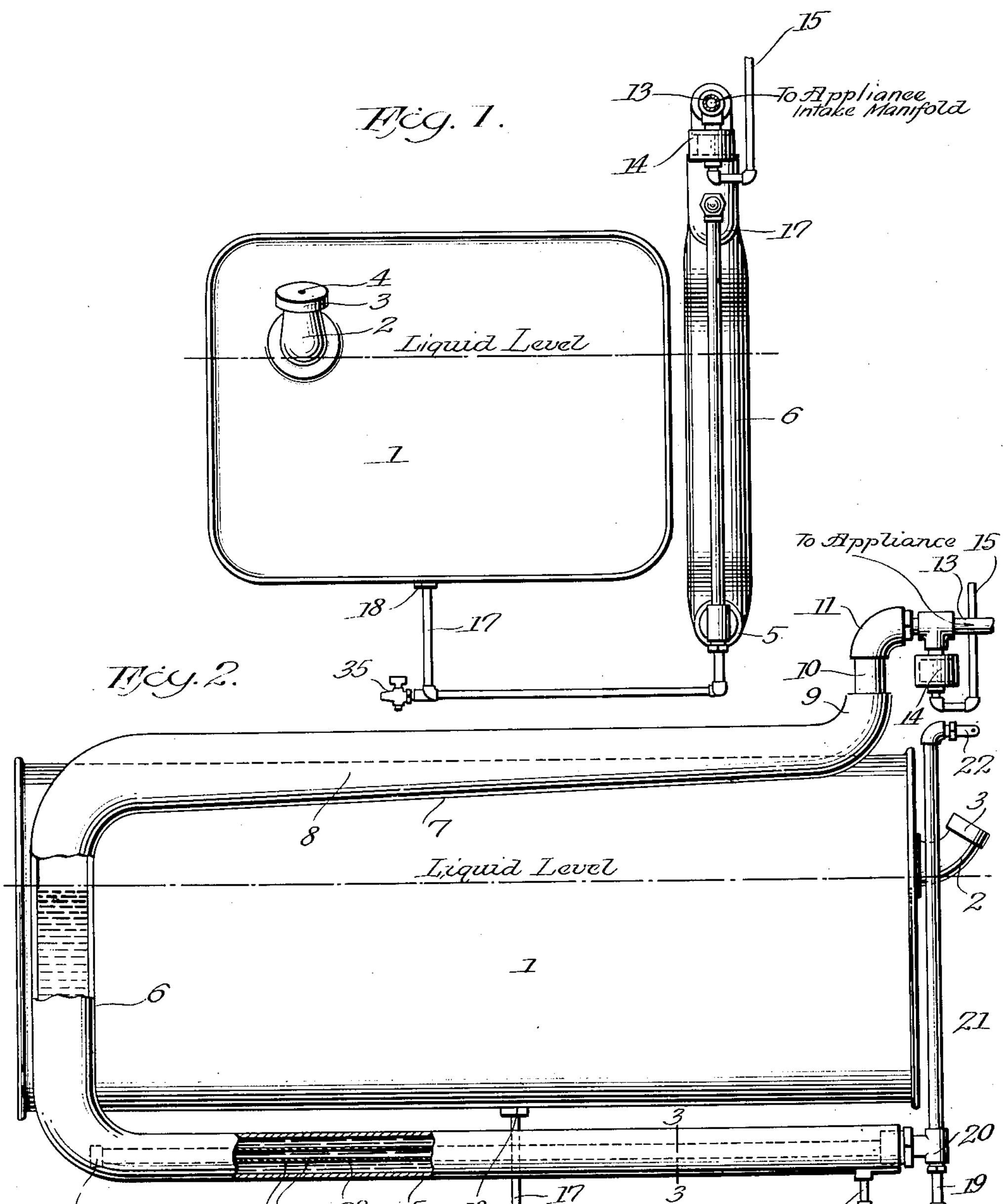
Sept. 11, 1934. A. E. DOBBS 1,972,874

CARBURETING SYSTEM

Original Filed April 17, 1929 2 Sheets-Sheet 1

Fig. 1.

Fig. 2.



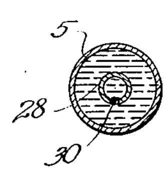


Fig. 3.

Inventor

Arthur E. Dobbs

By

Attorneys

Sept. 11, 1934. A. E. DOBBS 1,972,874

CARBURETING SYSTEM

Original Filed April 17, 1929 2 Sheets-Sheet 2

Fig. 4.

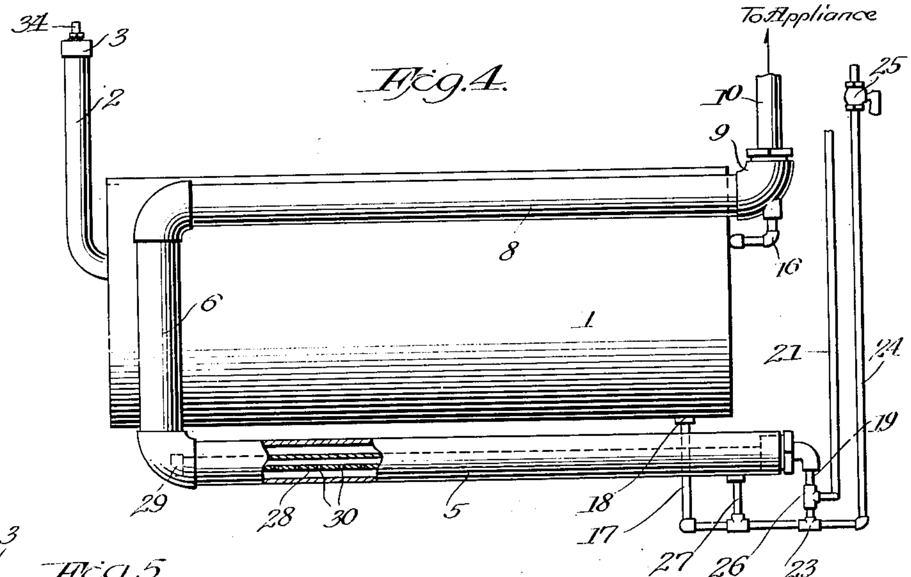


Fig. 5.

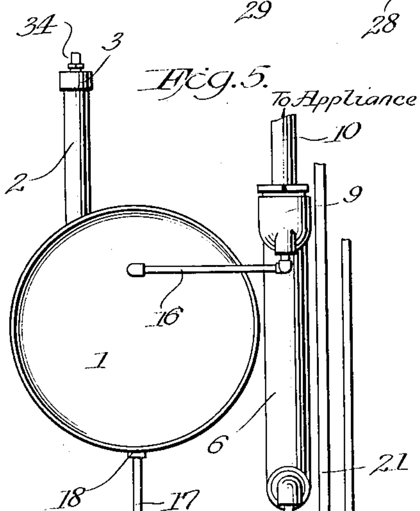
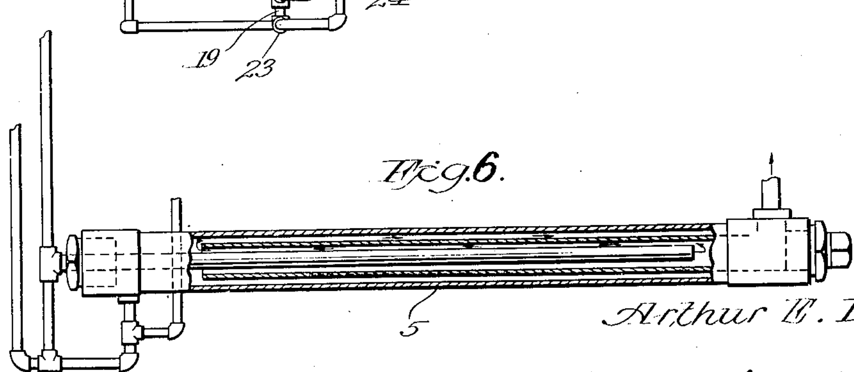


Fig. 6.



Inventor

Arthur E. Dobbs.

By

Attorneys

Patented Sept. 11, 1934 1,972,874

UNITED STATES PATENT OFFICE

1,972,874

CARBURETING SYSTEM

Arthur Emil Dobbs, Miami, Fla.

Application April 17, 1929, Serial No. 355,786
Renewed November 29, 1933

8 Claims. (Cl. 261—121)

This invention relates to an apparatus for carbureting appliances, which use as fuel, volatile liquids.

It has long been apparent to those skilled in the art, that the ordinary means in use today for producing vapor from volatile liquids are, as far as perfect carbureting is concerned, defective, highly inefficient, and expensive. The principal reason seems to be that the vapor is, in reality, a mist or wet vapor which does not give quick complete combustion, and, consequently, the result is a diminution of ultimate power. The secondary deleterious effects are the excess formation of carbonaceous deposits, extreme heat, and cutting the lubricating agent.

In the case of the ordinary hydrocarbon engine, as used in propelling vehicles, ships, airplanes and the like, slow and imperfect combustion caused by improper admixture of the hydrocarbon fuel will, in addition to poor performance, formation of carbonaceous deposits, and extreme heat, warp and burn the valves, and cut and dilute the lubricating agent in the crank case, which latter defect always necessitates the trouble and expense of changing the lubricant before it has served its purpose, and often results in injury to the entire motor. The same, of course, is true in the case of stationary hydrocarbon engines, both large and small.

Where volatile liquids have been converted into gases for lighting and heating purposes, difficulty has been experienced in obtaining a constant and uniformly suitable flame, because of the poor and changing combustible properties of improper admixtures.

The ultimate desire has been to produce a gas, the constituents of which will be so thoroughly and uniformly mixed at all times, and under all conditions, as to render perfect combustion, yet be entirely dry and cold. Heretofore, it has been customary to utilize heat in producing the gas. This has been found to be highly disadvantageous and unnecessary.

The advantages resulting from the use of my method and apparatus are manifold. The power produced by appliances using such admixture is tremendously increased. The tendencies toward carbonaceous deposits after exploding or burning the gas are reduced to a minimum. The possibility of the leakage of raw liquid fuel into the lubricating agent of a hydrocarbon engine, for example, to cause dilution is eliminated; and the decrease in heat created because of the cold gas is astounding, so that with the proper consistency of gas, it is possible to modify the cooling systems now used by hydrocarbon engines.

It is common knowledge, of course, that there are devices for impregnating air with liquid fuel. However, they have often been found impractical and, in many cases, altogether inoperative for modern appliances and modern volatile liquid fuels.

Consideration must be given in devices of this type to the peculiarities of volatile fuels under all conditions, such as weight, agitation, heat, and separation of the lighter and heavier elements.

With these and other advantages in mind, the invention is illustrated in the following drawings:

Figure 1 indicates an end view of the apparatus used in a vacuum system.

Figure 2 indicates a side view partially cut away of the apparatus used in a vacuum system.

Figure 3 indicates a cross-sectional view of the mixing chamber taken on the line 3—3 of Figure 2.

Figure 4 indicates a side view partially cut away of the apparatus used in a pressure system.

Figure 5 indicates an end view of the apparatus shown in Figure 4, and

Figure 6 indicates a modified form of the mixing chamber.

Referring specifically to the drawings, 1 indicates a closed receptacle which may be of any desired size or shape, depending upon the use to which the apparatus is to be put. A filling pipe 2 having a cap 3 is provided at the liquid level, which should be somewhat above the mid-point of the tank, which leaves at all times, an empty space at the top thereof. If the apparatus is intended for use in what is commonly known as a vacuum system, as shown in Figs. 1 and 2, a vent 4 is provided in the cap. Where, however, the system uses air pressure, as shown in Figures 4 and 5, the said vent is omitted and has in its place a suitable valve 34 for attaching means to clean the tank and tubes.

Positioned adjacent the tank 1 in any convenient manner is a mixing chamber 5, which extends horizontally preferably, but not necessarily, the length of said tank. Extending upwardly from one end of the mixing chamber 5 is a tube 6 which may be integral therewith, as shown in Figures 1 and 2, or connected thereto by a joint, as shown in Figures 4 and 5. From a point adjacent the top of the tank 1, there is provided a horizontal tube 8 integral with tube 6, as shown in Figures 1 and 2, or connected thereto by a joint, as shown in Figures 4 and 5. The tubes 5, 6 and 8 whether integral or connected by joints form a substantially U-shaped member. It will be noted in Figure

1 that the receiving tube 8 is larger than the mixing chamber 5 and that the underside 7 of the tube 8 is slightly inclined, the purpose of which is to allow any possible condensation to drain back into the liquid in tube 6. An elbow 9 forms a seat for pipe 10 in the form of apparatus shown in Figures 1 and 2. The said pipe has at its upper end elbow joint 11 and connected thereto is the appliance supply pipe 13. As a further means to eliminate possible condensation, a small chamber 14 is attached below and to pipe 13, and is provided with an air supply pipe 15. In the form of the apparatus shown in Figures 4 and 5, the elbow 9 forms a seat for pipe 10, which is the appliance supply pipe and as a means for draining any possible condensation which may form in tube 8, there is provided pipe 16 connecting said tube 8 to the tank 1.

A pipe 17 attached to the bottom of the tank at 18 in any suitable manner descends to a point below the mixing tube 5, and then extends horizontally beyond said tube and has attached at its end by suitable connection vertical pipe 19, and, as shown in Figures 1 and 2, said vertical pipe terminates in a T-shaped connection 20. Extending from the upper end of said T-shaped connection is the air supply pipe 21, having provided at its end a regulating or check valve 22. In the form of apparatus shown in Figures 1 and 2, a drain cock 35 is provided at the lowest point of pipe 17.

In the forms of the apparatus shown in Figures 4 and 5, the horizontal extension of pipe 17 terminates in a T-shaped connection 23, which connection has attached at its other end a drain pipe 24 provided at the end thereof with a suitable valve 25. Extending upwardly from the T-shaped connection 23 is the vertical pipe 19, which enters and is attached to, the mixing tube 5. Air supply pipe 21 is secured to pipe 19 by suitable connection 26 at a point below the mixing chamber 5.

A connecting pipe 27 is provided between mixing chamber 5 and horizontal pipe 17.

Within the mixing chamber 5 there is placed a tubular member 28 of smaller diameter, which is connected with the T joint 20 in the form of the apparatus, as shown in Figures 1 and 2, and with the vertical pipe 19 in the form of the apparatus shown in Figures 4 and 5. The tubular member 28 is capped at its other end as at 29, and has in the bottom thereof, extending the whole length of said tube, openings 30. It is very important that these openings be in the bottom of the tubular member, as will be realized when the operation of the apparatus is described.

In Figure 6 there is represented a modification of the mixing chamber 5, in that instead of a single inner tubular member having openings therein, there are provided two pipes fitting one within the other, and each having one open end.

The operation of the apparatus is as follows: The closed receptacle, or tank, is filled with a volatile liquid to the point predetermined by the position of the filling pipe, thus leaving an empty space always at the top of said tank. The mixing chamber and connecting pipes and tubes will, of course, be entirely filled with the fluid to the liquid level of the tank.

In the form used in the vacuum system, as shown in Figures 1 and 2, suction from the appliance attached to the apparatus, such as a hydrocarbon engine, will cause air to be drawn through the air supply pipe into the inner tubular member of the mixing chamber, where it will vent through the openings therein into the very bottom of the mixing chamber. The air will then percolate throughout the fluid in the mixing chamber and find an outlet through the tubes leading therefrom. In so doing the air becomes fully impregnated and highly charged with the volatile liquid, and finally flows into the appliance supply pipe as a dry cold gas. Any condensation will take place in the horizontal tube adjacent the top of the tank, and, because of the inclined bottom of said tube, will drain back into the liquid in the mixing chamber. Should there be, by chance, further condensation, it will be taken care of by the small receptacle and auxiliary air intake attached to the appliance supply pipe.

In the form of the apparatus shown in Figures 4 and 5, the air supply pipe is supplied with air under pressure, and it will be noted that the air is first brought to a point below the mixing tube and then ascends a short distance before entering the same. This is to give the air an additional upward impetus before entering the mixing tube.

It will be seen that the mixing tube is always full of liquid, due to the particular construction as shown. This eliminates the possibility of any formation of air pockets, and no matter what angle the apparatus is on, the mixing tube will always be supplied with liquid. Because of the particular construction of tubing, together with the drains for condensation leading from the mixing chamber, there is little or no possibility of any raw fuel reaching the appliance through the fuel supply pipe.

It has been found that by charging the liquid in the mixing chamber with air vented from the bottom of the inner tubular member in the mixing chamber, that the impregnation resulting therefrom is of highly efficient character. Such construction allows complete percolation of the air through the fluid, and only when the liquid has been completely exhausted from the mixing chamber will this impregnation cease.

After the apparatus has been in use for two or three minutes the tank and tubes will be found to be quite cold, and the gas that is emitted from the appliance supply pipe will be found to be cool as if it had purposely been refrigerated.

In order to clean the tanks, when necessary, in the form of apparatus shown in Figures 1 and 2, a drain valve is provided at the lowest point of the liquid supply pipe leading from the tank to the mixing chamber. In the form of apparatus shown in Figs. 4 and 5, the tank can be conveniently drained by supplying air pressure to the filling pipe and opening the valve at the top of the drain pipe.

Should it be found in use that the gas supplied by the apparatus is not of the combustible nature desired, further air can be added by any suitable and well known means before it reaches the appliance.

Experiments have proven that the dry gas manufactured by this method and apparatus is of a highly combustible nature with a minimum, if not an entire, elimination of waste products, and at the same time its cool nature tends to decrease the heat created by gases of this type, which have heretofore used some means for heating to aid vaporization.

It is understood that there are various changes in the construction of the apparatus which may be made by those skilled in the art without departing from the spirit of the invention, and which are covered by the appended claims.

I claim:

1. In a carbureting system, the combination of a fluid tank, an impregnating chamber comprising horizontally disposed portions and a vertically disposed portion, one portion of which is in communication with and filled from said tank, an air delivery pipe traversing said portion, means for inducing flow of air from said air pipe into the liquid in said impregnating chamber, and gas delivery means coupled to one of said horizontally disposed portions.

2. In a carbureting system, the combination of a fluid tank, an impregnating chamber having substantially horizontally disposed interconnected portions, a filling connection from said tank to one of said portions, an air pipe delivering to said filled portion, means for inducing a flow of air downwardly from said air pipe into the liquid-filled portion and causing it to pass to the other of said interconnected portions, and gas delivery means coupled to said last-named portion.

3. In a carbureting system, the combination of a fluid tank adapted to be filled to a predetermined fluid level, an impregnating chamber having horizontally disposed interconnected portions, one portion of said impregnating chamber being in communication with and filled from said tank, an air delivery pipe traversing said portion, means for inducing flow of air from said air pipe into the liquid in said impregnating chamber, and gas delivery means coupled to the other of said portions.

4. In a carbureting system, the combination of a fluid tank, an impregnating chamber comprising horizontally disposed portions and a vertically disposed portion, one portion of which is in communication with and filled from said tank, an air delivery pipe traversing said portion, means for inducing flow of air from said air pipe into the liquid in said impregnating chamber, gas delivery means coupled to one of said horizontally disposed portions, and means to eliminate any condensation therein.

5. In a carbureting system, the combination of a fluid tank, a substantially U-shaped member having liquid and gas receiving portions, a filling connection from said tank to one of said portions, an air pipe delivering to the liquid receiving portion, means for inducing a flow of air downwardly from said air pipe into said liquid receiving portion and causing it to pass to the other of said portions, and gas delivery means coupled to said last named portion.

6. In a carbureting system, the combination of a fluid tank, a substantially U-shaped member having liquid and gas receiving portions, said gas receiving portion being larger than said liquid receiving portion to allow accumulation of gas therein, a filling connection from said tank to said liquid receiving portion, an air pipe delivering to said liquid receiving portion, means for inducing a flow of air downwardly from said air pipe to said liquid receiving portion and causing it to pass to the said gas receiving portion, and gas delivery means coupled to said last named portion.

7. In a carbureting system, the combination of a fluid tank, superposed substantially horizontal communicating passageways exterior of said tank and in communication therewith, an air delivery pipe traversing one of said passageways, means for inducing flow of air from said air pipe into the liquid in said passageway, and gas delivery means coupled to the other of said passageways.

8. In a carbureting system, the combination of a fluid tank, a substantially horizontal chamber exterior of said tank and communicating therewith, a substantially horizontally disposed passageway exterior of said tank and communicating with said chamber, an air delivery pipe traversing said chamber, means for inducing flow of air from said air pipe into the liquid in said chamber, and gas delivery means coupled to said passageway.

ARTHUR E. DOBBS.