C. M. KEMP.

CARBURETER.

APPLICATION FILED JUNE 8, 1910.

1,069,068. Patented July 29, 1913.

Fig. 4

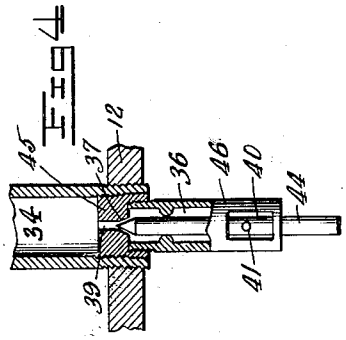


Fig. 5

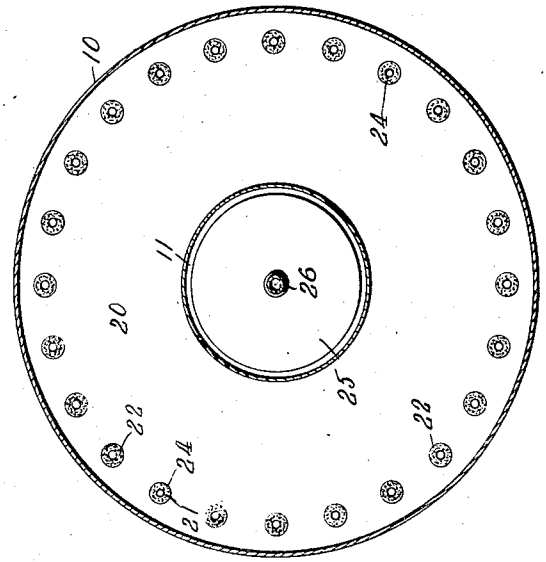


Fig. 2

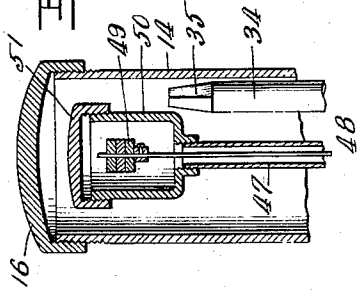
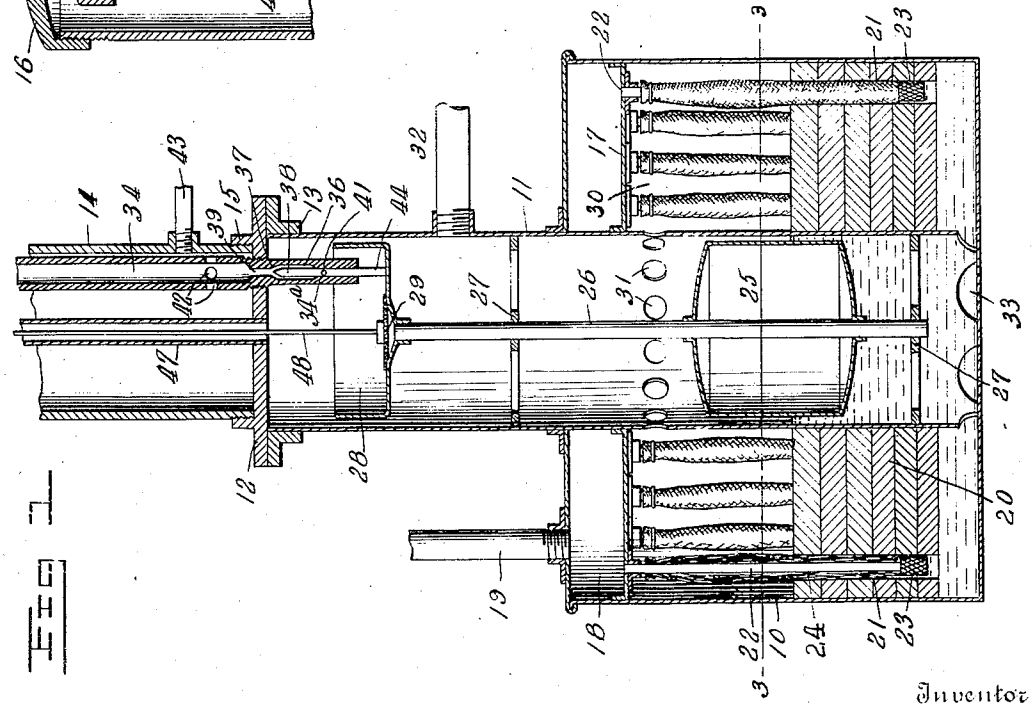


Fig. 1



Witnesses

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CARBURETER.

1,069,068. Specification of Letters Patent. Patented July 29, 1913.

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To all whom it may concern:

Be it known that I, CLARENCE M. KEMP, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to an apparatus for carbureting air; more especially to that class of machines for manufacturing gas to illuminate and heat individual building, or a few buildings with one plant such as houses, factories and the like.

The main object of this invention is to so combine and arrange the several parts thereof that a constant level of the carbureting fluid within the container may be attained whether that level be high or low with respect to the container; that the air to be carbureted shall enter the fluid in finely divided particles and as it emerges therefrom be further divided into minute or atomic particles (in the mechanical sense), thoroughly intermixed with the gaseous particles of the carbureting fluid to form a rich and so-called fixed gas which has great heat producing and illuminating properties.

With these and other objects in view the invention consists of the construction, combination and arrangement of parts hereinafter described and claimed and illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical sectional view of the lower part of a carbureter constructed in accordance with my invention; Fig. 2 is a like view of the upper part of the same; Fig. 3, a horizontal sectional view on the line 3—3 of Fig. 1, and Fig. 4, a detail sectional view of the inlet valve controlling the admission of the hydrocarbon or carbureting fluid.

In the drawings, the numeral 10 indicates a tank or container within which air is carbureted and from the bottom of which a preferably cylindrical chamber 11 extends vertically through and above the tank for a suitable distance. A cap plate 12 covers the upper end of the chamber and is attached thereto in any desired manner, as by a flanged ring 13. The tank is usually buried in the ground at any required depth and is connected with the surface of the ground by a casing 14 screwed into a flange 15 on the upper face of the cap plate 12. At the surface of the ground, the casing 14 is provided with a closure 16 of any suitable kind, a screw cap being shown, as an example, in the drawing.

Within the tank or container 10, a short distance below the top and surrounding the chamber 11, is an air tight diaphragm 17 forming with the top of the tank, an air receptacle 18 fed by an air pipe 19 from any source of pressure. Beneath the diaphragm 17 and a short distance above the bottom of the tank 10 is a relatively thick horizontal body or partition 20 fitting against the walls of the tank and the cylindrical chamber 11. Through the partition in a vertical direction are formed a number of holes 21 arranged preferably in a ring concentric with the chamber 11, see Fig. 3. Affixed fluid tight to the diaphragm 17 and extending downwardly through the space between the diaphragm and the partition, are a plurality of small tubes 22 equal in number and arrangement to the holes 21 but of less diameter and projecting into said holes to the bottoms thereof. Attached to the lower end of said small tubes 22 are caps 23 made of fine reticulated metal or wire gauze which break up the solid streams of air passing down said tubes, when air is forced into the receptacle 18 through the pipe 19, into fine particles or globules.

Surrounding each small tube 22 from the diaphragm 17 through the hole 21 to the perforated cap 23 is a skirt or covering 24 of some absorbent or capillary material, the use of which will be described later.

The tank or container 10 is kept filled to a certain height with gasolene or other suitable hydrocarbon, in this instance to the top of the partition 20, by means of a float 25 fastened on the lower end of a tubular stem 26 mounted to slide vertically in guides 27 within the cylindrical chamber 11. Supported on the upper end of the tubular guide stem 26 is a cup shaped receptacle 28 communicating with said tubular stem through which stem gasolene passes to the bottom of the tank 10 below the partition 20. The opening leading from the cup 28 is covered with a reticulated diaphragm 29 to prevent the passage of any foreign matter into the tubular guide stem which would obstruct the same.

As previously described, air entering the

tank or container 10 through the pipe 19 passes down the small tubes 22 and out through the reticulated caps 23 in minute bubbles into the gasolene filling the holes 21 in the partition. The escaping air rises in the holes and is subjected to further division as it passes through the gasolene soaked skirts 24 surrounding the small tubes and filling the holes 21. During the upward movement of the automatically divided air it combines with the volatile elements of the gasolene and enters the space 30 in the tank or container 10 between the diaphragm 17 and the partition 20, as a combustible gas rich in hydrocarbons. The gas flows from the space 30 through openings 31 in the walls of the chamber 11 into said chamber and from thence by way of the pipe 32 to the place of consumption.

The volatilization of the gasolene gradually reduces the quantity thereof in the tank and the normal level falls in said tank and the chamber 11 which communicate through openings 33 at the bottom of said chamber. The float 25 necessarily follows the movement of the gasolene and opens the gasolene inlet valve in the manner now to be described.

Within the casing 14 is a vertical tube 34, its upper end terminating a short distance below the top of the casing and its lower end extending through the cover plate 12 into the chamber 11 and near the bottom of the cup shaped receptacle 28. The tube 34 is screwed into the cover plate 12, and may be removed and reinserted at any time by means of a suitable tool fitted on its polygonal upper end 35. The lower end 34^a of the tube 34 contains a valve chamber 36 having a valve seat 37 at its upper end for a valve 38 adapted to open and close a channel 39 between the interior of the tube 34 and said valve chamber. The end 34^a of the tube has a slot 40 on one side communicating with and forming an outlet for the valve chamber. A pin 41 in the valve stem projects into the slot 40 and limits the downward movement of said stem and prevents it from falling out of the valve chamber. In the tube 34 just above the cover plate 12 are a series of holes 42 to admit a hydrocarbon fluid from the casing 14, which enters said casing through the fluid pipe 43, to the valve chamber and thence into the cup-shaped receptacle 28 through the slot 40. The stem 44 of the valve 38 slides freely in bearings in the valve chamber, and is sufficiently heavy to bear at all times on the bottom of the receptacle 28 and rise and fall therewith as the float 25 moves. When the float falls, owing to the lessening quantity of gasolene in the tank or container 10, the valve descends with the receptacle and opens communication with the channel 39 and the valve chamber 36, thus permitting gasolene to flow from the casing 14 into the receptacle 28 and thence through the tubular stem 26 to the bottom of the tank 10. As the tank fills, the float rises and lifts the valve, finally closing it when the proper level of gasolene in the tank 10 is reached.

One form of the valve structure is shown enlarged in Fig. 4. In this instance, the tube 34 ends at the under side of the cover plate 12, and screwed into the end of the tube is a plug 45 containing the channel 39 and the valve seat 37. The valve chamber 36 is formed in a separate tube 46 screwed into the bottom of the plug 45, or it may be integral therewith.

Rising from the center of the cover plate 12 is a tubular casing 47 within which is placed a rod 48 having an enlargement on its lower end to rest on the bottom of the receptacle 28, or the screen 29. The upper end of the rod 48 is arranged to receive one or more weights 49 which by their pressure acting through said rod and the tubular stem 26, change the buoyancy of the float and the height of the gasolene level in the tank or container 10, as the greater the weight the higher will such level be. The ability to change the gasolene level is of advantage, as it enables the production of gas to conform to the air pressure and also to the quality of hydrocarbon used.

The upper end of the tubular casing 47 is preferably enlarged or provided with an enlargement 50 to inclose the weights 49, and is closed by a screw cap 51 or other convenient means.

The valve mechanism hereinabove described forms the subject-matter of Letters Patent No. 990,143, granted to me on the 18th day of April, 1911, the same being divided out of this application and filed on September 7, 1910, Serial No. 580,930.

What I claim is:

1. In a carbureter, a container for hydrocarbon fluid, means for introducing air in a finely divided state into the body of said hydrocarbon fluid below its level, capillary material inserted partly into said hydrocarbon fluid to become saturated therewith and partly above said fluid, impervious material surrounding said capillary material, said impervious material being so disposed that the finely divided incoming air can escape only through the interstices of the said capillary material and to be thereby further divided that it may absorb more of the volatile portion of said hydrocarbon fluid, means for feeding hydrocarbon fluid to the container, and means for operating said feeding means governed by the height of fluid in the container.

2. In a carbureter, a container for a hydrocarbon fluid, a partition in said container provided with vertical openings, means in said openings for conveying air into the

body of said hydrocarbon below its surface, and fluid holding material in said openings projecting into the hydrocarbon fluid through which material air under pressure returns in a finely separated state and becomes intimately mixed with the hydrocarbon saturating said substance to form combustible gas.

3. In a carbureter, a container, a thick partition dividing said container into two sections, in the lower of which is placed a hydrocarbon fluid, a plurality of tubes projecting into openings formed in said partition and extending to near the bottom thereof, reticulated outlets for said tubes for finely dividing air forced through said tubes into the hydrocarbon fluid, and fluid holding material surrounding said tubes and filling said openings and extending both below and above the fluid level through which material the finely divided air is forced to pass and be more finely separated and thoroughly saturated with volatile hydrocarbon to form a combustible gas.

4. In a carbureter, a tank for containing a hydrocarbon fluid, a horizontal partition dividing said tank near the level of said fluid and provided with openings, means for maintaining the fluid level, tubes extending into said openings and below the fluid level through which air under pressure is forced into the body of said hydrocarbon fluid in a divided condition, fluid holding material surrounding said tubes and entering said fluid through said openings, said material dividing the air flowing outwardly therethrough into minute particles which mix intimately with the hydrocarbon to form a combustible gas.

5. In a carbureter, a tank adapted to contain hydrocarbon fluid, a thick horizontal partition dividing said tank near the level of said fluid, means operatively carried in an opening in said partition for maintaining the fluid level in the tank, and pipes having reticulated nozzles and surrounded by hydrocarbon absorbent material extending through holes in said partition to convey finely divided air into the fluid whence it escapes through the absorbent material thoroughly saturated with the volatile hydrocarbon.

6. In a carbureting apparatus, a tank having an air supply, a hydrocarbon fluid supply, means to control the supply of hydrocarbon to said tank, a partition of such thickness as to limit the quantity of hydrocarbon below the same, said partition having openings therethrough into which the hydrocarbon flows to a predetermined level, whereby a limited surface measure of hydrocarbon is maintained below the surface of said partition and a uniform quality of gas produced, air inlet pipes having reticulated outlets projecting into said openings, and absorbent material surrounding said pipes and filling said openings and extending above and below the fluid level.

7. In a carbureting apparatus, a tank for the hydrocarbon fluid, a thick partition in said tank provided with a plurality of openings extending therethrough, into which hydrocarbon fluid may enter from said tank, means by which incoming air is separated into a finely divided state in the lower ends of said openings through which and the hydrocarbon fluid therein said finely divided air passes and absorbs the volatile parts of said fluid, a hydrocarbon supply, a feeding device for delivering hydrocarbon fluid from said supply to the bottom of said tank to prevent the mixture of incoming hydrocarbon fluid mixing with air or gas, and means connected with said feeding device for automatically maintaining a constant height of fluid in the tank near the top of said thick partition.

8. In a carbureter, a tank having a diaphragm near its top and a partition near its bottom, a plurality of vertical holes through said partition, tubes for carrying air under pressure and extending downwardly into said holes containing a hydrocarbon fluid, capillary material surrounding said tubes through which the air passes to combine with the hydrocarbon to form a combustible gas, and a gas outlet.

9. In a carbureter, a tank, a float actuated inlet valve for a hydrocarbon fluid, a horizontal partition above the bottom of the tank forming a hydrocarbon fluid holder below and a gas space above the same, said partition having vertical perforations therethrough, air pipes opening into the air space in the tank and extending into said perforations, said pipes projecting into the hydrocarbon fluid, capillary material surrounding said air pipes for minutely dividing the air forced into said fluid whereby it absorbs the volatile parts of the fluid and forms a gas, and an outlet pipe for said gas connected to said tank.

10. In a carbureter, a tank, a thick partition dividing said tank into an upper gas space and a limited lower space for a hydrocarbon fluid, a plurality of openings being formed through said partition, inlet air pipes projected thereinto below the level of said hydrocarbon fluid, capillary material packed between the air pipes and the walls of the openings to retard the outward flow of air through said material whereby the air is minutely divided and readily absorbs a large quantity of hydrocarbon to form a richer gas.

11. In a carbureting apparatus, a tank, a thick impervious partition therein through which are formed a plurality of openings into which hydrocarbon flows from the bottom of said tank upward, to a predetermined

level, an air tube projecting into each opening to the bottom of the same and provided with a reticulated outlet from which outlets air under pressure emerges in a finely divided state and passes upwardly around said tubes through the hydrocarbon in said openings to the tank above the same, a hydrocarbon fluid supply, and automatic means for controlling the feed of said hydrocarbon fluid from the supply to the bottom of the tank.

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

CLARENCE M. KEMP.

Witnesses:
JOHN S. COLE,
EDGAR J. KEMP.