

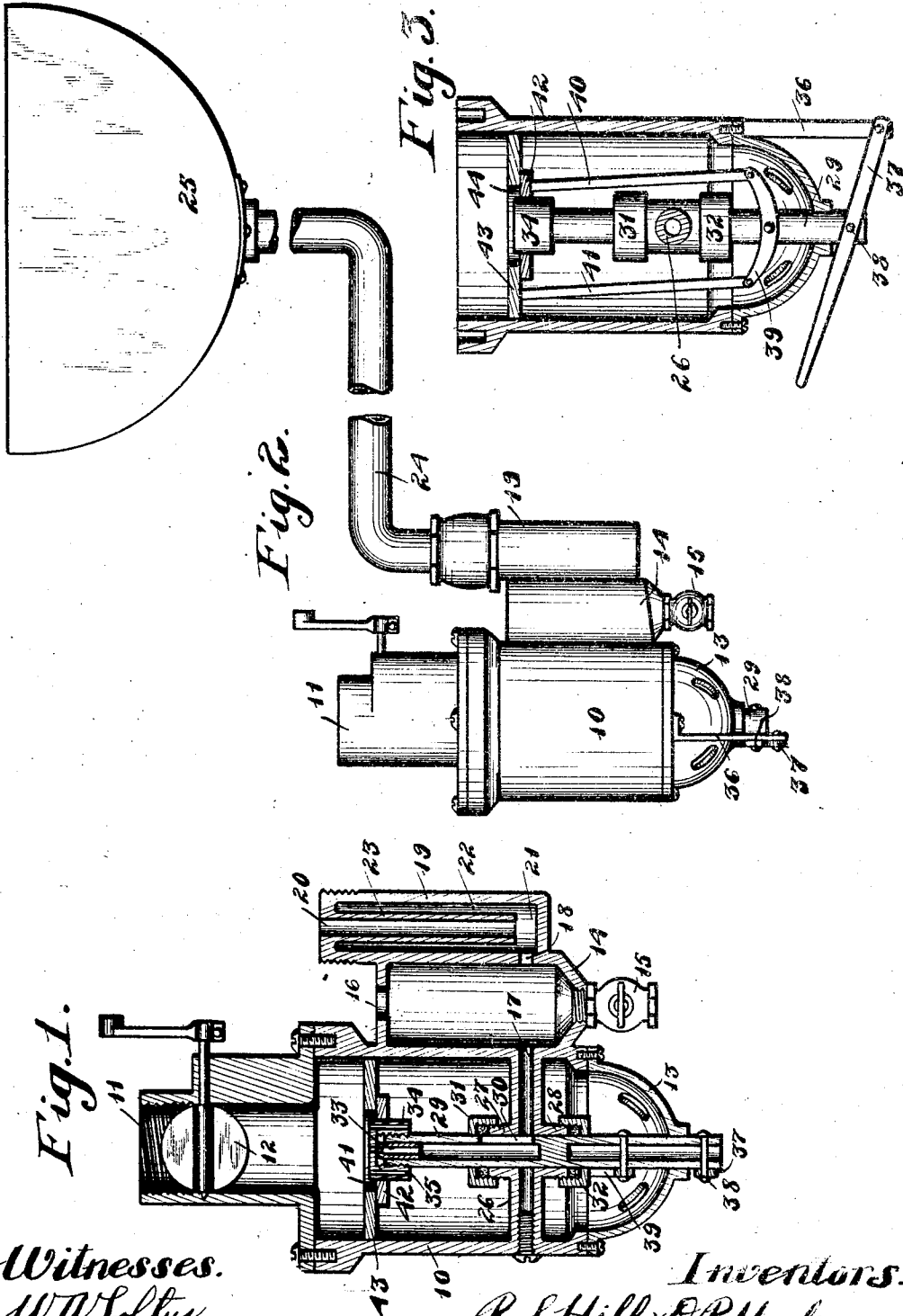
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CARBURETER.

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CARBURETER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, OLIVER P. UNDERWOOD and RAYMOND S. HILL, citizens of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Carbureter, of which the following is a specification.

This invention relates to that class of carbureters in which a gasoline distributing tube is provided within the carbureter chamber and the gasoline or other liquid fuel is discharged through said distributing tube into a current of air which vaporizes the gasoline and delivers it to an internal combustion engine or the like. In carbureters of this class it is desirable that the gasoline be maintained at a certain predetermined level below the discharge end of said discharge tube and that it be drawn from the discharge tube by the suction of air.

Our object is to provide means whereby the gasoline may be freely fed to the discharge end of the distributing tube and normally maintained at a certain predetermined level below the upper end of said discharge tube regardless of the amount of pressure upon the gasoline being delivered to the discharge tube.

More specifically it is our object to provide means whereby the level of the gasoline relative to the discharge end of the tube may be readily and quickly adjusted by the operator so that the gasoline is close to the discharge end of the tube or at a point a considerable distance below it to meet the various requirements of use.

A further object is to provide a carbureter of this class of simple, durable and inexpensive construction that will not be injuriously affected by violent shaking or jarring applied to it as is the case when carbureters are used on devices like automobiles.

Our invention consists in certain details, in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a vertical, central, sectional view of a carbureter embodying our invention. Fig. 2 shows a side elevation of same with a gasoline supply tank connected

therewith, and Fig. 3 shows a detail, sectional view through the carbureter chamber taken on a line at right angles to that on which Fig. 1 is taken.

Referring to the accompanying drawings, we have used the reference numeral 10 to indicate the hollow body portion of the carbureter. At its top is a pipe 11 containing a throttle valve 12 for controlling the flow of mixed air and gasoline from the carbureter. At the bottom of the carbureter chamber is a perforated bottom plate 13 having an opening at its center to form a bearing for the distributing tube hereinafter described.

Formed integral with one side of the carbureter chamber is a cylindrical chamber 14 having at its bottom a pet cock 15 and having an opening 16 at its top. This cylindrical chamber 14 is provided with a discharge passageway at 17 and on its side opposite from the passageway 17 is a fuel feeding passageway 18. Formed integral with the side of the cylindrical chamber 14 is a second cylindrical chamber 19 having a vertically arranged opening 20 extending from its top to a point spaced apart from its bottom and leading into a large recess 21, which recess communicates with the passageway 18. Formed in the cylindrical chamber 19 surrounding the opening 20 is a cylindrical recess 22 spaced apart from the cylindrical opening 20 by the tubular wall 23. A fuel supply pipe 24 communicates with the top of the opening 20 and leads to a gasoline supply tank 25, which tank is closed on all sides.

By the construction described, it is obvious that gasoline from the tank 25 will flow through the pipe 24 and into the opening 20. From this opening it will descend to the chamber 21 and it will flow up into and around the cylindrical recess 22 and thereby the pressure upon the gasoline and the speed of its flow will be retarded. Then when the gasoline flows through the passageway 18 into the chamber 14 the opening in the upper end of said chamber will permit the air to rest on top of the gasoline supply tank at atmospheric pressure which obviously will tend to maintain the level of the gasoline within the chamber 14 at a substantially uniform point, it being understood that the tank 25 from which the gasoline is delivered is closed against air pres-

sure so that when the level of the gasoline within the tank is raised or lowered the level within the chamber 14 will remain substantially the same.

- 5 Formed within the carbureter chamber 10 is a transversely arranged tube 26 communicating with the discharge passageway 17. This tube has at its central portion an upwardly extended screw threaded tube 27 and
10 a downwardly extended screw threaded tube 28. Extended vertically through these tubes 27 and 28 is the gasoline discharge tube 29. This tube 29 is provided with a slot at 30 designed to communicate with the
15 opening in the tube 26 so that gasoline may freely flow through the tube 26 into the tube 29 when said latter tube is adjusted vertically to any position out of its limit of movement.
- 20 In order to maintain tight joints around the tube 29, we have provided two stuffing boxes 31 and 32 at the ends of the tubes 27 and 28 and surrounding the tube 29. In the top of the tube 29 is a distributing plug
25 33 having a small vertical opening and screwed on top of the tube 29 is a cap 34 having an opening at its top to coincide with the opening in the plug 33 and also having a series of openings 35 extended vertically through its side edges. At the bottom of the carbureter casing is a support
30 36 to which a lever 37 is fulcrumed. This lever is pivoted at 38 to the lower end of the distributing tube 29 so that said distributing tube may be raised and lowered within
35 the carbureter chamber. By this arrangement it is obvious that if the gasoline is maintained at a normal level within the chamber 14 it will also maintain a similar
40 level within the distributing tube 29. If the tube 29 is moved downwardly by the lever 37 then the level will be near the top of the tube 29 or if said tube 29 is moved upwardly the gasoline level will be spaced
45 farther apart from the top of the tube and in the latter instance the air being drawn through the carbureter chamber will not take up so much gasoline proportionately as in the former instance so that the device
50 may be adjusted to suit different requirements in use by simply manipulating the lever 37.

- We have also provided means whereby the relative proportions of gasoline and air delivered by the carbureter may be varied automatically in proportion to the velocity of the air being drawn through the carbureter casing at relatively low speed. The current of air will run relatively close to the gasoline supply and when the air is being drawn through at relatively high speed the greater portion of the air will pass through at a point spaced apart from the gasoline so that the mixture will be substantially uniform
55 at all times for the reason that in order to

take up or vaporize a certain quantity of gasoline air that is traveling through the carbureter at slow speed it must be discharged closer to the supply of gasoline than air that is passing through the carbureter at high speed. This result is accomplished as follows: Centrally mounted upon the tube 29 is a lever 39 and pivoted to the ends of the lever are two links 40 and 41. The link 40 is attached at its upper end to a disk 42, which disk is slidingly fitted around the cap 34 and its periphery extends from said cap outwardly to a point about midway between the cap 34 and the adjacent interior surface of the carbureter casing. Fixed to the upper end of the other link 41 is a second disk 43. This disk is large enough in diameter to slidingly fit the interior of the carbureter casing and at its central portion is a relatively large opening 44 which is larger than the cap 34 and somewhat smaller in diameter than the disk 42. These parts are so arranged that when the disks 42 and 43 are in the positions shown in Figs. 1 and 3, very little air will be permitted to pass upwardly through the carbureter chamber except through the openings 35 in the cap 34. However when an air suction is applied to the top of a carbureter chamber it will elevate the disk 43 and when this is done the disk 42 will be correspondingly lowered so that air may pass through between the disks 42 and 43 and up through the opening 44 in the upper disk. When the disks are relatively close together this current of air will be forced inwardly toward the center of the distributing tube 29 but when said disks are moved apart to their maximum limit the air will pass upwardly without being discharged so close to the end of the distributing tube. It is well known that as the velocity of a current of air passing through a carbureter increases the quantity of gasoline that may be taken up by it will increase proportionately; hence as the velocity increases the disks 42 and 43 tend to decrease the proportion of gasoline vaporized by the air. By this arrangement the proper proportions of gasoline and air are maintained to meet the requirements of use. Furthermore by having the disks 40 and 42 pivotally connected with the tube 29 they jointly move up and down with said tube to be in proper position relative to the discharge end of the tube as it is moved up and down to its proper position relative to the gasoline level within the carbureter chamber.

In practical operation and assuming that the gasoline level within the tube 29 is being maintained by means of the level maintaining devices herein shown and described or by any other well known device for this purpose, and assuming further that an internal combustion engine is connected to the pipe 11 at the top, then as the air is rapidly

drawn through the carbureter chamber it will pass through the openings 35 and form a partial vacuum above the opening in the plug 33 to thereby draw up the gasoline within the tube 29 and commingle said gasoline with the air to form a vaporized mixture suitable for the requirements of an internal combustion engine. If the mixture proves, under the conditions of use at a certain particular time, to be too rich in gasoline, then the operator may, by elevating the handle of the lever 37 raise the discharge end of the tube 29 to a point farther spaced above the gasoline level or by lowering said tube 29 the opposite result may be accomplished. When the tube 29 is in any position of its movement the current of air passing through the carbureter chamber will be directed close to the small end of the plug 33 when the velocity is relatively low and it will be directed farther away from the small end of the plug 33 when the velocity of the air is relatively high so that an approximately uniform mixture will be provided under all of the conditions as to air velocity usually encountered in practice.

We claim as our invention:

1. In a device of the class described, the combination of a carbureter casing, a vertical distributing tube for liquid fuel, slidably mounted within the carbureter casing, a horizontal intake tube communicating with the interior of said carbureter casing, said distributing tube being provided with a slot communicating with said intake tube, means for vertically adjusting said distributing tube, means for admitting air to the interior of the carbureter casing, and means whereby the liquid in said intake tube may be maintained at the same level.

2. In a device of the class described, the combination of a carbureter casing, a vertical distributing tube for liquid fuel, slidably mounted within the carbureter casing, a horizontal intake tube communicating with the interior of said carbureter casing, said distributing tube being provided with a slot communicating with said intake tube, means for vertically adjusting said distributing tube, means for admitting air to the interior of the carbureter casing, and means for regulating the amount of air passing adjacent to the discharge end of said distributing tube.

3. In a device of the class described, the combination of a carbureter casing, a vertical distributing tube for liquid fuel, slidably mounted within the carbureter casing, a horizontal intake tube communicating with the interior of said carbureter casing, said distributing tube being provided with a slot communicating with said intake tube, means for vertically adjusting said distributing tube, means for admitting air to the interior of the carbureter casing, and means

for regulating the amount of air passing adjacent to the discharge end of said distributing tube, said means being automatically operated by the suction from the engine.

4. In a device of the class described, the combination of a carbureter casing, a vertical distributing tube for liquid fuel, slidably mounted within the carbureter casing, a horizontal intake tube communicating with the interior of said carbureter casing, said distributing tube being provided with a slot communicating with said intake tube, means for vertically adjusting said distributing tube, means for admitting air to the interior of the carbureter casing, and means for regulating the amount of air passing adjacent to the discharge end of said distributing tube, said means being automatically operated by the suction from the engine, and comprising a plate of approximately the same diameter as the interior of the casing and having a large central opening, said plate being slidably mounted adjacent to the discharge end of the distributing tube, a second plate slidably mounted on said distributing tube adjacent to said first plate, said second plate being of smaller diameter than said first plate but being of sufficient diameter to close the central opening in said second plate when the plates are together, a lever centrally and pivotally mounted on said distributing tube, a link pivotally connected with one end of said lever and with one of said plates, a second link pivotally connected with the other end of said lever and with the other of said plates.

5. In a device of the class described, the combination of a carbureter casing, a vertical distributing tube for liquid fuel, slidably mounted within the carbureter casing, a horizontal intake tube communicating with the interior of said carbureter casing, said distributing tube being provided with a slot communicating with said intake tube, means for admitting air to the interior of the carbureter casing, means for regulating the amount of air passing adjacent to the discharge end of said distributing tube, said means being automatically operated by the suction from the engine, and comprising a plate of approximately the same diameter as the interior of the casing and having a large central opening, said plate being slidably mounted adjacent to the discharge end of the distributing tube, a second plate slidably mounted on said distributing tube adjacent to said first plate, said second plate being of smaller diameter than said first plate but being of sufficient diameter to close the central opening in said second plate when the plates are together, a lever centrally and pivotally mounted on said distributing tube, a link pivotally connected with one end of said lever and with one of said plates, a

second link pivotally connected with the other end of said lever and with the other of said plates, said first named plate being located above said second named plate, and
5 a discharge tube leading from the upper end of said carbureter casing.

6. An improved carbureter comprising a carbureter casing with openings for the admission of air, a transverse tube within the
10 carbureter casing, an upright distributing tube slidably mounted in said branches and provided with a slot to provide communication between said tubes, stuffing boxes on
15 said transverse tube and surrounding the upright tube, a cap at the top of the upright tube, having an opening through its center for liquid fuel discharge and also having a series of openings around its sides forming air passageways, means for vertically ad-

justing the upright tube within the carbureter casing, a lever fulcrumed to the upright tube, two links connected with the lever at opposite ends, a disk fixed to one of said links and slidingly mounted on said cap, the periphery of said disk being spaced
20 apart from the interior of the casing, a second disk carried by the other link having a large central opening spaced apart from the sides of said cap and having its periphery close to the interior of the casing; and
25 a throttle valve at the top of the casing, substantially as and for the purposes stated.

Des Moines, Iowa, August 12, 1910.

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Witnesses:

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