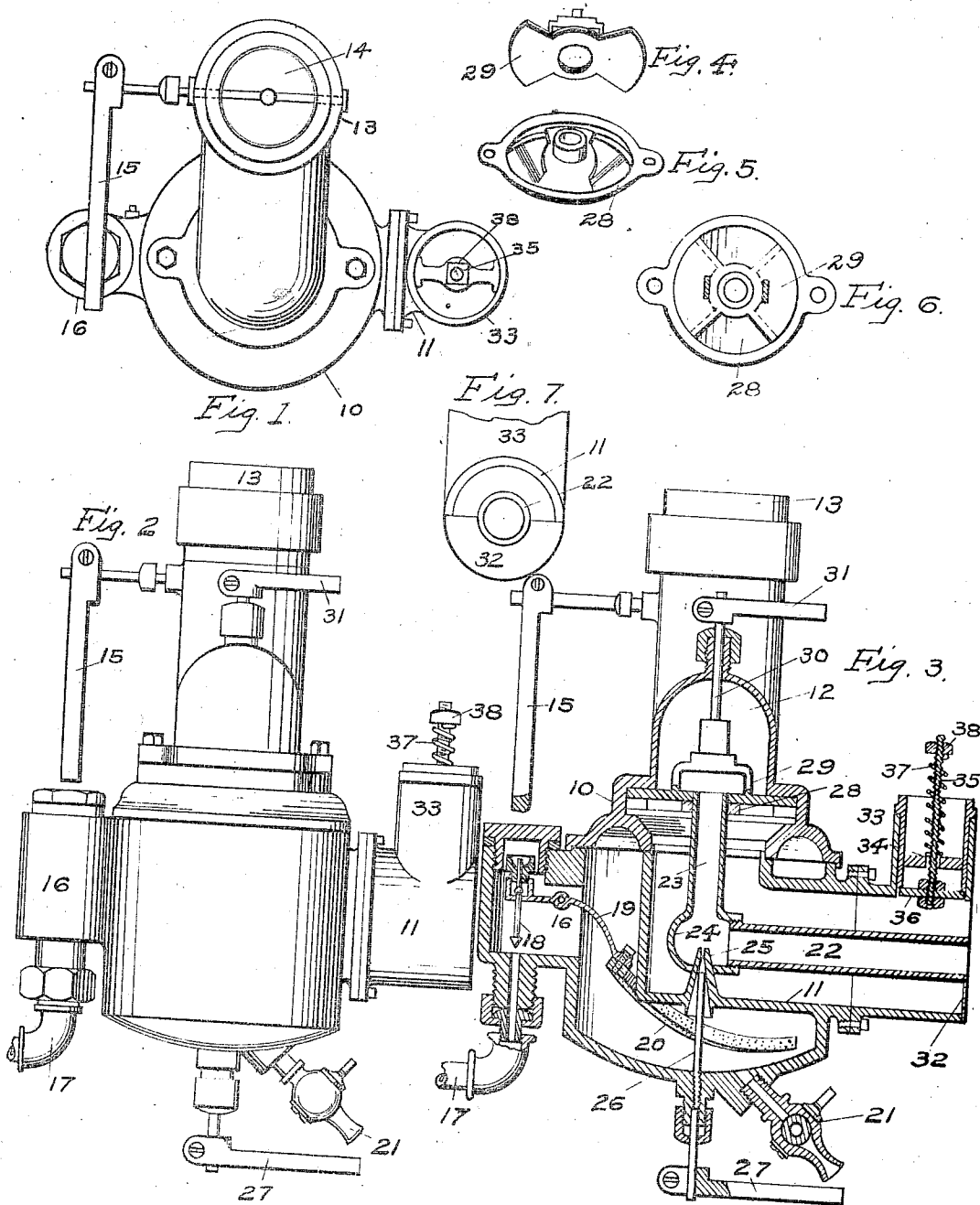


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J. E. RUSSELL.
CARBURETER.
APPLICATION FILED FEB. 5, 1912.

1,044,576.

Patented Nov. 19, 1912.



Witnesses.

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UNITED STATES PATENT OFFICE.

JEROME E. RUSSELL, OF RUDD, IOWA.

CARBURETER.

1,044,576.

Specification of Letters Patent.

Patented Nov. 19, 1912.

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To all whom it may concern:

Be it known that I, JEROME E. RUSSELL, a citizen of the United States, residing at Rudd, in the county of Floyd and State of Iowa, have invented a certain new and useful Carbureter, of which the following is a specification.

My invention relates to and consists in certain improvements on the type of carbureters illustrated in my application for United States Letters Patent, filed Feb. 28, 1911, Ser. No. 611,326.

In my present invention there is a vapor tube contained within the air tube and it is my object to provide means whereby the mixture within the vapor tube will immediately, after passing the spraying nozzle, be subjected to an increased velocity and to an increased degree of vacuum to thereby produce a more perfect mixture of the particles of gasoline with the air; and my object is further to provide a device of this kind in which, when the air is permitted to pass through the air tube, a proper proportion and quantity of air will also enter and pass through the vapor tube.

My 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 my claims and illustrated in the accompanying drawings, in which:

Figure 1 shows a top or plan view of a carbureter embodying my invention. Fig. 2 shows a side elevation of same. Fig. 3 shows a vertical, longitudinal, central, sectional view of same. Fig. 4 shows a perspective view of the movable valve member for the air tube. Fig. 5 shows a similar view of the stationary valve member. Fig. 6 shows a top or plan view of the movable and stationary valve members combined, the movable valve being in its closed position, and Fig. 7 shows a detail view illustrating the inlet end of the air and vapor tubes.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate generally the casing of the carbureter. Admitted into one side of the casing 10 is an air tube 11 which passes through the body of the carbureter and discharges near the top into the laterally extended discharge tube 12. This discharge tube finally is extended straight upwardly at 13 and is provided with a throttle valve 14 of ordinary

construction having a lever 15. Arranged at one side of the carbureter body is a gasoline inlet chamber 16 provided with a supply pipe 17 at its lower end controlled by a needle valve 18. This needle valve is carried by a lever 19 on which is a float 20 within the carbureter chamber whereby the level of gasoline within the carbureter chamber may be maintained in a substantially uniform manner. This float valve mechanism is of the ordinary construction and of itself forms no part of my present invention. At the bottom of the carbureter body is a drain valve 21 of ordinary construction.

Arranged within the air tube 11 is a smaller tube 22 which I have termed the vapor tube and which extends from the inlet end of the air tube to the outlet end thereof. This vapor tube is characterized by having the inlet portion of it made larger in diameter than the outlet portion 23. At the junction of the parts 22 and 23 is an enlarged chamber 24 into which a spraying nozzle 25 is inserted. The size of the enlarged chamber is such that when the nozzle is inserted in it the carrying capacity of the part 24 will be the same as the part 22. This nozzle is open at its lower end into the gasoline chamber of the interior of the carbureter body and the nozzle is controlled by a needle valve 26 of ordinary construction provided with a controlling lever 27 at its lower end.

At times it is desirable to have all of the air that flows through the carbureter pass through the vapor tube and at other times it is desirable to have air pass through both the vapor tube and the air tube. In order to properly control the passage of air in this manner, I have provided a valve surrounding the upper end of the vapor tube to control the passageway from the air tube. This valve comprises a stationary valve member 28 having openings therein and a movable valve member 29 capable of covering or uncovering said openings. The movable valve member 29 is fixed to a stem 30 provided with a lever 31 and when this lever 31 is in one position the passageway through the air tube is unobstructed and when in its other position the passageway through the air tube is completely closed. In all positions of the valve the passageway through the vapor tube is unobstructed.

In order to support the inlet end of the vapor tube 22 and at the same time to partially close the inlet end of the air tube, I

have provided a small partition 32 shown in Figs. 3 and 7 and covering approximately the lower half of the inlet opening of the air tube. Under ordinary circumstances this partition 32 will permit of the entrance of just the right proportion of air through the air tube and air through the vapor tube. If the partition 32 were omitted an excessive quantity of air would flow through the air tube and the amount of air flowing through the vapor tube would be too small to carry with it a proper amount of gasolene from the nozzle 25.

When the suction on the carbureter is excessive and it is desirable to permit an unusual quantity of air to enter the air tube the spring actuated air inlet valve is opened automatically. This valve comprises a tube 33 open at both ends, the lower end being in communication with the air tube 11. In the tube 33 is a partition 34 through which the valve stem 35 is slidably extended. At the bottom of the valve stem 35 is a valve 36 which is normally held seated against the lower end of the valve 33 by means of the spring 37. An adjusting nut 38 provides for regulating the tension of the spring. When this valve is held open by the suction of air within the air tube 11 a greater quantity of air may be made to pass through the air tube 11 than is possible when the valve 36 is closed.

In practical operation and assuming that my improved carbureter is connected in the ordinary manner with an internal combustion engine, and assuming that it is desired to start up the engine when it is cold, I have found that the best results are obtained by the use of an unusually rich mixture of vapor. In order to obtain this rich mixture I close the movable valve member 29, thus completely preventing the passage of air through the air tube so that the entire suction of the engine is applied to the vapor tube. By my improved construction of vapor tube, it is obvious that the air will be forced through the vapor tube at a very rapid rate, thus taking up from the nozzle 25 a large amount of gasolene in proportion to the amount of air, and thus making what is termed a relatively rich mixture. When an unusually large amount of gasolene is taken up in the manner just described, it is desirable to commingle the gasolene with the air to the greatest possible extent so that the particles of gasolene will be broken up as much as possible. For this purpose I have so arranged the vapor tube that immediately after the gasolene commingles with the air the mixture of gasolene and air will be subjected to an increased velocity and to an increased degree of vacuum, thus permitting the vapor to expand and the particles of liquid fuel to be broken up. I obtain this result by having the passageway from the

discharge end of the nozzle 25 to the discharge end of the vapor tube of smaller capacity than the other parts of the vapor tube and of the discharge pipe into the engine.

After the engine to which the carbureter is attached has become warm and it is desired to operate it in an economical and efficient manner a larger proportion of air should be supplied to the mixture. This is done by manipulating the valve stem 31 to open the valve member 29, whereupon a quantity of air passes through the air tube and a certain quantity of air passes through the vapor tube, a current of air in the vapor tube being the sole means of taking up the gasolene from the nozzle 25. Immediately after the vapor passing through the vapor tube is discharged from the vapor tube it will then be commingled with the air through the air tube and thus the proper mixture will be formed.

When the engine is running at a relatively high speed it is desirable to increase the proportionate amount of air. This I have provided for by means of the automatic air inlet valve arranged on the inlet portion of the air tube.

I claim as my invention:

1. In a carbureter, the combination of a suitable casing, a level maintaining means for liquid fuel within the casing, an air tube extended through the casing and arranged to discharge upwardly, a valve for controlling the discharge end of the air tube, a vapor tube open at both ends arranged within the air tube and extending the full length of the air tube, a nozzle for liquid fuel admitted into the vapor tube, and means for partially closing the inlet end of the air tube without affecting the inlet end of the vapor tube.

2. In a carbureter, the combination of a suitable casing, a level maintaining means for liquid fuel within the casing, an air tube extended through the casing and arranged to discharge upwardly, a valve for controlling the discharge end of the air tube, a vapor tube open at both ends arranged within the air tube and extending the full length of the air tube, a nozzle for liquid fuel admitted into the vapor tube, and a partition arranged across the lower portion of the inlet end of the air tube, said partition being also arranged to support the inlet end of the vapor tube without obstructing it.

3. In a carbureter, the combination of a suitable casing, a level maintaining means for liquid fuel within the casing, an air tube extended through the casing and arranged to discharge upwardly, a valve for controlling the discharge end of the air tube, a vapor tube open at both ends arranged within the air tube, and extending

the full length of the air tube, a nozzle for liquid fuel admitted into the vapor tube, means for partially closing the inlet end of the air tube without affecting the inlet end of the vapor tube, and a spring actuated air inlet valve arranged on the air tube and designed to open automatically to increase the air carrying capacity of the air tube upon an excessive suction being applied to the discharge end of the air tube.

4. In a carbureter, the combination of an air tube open at both ends, means for regulating the passage of air through the air tube, a vapor tube comprising a member

extended through the inlet portion of the air tube, another member extending through the outlet portion of the air tube, the latter member being of less carrying capacity than the former, there being at the intersection of said two members an enlarged chamber, and a nozzle for liquid fuel admitted into said enlarged chamber, for the purposes stated.

Des Moines, Iowa, January 17, 1912.

JEROME E. RUSSELL.

Witnesses:

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