

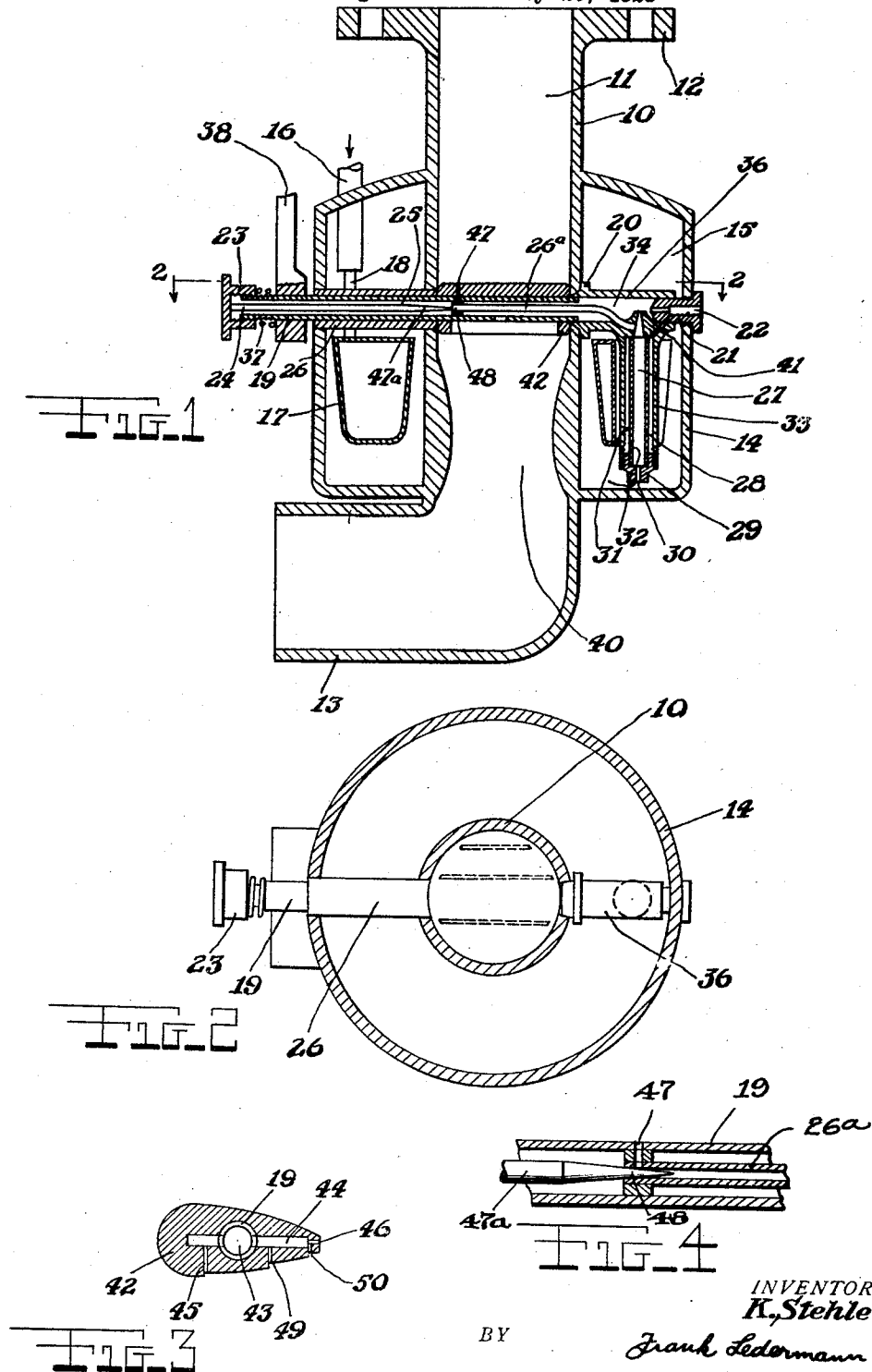
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TRIPLE ATOMIZATION CARBURETOR

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TRIPLE-ATOMIZATION CARBURETOR

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This main object of this invention is to provide a carburetor having a self-contained vacuum tank and is constructed in such manner that the maximum efficiency is obtained through means of a novel butterfly valve which controls the amount of atomized gasoline at this stage of operation.

Another object of this invention is to provide a carburetor which atomizes the gasoline passing into the device from a self-contained vacuum tank in a novel manner and conveys this atomized gasoline to a butterfly valve provided with slots out of which said gasoline is extracted, the degree of flow of atomized gasoline being controlled by the extent of opening of the butterfly valve.

Still another object of this invention is to provide a carburetor which impregnates gasoline with air in two stages during the process of atomizing the gasoline.

The above and other objects will become apparent in the description below, in which like characters of reference refer to like-named parts in the drawing.

Referring briefly to the drawing, Figure 1 is a longitudinal sectional elevational view of the carburetor, showing the same in closed position.

Figure 2 is a sectional elevational view of the carburetor taken on line 2—2 of Figure 1.

Figure 3 is a cross sectional view through the butterfly valve showing the construction thereof.

Figure 4 is an enlarged sectional elevational view through the fuel ducts.

Referring in detail to the drawing, the numeral 10 indicates a cylindrical housing in which a vertical channel 11 is formed. The upper end of the cylindrical housing is provided with an encircling flange 12 which usually is provided with openings and is adapted to be secured to the intake manifold of the engine to which the device is applied, the manifold not being shown on the drawing. The lower end of the housing extends at right-angles as a sleeve 13. This sleeve has a channel therein which opens at its end and communicates with the channel 11. At the lower end of the channel 11, immediately above the position where it com-

municates with the channel of the sleeve 13, an inwardly flared Venturi tube 40 is formed. Above the sleeve 13 an annular drum 14 is formed. This drum is integral with the housing and has a chamber 15 provided therein. The chamber receives liquid gasoline through a tube 16 provided with a needle valve seat (not shown) at its lower end. The drum serves as the vacuum tank and houses an annular float 17 which has a needle valve 18 mounted at one position upon its face. Said valve 18 cooperates with the seat in the tube 16 when the float 17 has been raised to closing position by contacting with said seat. Aligned openings pass through the walls of the vacuum tank and the housing 10. A hollow shaft 19 is mounted in a tube 26 which has its end secured in the wall of the housing 10 and the vacuum tank and serves as a journalling member for the hollow shaft 19. This hollow shaft is adapted to be rotated by means which will be more fully hereinafter described. One of the open ends of the shaft extends or telescopes into a nozzle body 36. This nozzle body has one end conically formed on one side of a flange 20 so that it can conveniently seat upon a surface in one of the walls of the cylindrical housing 10. This nozzle body is secured rigidly in place between the wall of the vacuum tank and the cylindrical housing and its opposite end is cradled upon an inlet stud 21 which is provided with threads which engage the threaded end of the nozzle body and also engage the wall of the vacuum tank. This stud serves as an inlet member and has a passageway 22 passing through it from end to end, being open to atmosphere at its outer end and at its inner end open to the passageway 34 formed in the nozzle body. The passageway 34 of the nozzle body communicates with the bore 25 of the hollow shaft.

A tube 26a is rigidly mounted in the nozzle body and extends axially into the hollow shaft 19. This tube ends approximately midway the length of the hollow shaft and has an elongated opening passing through its wall, this opening being communicated with by a vent in the butterfly valve which will be more fully hereinafter described. A spin-

dle 24 having a slender point 47a is adapted to close or open this elongated opening in the end of the tube 26a and is adjusted to extreme or intermediate positions by rotation
 5 of a knurled head 23 which is seated upon a spring 37. The spring is mounted upon the face of an operating lever 38.

A vertical nozzle is formed in the nozzle body. This nozzle is enclosed within a sleeve
 10 28 which seats in a recess portion of a nut 29 which has an opening 30 therein through which fuel enters into the nozzle chamber 27. From this chamber fuel percolates out of the nozzle 27 into an auxiliary chamber 31
 15 through an opening 32. The nut 29 and sleeve 28 are threadably secured to a neck 33 which extends downwardly in the vacuum tank. The upper end of the nozzle passage 27 is conically shaped and its exit is at a level with
 20 the opening 22 in the stud 21 so that the air and gasoline are mixed at this point a second time. A by-pass 41 communicates with the passageway 22 in the stud 21 and, with the annular chamber 31 in the neck 33 of the
 25 nozzle body, air is adapted to be by-passed through the passageway 41 into the annular chamber 31 and is adapted to be mixed in this chamber and pass through the opening 32 in the lower end of the nozzle 28.

Mounted on the hollow shaft 19, within the channel 11, above the venturi 40, is an oval-shaped body 42. This body 42 comprises the butterfly valve and is provided with a diametral opening 43 through which the
 30 hollow shaft 19 passes. This butterfly valve body has a canal 44 passing partly and diametrically through it at right-angles to the opening 43. The butterfly valve is permanently secured to the hollow shaft 19 which is
 35 rotatable through means of the crank arm 38. The canal 44 communicates with a plurality of slits 45 which are formed at mutually spaced-apart positions on the lower face of the butterfly valve. A small opening 47
 40 passes through the butterfly valve body and communicates with the tube 26a through the elongated opening formed in the collar 48 and the tube. The lateral canal 44 has a small vent 46 communicating with it which extends
 45 to the edge of the valve body 42.

The device is adapted to serve as a carburetor and its distinctive manner of operating is that of impregnating the liquid gasoline
 50 twice and to deliver this mixture in atomized condition into the cylindrical housing 10 in variable quantities, according to the degree in which the butterfly valve has been opened. When the butterfly valve body 42 is in closed
 55 position an idling mixture of fuel is furnished to the combustion engine. The least amount of atomized gasoline is at this position furnished to the engine. If the engine is to idle and slowly rotate, air is drawn in from the stud opening 22 into the passageway
 60 41 and then enters the annular chamber 31.

Air and gas are both drawn thereafter through the opening 32 and after passing through this opening are in atomized condition. This atomized gasoline, at the idling
 70 position, is drawn into the tube 26a and then passes through the opening 47 in the butterfly valve thus providing an idling mixture of atomized gasoline. Should the throttle lever 38 be rotated to a position where the butterfly valve will be slightly opened, atom-
 75 ized gasoline will pass through the tube 26a, as before mentioned, and exit through the opening 47 and, at the same time, gasoline will be drawn through the nozzle jet 30 into the passageway 27 of the nozzle. After this
 80 gasoline is drawn through this vent 30 it is mixed at the opening 32 with air for the first time and becomes atomized. This gasoline passes upwardly in the nozzle member. Some of it exits from the nozzle into the tube
 85 26a while the greater portion of it passes out of the conical tip of the nozzle at the upper end of the neck. As it leaves the nozzle tip a stream of air, passing into the opening
 90 22 from atmosphere, again mixes with the atomized gasoline in the chamber 34 and passes into the butterfly valve canal through openings 49 formed in the hollow shaft 19. The influence of the Venturi curve will cause
 95 a suction which will draw this atomized gasoline through the vent 46. The valve, therefore, when rotated to partly open position will eject a stream of atomized gasoline from two positions: through the vent 46 and open-
 100 ing 47. Should the valve body 42 be opened to a greater degree the influence of the main air stream, disturbed by the Venturi formation 40, causes atomized gasoline to be sucked through the opening 47 and vent 46 and also through the central slit 49 in the valve body.
 105 The quantity of atomized gasoline which passes from the valve body may be varied from the idling position to a position (when the valve body is completely open) where the atomized gasoline will pass through all of
 110 the slits in the valve body and also through the vent 46 and opening 47, giving a maximum amount of gasoline to the engine.

It is to be noted that certain changes in form and construction may be made without
 115 departing from the spirit and scope of the invention.

I claim:

1. In a carburetor, a housing communicating with an intake manifold, a venturi
 120 in said housing, an annular valve body above said venturi, an opening in one face of said valve body, said opening adapted to permit egress from said valve body of an idling mixture of atomized gasoline, diametral slits in
 125 said valve body, said valve body having a canal communicating with said diametral slits, said slits being so positioned in said valve body that atomized gasoline is drawn from all of said slits when said valve body
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is rotated to the completely open position and through only one of said slits when in partly open position, a rotatable hollow shaft supporting said valve body, means in said shaft for conveying atomized gasoline into the opening in said valve body, a tube stationary in said hollow shaft extending to said opening and communicating therewith, a spindle having a pointed end, said tube being open at one end, said spindle being adapted to have its pointed end register in the open end of said tube to adjust the degree of opening of said opening in said valve body, and means for mixing air with atomized gasoline several times before transferring said gasoline to said hollow valve body.

2. In a carburetor, a housing communicating with an intake manifold, a venturi in said housing, a rotatable valve body above said venturi, a plurality of longitudinal openings in said valve body, a hollow rotatable shaft supporting said valve body, a stationary tube passing partly through said shaft, a vacuum tank, a nozzle body in said vacuum tank, said tube being anchored in said body, a stud supporting one end of said nozzle body, a nozzle, the center of said valve being hollow, said valve having a vent opening therein on the face opposite to the face provided with the longitudinal openings for passing fuel when said motor is idling and means for drawing air into said nozzle mixing said air with gasoline in said nozzle and again mixing said atomized gasoline a second time with air as the atomized gasoline passes out of said nozzle.

3. In a carburetor, a housing communicating with an intake manifold, a venturi in said housing, a rotatable valve body above said venturi, a plurality of longitudinal openings in said valve body, a hollow shaft supporting said valve body, a stationary tube passing partly through said shaft, a vacuum tank, a nozzle body in said vacuum tank, said tube being anchored in said body, a stud supporting one end of said nozzle body, a nozzle, and means for drawing air into said nozzle mixing said air with gasoline in said nozzle and again mixing said atomized gasoline a second time with air as the atomized gasoline passes out of said nozzle, an internal sleeve in said nozzle body forming said nozzle and an encircling chamber, a cap on said nozzle body supporting said sleeve, said cap and said sleeve having an opening therein, said cap being adapted to have gasoline filter through said opening therein and pass into the nozzle chamber and out of said nozzle chamber into said annular chamber surrounding said sleeve through said sleeve opening, and means for passing air into said annular chamber surrounding said sleeve to mix gasoline with air in said annular chamber surrounding said sleeve.

4. In a carburetor, a housing communicating with an intake manifold, a venturi in said housing, a rotatable valve body above said venturi, a plurality of longitudinal openings in said valve body, a hollow shaft supporting said valve body, a stationary tube passing partly through said shaft, a vacuum tank, a nozzle body in said vacuum tank, said tube being anchored in said body, a stud supporting one end of said nozzle body, a nozzle, and means for drawing air into said nozzle mixing said air with gasoline in said nozzle and again mixing said atomized gasoline a second time with air as the atomized gasoline passes out of said nozzle, an internal sleeve in said nozzle body forming said nozzle and an encircling chamber, a cap on said nozzle body supporting said sleeve, said cap and said sleeve having an opening therein, said cap being adapted to have gasoline filter through said opening therein and pass into the nozzle chamber and out of said nozzle chamber into said annular chamber surrounding said sleeve through said sleeve opening, and means for passing air into said annular chamber surrounding said sleeve to mix gasoline with air in said annular chamber surrounding said sleeve, said stud having an axial opening therein, the opening extending at an angle to said nozzle, and a by-pass communicating with said opening in said stud and said annular chamber surrounding said sleeve, said by-pass delivering air to said annular chamber surrounding said sleeve, said nozzle and by-pass and opening in said stud being adapted to impregnate gasoline with air twice.

In testimony whereof I affix my signature.

KARL STEHLE.

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