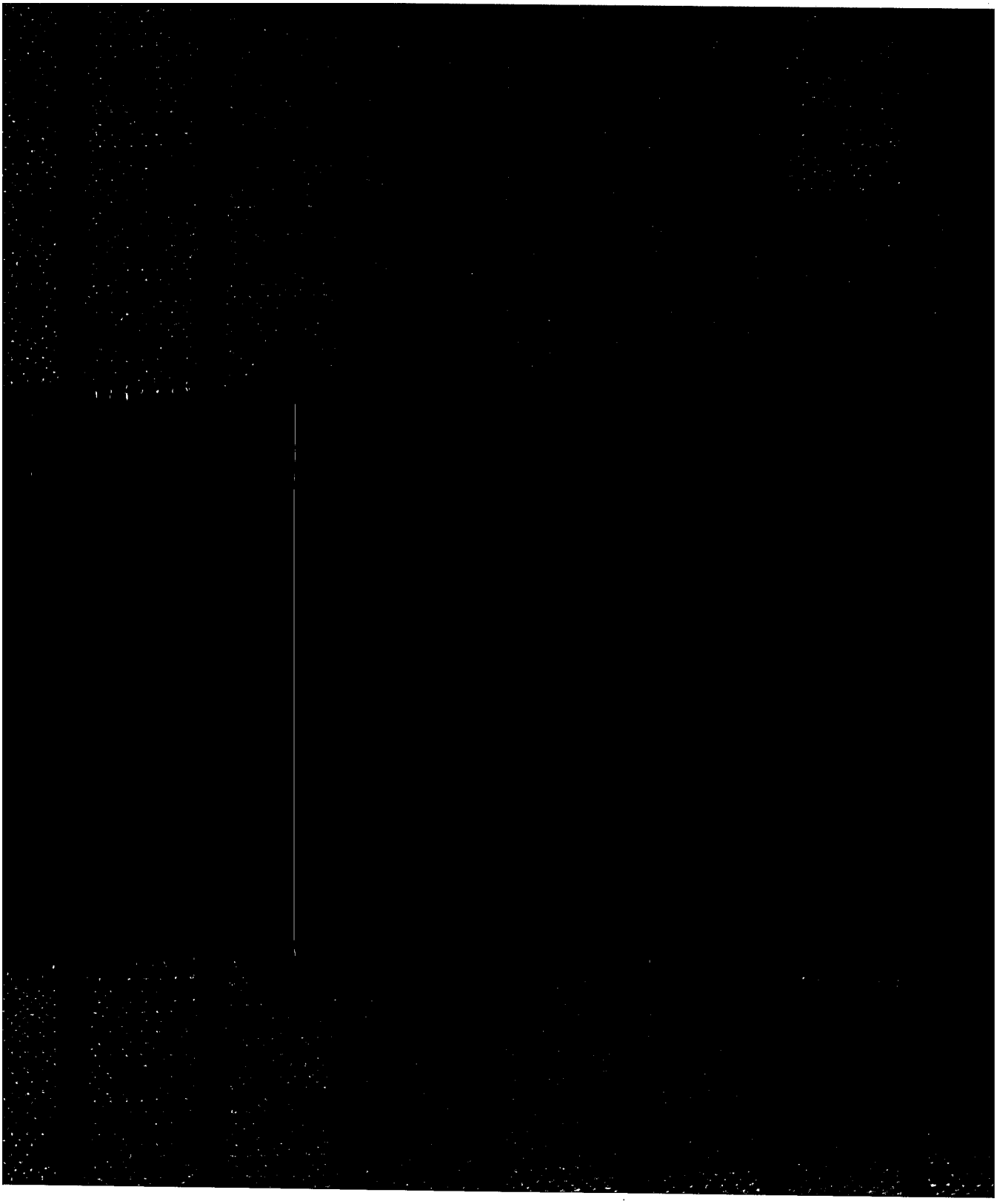


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C. J. VOEGTLE

CARBURETOR

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Fig. 1.

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C. J. VOEGTLE

CARBURETOR

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Fig. 2.

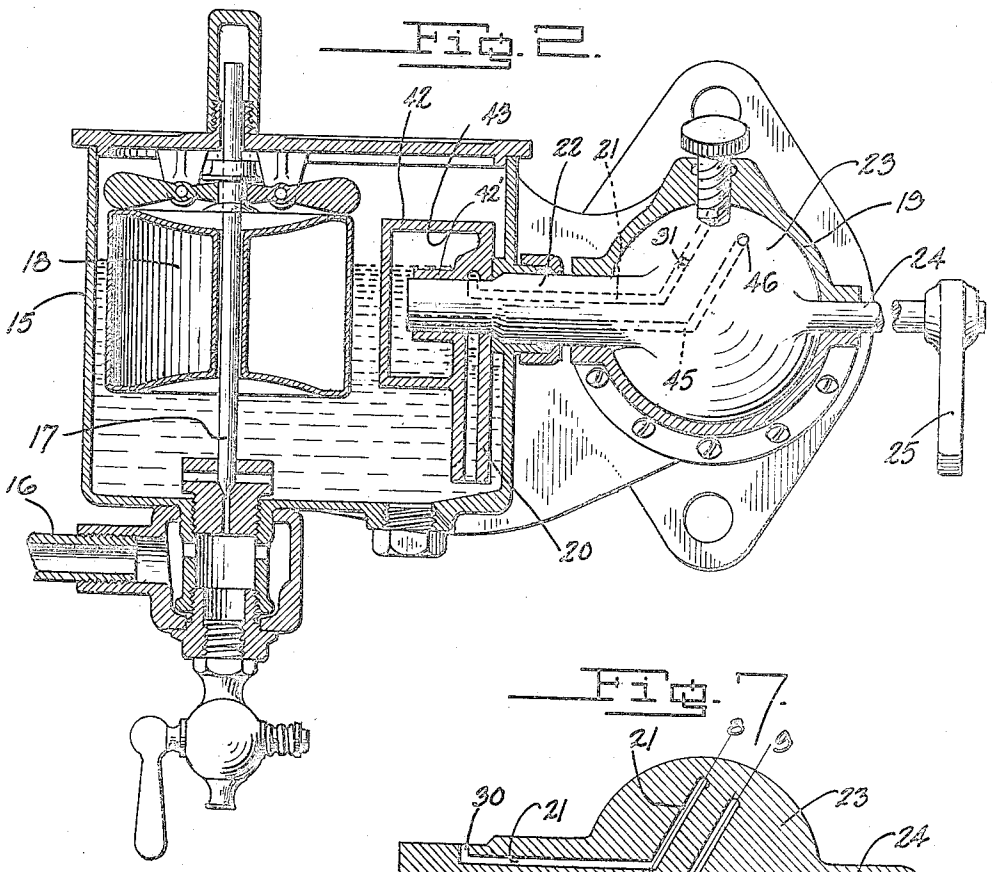


Fig. 7.

Fig. 8.

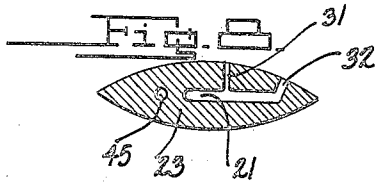
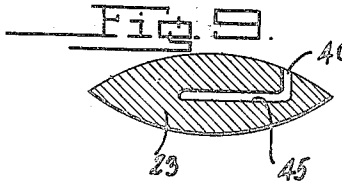


Fig. 9.



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Fig. 3.

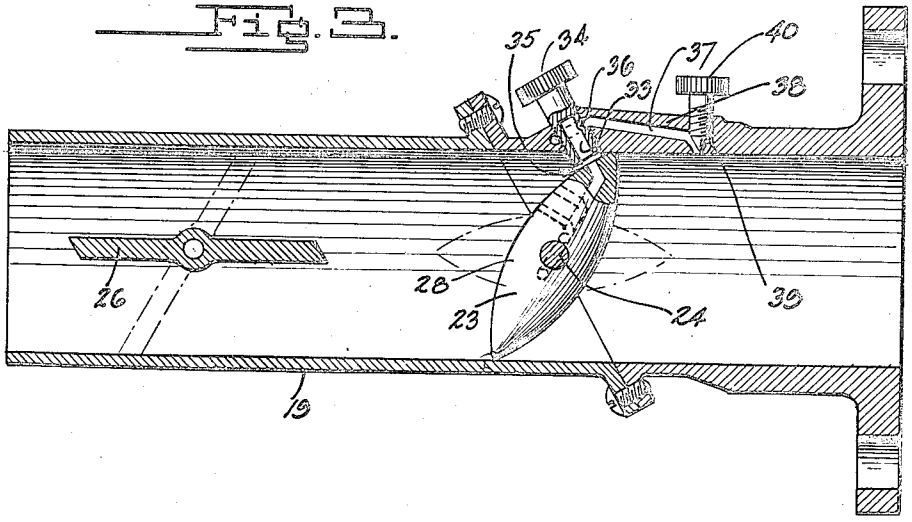


Fig. 4

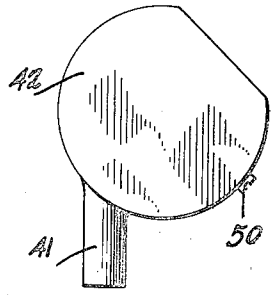


Fig. 5.

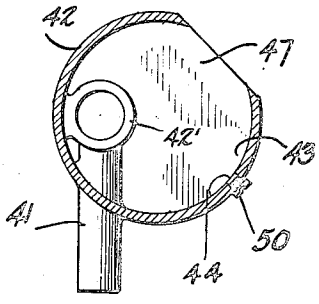


Fig. 6.

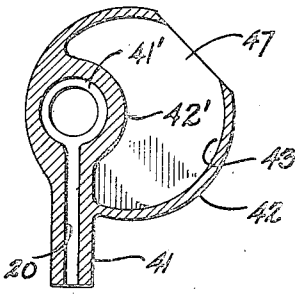
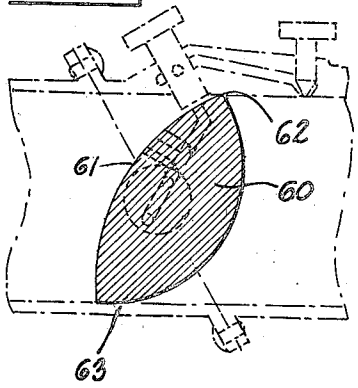


Fig. 12.



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Patented Dec. 18, 1923. 1,478,152

UNITED STATES PATENT OFFICE.

CHARLES J. VOEGTLE, OF WEST HOBOKEN, NEW JERSEY.

CARBURETOR.

Application filed October 23, 1919. Serial No. 332,579.

To all whom it may concern:

Be it known that I, CHARLES J. VOEGTLE, a citizen of the United States, residing at West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Carburetors, of which the following is a specification.

This invention relates to improvements in carburetors for internal combustion engines.

The primary object of the invention is the provision of a carburetor embodying novel means for supplying an accelerating quantity of fuel.

A further object of the invention is the provision of a carburetor adapted for use in the supplying of fuel charges to internal combustion engines, embodying novel cooperative means to supply fuel charges to the engine for ordinary running; for idling purposes; and means to supply a limited accelerating quantity of fuel to the internal combustion engine such as is desirable to provide a mixture of more than ordinary richness, as when starting or accelerating the speed of the motor.

Other objects and advantages of this invention will appear during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a plan view of the improved carburetor, showing certain parts thereof in section.

Figure 2 is a vertical cross sectional view, taken through the improved carburetor.

Figure 3 is a longitudinal cross sectional view taken through a tube of the carburetor in which the throttle valve operates.

Figure 4 is a side elevation of a novel accelerating well structure used with this invention.

Figures 5 and 6 are cross sectional views taken through the improved accelerating well structure showing details thereof.

Figure 7 is a longitudinal cross sectional view taken through the throttle valve construction, showing novel features thereof.

Figures 8 and 9 are cross sectional views taken on their respective lines in Figure 7 of the drawings.

Figure 10 is an end view of a calibrating plug used in this invention.

Figure 11 is a cross sectional view of the improved calibrating plug, illustrating the mounting of the same in a port of the improved carburetor.

Figure 12 is a cross sectional view, taken through a modified form of throttle valve.

Figure 13 is a cross sectional view, taken through a portion of the carburetor, showing the cooperative position of the accelerating well structure within the constant level fuel chamber thereof when the throttle valve is opened to a substantial degree, showing the relative levels of fuel in the constant level fuel chamber and accelerating well.

Referring to the drawings, the carburetor structure preferably includes the usual casing 15, providing the constant level fuel chamber into which fuel, such as gasoline, enters thru a suitable supply pipe 16; the entrance of such fuel being controlled in any suitable manner, as by the float actuated needle valve 17, and float structure 18, substantially as is illustrated in Figure 2 of the drawings. The carburetor structure includes an air tube 19, into which air is drawn by engine suction for admixture with fuel, the fuel under normal operation of the engine passing from the constant level fuel chamber through a passageway 20, and thence into a passageway 21 which extends longitudinally thru the stem and valve portions 22 and 23 respectively of the throttle valve construction. The valve 23 may be of ellipsoidal cross section, and is rockably mounted within the tube 19, being supported therein by the stem 22, and a second stem 24 to which the operating lever 25 is connected, substantially as is illustrated in Figures 1 and 2 of the drawings. The valve 23 is preferably positioned between the choke valve 26 in the tube 19, and the communication of the tube 19 with the internal combustion engine (not shown). The convex face 28 of the valve 23 will guide the air upwardly thereover, and since the valve 23 tends to obstruct the passage of air through the tube 19 by reducing the opening therethrough, the air thus guided upwardly over the convexed surface 28 will naturally increase in speed so that the fuel mixture will be fed to the cylinders of the engine with which the carburetor is associ-

ated at a high velocity, notwithstanding the low running speed of the engine.

Referring again to the passageway 21 which extends through the throttle valve construction, the same preferably opens radially through the stem 22, as shown at 30 in Figure 7 of the drawings, and has communication with the passage 20. The passageway 21 inclines upwardly through the valve 23 and opens through the convex side 28 of said valve through a branch port 31, preferably located above the axis of the valve so that the air being drawn through the tube 19 will draw the fuel through the passageway 21 out of the port 31 to be mixed with the air passing thru the tube 19 to supply an explosive charge. The passageway 21 also extends along the valve 23, from the port 31, and opens thru an idling jet or port 32 which aligns with a recess 33 in the end of an adjustable screw member 34. This screw member 34 is a means for varying the distance, indicated at 35, between the valve 23 at the jet or port 32, and the end of said member 34, to regulate the quantity of air which is drawn into the recess 33, when the valve 23 is closed within the tube 19. The screw 34 preferably has a plurality of transverse openings 36 therein, which have communication with a by-pass 37. The by-pass 37 extends longitudinally in a re-inforced portion 38 of the tube 19 and opens through a constricted port 39 into the passageway of tube 19. The port 39 may be designated as an outlet which cooperatively receives therein an adjustable screw member 40, substantially as is illustrated in Figure 3 of the drawings.

When the engine with which the improved carburetor is associated is idling, it derives its supply of fuel from the carburetor through the ways 20 and 21 and through the by-pass 37 from the port 32. The quality of fuel is regulated by means of the member 34, as it is obvious that the greater the space 35 between the closed throttle valve and the member 34, the greater will be the quantity of air supplied with consequent lessening of fuel from the passageway 21. The valve 40 upon the engine side of the throttle valve 23 constitutes means for regulating the quantity of mixed air and fuel for feed into the tube 19. As soon as the valve 23 is moved from a closed position and sufficient suction is provided by the engine to overcome the inertia of liquid fuel in the port 31, the air is admixed with the fuel from the port 31, and little if any fuel passes through the by-pass 37.

The member 42 preferably includes an accelerating well 43 of limited capacity, which is substantially circular in cross section, however, having a segment cut away to provide an opening 47 in the top thereof. The member is also provided with an eccentric opening in one side thereof, which has an inwardly extending flange 42′ thereabout, which adapts the member for mounting upon an end of the stem 22 which projects into the carburetor casing. A stem portion 41, which has the above mentioned way 20 therein is preferably integral with the structure of the well 43 and is a part of the member 42.

In the adaptation of the member 42 upon its stem 22, the way 20 communicates with the opening 30 through a circumferential groove 41′ extending about the stem 22 and provided in the structure of the member 42, for directly conveying the liquid fuel from the constant level fuel chamber of the carburetor into the passageway 21 at all times. A second passageway 45 is provided longitudinally in the stem 22 and valve 23, having an outlet port 46 into the tube 19; said passageway 45 preferably leading directly into the accelerating well 43 to establish direct communication between said accelerating well 43 and the tube 19.

With the valve 23 closed, as is shown in Figure 3 of the drawings, the member 42 will assume the position as indicated in Figure 2 of the drawings, and as further indicated in dot and dash lines in Figure 13. In this position, the well 43 will gradually fill through an inlet port 44 provided therein, until the liquid level within the well 43 will equal the height of the fuel in the constant level fuel chamber 15. Normally, the fuel, as is illustrated in Figure 2 of the drawings, comes to a sufficient height to submerge the end of the stem 22. In this position, with the valve 23 closed, the fuel will be fed from the chamber thru the passageway 20 into the way 21, and outwardly through the port 32 as hereinbefore described.

The valve 23, of course, assumes various open positions consistent with the engine speeds. Moderate engine speeds require that the valve 23 be slightly open in the tube 19, thus permitting feeding of fuel through both ports 31 and 46. With the valve 23 in this position, the calibrated plug 50 located in the inlet port 44 is below the level of fuel in the constant level fuel chamber, and thus permits the flow of fuel into the accelerating well 43. The opening 52 in the plug 50 is of such size that flow of fuel into the accelerating well 43 is equal to the discharge through the port 46, and consequently maintains the fuel level in the well equal with that in the constant level fuel chamber. It can be seen that when the valve 23 is thrown to a fully open position, in order to accelerate the engine, the well 43 will be rocked to create a static head of fuel over that in the constant level fuel chamber for additional feed of fuel from the port 46. The maximum head of fuel in the accelerating

well above the level of fuel in the constant level fuel chamber will be created when valve 23 is thrown wide open from closed position.

The flow of fuel from the well 43 will continue until the fuel above the passage 45 is exhausted. There will then be no replenishment of said well 43 until the valve 23 is sufficiently closed to submerge the inlet port 44.

It is to be noted that the port 46 is larger than the ports 31 or 32, so that the auxiliary or accelerating fuel supply in the accelerating well 43 may easily flow into the tube 19 to provide an enriched fuel mixture lasting for a sufficient length of time to accelerate the engine speed as desired. However, after exhaustion of the fuel supply from the well 43, a mixture of ordinary consistency continues to flow thru the valve 23 should the same remain open.

As a means for regulating the size of the ports 31, 32, 44 and 46, calibrated plugs 50 are provided, including screw threaded shanks 51 adapted for insertion in any of the said openings or ports. These plugs 50 are preferably provided with passageways 52, of predetermined size, through which the fuel is drawn. Provision of such calibrating plugs will obviate the provision of a particular type of carburetor for the different types of internal combustion engines, as it can readily be understood that by insertion or removing of plugs in the port openings above mentioned, the size of such ports may be regulated consistent with the desire.

In Figure 12 of the drawings, a modified form of valve body is shown, providing a convexed face 61, which corresponds to the face 28 above described for the preferred type of throttle valve, but which has an opposite face 63 of greater convexity, so that as the valve is rocked from the position shown in Figure 12, it will constrict the passageway below the valve and direct the major portion of the entering air over the face 61 and consequently over the ports 31, 32 and 46, for increasing the velocity of the air or gas as it passes thru the tube 19.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claim.

I claim:

In a carburetor, the combination of a constant level fuel chamber, a tube, an oscillating throttle valve in said tube having a stem extending into said constant level fuel chamber, an accelerating well eccentrically mounted upon the stem of the valve which extends into the constant level fuel chamber, said accelerating well having an inlet port adapted to maintain the liquid level therein the same as the liquid level in the constant level fuel chamber, said stem of the throttle valve having a passageway therein establishing communication between the accelerating well and said tube, said accelerating well being adapted to rotate with said valve so that when said valve is opened the inlet port of the accelerating well will be above the level of the liquid fuel in the constant level fuel chamber and the level of liquid fuel within the accelerating well will be considerably higher than the level of the fuel in the constant level fuel chamber, whereby the liquid in said accelerating well will feed its limited supply through the passageway of said valve stem to said tube.

CHARLES J. VOEGTLE.