

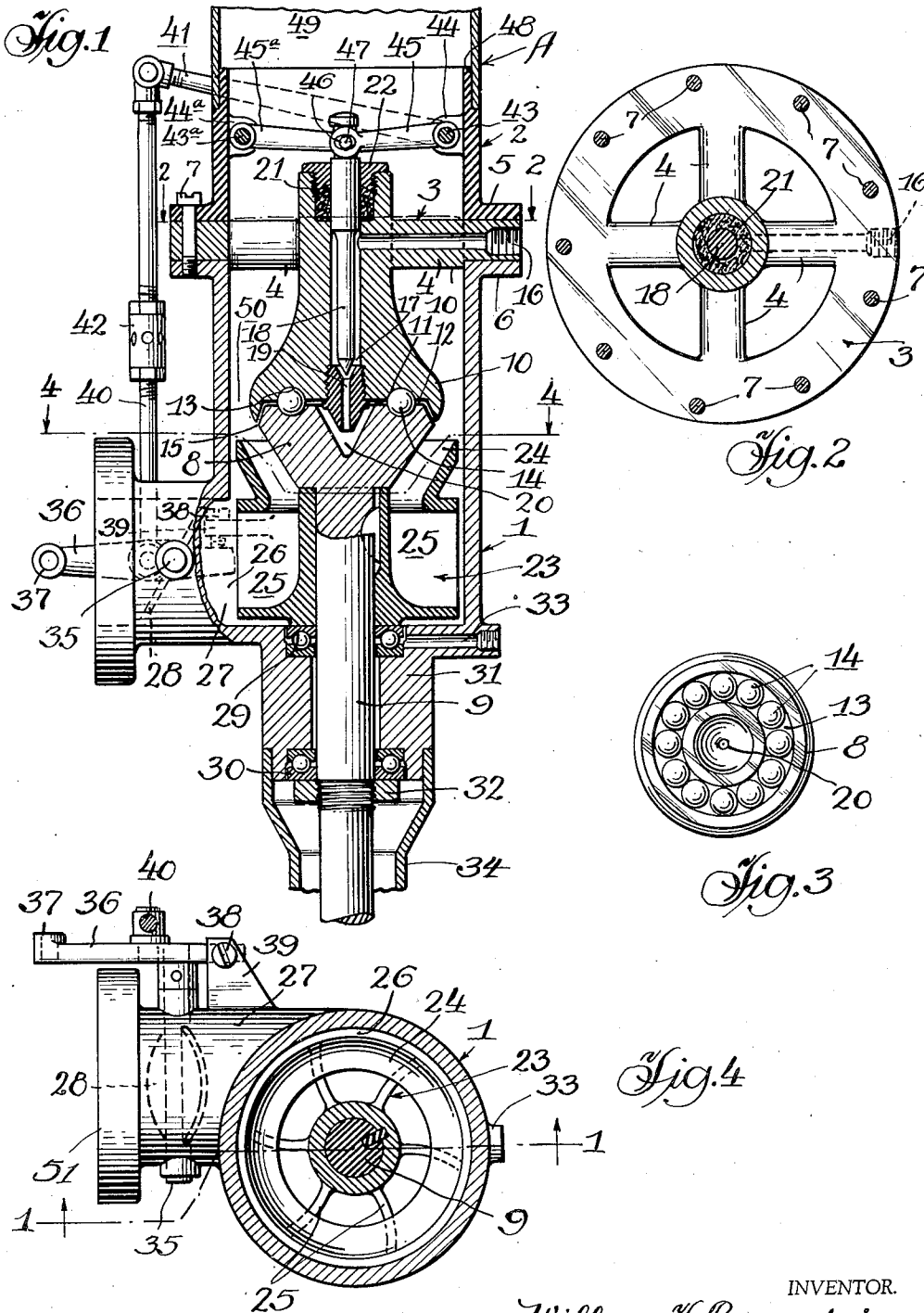
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CARBURETOR CONSTRUCTION

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CARBURETOR CONSTRUCTION

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The present invention relates to a novel carburetor and more particularly to such a device provided with complementary parts so constructed and arranged as to cause most efficient fuel atomization by forcing the liquid fuel by centrifugal pressure between the complementary surfaces and associated rolling members for disintegrating and atomizing the liquid fuel. In the disclosed embodiment these complementary parts comprise a stationary or fixed member, a rotatable member and rolling elements therebetween adapted to receive a predetermined quantity or flow of liquid fuel, atomizing this fuel by centrifugal pressure and disintegrating and projecting or expelling the fuel so atomized into the path of an entering air stream and mixing and blending the fuel and air to form an efficient combustible mixture.

In the preferred embodiment liquid fuel from either a gravity or pressure supply enters a priming well which provides an initial priming supply of fuel to be atomized. Thus the novel construction of carburetor assures a quick starting as well as a constant forced delivery of liquid fuel to the atomizing members, necessary in securing a quick, positive and uniform flow of atomized fuel.

The invention further relates to a novel centrifugal fan operable to draw a predetermined or requisite quantity of air into the mixing chamber of the carburetor, which air is thoroughly mixed or blended with the atomized fuel as this fuel is projected by centrifugal force into the air stream adjacent the intake of the fan.

The provision of the novel internal centrifugal pressure fan in combination with the novel mechanical disintegration or fuel converting means results in positive delivery and uniform flow of highly combustible mixtures of liquid fuel and supporter of combustion into the combustion chamber. This novel construction prevents any occurrence of vapor lock such as is common in many of the conventional carburetors.

Further objects of the present invention relate to the novel details of the construction of the carburetor whereby the atomization of the liquid fuel, accomplished by the application of centrifugal force and pressure and mechanical disintegration, makes possible the use of low grade liquid fuel. The blending of this atomized low grade fuel with air for supporting combustion results in a highly combustible and economical mixture suitable for use in internal combustion engines of any make or type.

Further objects, advantages and capabilities

will be apparent from the disclosure, or are inherent in the device. In the drawing:

Fig. 1 is a view in vertical cross-section of a carburetor constructed in accordance with our invention and taken on the irregular line 1-1 of Fig. 4.

Fig. 2 is a view in horizontal cross-section taken in a plane represented by the line 2-2 of Fig. 1.

Fig. 3 is a top plan view of the rotatable member shown in Fig. 1.

Fig. 4 is a view in horizontal cross-section taken on the line 4-4 of Fig. 1.

Referring more particularly to the disclosure in the drawing, the novel carburetor construction is provided with a sectional housing having a main body part 1 and an upper section 2 adapted to enclose and support the novel operating mechanism. Mounted within the housing is a stationary or fixed member 3 having spaced radially projecting and supporting arms 4, with their ends clamped between the annular flanges 5 and 6 of the upper and lower sections 2 and 1, respectively, and retained thereat by means of bolts 7 or other attaching means. The member 3 is flared at its lower end and cupped in a manner to receive a rotatable member 8 secured to the upper end of a shaft 9 and continuously rotated in any desired manner from the engine drive mechanism.

The lower flared end 10 of the member 3 and the upper end of the rotatable member 8 have complementary surfaces 11 and 12, and each member is formed with an annular raceway 13 for the reception of a plurality of rolling and disintegrating elements 14, shown in the disclosed embodiment as in the form of balls. The complementary surfaces 11 and 12 are spaced apart a distance just sufficient to permit passage of the liquid fuel therebetween by centrifugal force, and with these complementary surfaces and the balls 14 atomizing the liquid fuel by a rolling and wiping contact. The centrifugal force and pressure created when the shaft 9 and member 8 are rotated at a relatively high speed, thoroughly atomizes and projects the fuel outwardly and downwardly at the annular discharge 15.

Liquid fuel from either a gravity or pressure supply enters through a passage or port 16 into the fuel well 17. In this well is mounted an adjustable needle valve 18 cooperating with a jet or passage in the valve seat 19 for controlling the liquid fuel passing into a priming well 20. In order to permit longitudinal adjustment of the needle valve and to prevent leakage of the fuel, there is provided an encompassing packing

21 and a packing gland 22 threaded into the upper end of the member 3. This permits a ready removal and/or replacement of the needle valve should that become necessary. The valve seat 19 is likewise threaded into the member 3, so that it may be readily removed or replaced should the occasion arise.

Keyed or otherwise secured upon the shaft 9 is a centrifugal fan 23 provided with an outwardly flared annular intake 24, blades 25 and radial discharge ports 26 leading to a tangentially arranged discharge or exhaust 27 adapted to be controlled by a throttle valve 28. Bearings 29 and 30 are mounted in the reduced neck 31 of the housing part 1 for positioning, supporting and aligning the rotatable member 8 and the fan 23 so as to maintain these members in their proper relationship. A lock nut or set collar 32 is threaded upon the shaft and is adapted to bear against the underside of the bearing 30 and provide a means for adjusting and proper positioning of the bearings and members 8 and 23, and compensating for any wear on the relatively rotatable parts. In order to adequately lubricate the bearings, the invention comprehends a port 33 communicating with a lubricant supply and leading to the upper bearing 29 and from this bearing about the annular space or clearance provided between the shaft 9 and reduced neck 31 of the housing section 1, to the lower bearing 30. Any lubricant escaping beyond the bearing 30 passes along the shaft 9 and through the sleeve or housing 34 enclosing the shaft and connecting the housing 1 with the power drive unit of the engine.

The throttle valve 28 is mounted upon a control shaft 35 pivotally mounted in the discharge 27 of the housing 1. Attached to an extending end of this shaft 35 is a valve operating lever 36 having an end 37 connected to the usual manual and/or automatic control with which vehicles or combustion engines are equipped. The opposite end of the lever seats against a throttle adjusting screw 38 threaded in a stop lug 39 projecting from the housing 1. Secured to the lever 36 intermediate its ends is a rod or lever 40 connecting with an arm or lever 41 for controlling the needle valve 18. The rod or lever 40 is preferably made in sections and these sections connected by a coupling or turnbuckle 42 to allow for adjustment of its effective length and stroke.

The needle valve controlling arm or lever 41 is secured at its free end to a stub shaft 43 pivotally mounted in a bearing lug 44, and to this stub shaft is secured an operating arm or lever 45 having an elliptical opening 46 for the reception of a pivot 47 formed or provided adjacent the upper end of the needle valve 18. A similar operating arm or lever 45^a is secured upon a stub shaft 43^a pivotally mounted in a bearing lug 44^a disposed at the side of the section 2 located opposite to the bearing lug 44. This construction permits smooth operation and minute and accurate adjustment of the needle valve. It will be apparent that the needle valve 18 and throttle valve 28 operate together by reason of the system of interconnected levers.

The housing section 2 is reduced at 48 for the reception of the neck A of an air cleaner of any desired type and construction. Air, after being cleaned or filtered, passes through the opening or passage 49 and the annular throat 50 of the Venturi chamber. The Venturi chamber communicates with the intake 24 of the fan where the atomized fuel and air are properly mixed and the mixture then discharged or forceably ejected

through the radial discharge ports 26 of the fan to the combustion chamber of the power plant.

Liquid fuel from either gravity or pressure supply enters the liquid fuel well 17 through the communicating passage 16 and is controlled by the liquid fuel valve 18. By a movement of the liquid fuel valve away from the valve seat 19, fuel is admitted into the centrifugal priming well 20. When the member 8 is rotated the fuel in the centrifugal priming well moves outwardly by centrifugal force and enters the relatively narrow space between the complementary surfaces 11 and 12 of the members 3 and 8 and the movable rolling members 14, thereby causing fuel disintegration and atomization.

As atomized fuel is expelled from between the complementary surfaces, it is mixed and blended with air from the Venturi chamber and enters the suction of the centrifugal fan 23 by means of the annular intake or shroud 24. The mixture of atomized fuel and air leaves the carburetor by centrifugal pressure through the exhaust passages or ports 26 and outlet passage or discharge 27. A collar 51 is provided for attaching the carburetor to the power unit.

The above described centrifugal pressure carburetor provides an efficient and simple mechanical means of atomizing liquid fuel and blending with air in such proportion as to secure improved combustion over prior conventional carburetors. By reason of the centrifugal force or pressure produced, the rolling members or balls tend to move outwardly, thus developing increased pressure and making possible the disintegration and mixing and blending of water or water vapor and liquid fuel, resulting in a more combustible mixture of greater power. This final combustible mixture comprises a mixed vapor phase including water vapor and atomized or vaporized fuel. If desired, a lubricant may likewise be mixed and blended with the combustible mixture and delivered to the internal parts of the engine requiring lubrication.

Although we have disclosed a preferred illustrative embodiment of our invention, it is to be understood that the same is susceptible of modification and change and comprehends other details and constructions without departing from the spirit of the invention.

Having now described our invention, we claim:

1. In a carburetor construction, a housing therefor, a stationary member mounted within the housing, a member rotatably mounted in the housing beneath but in close proximity to said stationary member, complementary surfaces on said members, opposed annular raceways in said members, a plurality of balls received in said raceways and having a wiping and rolling contact with the outer surfaces of said raceways upon rotation of said rotatable member, a priming well located at the center of the rotatable member, a controllable inlet in the stationary member for supplying fuel to the well, and means for rotating said rotatable member at a speed sufficient to produce centrifugal pressure forcing the liquid fuel outwardly from the priming well and between the complementary surfaces of said members and disintegrating and atomizing this fuel by the wiping contact between the balls and these surfaces.

2. In a carburetor construction for atomizing liquid fuel, a stationary member and a rotatable member maintained in close proximity, rolling elements between said members and having a wiping and rolling contact therewith upon rota-

tion of said rotatable member, a well provided at the central portion of said rotatable member, means for supplying liquid fuel to the well, and means for rotating said rotatable member at a speed sufficient to produce centrifugal pressure forcing the fuel outwardly between the adjacent surfaces of said members and the rolling elements, said members and elements being so constructed and arranged that as the fuel is forced outwardly by centrifugal pressure it is disintegrated and atomized by the wiping and rolling contact between the surfaces on said members and elements.

3. In a carburetor construction, a housing therefor, a member secured in the housing against rotation and a member rotatable in the housing, complementary cupped surfaces on said members maintained in relatively close relationship, roller members received between said surfaces, means for supplying liquid fuel to said surfaces, and means for rotating said rotatable member at a speed sufficient to force the fuel outwardly between the complementary surfaces of said members and roller members and thereat disintegrate and atomize the fuel by contact with said surfaces and roller members.

4. In a carburetor construction for atomizing liquid fuel, a housing therefor, a stationary member secured in the upper portion of said housing and having a passage connected with a liquid fuel supply, a valve in said member for controlling the quantity of fuel supplied, a member rotatable in the lower portion of said housing and provided with a centrally disposed well located below said passage and valve for receiving the fuel for initially priming the carburetor, and rolling elements intermediate said stationary and rotatable members and having a wiping contact therewith for disintegrating and atomizing the liquid fuel.

5. A centrifugal pressure carburetor comprising a stationary member adapted to be connected to a liquid fuel supply and having a passage for the entering fuel and a valve controlling the flow of fuel to the carburetor, a member rotatable with respect to said first mentioned member and provided with a well for receiving the fuel supplied to the carburetor, rolling elements between said members and having a rolling and wiping contact therewith for mechanically disintegrating and atomizing the fuel as said last mentioned member is rotated, and means for mixing and blending the atomized fuel with a desired quantity of air to form a combustible mixture.

6. A centrifugal pressure carburetor for an internal combustion engine, comprising a housing, a member mounted in the housing against rotation, a liquid fuel well in said member, an adjustable control valve and seat within the well and provided with a jet for the liquid fuel, a member mounted for rotation within the hous-

ing and adapted to be rotated from the engine drive, complementary surfaces on said members maintained in close relationship, rolling elements associated with said members for disintegrating and atomizing the liquid fuel, a priming well located centrally of the rotatable member for receiving the fuel from the fuel supply well, a chamber having a throat formed between the periphery of the non-rotatable member and the housing, and a fan having an intake adjacent the throat and adapted to draw air through the chamber and mix and blend it with the atomized fuel, and then discharge the combustible mixture from the carburetor by centrifugal pressure.

7. In a carburetor construction, mechanism for disintegrating and atomizing liquid fuel comprising a stationary member and a rotatable member maintained in close proximity, rolling elements between said members, means for supplying liquid fuel to the interior of said members, and means for rotating said rotatable member at a speed sufficient to produce centrifugal force causing the liquid fuel to pass outwardly between the contiguous surfaces of said members and elements to disintegrate and atomize the fuel.

8. In a carburetor construction for disintegrating liquid fuel, a housing therefor, a stationary member having an inlet for the liquid fuel, a rotatable member located below said stationary member and having a well for receiving the fuel, complementary surfaces on said members in close relationship with one another and having a raceway, rolling elements in said raceway adapted to move outwardly by centrifugal force, said rolling elements having a rolling, wiping contact whereby to disintegrate and atomize the fuel.

9. In a carburetor construction for distintegrating liquid fuel, complementary members one of which is stationary and the other of which is rotatable, means for supplying liquid fuel to the rotatable member, a raceway provided in each of said members, and rolling members in said raceways forced outwardly by centrifugal force into wiping and rolling contact with said complementary members for distintegrating and atomizing the fuel and ejecting it from between said complementary members.

10. In a carburetor construction, mechanism for disintegrating liquid fuel supplied to the carburetor comprising relatively rotatable members having complementary surfaces spaced apart, rolling elements intermediate said surfaces and having a wiping and rolling contact therewith, and means for supplying liquid fuel to said surfaces and forcing the fuel outwardly by centrifugal pressure through a tortuous path between said surfaces and elements to thereby disintegrate and atomize the fuel.

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