March 15, 1927. 1,620,925

R. M. TANGYE

CARBURETOR

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Fig. 1

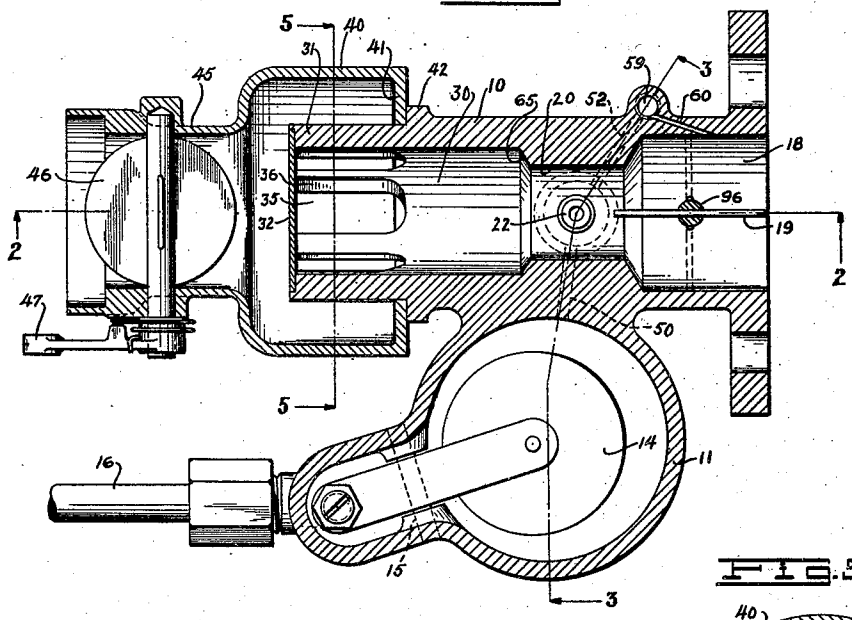


Fig. 5

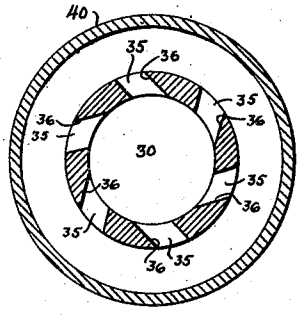
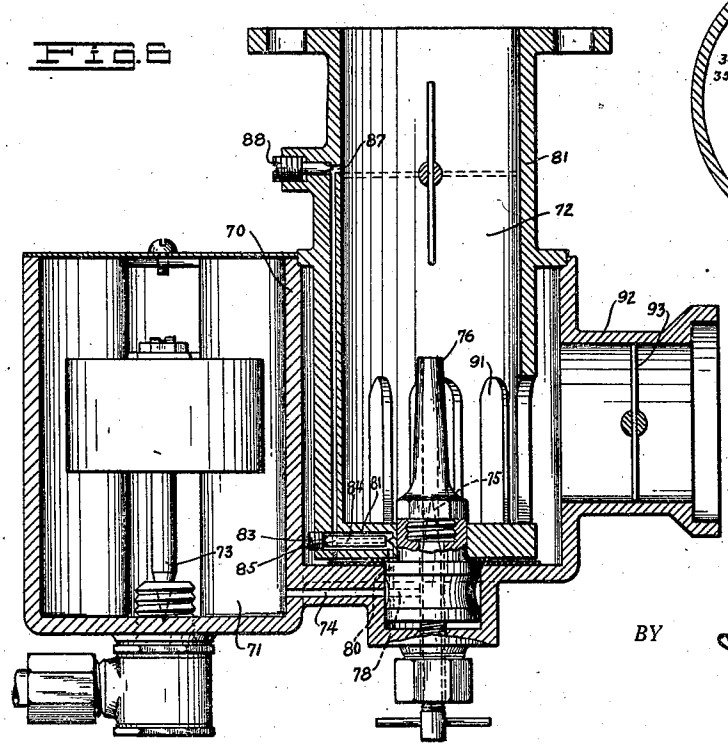


Fig. 6



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Fig. 2

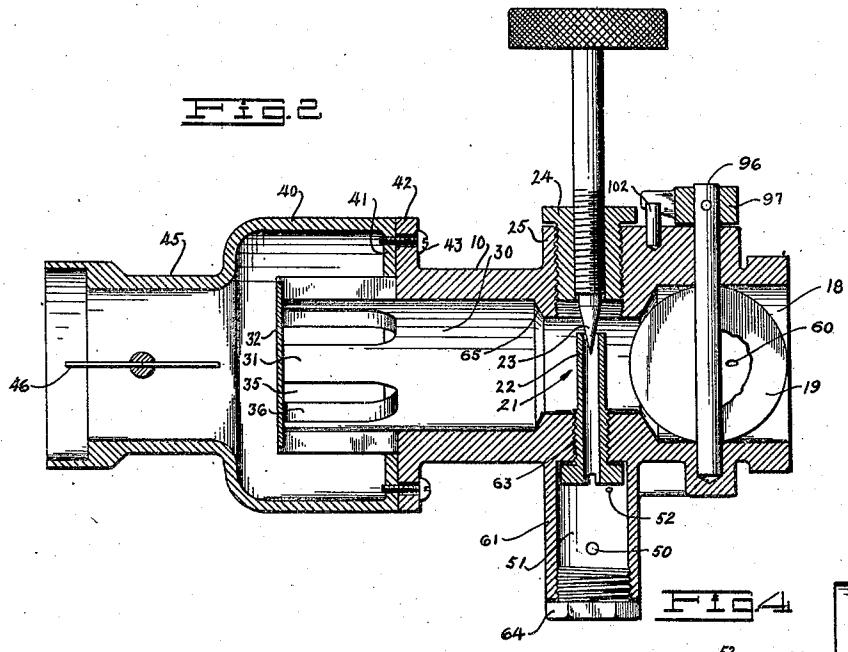


Fig. 4

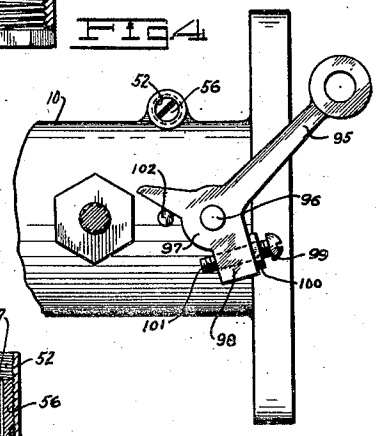
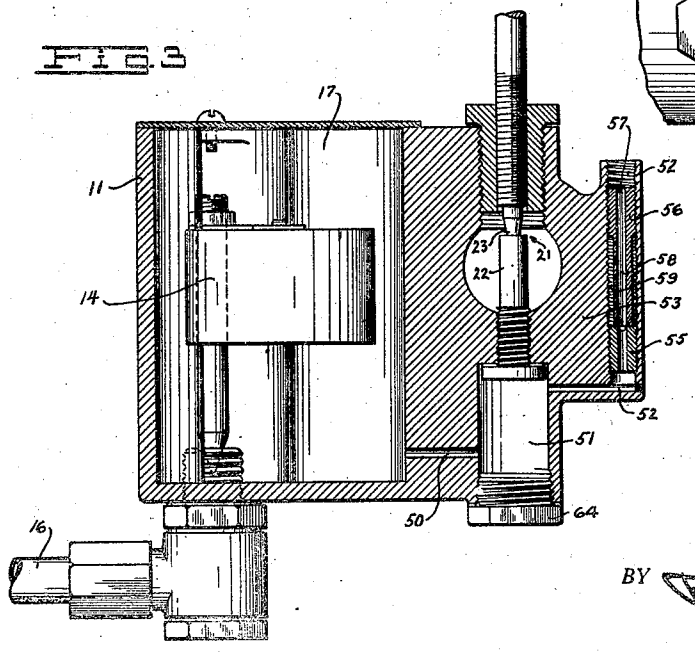


Fig. 3



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UNITED STATES PATENT OFFICE.

ROY MORTIMER TANGYE, OF DENVER, COLORADO.

CARBURETOR.

Application filed December 9, 1924. Serial No. 754,739.

This invention relates to carbureting devices.

The general object of the invention is to provide an improved carburetor which will produce a highly efficient mixture for admission to the cylinders of gasoline engines.

One of the specific objects of the invention is to provide a carburetor including a body part having a tubular extension thereon which is provided with tangential apertures and wherein means is provided whereby air entering the mixing chamber of the carburetor will pass through the tangential apertures and will be caused to revolve rapidly.

Another object of the invention is to provide a carburetor with means whereby air will enter the mixing chamber laterally and in entering will be caused to whirl rapidly to effect complete atomization of the particles of the fuel.

A further object of the invention is to provide a carburetor having radially arranged ports thereon and having a cap fitted over the ported portion of the carburetor to cause air to enter the carburetor mixing chamber from all sides.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings wherein Fig. 1 is a central sectional view through a carburetor showing my invention; Fig. 2 is a central section on line 2—2, Fig. 1; Fig. 3 is a section on line 3—3, Fig. 1; Fig. 4 is a detail in elevation showing the method of adjusting the throttle; Fig. 5 is a section on line 5—5, Fig. 1; and Fig. 6 is a central sectional view of a modified form of my invention.

Referring to the drawing by reference characters, I have shown a carburetor embodying the features of my invention at 10. As illustrated, the carburetor comprises a body portion or casing having a float chamber 11 thereon. The float chamber may accommodate a float 14 which may be mounted on pivots 15 for controlling the flow of gasoline through the supply pipe 16. The float chamber is preferably a cylindrical chamber or well as shown at 17. Adjacent the float chamber 17 I show the casing as provided with a longitudinal bore 18. The axis of this longitudinal bore is preferably arranged at right angles to the axis of the chamber 17.

The longitudinal bore 18 is indicated as provided at one end with a throttle device 19 shown as a butterfly valve. The bore 18 is constricted as at 20 and in this constricted part I arrange a needle valve 21. This needle valve includes a valve seat 22 and an adjusting member 23 which is threaded in a cap 24 on the casing. The end 30 of the tube defining the bore 18 is provided with a wall 31 of substantial thickness. The wall 31 at the end is fitted with a closure plate 32 as clearly shown in Fig. 1.

The wall 31 is shown as provided with a plurality of elongated slots 35, the walls of which, as shown at 36, are tangentially arranged to cause air entering the walls to be deflected to produce a whirling action.

The portion 31 of the carburetor is adapted to be surrounded by a cap member 40. The cap member is shown as provided with an end flange 41 which may fit upon a shoulder 42 on the casing and may be secured thereto by fastening members 43. The cap 40 is spaced from the wall 31 so as to provide a passage entirely around this wall.

The cap 40 is provided with a restricted portion 45 in which I mount a choke valve 46 adapted to be operated by means of a lever 47. The choke valve controls the amount of air passing through the mixing chamber.

A passageway 50 extends through the casing and serves to connect the float chamber or well 17 with the needle valve chamber 51. The gasoline in the needle valve chamber 51 will be drawn therefrom by the partial vacuum produced in the engine and will be atomized in the usual manner.

In order to provide a by-pass from the chamber 51 to the intake manifold and to provide fuel for "idling" when the valve 19 is entirely closed, I show a passage 52 which extends from a point adjacent the top of the chamber 51 laterally in a protuberance 53. The protuberance 53 is provided with a vertically threaded well 54 in which I arrange a threaded seat 55 and a threaded valve 56. The valve 56 is provided with a screw driver engaging slot 57 and with a central aperture 58. The valve chamber 59 is provided with a conduit 60 which leads to the intake 18. The valve 19 is shown (in dotted lines) in closed position and it will be noted that when it is closed the passageway 60 remains unobstructed so that a mixture of air and gasoline will be drawn directly to the intake manifold. The relative

amount of air and gasoline drawn may be adjusted by inserting a screwdriver in the well 54 and turning the threaded valve 56.

The needle valve seat 22 may be arranged in the well 51 which is in a protuberance 61 as shown in Fig. 2. This valve seat 22 may be threaded as at 63 and the well 60 may be closed by the threaded cap 64 as shown.

From the foregoing description it will be apparent that when the carburetor is in service position and the engine started, that a partial vacuum will be produced in the chamber 18 and in the chamber 30. Air will rush into the chamber 30 through the tangential slots and will be rapidly revolving as it leaves these slots. At the same time gasoline will be drawn through the needle valve 22 into the restricted portion 20.

As the gasoline enters the mixing chamber containing the needle valve it will meet the whirling air entering therein and the fluid droplets or unvaporized gasoline will be broken up and thoroughly atomized so that a uniform mixture will be fed to the engine.

The reduced bore 30 provides a shoulder 65. This shoulder serves to constrict the advancing column of whirling air in the chamber 30 and sets up what might be termed a miniature "whirl wind" in this chamber thus virtually tearing to pieces the unvaporized fuel.

It is well recognized that a large amount of the "knocking" in engines, the deposit of carbon, the heating of the engine, etc., is brought about by the fact that the carburetors heretofore in use have delivered a mixture composed partly of atomized gasoline and partly of gasoline in the form of minute droplets. In order to secure good results within the engine cylinder, it is essential that the mixture therein not detonate but rather that it be ignited by the spark plug and burn. When the mixture comprises atomized gasoline and these fuel droplets the latter do not burn but explode thus causing a loss in energy, knocking and many other objections. With my invention the droplets are broken up and a superior mixture results.

In Fig. 6 I have shown a slight modification of my invention wherein the casing 70 is provided with a float chamber 71 and a mixing chamber 72. The float chamber may contain a needle valve 73 and a passageway 74 may serve to connect the float chamber with the lower portion of the jet forming a chamber containing the needle valve 75. This needle valve device includes a spraying member 76 which is secured on a body 77. This body 77 is provided with a circumferentially slotted recess and a diametrical recess 78 which forms a passageway for gasoline from the conduit 74. The body 71 has a longitudinally extending recess 80 therein which communicates with a transverse recess 81 on the tubular member 81′ therein. The inner end of the transverse recess is provided with a needle valve member which is adapted to co-act with a threaded plug 83. This threaded plug is hollow having a cavity 84 therein and having at the end a valve seat for co-acting with the valve member. The hollow cavity 84 communicates by means of a lateral recess 85 with the longitudinally extending cavity 86.

The longitudinal cavity 86 in turn is connected with the discharge opening 87 shown as controlled by the valve 88. The discharge opening 87 is beyond the throttle valve 88 so that when the latter is closed gasoline may be drawn directly from the recess 78 without going through the other parts of the carburetor.

The tubular member 81 is shown as closed at its lower end and as provided in its side walls with recesses 91. These recesses 91 are tangentially arranged and are so constructed that they will provide a whirling body of air about the spraying nozzle 76. The carburetor is shown as provided with an intake passage 92 having a choke valve 93 therein.

From the foregoing description it will be apparent that air drawn into the carburetor will enter through the tangential recesses 91 where it will be caused to whirl rapidly, thus breaking up and atomizing the fuel which passes the needle valve.

Both forms of carburetor described may be provided with the valve control mechanism 95 shown in Fig. 4. This control valve comprises a body 97 having a projecting lug 98. This projecting lug is shown as provided with a threaded member 99 and with a lock nut 100 for holding the threaded member in adjusted position. The threaded member is adapted to have its end portion 101 engage a stop member 102 conveniently arranged so that the maximum amount the throttle may move will be limited.

Having thus described my invention, I claim:

1. A carburetor comprising a casing having a float chamber and having a transverse member at one side thereof, said transverse member having an axial bore therethrough, one end of said transverse member comprising a tubular body having a closure at its outer end and tangentially arranged slots in the peripheral wall of said tubular body.

2. A carburetor comprising a casing having a float chamber and having a transverse member at one side thereof, said transverse member having an axial bore therethrough, a nozzle in said axial bore, one end of said transverse member comprising a tubular projection having a closure on its outer end, tangentially arranged slots in the peripheral wall of said tubular projection and a cap fitted about said tubular projection and

spaced therefrom whereby air may be directed to said slots.

3. A carburetor comprising a casing having a float chamber therein, a transverse member having a central bore arranged adjacent said float chamber, a nozzle in said bore, a connection between the nozzle and the float chamber, a passageway for air to the nozzle, an end closure plate for said passage, the walls defining said passage having tangential slots therein, a cap for closing said tangential slots, said cap having a side wall spaced from said slots and a choke valve for controlling the flow of gasoline to said cap.

4. A carburetor comprising a casing having a float chamber and having a transverse member at one side thereof, said transverse member having an axial bore therethrough provided with a reduced central portion, a nozzle in said reduced central portion, a passageway leading from said float valve chamber to said nozzle, said transverse member having a throttle valve at one end thereof, the other end of said transverse member comprising a tubular projection having a closure at its outer end, tangentially arranged slots in the peripheral wall of said tubular projection and a cap fitted about said tubular projection and spaced therefrom, whereby air may enter said slots and a valve for controlling the admission of air to the transverse member.

In testimony whereof, I hereunto affix my signature.

ROY MORTIMER TANGYE.