

F. J. WATT.

CARBURETER.

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932,360.

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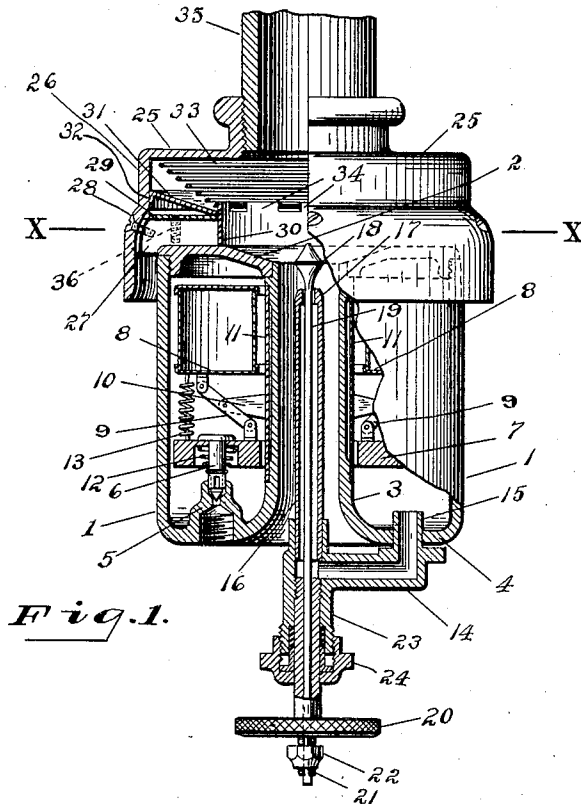


Fig. 1.

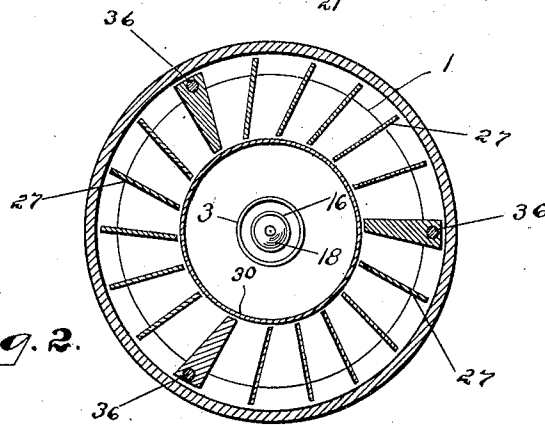


Fig. 2.

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To all whom it may concern:

Be it known that I, FRANK J. WATT, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to carbureters for explosive engines and especially to certain features therein adapted to automatically maintain a constant mixture regardless of the engine speed, or to the swashing of the liquid in the carbureter reservoir.

15 The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a view, partially in longitudinal section and partially in elevation, of a carbureter embodying features of the invention. Fig. 2 is a view in section on line X—X of Fig. 1.

20 In the drawings, 1 represents an upright cylindrical shell closed at its upper end by a cover 2 removably secured therein, and provided with an axial air tube 3 whose lower flared or bell-shaped mouth is integral with the bottom wall 4 of the casing, and whose upper open end extends through a dished central portion of the cover which fits tightly around it. The annular chamber of the casing constitutes the reservoir which is supplied through proper pipe connections fitted to a nipple 5 in the casing bottom, having an apertured valve seat on which a downwardly acting inlet valve 6 closes. The lower reduced end of the valve is tapered or coned to close on the seat, and its stem is longitudinally grooved to form open passages when the valve is raised. The valve is carried by a centrally apertured disk 7 which forms a counterbalance within the chamber, for a hollow annular float 8 to which it is articulated by oppositely disposed equalizing levers 9 fulcrumed on radial brackets 10 secured to a sleeve 11, slipped over the tube 3.

25 A conoidal spiral spring 12 in compression between the disk and lower part of the stem allows the disk to drop after the valve is seated, provided any violent swashing of the fluid in the reservoir causes the float to rise above its usual upper limit and the disk to lower, this separation of the float and coun-

terbalance being resisted also by interposed springs 13.

A horizontal tubular arm 14 having an outer shouldered nipple 15 seated in an aperture in the casing bottom, carries at its inner end a central feed pipe 16 extending through the air tube 3, that has a jet nozzle 17 on its upper end, closed by an inwardly seating conical regulating valve 18 which acts both as a closure and a deflector. The latter is carried by a stem 19 passing down through the pipe which is removably secured at its lower end to an adjusting thumb-screw 20, a split taper sleeve 21 integral with the thumb-screw being closed on the stem by a nut 22

70 The thumb-screw engages a depending nipple 23 in the arm 14, a packing gland or stuffing box 24 insuring a close joint. The angle of the valve cone should be such as to project the conical film off at an angle of 45 degrees or thereabout.

A vaporizing or mixing chamber is formed centrally over the reservoir by a hollow cap 25 having a depending peripheral flange 26 resting on and extending below the projecting ends of oblique or radial ribs 27 secured or integrally formed on the upper face of the outer portion of the cover 2. Screws 28 or the like engaging certain of the ribs adapted to receive them or other suitable means secure the cap in place.

A flat centrally apertured disk 29 seated on the ribs 27 and secured thereto by screws 36 forms therewith substantially radial air passages or ducts from the outer annular opening between the cap flange and casing, whose inner mouths are closed by a depending flange 30 of an auxiliary air valve 31 whose outer flange 32 is guided by the peripheral wall of the cap 25, a spiral tapered spring 33 in compression between the cap and valve centered on the latter by lugs 34, holding the latter closed past the air passages. A central nipple on the cap 25 is fitted for pipe connection 35 with the motor intake.

100 In operation, the suction by the motor draws the air sharply in through the central air tube past the jet nozzle which projects a conical film of fuel transversely into the in-rushing air column. The auxiliary air valve is also raised by the partial vacuum created by the motor, and the incoming radial air currents from the air passages evenly dis-

seminate and thoroughly vaporize the fuel so that the product leaving the chamber is uniform, the auxiliary valve automatically varying the amount of air admitted in proportion to the force of the engine suction.

The situation of the controlling valve at the point of discharge and at the point of greatest velocity of influx of air through the unimpeded bell-shaped air tube gives greatest efficiency possible for weak suction, where the motor is running slow or light.

Similar efficiency for the other extreme of heavy work and consequently sharp and rapid intake is obtained by the disposition of the auxiliary valve, which admits air equally from all directions against the film of fuel, the valve opening having large area even for slight lift of the closure. Furthermore, the nozzle projects its fuel jet or spray at substantially the same angle across all the incoming air currents, both from the regular and auxiliary inlets, thereby further insuring proper vaporization. The direction of the air currents causes rapid rotation of the contents of the mixing chamber without mechanical aid in the shape of fans or the like.

The annular reservoir permits of a large float with small amount of fuel, thereby insuring sufficient buoyancy to lift the valve readily, the counterbalance increasing the sensitiveness of the float against permanent change of level in the reservoir, while the submergence of the weight and the direction of its motion in opposition to the rise and fall of the float steadies the float from jumping if the reservoir contents is violently agitated by jolting or the like.

The regulating valve and its feed pipe may be readily withdrawn for inspection and repair, and the other parts are similarly accessible, as the cap may be removed, the cover plate taken off the air passage, the cover itself unscrewed, and the float, counterbalance, inlet valve and connections withdrawn bodily without trouble.

Another very advantageous feature is the practically unimpeded air passages which give direct entrance to the air, while they are so shielded and disposed that bodily movement of the carbureter does not materially affect them.

Obviously, the details of construction may be varied without departing from the spirit of the invention and I do not care to limit myself to any particular form or arrangement of parts.

What I claim as my invention is:—

1. A carbureter comprising a cylindrical reservoir, a mixing chamber thereon, an axial air tube extending through the reservoir into the chamber, converging air ducts through the chamber whose outlets surround the discharge of the tube, a jet nozzle and regulating valve at the discharge mouth of the tube

whose pipe connections with the reservoir extend longitudinally through the tube and whose adjusting means lie without and below the reservoir, a valve for the duct outlets, a discharge opening in the chamber alined with the air tube, said discharge opening, duct valve, air tube, jet valve and connections presenting a substantially unimpeded air passage longitudinally through the carbureter and fuel supply means for the reservoir.

2. A carbureter comprising a cylindrical reservoir, a mixing chamber thereon, an axial air tube extending through the reservoir into the chamber, converging air ducts through the chamber whose outlets encircle the mouth of the tube, a radial hollow arm opening through the reservoir bottom, a pipe on its inner end extending longitudinally through the tube, a jet nozzle at the upper end of the pipe, a combined regulator and deflector valve at the nozzle adapted to project a spray across the tube and duct outlets, an adjusting screw for the valve below the arm and without the reservoir, a valve controlling the duct outlets, and fuel supply means for the reservoir.

3. A carbureter comprising a cylindrical reservoir, a cover thereon, an axial air tube through the reservoir and cover, radial ribs on the cover, a centrally apertured disk on the ribs, a circular cap supported at its margin on the outer ends of the ribs, an annular valve within the cap adapted to close past the inner ends of the ribs, a spring interposed between the cap and valve, a discharge outlet in the cap over the valve, spraying means at the outlet of the tube, and fuel supply means for the reservoir.

4. A carbureter comprising a cylindrical reservoir, a cover thereon, an axial air tube through the reservoir and cover, radial ribs on the cover extending beyond its periphery, whose inner ends are disposed in a circle, a centrally apertured disk seated on the ribs, a circular hollow cap supported on the outer ends of the ribs having a peripheral dependent flange extending below the reservoir cover, an annular valve within the cap adapted to close past the inner ends of the ribs, a spring interposed between the cap and valve, a discharge outlet in the cap over the valve, spraying means at the outlet of the tube, and fuel supply means for the reservoir.

5. A carbureter comprising a cylindrical reservoir, a cover thereon, an axial air tube through the reservoir and cover whose inner ends are disposed in a circle, radial ribs on the cover, a centrally apertured disk on the ribs, a circular cap supported at its margin on the outer ends of the ribs, an annular valve within the cap having an inner dependent flange adapted to close past the inner ends of the ribs, and an outer peripheral flange having sliding engagement with the peripheral wall of the cap, a spring inter-

posed between the cap and the valve, spraying means at the outlet of the tube, and fuel supply means for the reservoir.

5 6. A carbureter comprising a cylindrical mixing chamber, an annular reservoir whose hollow core is bell-shaped at its lower end and forms a central air tube discharging centrally into the chamber, radial air ducts into the chamber having convergent common
10 division walls, a common annular inlet, and outlets disposed in a circle around the discharge end of the air tube, an annular automatic valve closing the duct outlets, a jet nozzle and valve adapted to project a spray
15 across the mouths of the ducts and air tube at the same angle to the air currents from the ducts and tube, a discharge outlet in the chamber alined with the reservoir core, said air tube, discharge tube and convergent
20 ducts being proportioned to concentrate the air currents upon the jet at the point of greatest velocity of the current and to present unimpeded passage to the air currents through the carbureter, and a float controlled fuel supply valve in the reservoir.

25 7. A carbureter comprising an annular reservoir, a mixing chamber thereon consisting of a circular cap whose flange extends over the upper end of the reservoir, at an interval
30 therefrom, convergent ducts leading from the annular space between the flange and reservoir to the upper mouth of the central opening of the annular reservoir, an annular valve axially reciprocable in the cap adapted
35 to simultaneously close the ducts, a spring between the valve and cap adapted to seat the valve, an axial pipe in the reservoir core carrying a jet nozzle and deflecting regulating valve at its upper end adapted to project
40 a conical film across all the air currents from

the reservoir aperture and the ducts at substantially equal angles, a radial hollow arm connecting the bottom of the reservoir and the lower end of the pipe, a hand-screw for the regulating jet valve below the arm, a
45 discharge outlet in the cap in axial alinement with the reservoir outlet, said duct valve, jet valve and its connections and the reservoir aperture providing a substantially unimpeded straight air passage from the
50 base through the carbureter cap, and fuel supply means for the reservoir.

8. In a carbureter having a reservoir, a mixing chamber connected thereto and a
55 main air supply tube leading through the reservoir into the chamber, means for projecting a conical jet of fuel into the chamber at the outlet of the tube comprising a hollow transverse arm below the reservoir, connect-
60 ed thereto at its outer end, a nipple at its inner end in axial alinement with the air tube, a pipe secured in the upper end of the nipple, extending axially through the air tube having a jet nozzle at its upper end at
the air tube outlet, a centrally apertured
65 adjusting screw passing through a packing gland on the lower end of the nipple longitudinally adjustable in the nipple, a valve stem removably and adjustably secured in the screw aperture, extending axially through
70 the pipe and nozzle, and a regulating closure for the nozzle consisting of an inverted conical deflector secured at its apex to the upper end of the valve stem.

In testimony whereof I affix my signature 75 in presence of two witnesses.

FRANK J. WATT.

Witnesses:

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JOHN ROCHE.