R. W. GALLAGHER.

CARBURETER.

APPLICATION FILED NOV. 10, 1909.

976,258.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

FIG. 1

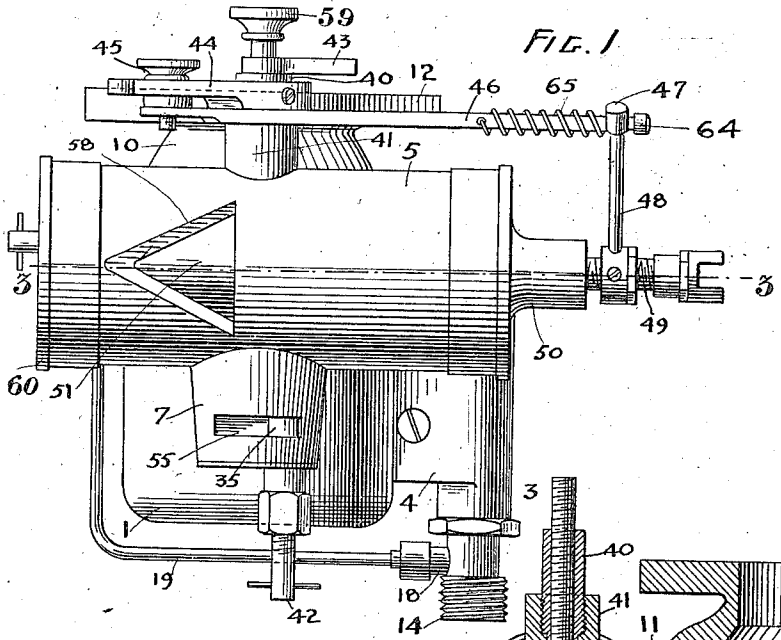


FIG. 2

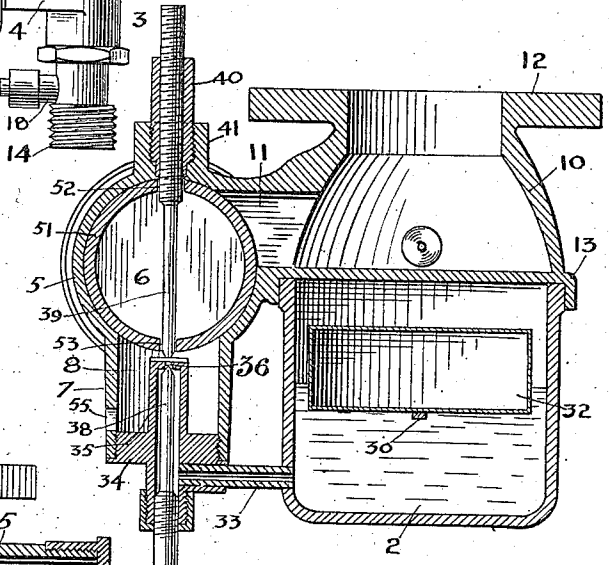
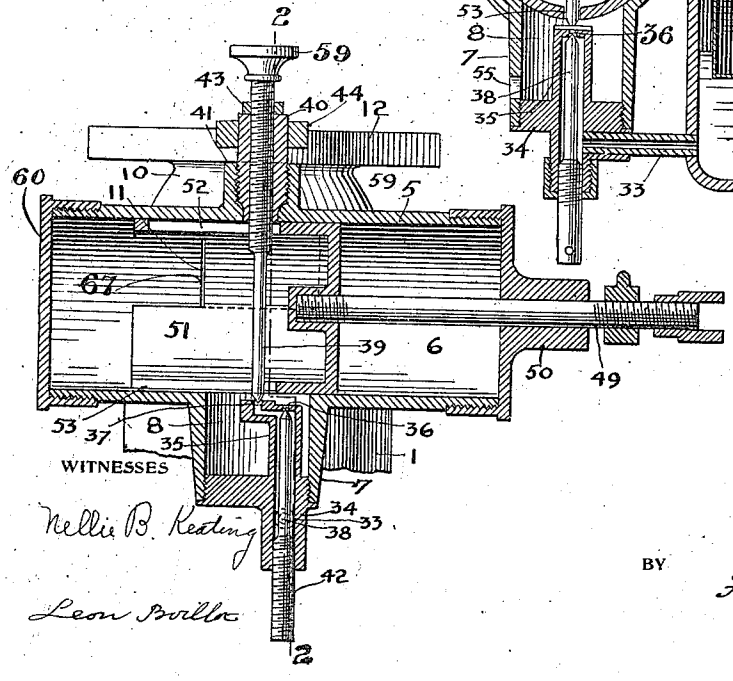


FIG 3



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2 SHEETS—SHEET 2.

FIG. 4

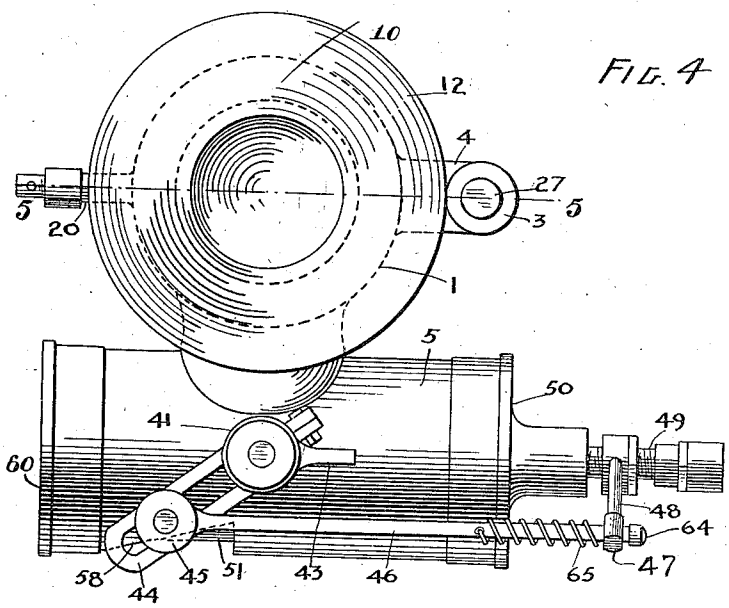


FIG. 5

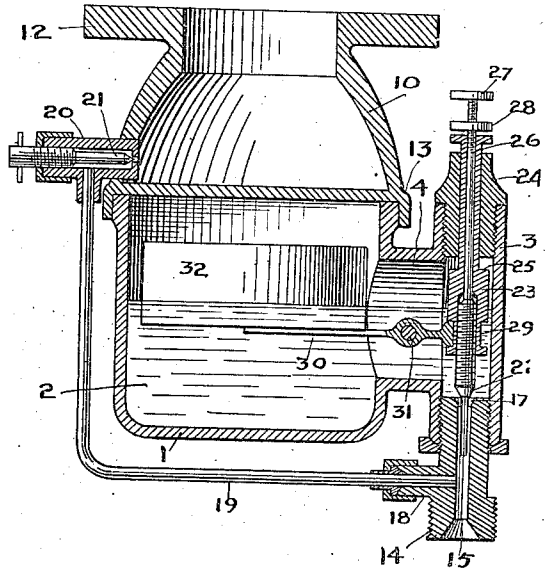
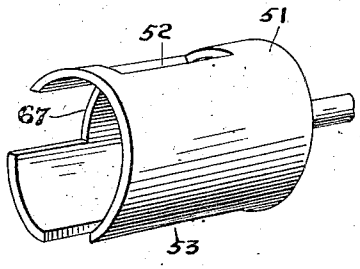


FIG. 6



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CARBURETER.

976,258. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed November 10, 1909. Serial No. 527,227.

To all whom it may concern:

Be it known that I, RICHARD W. GALLAGHER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to carbureters for gasolene engines, and the objects of the invention are to provide a carbureter of such construction that it will always supply a given volume of the mixture of gas and air for a given position of the throttle lever; second, one in which the ratio of the mixture may be varied as may be desired; third, of such construction as to permit the engine to be started with the throttle practically closed thereby preventing the engine racing immediately after starting; fourth, to provide, in such a carbureter, means, for flushing the carbureter with gasolene, having no connection with the float, so that the accurate action of the float may not be impaired by operating said flushing means; fifth, to provide means for thoroughly mixing the gas and air before supplying it to the engine, thereby insuring a more steady suction from the nozzles; sixth, to provide means for varying the normal level of the gasolene in the float chamber; seventh, to provide a construction of float valve by which the float can positively force the valve to its seat to close the same.

In the accompanying drawing, Figure 1 is a side view of the carbureter; Fig. 2 is a transverse section on the line 2—2 of Fig. 3; Fig. 3 is a longitudinal section on the line 3—3 of Fig. 1; Fig. 4 is a plan view; Fig. 5 is a longitudinal section on the line 5—5 of Fig. 4; Fig. 6 is a perspective view of the air slide valve.

Referring to the drawing, 1 indicates the casing of a float chamber 2, 3 indicates a float valve casing and 4 a connection between them.

5 indicates a cylindrical casing of a mixing chamber 6 having a substantially cylindrical downward extension 7, forming a fixed air supply chamber 8.

10 indicates a reservoir or mixing dome, and 11 a passage between the reservoir and mixing chamber. Said dome is formed with a horizontal circular flange 12 by which the carbureter can be secured in the proper position relative to the engine, and with a circular depending flange 13 to which is secured the upper edge of the float chamber.

Into the lower end of the valve casing 3 is screwed a small T-shaped casting 14 formed with a vertical bore 15, its lower end being adapted to be connected with a pipe for supplying gasolene to the carbureter, and its upper end being formed into a valve seat 17. Said casting is also formed with a lateral apertured extension 18 to which is connected a tube 19 leading to a small valve casing 20 screwed into the side of the reservoir, and adapted to be closed by a needle valve 21. The object of this tube and needle valve is to enable gasolene to be admitted direct, when desired, to the reservoir or mixing dome to flush said reservoir, thus making the engine easy to start at all times. Moreover, an important advantage of this independent gasolene flushing attachment is that it is no longer necessary to provide a connection with the float, but the latter can now be free. It is necessary with most carbureters to provide means, connected with the float, for opening the valve of the gasolene supply, when necessary to obtain an initial supply of gasolene vapor to start the engine. Such a connection impairs the accurate action of the float; so that it is very liable to need adjustment, which is not an easy matter after it is once out of order. By interposing the mixing dome between the mixing chamber and the engine, a very steady suction is created, which, in turn, causes the air and gasolene vapor to be well and thoroughly mixed, so that the engine runs smoothly and steadily.

The valve seat 17 is adapted to be closed by a main supply valve 22 which is screwed within a sleeve 23, which sleeve extends through a collar 24 screwed into the upper end of the casing 3, and the sleeve has a shoulder 25 adapted to abut against the lower end of the collar to limit the upward movement of the sleeve. Said valve 22 has a stem 26 extending upward through the end of said sleeve, and carrying at its upper end a head 27, by which said valve can be conveniently screwed in said sleeve for adjustment, said stem 26 being threaded at its upper end, and a nut 28 being screwed on said threaded end for the purpose of locking said stem in the position to which it is adjusted within the sleeve. Said sleeve is formed

near its lower end with a circumferential groove 29 which is engaged by the end of a lever 30 pivoted on a cross pin 31, the other end of said lever carrying a float 32 within the float chamber. By reason of the groove 29, the valve is not only raised from its seat when the float falls, but is also forced down on to its seat when the float rises, instead of merely finding its seat by its own weight.

By the above arrangement the level of the gasolene in the float chamber is maintained constant, as, when the float rises to a certain pre-determined level, the valve 22 is closed, and when it falls below said level the valve is opened to admit more gasolene. Moreover, this level can be varied by adjusting the valve within the sleeve 23.

From the bottom of the float chamber a pipe 33 leads to a small casting 34 screwed into the extension 7, said casting 34 being formed with a vertically extending gasolene conduit 35. Said gasolene conduit terminates at its upper end in two valve seats 36, 37, of which the seat 36 is adapted to be closed from below by a set valve 38 screwed through the lower portion of said casting 34 and extending upward in said conduit, while the other valve seat 37 is adapted to be closed from above by a downwardly extending gasolene throttle valve 39 screwed through a sleeve 40, which itself is formed on the outside with relatively coarse threads, and is screwed through a bearing 41 therefor, formed upon the cylindrical casting 5 of the mixing chamber. The lower valve 38 is always open, and is provided with a suitable head 42 by which it can be adjusted by hand so that a sufficient amount of gasolene will flow past the valve seat 36 into the mixing chamber to start the engine, but said set valve does not furnish gasolene for the regular running of the engine after it has been started, the gasolene for regular running being admitted by the gasolene throttle valve 39. Said valve 39 is also provided with a head 59, by which it can be turned within the sleeve 40, but it does not turn normally therein, but only for the purpose of adjustment, being locked in its adjusted position in the sleeve by a lock nut 43. By loosening the lock nut, the valve may be adjusted by screwing it up or down in the sleeve 40. The valve 39 is opened or closed by the turning of the threaded sleeve 40 within the internally threaded bearing 41, and this turning is effected by means of a slotted rock-arm 44 secured to the sleeve, and in the slot of which arm is adjustably secured a bolt 45 which itself is secured to the end of a link 46 the end of which passes slidably through a block 47 which is revolubly mounted upon an arm 48 extending obliquely upward from a stem 49 having a forked end to enable it to be suitably connected to a throttle lever, not shown. Thus, by the movement of the rock arm, the sleeve 40 is turned, and therefore also, on account of its threaded engagement with the bearing 41, moved longitudinally, thereby causing the valve 39 to advance to, or recede from its seat according to the direction in which the sleeve is turned. Said stem 49 passes through an apertured head 50 of the mixing chamber and is attached, within said mixing chamber, to a hollow cylindrical shell or air valve 51, which is formed with upper and lower longitudinal slots 52, 53, of such length as to permit said valve 51 to move through its full stroke although the valve 39 extends diametrically across the valve 51.

The lower chamber 8 is formed with an air port 55, which is always open to admit air to said lower chamber, and thence through the slot 53 in the valve to the mixing chamber. The air thus admitted is sufficient for mixture with the gasolene. The cutaway portion 67 is made sufficiently deep, as shown in Fig. 3, that its inner edge is, even when the valve 51 is closed, slightly beyond or inside the outer edge of the passage 11 leading to the reservoir or mixing dome 10. Thus, even when the valve 51 is closed and the gasolene throttle valve 39 for the gasolene is shut off, a narrow opening is left for the passage of a limited quantity of commingled air and gasolene vapor, admitted respectively through the port 55 and valve seat 36, for starting the engine. As the shell 51 slides outward, the sleeve 40 is turned to open the valve 39, admitting gasolene past the valve seat 37 into the mixing chamber. To admit air to mingle therewith, the side of the mixing chamber is formed with an air port 58, which in form is an isosceles triangle, having its apex close to the closed head 60 of the mixing chamber and its base remote therefrom. As the hollow valve is withdrawn from the closed head, more and more of said opening is uncovered, admitting more and more, as may be desired, of the air into the mixing chamber. The air thus admitted and mixed with the vapor of gasolene admitted through the valve seat 37 flows by the cutaway portion 67 of the valve 51 and by the passage 11 to the mixing dome or reservoir 10, and from the reservoir 10 the mixture enters the induction pipes, not shown, by which it is conducted to the engine cylinder or cylinders.

The link 46 has a head 64 which bears against the block 47, and a coiled spring 65 is mounted on the other side of the block 47 from the head 64. It is fastened to the link 46 and to the block 47 and tends to retract the link 46 to hold its head 64 against the block 47, yet it permits the stem 49 to be pushed in, the block 47 sliding on the link 46 and compressing the spring 65, after the link 46 has moved the slotted arm 44 into such a position that the gasolene throttle

valve 39 is closed. Then after the valve 39 has been closed, an outward movement of the valve 51 will not cause a similar movement of the link 46 and a lifting of the gasolene throttle valve 39, until the block 47 strikes the head 64 of the link 46. By adjusting the end of the link 46 on the slotted arm 44, the desired ratio of amplitude of movement of the valve 39 to that of the valve 51 may be secured.

After the engine has been started, the gasolene throttle valve is opened to admit more gasolene, and at the same time the air valve is opened to a corresponding extent to produce the requisite mixture. Gasolene will now enter almost entirely through the gasolene throttle valve, although the set valve is also open. This is due to the fact that the conical end of the throttle valve points downward in its seat, whereas the conical end of the set valve points upward. This arrangement causes the suction around the conical end of the gasolene throttle valve to increase downward, whereas that around the conical end of the set valve decreases downward. Hence the suction from the engine on the gasolene in the gasolene throttle valve is greatly increased, whereas that in the set valve is greatly decreased.

The following advantages arise from the above described provision of the set and gasolene throttle valves. The engine may be started with the gasolene throttle valve practically closed, which prevents the engine racing immediately after starting, as is the case with most other carbureters. On account of the form of the air port at the side of the mixing chamber, the amount of air admitted therethrough is at all times substantially proportioned to the gasolene admitted by the gasolene throttle valve, however wide the latter may be opened, thus giving a perfect mixture at all positions of the throttle. At the same time, the means for admitting the gasolene are adjustable to give any quality of mixture desired, regardless of the condition of the atmosphere. Again, since only a given volume of mixture will enter the engine at a fixed position of the throttle, regardless of the momentum of the engine, the engine will not race when the clutch is released.

I claim:—

1. In a carbureter, a float chamber, a float therein, a valve for admitting gasolene to the float chamber, an operative connection between said float and valve to maintain said float at a uniform level, a mixing chamber for mixing air and gasolene vapor, a valve for admitting gasolene from the float chamber to the mixing chamber, a mixture reservoir, connected with said mixing chamber, and having an opening through which the engine can be supplied, and means, independent of said mixing chamber, for flushing the reservoir with gasolene, substantially as described.

2. A float chamber, a float therein, valve means, controlled by the float, for admitting gasolene to the float chamber, a cylindrical horizontal mixing chamber at one side of the float chamber, a reservoir above the float chamber communicating with the mixing chamber, a gasolene passage from the float chamber to the mixing chamber, an adjustable set valve, an opening of variable size between the gasolene passage and the mixing chamber, a throttle valve extending through the mixing chamber for controlling admission of gasolene to the mixing chamber, the mixing chamber having a side opening for air admission and also an opening in the bottom, the latter being always open, a valve in the mixing chamber for regulating the side air admission opening and admission of mixture to the reservoir, a sleeve threaded in the casing of the mixing chamber, said throttle valve having its stem screwed in the sleeve, an arm clamped to the sleeve, a link adjustably attached to the arm, a stem on the air valve, and means connecting the air valve stem and link permitting a limited relative movement, substantially as described.

3. A float chamber, a float therein, valve means, controlled by the float, for admitting gasolene to the float chamber, a cylindrical horizontal mixing chamber at one side of the float chamber, a reservoir above the float chamber communicating with the mixing chamber, a gasolene passage from the float chamber to the mixing chamber, an adjustable set valve giving an opening of variable size between the gasolene passage and the mixing chamber, a throttle valve extending through the mixing chamber for controlling admission of gasolene to the mixing chamber, the mixing chamber having a side opening for air admission and also an opening in the bottom, the latter being always open, a valve in the mixing chamber for regulating the side air admission opening and admission of mixture to the reservoir, an arm attached to the air valve stem, a block journaled in the end of said arm, a link passing through the block and having a head, and a coiled spring bearing against the block and secured to the link, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RICHARD WILLIAM GALLAGHER.

Witnesses:
JOHN KEATING,
FRANCES C. THOMER.