

Aug. 9, 1966

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3,265,050

CARBURETOR CONSTRUCTION

Filed July 1, 1964

6 Sheets-Sheet 1

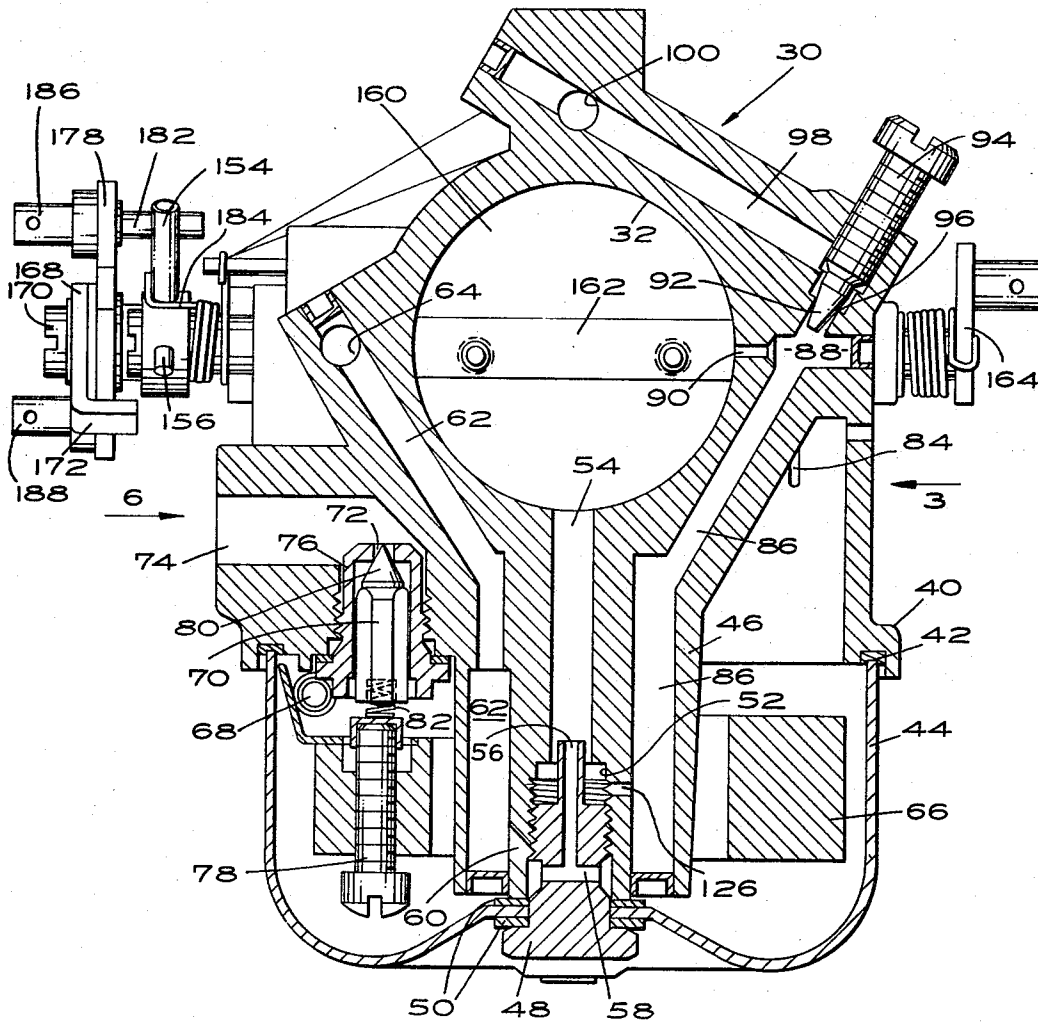


FIG. 1

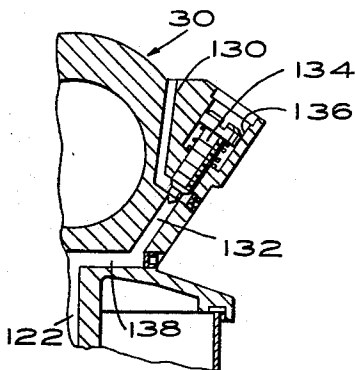


FIG. 2

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6 Sheets-Sheet 2

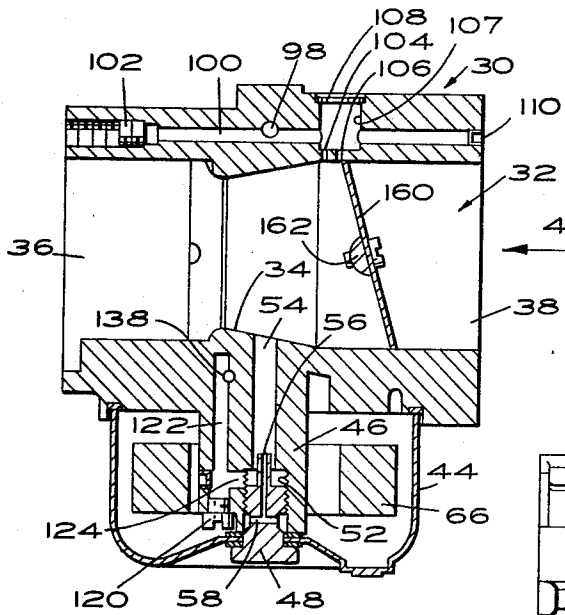


FIG. 1

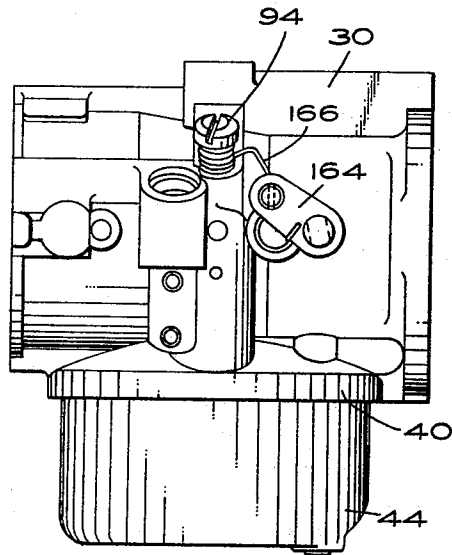


FIG. 2

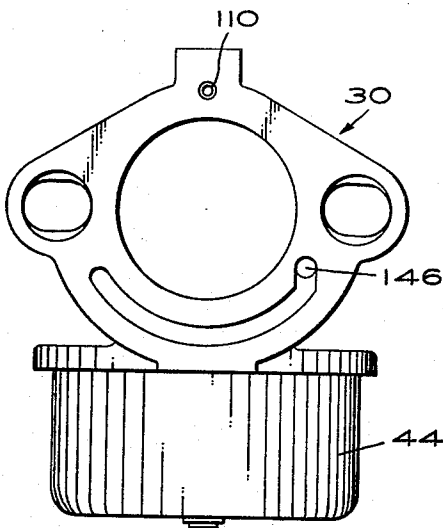


FIG. 3

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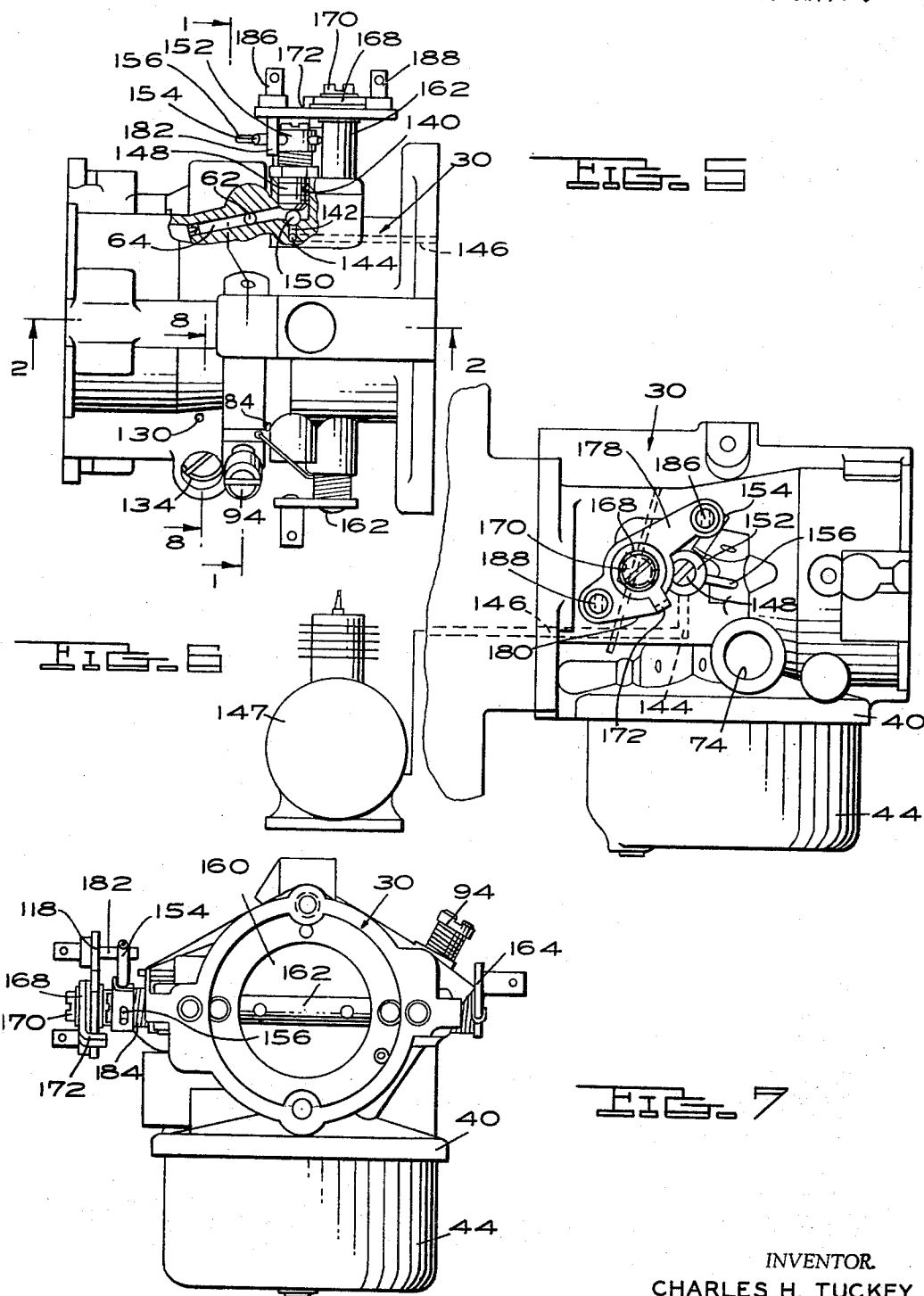
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6 Sheets-Sheet 3



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3,265,050

Filed July 1, 1964

6 Sheets-Sheet 4

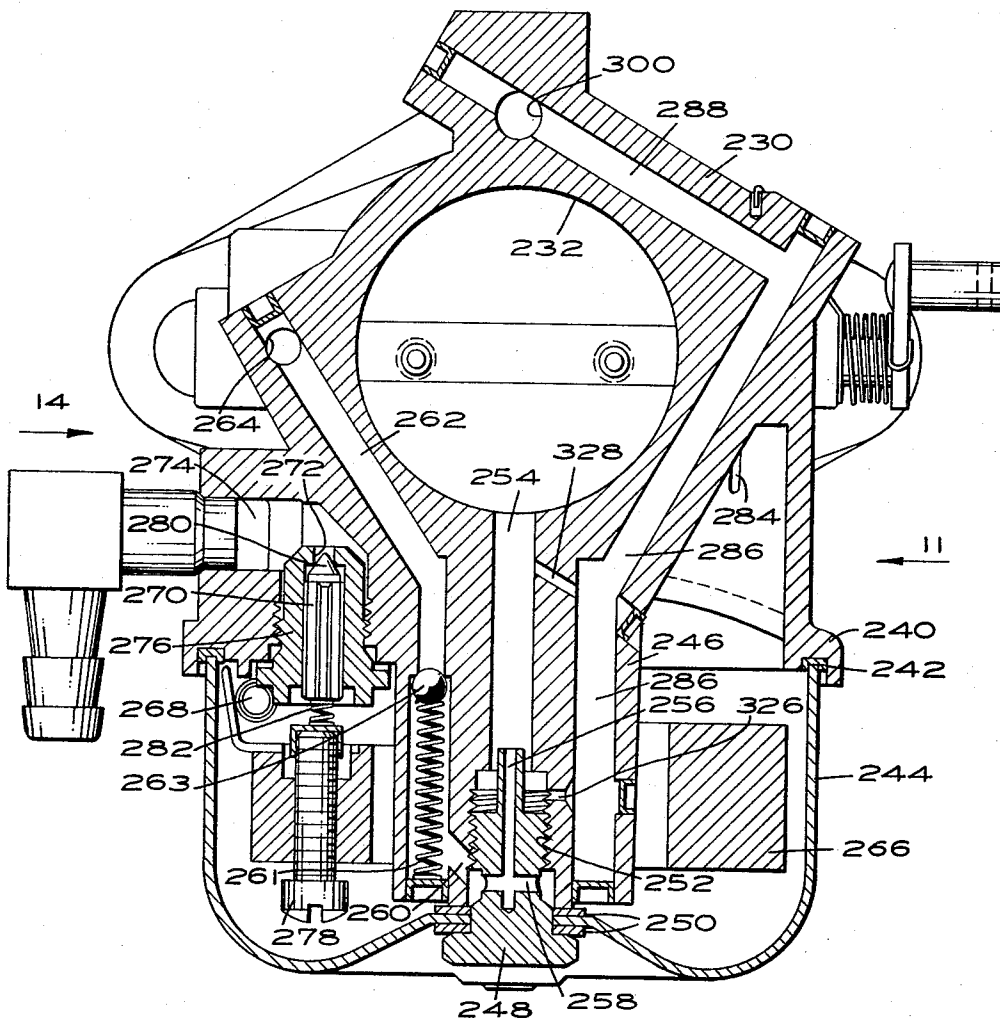


FIG. 9

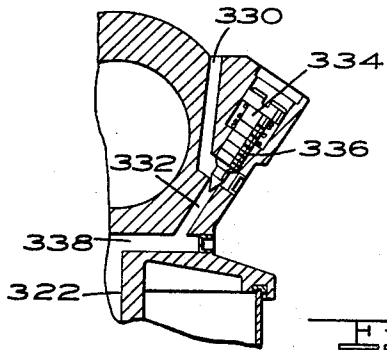


FIG. 16

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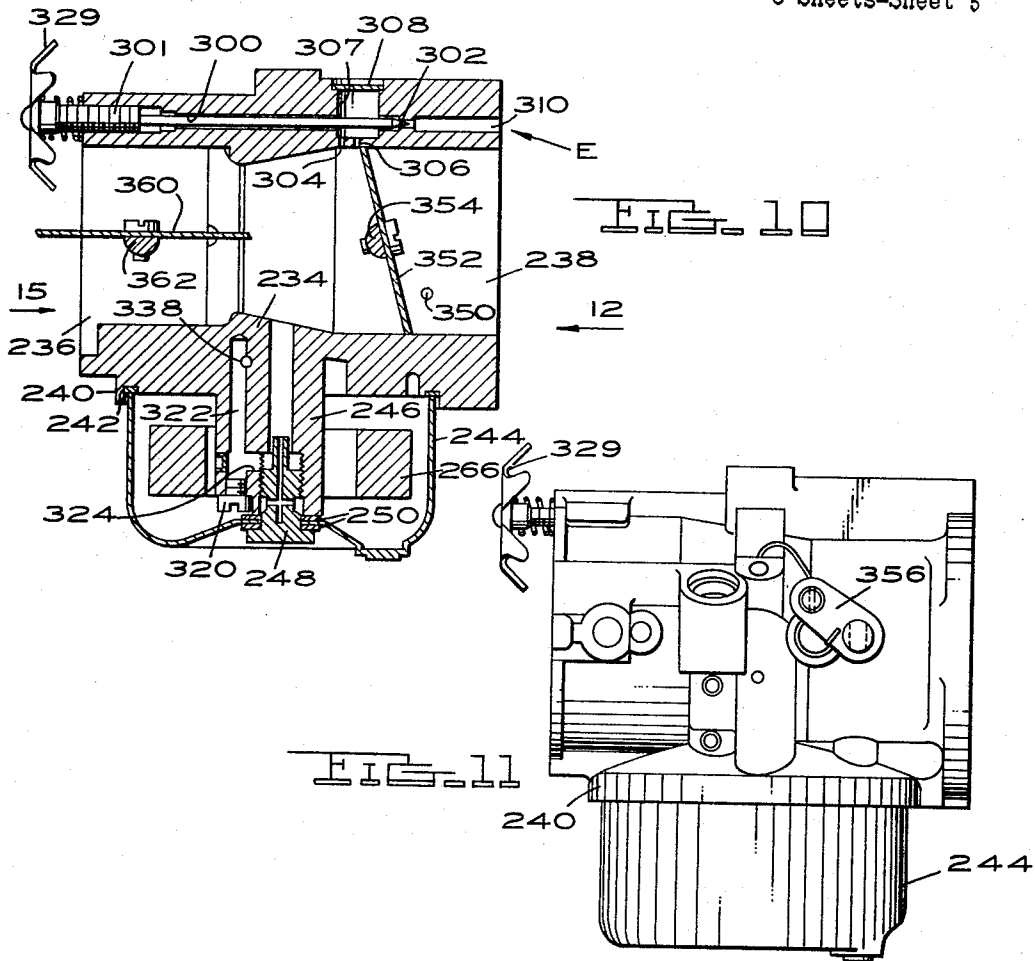
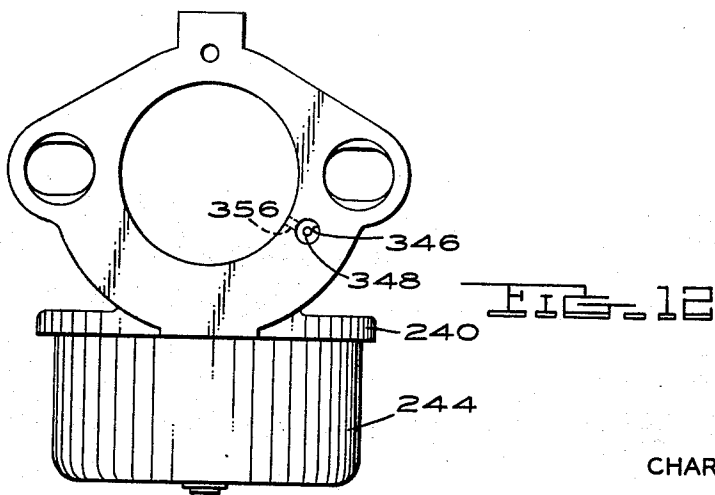
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CARBURETOR CONSTRUCTION

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6 Sheets-Sheet 5



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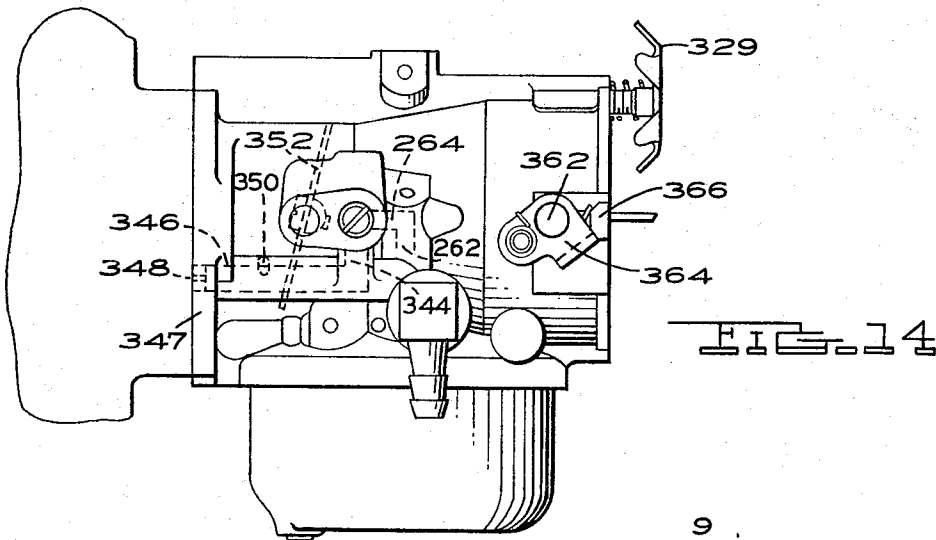
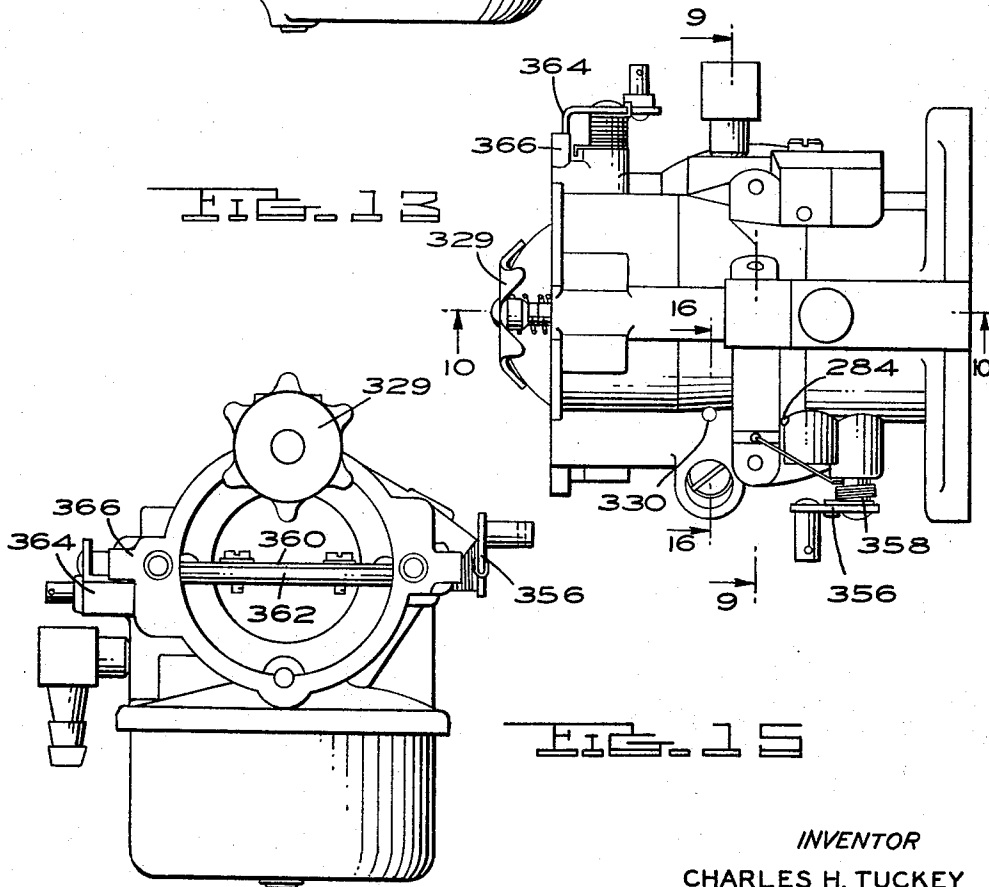
Aug. 9, 1966

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3,265,050

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6 Sheets-Sheet 6



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3,265,050

CARBURETOR CONSTRUCTION

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Filed July 1, 1964, Ser. No. 379,514

13 Claims. (Cl. 123-119)

This invention relates to a carburetor construction and more particularly to a carburetor which utilizes a boosting pressure to furnish fuel at times when the engine is calling for fuel and cannot obtain it by normal aspiration through the venturi of the carburetor.

It is an object of the invention to provide a carburetor which can eliminate an acceleration pump and yet one which will permit an engine to slow down with a wide open throttle and still operate successfully. This is called "lugging down" and happens in the case of a lawn mower when it may suddenly hit heavy grass or in a chain saw when the load is heaviest even with a wide open throttle. It can occur also in outboard motor power where a sudden surge of power is required and the throttle is open wide for pulling a net, for example, or towing a water skier.

It is a further object to provide a carburetor construction in which the mechanism can act as a supplemental choke at idle speeds when starting and will also increase fuel control during running and top throttle positions when more power is called for without an increase in speed. This is partly due to the fact that when supplemental pressure is derived from the crankcase of a two-cycle engine, for example, the pulses which furnish the supplemental fuel are slower in tempo but more fuel is delivered per pulse. As the speeds comes up, less fuel per pulse is delivered and thus the system balances out.

Another object is the provision of one embodiment of the invention wherein a mechanical control assists in the supplemental fuel output and a second embodiment wherein the control is accomplished by a pneumatic balance associated with the throttle valve.

Another object of the invention is a device which can be used in a carburetor regardless of the source of fuel reservoir, that is, whether it is a float reservoir or diaphragm reservoir.

It is a further object to provide an accelerator control for supplemental fuel which is an improvement over an accelerator pump which gives one shot of fuel under starting or accelerating circumstances; in this latter type of carburetor after this one shot, the supplemental fuel is gone, whereas with the present device as long as the need is there, the greater fuel per cycle or pulse is delivered maintaining a proper fuel-air ratio.

Another object is the provision of a carburetor wherein priming action may be obtained without a change of throttle position.

An additional feature of the carburetor construction is the fact that it will compensate for variations in air pressure so that regardless of the barometric pressure at any level, it will operate successfully, and when taken to high level areas, it will also balance out and operate successfully.

Other objects and features of the invention relating to details of construction and operation will be apparent in the following description and claims.

Drawings accompany the disclosure and the various views thereof may be briefly described as:

FIGURE 1, a transverse section through a carburetor construction taken on line 1-1 of FIGURE 5 showing many of the main passages and the control system.

FIGURE 2, a longitudinal section through the carburetor taken on line 2-2 of FIGURE 5.

FIGURE 3, a side view of the carburetor taken at line 3 of FIGURE 1.

FIGURE 4, an end view of the carburetor taken on line 4 of FIGURE 2.

FIGURE 5, a top view of the carburetor.

FIGURE 6, a side view of the carburetor taken at line 6 of FIGURE 1.

FIGURE 7, an end view of the carburetor taken at line 7 of FIGURE 5.

FIGURE 8, a partial section taken on line 8-8 of FIGURE 5.

FIGURE 9, a transverse sectional view of a modified construction of the carburetor taken on line 9-9 of FIGURE 13.

FIGURE 10, a longitudinal sectional view taken on line 10-10 of FIGURE 13.

FIGURE 11, a side view taken at line 11 of FIGURE 9.

FIGURE 12, an end view taken at line 12 of FIGURE 10.

FIGURE 13, a top view of the carburetor.

FIGURE 14, a side view taken at line 14 of FIGURE 9.

FIGURE 15, an end view taken at line 15 of FIGURE 10.

FIGURE 16, a partial section taken on line 16-16 of FIGURE 13.

Referring to the drawings:

In FIGURE 1, a carburetor housing 30 has a bore 32 provided with a conventional venturi 34, the bore having an air inlet opening 36 and a manifold outlet 38. The bottom of the housing has a circular flange portion 40 for receiving, in sealed relation, against a gasket 42, a carburetor float bowl 44. This float bowl surrounds a depending column portion 46 integral with the main carburetor casting extending down into the bowl 44 and serving as a support for the bowl by reason of a mounting screw 48 which seals to the housing by reason of gasket washers 50. The screw 48 recesses into a threaded bore 52 which leads to a normal main throttle passage 54 terminating at the venturi section 34 of the carburetor. The screw 48 has a central injection passage 56 and a cross passage 58 connecting with a side port 60 in the wall of the column 46 leading to a vertical passage 62 which angles to the left as viewed in FIGURE 1 to connect to an axially extending passage 64 to be referred to later.

The float bowl contains a standard ring float 66 hinged at 68 to control a float valve 70 co-operating with a valve port 72 in a fuel inlet passage 74. Valve 70 is mounted in a threaded thimble housing 76 in which is formed the port 72.

An adjustment screw 78 in the hinged area of the float 66 can be positioned to control the float valve. The float valve preferably has a plastic tip 80 and a contact spring 82 mounted between the screw 78 and the valve 70. The chamber within the float bowl 44 is vented to atmosphere through a small vertical passage 84 the top of which is shown in FIGURE 5 and which terminates in the casting as shown in FIGURE 1 above the float.

On the right-hand side of the depending column 46 of the main housing 30, as viewed in FIGURE 1, is a vertical passage 86 which rises to pass to the right-hand side of the bore 32 as shown in FIGURE 1 to a short horizontal passage 88 which terminates in a small port 90 leading to the bore. The top of passage 86 is controlled by a blunt needle valve 92 at the end of a control screw 94. The needle valve controls a port 96 leading to an angled passage 98 which connects to an axial bore 100 above the bore 32. Bore 100 is plugged at 102 at the left end and is connected to the bore 32 through two spaced short ports 104 and 106 at the bottom of a chamber 107 which

is plugged at the top by a plug 108. The right end of bore 100 is open at 110 to form an idle discharge port.

This series of passages starting with passage 86 is the idle system for the carburetor which receives fuel from the central bore 52 which contains the threaded jet or injection screw 48. Fuel is supplied from the float bowl through a hollow screw 120 threaded into the bottom of a vertical drilled passage 122 shown best in FIGURE 2. In reference to FIGURE 1, this passage would lie parallel to the main throttle passage 54 and in front of it. The passage 122 is connected to the bore 52 by a cross passage 124 and this bore 52 is also connected by a small cross passage 126 to the vertical side passage 86 in the idle system. Air will bleed into the idle system through the passage 90 from the central bore 32 of the carburetor and the idle adjustment is obtained through the blunt needle valve screw 94.

A variable air bleed is provided for the vertical passage 122 of FIGURE 2. This is shown in FIGURE 8 originating in a vertical passage 130, open to atmosphere, which intercepts an angled passage 132 having a control valve screw 134 recessed into a bore 136. Passage 132 connects with a horizontal passage 138 which intercepts the passage 122 near the top. There will be a column of fuel in vertical passage 122 commensurate with the head of fuel in the float bowl 44. When this fuel is called for by the main throttle, this column of fuel will shorten and, generally speaking, when the engine reaches speed, the level of the fuel in this passage 122 will go down and air can bleed through into the main carburetor passage 54 past the adjustment screw 134.

Referring now to passage 64 which extends axially of the carburetor from the rising passage 62 to the level of the central carburetor bore 32 as shown in FIGURE 1, this bore 64 extends over to intercept (FIGURE 5) a threaded valve bore 140 as shown in FIGURE 5. The valve bore 140 comes in from the side of the carburetor and terminates in a short horizontal passage 142 which connects with a short vertical passage 144 leading downwardly to an axial passage 146, the entrance to which is shown in FIGURE 4. This passage 146 is also shown in dotted lines in FIGURE 6 wherein it will be seen that it connects with the short vertical passage 144. Also in FIGURE 6, there is a showing of a two-cycle engine 147, the passage 146 being shown connected to the crankcase of a two-cycle engine. Other standard sources of pulsating pressure related to engine speed may be utilized.

In the valve bore 140 is a control screw 148 threaded into the bore and below this screw is a ball 150 which blocks the short passage 142 when seated. Screw 148 is controlled by a capstan-like head 152 and is movable in this head for purposes of adjustment. The capstan has a control arm 154 and a stop arm 156. Screw 148 has a left-hand thread and, accordingly, as viewed in FIGURE 6, when the arm 154 is rotated in a clockwise direction, the screw 148 will rise, relieving pressure on the ball 150 and allowing this ball to be moved from its seat by pressure which comes through passages 144 and 146 from the engine block (not shown), there being a connection from the crankcase of an engine so that pulses of an engine will be reflected in these passages.

The control mechanism for the screw 148 is also associated with the control mechanism for a throttle valve 160 within the main bore 32. This throttle valve 160 is mounted on a shaft 162 extending transversely through the carburetor having at the right-hand end, as viewed in FIGURE 7, a control crank arm 164 urged in a clockwise direction, as viewed in FIGURE 3, by a coil spring 166. The throttle shaft 162 extends out of the other side of the carburetor as shown in FIGURE 5, and has thereon a primary control plate 168 solidly attached to the shaft by a screw 170. This control plate 168 has a dog projection 172.

A secondary control lever 178 is freely pivoted on the control shaft 162 directly below the plate 168 and in a

position where the dog 172 may contact it at a shoulder 180. At right angles to the lever 178 is a pick-up stud 182 which lies adjacent the control arm 154. A coil spring 184 tends to rotate the screw 148 in a counterclockwise direction, as viewed in FIGURE 6, so that the control arm 154 is held against the stud 182. The spring thus tends to return the screw 154 to a closed position. The stop arm 156 will abut against the shaft 162 in the extreme clockwise position of the control head 152, as viewed in FIGURE 6. Two control studs 186 and 188 extend outwardly from the control lever 168 so that this lever can be manually or remotely shifted.

As viewed in FIGURE 6, it will be seen that the control lever 178 may be shifted clockwise to rotate the control head 152 clockwise without disturbing the primary control plate 168. When the throttle shaft 162 is rotated in a counterclockwise direction as viewed in FIGURE 2, which is an opening direction for the throttle, the screw 170 and the plate 168 will be rotated in a clockwise direction as viewed in FIGURE 6. Thus, opening the throttle forces the lever arm 178 to shift the screw 148 in a clockwise direction which lifts the screw, thus freeing the ball 150 and allowing the pulsing pressure from passage 146 (FIGURE 6) to pass through passage 144 to passage 64 and passage 62 leading downwardly, as shown in FIGURE 1, to the short cross passage 60 and to the fuel passages through the injection passage 56 of screw 48. Thus, in addition to the suction or reduced pressure in the throttle bore pulling fuel through the main throttle passage 54, there is a pressure pulse pushing or injecting fuel through this bore.

Prior to acceleration, as explained previously, there will be a column of fuel in the vertical passage 122, shown in FIGURE 2. Thus, additional fuel is available to feed to the passage 54. As previously pointed out, the top of the vertical passage 122 is connected to an air bleed so that when the column of fuel is reduced in passage 122, it can serve as an inlet for air which can mix with the fuel as it moves up through the main throttle passage 54. During the idle cycle, when fuel is passing through the passages 86, 98 and 100 to the idle discharge port 110, throttle 160 is, of course, closed. During the idle cycle, the throttle being closed, the valve 150 is also closed. Upon acceleration and during the running cycle at any speed, the pressure pulsing through passage 146 will facilitate the injection of fuel into the main bore of the carburetor. During these periods, the ball 150, being free, will serve as a check valve. Since in a lugging down operation where an engine is loaded to the point that, even with throttle open, it is operating at a reduced speed, the pulsing effect through the passage 146 is increased by reason of the longer strokes so that more pressure injection results under these conditions to prevent stalling. The longer duration of the pulse in this lugging down condition means more time between pulses which allows fuel to replenish in fuel columns of passages 122 and 54. Also in this condition the crankcase pulses are stronger, pressures are higher because there is more time to fill the crankcase with air, between pulses, through the standard reed valve or its equivalents.

The injection pressure from the crankcase also causes more intimate mixture of air with the fuel entering the venturi or mixing passage and initiates the atomization which is essential to good combustion and most effective use of fuel. No choke valve is needed in this embodiment since, by opening the throttle, the crankcase pulse can be used as a primer to pump fuel in during the starting cycle.

Referring to the embodiment shown in FIGURES 9 to 16, a pneumatic control, in contrast to the mechanical control previously described, is obtained in this structure in combination with certain passages which co-operate with the throttle valve of the structure. In FIGURE 9, a carburetor housing 230 has a bore 232 provided with a conventional venturi 234 (FIGURE 10), the bore having an air inlet opening 236 and a manifold outlet 238.

5

The bottom of the housing has a circular flange portion 240 for receiving, in sealed relation against a gasket 242, a carburetor float bowl 244. This float bowl surrounds a depending column portion 246 integral with the main carburetor casting extending down into the bowl 244 and serving as a support for the bowl by reason of a mounting screw 248 which seals to the housing by reason of gasket washers 250.

The screw 248 recesses into a threaded bore 252 which leads to a normal main throttle passage 254 terminating at the venturi section 234 of the carburetor. The shank of screw 248 has a central jet or injection passage 256 and a cross passage 258 connecting with a side port 260 in the wall of the column 246 leading to a vertical passage 262 containing a spring-backed check valve 263 and angled to the left, as viewed in FIGURE 9, to connect to an axially extending passage 264 to which later reference will be made.

The float bowl contains a standard ring float 266 hinged at 268 to control a float valve 270 co-operating with a valve port 272 in a fuel inlet passage 274. Valve 270 is mounted in a threaded thimble housing 276 in which is formed the port 272. An adjustment screw 278 threaded in the hinged area of the float 266 can be positioned to control the float valve. The float valve preferably has a plastic tip 280 and a contact spring 282 mounted between the screw 278 and the valve 270. The chamber within the float bowl 244 is vented to atmosphere through a small vertical passage 284, the top of which is shown in FIGURE 13 and which terminates in the casting as shown in FIGURE 9 above the float.

On the right-hand side of the depending column 246 of the main housing 230 (as viewed in FIGURE 9) is a vertical passage 286 which rises to pass through the right-hand side of the bore 232, as shown in FIGURE 9, to an upward angled passage 288 leading to an axial passage 300 extending along the top of the casting 230 from one end to the other. Passage 300 contains at the left-hand end, as viewed in FIGURE 10, a long threadably adjusted screw 201 cooperating with a restricted passage 302 and a portion of this passage 300 is connected to the bore 232 through two spaced short idle ports 304 and 306 at the bottom of a chamber 307 which is closed at the top by a plug 38. The right-hand end of the passage 300 is open at 310 to the engine block. This series of passages constitutes the idle system for the carburetor and receives fuel from the central bore 252 which contains the threaded screw 248. Fuel is supplied from the float bowl through a hollow screw 320 threaded into the bottom of a vertical drilled passage 322 shown best in FIGURE 10.

In reference to FIGURE 9, this passage 322 lies parallel to the main throttle passage 254 and in front of it toward the observer. The passage 322 is connected to the bore 252 by a cross-passage 324 and this bore 252 is also connected by a small cross-passage 326 to the vertical side passage 286 in the idle system. Air will bleed from the main bore 232 into the idle passage 286 through a short passage 328 which is positioned just below the entrance of the passage 254 to the bore 232. The idle adjustment is obtained through the regulation of the needle valve 301 at the restriction 302 by the outer knob 329.

A variable air bleed is provided for the vertical passage 322 of FIGURE 10. This is shown in FIGURE 16 originating in a vertical passage 330 which intercepts an angled passage 332 having therein a control valve screw 334 recessed into a threaded bore 336. Passage 332 connects with a horizontal passage 338 which intercepts the passage 322 adjacent the top thereof. There will be a column of fuel in vertical passage 322 commensurate with the head of fuel in the float bowl 244. When this fuel is called for by the main throttle, this column of fuel will shorten and, generally speaking, when the engine reaches speed, the level of the fuel in this passage 322 will go down and air can bleed through into the main carburetor passage 254 past the adjustment screw 334.

6

If reference is made to FIGURE 14, there will be found in dotted lines the angled passage 262 which connects to a short axial cross passage 264 found also in FIGURE 9. This passage connects with a short vertical passage 344 leading to an axial passage 346 opening to the engine mount flange 347. At the surface of this flange there is a plug restriction 348 which has a small hole approximately .035" in diameter. A short drilled passage 350 in the wall of the housing off the main bore 238 connects the main bore 238 with passage 346. This passage 350 has a diameter of about .043". The opening 348 is positioned to be connected to the crankcase of an engine so that the pulses in said crankcase will be transmitted to the passage 346.

In the bore 238 is located a throttle valve 352 on a horizontal pivot 354 controlled by a lever arm 356, shown in FIGURE 11, there being a suitable return spring 358 provided to act on the lever 356. This throttle is mounted in such a way that when it is in a closed position as shown in FIGURE 10, the opening 350 is outside the throttle, that is, toward the engine a short distance and so disposed that as the throttle opens, the opening 350 is in direct association with the stream moving through the carburetor. Also in the carburetor bore at 236 is a choke valve 360 mounted on a horizontal shaft 362 which is controlled by a suitable lever and stop mechanism 364 co-operating with a stop tab 366 which tends to hold the choke plate 360 in horizontal position except when actuated.

It will be seen from the above that pulses from the engine crankcase (not shown) which reach the passage 346 through the opening in plug 348 will move through the respective passages 344, 264 and 262 to the check valve 263 which is biased against this pressure. A spring 261 will permit the check valve 263 to open under a predetermined pressure so that a pneumatic pulse from the crankcase can pass through the passage 260 and the cross passage 258 in screw 248 to the central injection passage 256 and the main carburetor jet opening 254. Here these pulses assist in the discharging of fuel out of this main nozzle. As the throttle valve is opened, the crankcase pulses become greater in magnitude, thereby causing the nozzle to feed extra fuel at extremely low speeds. Under these same conditions, with a standard carburetor, the fuel feed is entirely dependent upon the suction in the throat of the venturi to start the nozzle feeding. At full throttle and a slow speed due to a heavy load, these suction forces are rather small, and there is a tendency for the engine to stall because of lack of fuel. In the present system, this problem is overcome and the pulses from the crankcase also serve as an accelerating device at any time that the throttle is opened suddenly from a slow idle position.

It will be recalled that in the embodiment shown in FIGURES 1 to 8, a mechanical valve is used to control these pulses. In the present embodiment, shown in FIGURES 9 to 16, the limiting jet opening in plug 348 controls the amount of pulse signal coming from the crankcase. At the small passage 350 on the downstream side of the throttle valve 352, there would be a compensating suction which would diminish the strength of the crankcase pulse. The holes 348 and 350 are balanced in size to the point that the strength of the pulse is such that they will not feed to the main nozzle jet 254 at slow idle. As the throttle is opened, the crankcase pressures start to increase and as the throttle is additionally opened, the passage 350 moves to the upstream side of the throttle valve thereby decreasing the suction effect at this point. At the same time, the pulse forces continue to increase in passage 262 to a point where the spring-loaded ball 263 is forced off its seat permitting the pulse to continue up to the nozzle bore 254. The hole 350 can be located axially of the venturi passage relative to the throttle valve to advance or diminish the effect of supplemental pulse action to fit the needs of a particular engine and likewise

the size of the holes and the rating of spring 261 can be calibrated for the desired effect just as any carburetor is normally calibrated to the demands of a particular engine.

It will thus be seen that there is provided in this carburetor construction a means for increasing fuel supply under the circumstances of slow speed where normal fuel suction in the bore would be so low that adequate fuel would not reach the engine and stalling becomes a real problem. Thus, the lugging down periods of an engine results in increasing fuel supply which prevents this stalling condition. In fact during the lugging down periods, as previously described, the length of the pulses is increased and thus they are more effective in supplementing fuel supply. In addition, it has been found that the systems described compensates for changes in atmosphere so that an engine will operate in high altitudes with the same favorable characteristics that it has at low altitudes. It should also be mentioned that the effect above described, with respect to both embodiments, is functional during any particular position of throttle opening. That is even at one-quarter or one-half throttle, a lugging down of the engine will bring in to play the compensation forces.

I claim:

1. In combination, a carburetor and an engine comprising:

- (a) a supply of fuel,
- (b) a venturi passage and means connecting said passage to said supply of fuel wherein fuel is induced from said supply into said passage,
- (c) a source of pulsating fluid pressure responsive to the action of said engine, and
- (d) means connecting said source of fluid pressure to said fuel supply and to said venturi passage to cause fuel to be injected into said venturi passage to supplement the induction action of said venturi passage.

2. A carburetion system for increasing the supply of fuel to an engine under open throttle conditions and reduced speed due to load which comprises:

- (a) an internal combustion engine,
- (b) a carburetor having a venturi passage, a fuel supply and means to connect for induction of fuel from said supply to said venturi due to vacuum created by said engine,
- (c) a source of pulsating fluid pressure created by the operation of said engine and responsive in frequency to the r.p.m. of said engine, and
- (d) means associating said fuel supply and venturi passage wherein fluid pulsations from said source will cause a supplemental fuel supply to be introduced into said venturi passage.

3. A carburetion system for increasing the supply of fuel to an engine under open throttle conditions and reduced speed due to load which comprises:

- (a) an internal combustion engine,
- (b) a carburetor having a venturi passage, a fuel supply and means to connect for induction of fuel from said supply to said venturi due to vacuum created by said engine,
- (c) a source of pulsating fluid pressure created by the operation of said engine and responsive in frequency to the r.p.m. of said engine,
- (d) means associating said fuel supply and venturi passage wherein fluid pulsations from said source will cause a supplemental fuel supply to be introduced into said venturi passage,
- (e) a throttle valve in said venturi passage movable through a range from closed to open positions, and
- (f) means associated with said throttle valve to control the fluid pulsations from said source in reaching said venturi such that said pulsations are primarily effective when said throttle is in open position.

4. A device as defined in claim 3 in which the means to control said fluid pulsations comprises a valve mounted in a passage between said engine and fuel supply, said valve being movable to an open position upon opening movement of said throttle.

5. A device as defined in claim 4 in which said valve in open position serves as a unidirectional valve open toward said venturi passage.

6. A device as defined in claim 4 in which the said fluid pulsations are connected by a passageway in said carburetor or to said fuel supply, and means connecting said passageway to said venturi passage adjacent said throttle valve wherein the effect of said pulsations is diminished when said throttle is at closed or near closed position.

7. A device as defined in claim 6 in which a unidirectional valve is positioned in said passageway open in the direction toward said venturi.

8. A carburetion system for increasing the supply of fuel to an engine under open throttle conditions and reduced speed due to load which comprises:

- (a) a carburetor body having a venturi passage extending therethrough,
- (b) a throttle valve in said passage,
- (c) means forming a fuel supply receptacle in said body adjacent a main fuel passage leading to said venturi passage,
- (d) a fuel well at one end of said main fuel passage,
- (e) means forming a connecting passage between said fuel supply receptacle and said fuel well to permit fuel in said receptacle to flow to said fuel well,
- (f) a pressure jet in said body having an outlet adjacent said fuel well directed through said main fuel passage toward said venturi passage,
- (g) a passageway in said body adapted to be connected to a source of fluid pressure leading to said pressure jet, and
- (h) means in said passageway responsive to the position of said throttle valve to control the force of fluid pressure in said passageway.

9. An engine and carburetor combination for increasing the supply of fuel to an engine under open throttle conditions and reduced speed due to load which comprises:

- (a) a two-cycle engine having a crankcase fuel intake system,
- (b) a carburetor body having a venturi passage extending therethrough,
- (c) a throttle valve in said passage,
- (d) means forming a fuel supply receptacle in said body adjacent a main fuel passage leading to said venturi passage,
- (e) a fuel well at one end of said main fuel passage,
- (f) means forming a connecting passage between said fuel supply receptacle and said fuel well to permit fuel in said receptacle to flow to said fuel well,
- (g) a pressure jet in said body having an outlet adjacent said fuel well directed through said main fuel passage toward said venturi passage,
- (h) a passageway in said body adapted to be connected to said crankcase to provide a source of pulsing fluid pressure to said pressure jet, and
- (i) means in said passageway responsive to the position of said throttle valve to control the force of fluid pressure in said passageway.

10. In a carburetor of the type having a venturi passage, a throttle valve therein, and a main fuel jet connecting a fuel supply therewith, the combination comprising:

- (a) a pressure jet in said main fuel jet directed toward said venturi,
- (b) a source of fluid under pressure connected to said pressure jet to supplement the induction action of said venturi, and
- (c) means associated with said throttle valve to render said supplementation pressure primarily effective in the open throttle position, and

(d) a reserve fuel well adjacent said supply having an atmospheric vent to connect with said main fuel jet through said well under open throttle conditions.

11. In a carburetor of the type having a venturi pas-

sage, a throttle valve therein, and a main fuel jet connecting a fuel supply therewith, the combination comprising:

- (a) a pressure jet in said main fuel jet directed toward said venturi,
- (b) a source of fluid under pressure connected to said pressure jet to supplement the induction action of said venturi, and
- (c) means associated with said throttle valve to render said supplementation pressure primarily effective in the open throttle position, said source of fluid under pressure being carried to said pressure jet through a passageway containing a restricted port in said carburetor, and means in said passageway between said port and said jet forming a connection between said venturi passage adjacent said throttle valve and said passageway, said connection being downstream of said throttle valve when it is in closed position whereby said fluid under pressure from said source is rendered effective when said throttle is away from closed position.

12. In a carburetor having a venturi passage for delivering a fuel and air mixture to an engine and designed to have a fuel supply to said engine supplemented under conditions of increased load and reduced speed,

- (a) means to hold a supply of fuel in said carburetor adjacent said venturi passage,
- (b) main jet means in said carburetor to connect said supply of fuel to said venturi to expose said fuel to

the lowered pressure in said venturi and cause the fuel to be induced into the venturi,

- (c) a source of gaseous fluid under a pressure responsive to engine action which increases in effectiveness as an engine decreases in speed, and
- (d) means in said carburetor forming a passage leading to said main jet to connect said source of gaseous fluid to said main jet and said fuel supply to carry fuel from said supply into said venturi passage to supplement the quantity of fuel induced in to said venturi passage from said supply.

13. A carburetion system as defined in claim 12 in which a throttle valve is provided movable from a closed to an open position to control flow through said venturi, and means associated with said throttle valve to render said supplementation action of said gaseous fluid from said source primarily effective when the throttle is positioned away from the closed position.

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