

May 16, 1967

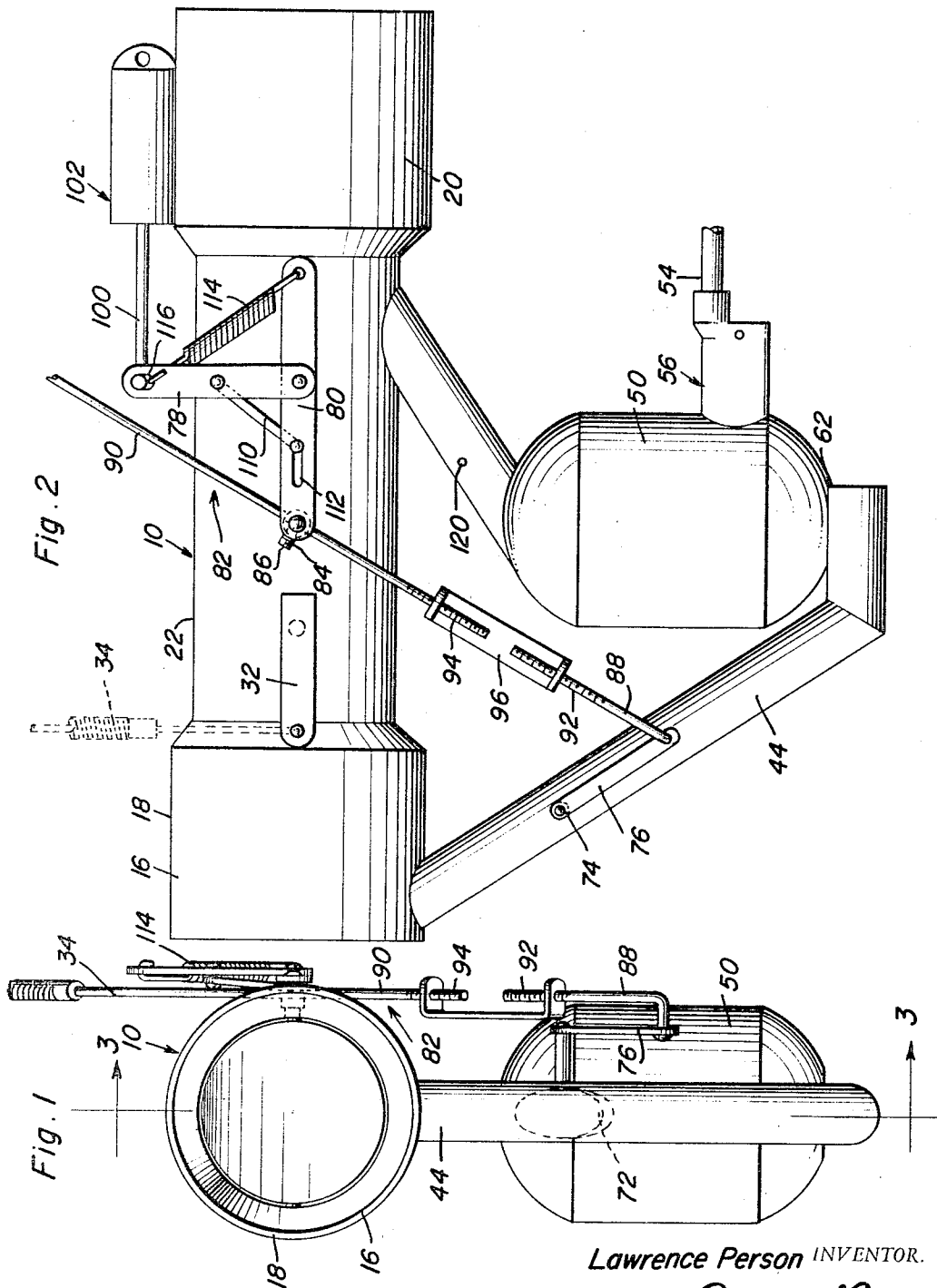
L. PERSON

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CARBURETOR CONSTRUCTION

Filed April 29, 1965

2 Sheets-Sheet 1



Lawrence Person INVENTOR.

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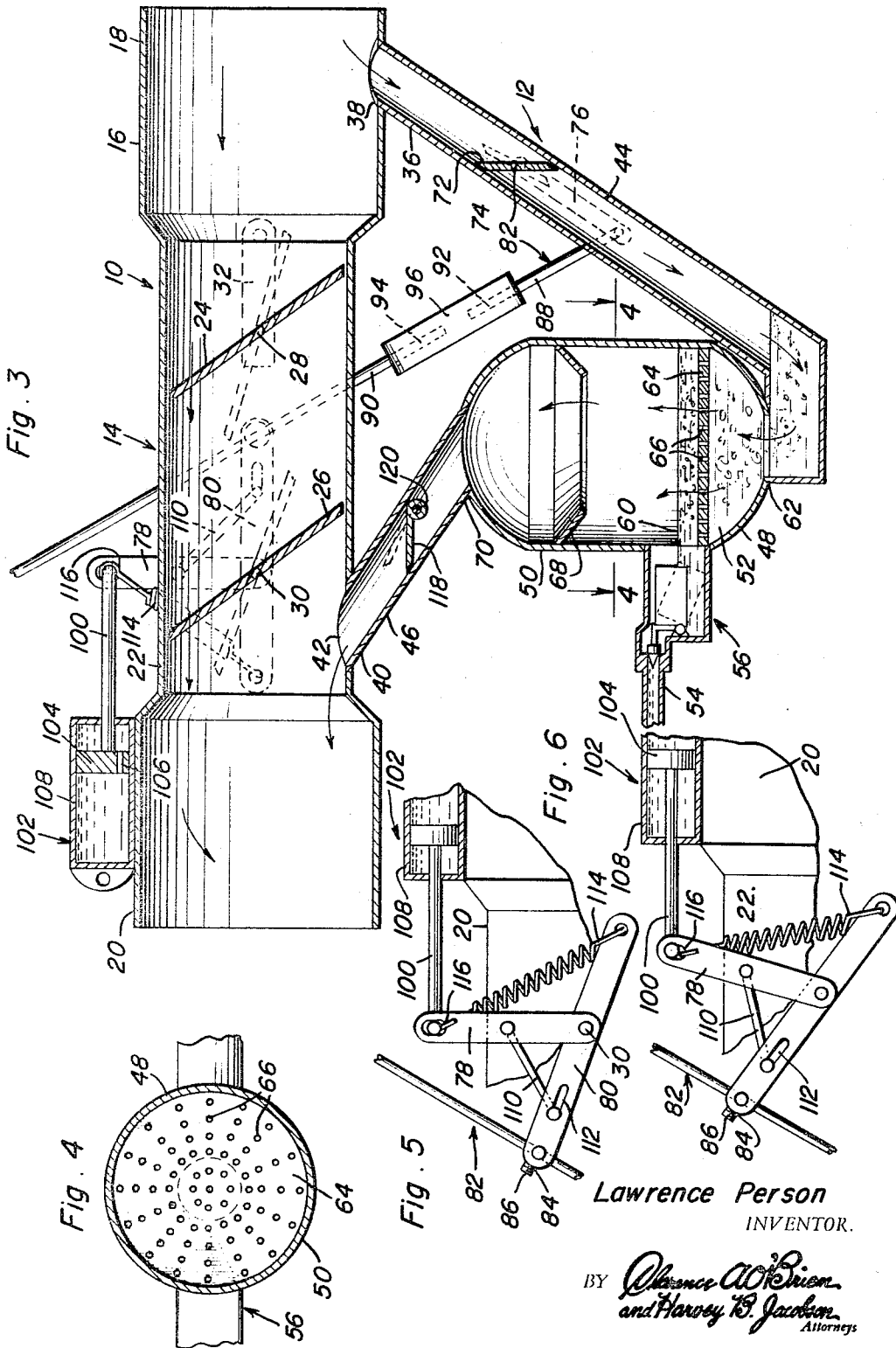
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1

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CARBURETOR CONSTRUCTION
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Filed Apr. 29, 1965, Ser. No. 451,827
6 Claims. (Cl. 261-46)

This invention relates to a novel and useful carburetor construction and more specifically to a carburetor construction utilizing first and second air passage means with each air passage means being provided with an air flow regulating butterfly valve and one of the air passage means having fuel inlet means operatively associated therewith to admit fuel thereinto in amounts increasing and decreasing as the flow of air through the air passage increases and decreases, respectively. In addition, means is provided for operatively connecting the butterfly valves together for opening and closing of one butterfly valve in response to opening and closing of the other butterfly valve but including a lost motion connection affording for movement of one of the butterfly valves toward the open position independent of movement of the other butterfly valve from its closed position, there being provided means yieldingly urging the slave butterfly valve to an open position corresponding to the adjusted open position of the master butterfly valve and also means for delaying movement of the slave butterfly valve toward a further open position in response to movement of the master butterfly valve to a corresponding open position.

By utilizing this type of construction a more precise air and fuel mixture may be provided by the carburetor throughout a wider engine speed range and, as will hereinafter be more fully set forth, the necessity for an accelerator pump is eliminated without a great sacrifice in engine operation of an associated internal combustion engine.

The carburetor of the instant invention, in addition to including a novel arrangement of air passages extending therethrough further includes novel fuel inlet means for admitting fuel into only one of the air passages extending through the carburetor. Although somewhat similar fuel inlet means have been used heretofore, the instant fuel inlet means is particularly well adapted for use in conjunction with a carburetor including the aforementioned novel air passages extending therethrough.

The main object of this invention is to provide an improved carburetor construction constructed in a manner so as to provide a more precise mixture of fuel and air throughout a wider range of engine operating speeds.

Another very important object of this invention is to provide a carburetor construction which will eliminate the necessity for an accelerator pump assembly.

Still another object of this invention is to provide a carburetor including improved fuel inlet means having structural features adapted to more fully atomize the liquid fuel being mixed with the air passing through the carburetor.

Another object of this invention is to provide an improved carburetor construction including structural components that may be readily rearranged in their positions relative to each other so as to adapt the carburetor construction to be readily manufactured for use on substantially all existing internal combustion engines.

A final object of this invention to be specifically enumerated herein is to provide an improved carburetor construction which will conform to conventional forms of manufacture, be of simple construction and dependable in operation so as to provide a device that will be economically feasible, long lasting and relatively troublefree.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter

2

described and claimed, reference being had to the accompanying drawings, forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an end elevational view of the carburetor construction of the instant invention;

FIGURE 2 is a side elevational view of the assembly illustrated in FIGURE 1;

FIGURE 3 is a longitudinal vertical sectional view taken substantially upon the plane indicated by the section line 3-3 in FIGURE 1;

FIGURE 4 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 4-4 of FIGURE 3; and

FIGURES 5 and 6 are fragmentary side elevational views of the center portion of the embodiment illustrated in FIGURE 2 illustrating the lost motion connection between the two butterfly valves of the carburetor in different positions of operation and with parts of the carburetor being broken away and shown in vertical section.

Referring now more specifically to the drawings, the numeral 10 generally designates the carburetor construction of the instant invention which includes first and second air passage means generally referred to by the reference numerals 12 and 14. The second air passage means 14 comprises an elongated tubular body 16 including an inlet end 18 and an outlet end 20. The body 16 further includes a diametrically reduced center section 22 in which a pair of butterfly valves 24 and 25 are disposed for individually and selectively controlling the flow of air through the second air passage means 14. The butterfly valve 24 is pivotally supported for rotation about a horizontal axis defined by a pivot pin 28 journaled from the body 16 and the butterfly valve 26 is pivotally supported within the center section 22 by means of a pivot pin 30 journaled from the body 16. The butterfly valve 24 comprises a choke valve and an operating lever 32 is secured to one end of the pivot pin 28 on the exterior of the body 16 and is adapted to have a Bowden cable assembly 34 operatively associated therewith for controlling the position of the butterfly valve 24 from a remote position.

The first air passage means 12 includes an inlet end 36 which opens into the inlet end 18 of the body 16 as at 38 and an outlet end 40 which also opens into the body 16 as at 42. The air passage means 12 includes a first inlet section 44, a second outlet section 46, and a third intermediate fuel inlet section 48 communicating the outlet and inlet end portions of the inlet and outlet sections 44 and 46.

As can best be seen from FIGURE 3 of the drawings, the fuel inlet section 48 comprises a hollow fuel reservoir including a generally cylindrical housing 50 in whose lower end a predetermined quantity 52 of liquid fuel is maintained. A fuel inlet pipe 54 adapted to be communicated with a suitable source of liquid fuel under pressure is communicated with the interior of the reservoir 50 by means of a float valve assembly generally referred to by the reference numeral 56 and which is operable to maintain a static fuel level within the reservoir 50 such as that designated at 60.

The outlet end of the inlet section 44 opens through the bottom of the housing 50 as at 62 and the housing 50 is provided with a generally horizontally disposed partition 64 including a plurality of apertures 66. The partition 64 is disposed below the level 60. Still further the housing or reservoir 50 includes an upper partial partition 68 which is generally annular in plan shape and which is disposed adjacent the upper end of the housing or reservoir 50 slightly below the point 70 in which the inlet end of the outlet section 46 opens into the top of the housing 50.

The inlet section 44 has a butterfly valve 72 rotatably supported therein by means of a pivot pin or shaft 74 journaled from the inlet section 44 and the shaft 74 has a lever arm 76 secured to one end thereof.

One end of the pivot shaft or pin 30 from which the butterfly valve 26 is supported projects through a corresponding side of the center section 22 in the body 16 and has one end of a lever arm 78 secured thereto. In addition, an intermediate portion of a lever arm 80 is journaled on the pivot pin 30 and one end of the lever 80 is secured to a connecting rod assembly generally referred to by the reference numeral 82 for adjustable movement therealong by means of a pivoted clamp assembly 84 including a setscrew 86 for engagement with the connecting rod assembly 82. The end of the connecting rod assembly 82 remote from the lever 80 is pivotally secured to the free end of the lever 76 in any convenient manner and it may be seen from FIGURES 1-3 of the drawings that the connecting rod assembly 82 includes two aligned end sections 88 and 90 which are externally threaded as at 92 and 94 and interconnected by means of a center section 96 including two oppositely threaded and aligned bores (not shown) in which the end sections 88 and 90 are threadedly engaged. Accordingly, it may be seen that the distance between the end portions of the members 76 and 80 to which the connecting rod assembly 82 is secured may be adjusted by means of adjustment of the center section 96.

A lost motion connection is provided between the levers 78 and 80 and the free end of the lever 78 is pivotally secured to a piston rod 100 of a fluid controlled dashpot assembly generally referred to by the reference numeral 102. The dashpot assembly 102 includes a piston head 104 on the end of the piston rod 100 remote from the lever 78 and which is provided with a metered passage 106 and is slidably received within a fluid filled cylinder 108 of the dashpot assembly 102 carried by end section 20 of the body 16.

A limiting lever 110 has one end pivotally secured to the lever 78 intermediate a piston rod 100 and the pivot pin 30 and the other end pivotally and slidably connected to one end of the lever 80 intermediate the pivot pin 30 and the connecting rod assembly 82 by means of a longitudinal slot 112 formed in the lever 80. The end of the lever 80 remote from the connecting rod assembly 82 has one end of an expansion spring 114 secured thereto and the other end of the expansion spring 114 is secured to the free end of the lever 78 as at 116.

Finally, the outlet section 46 of the air passage means 12 includes a one-way flap valve 118 which is pivotally supported therein by means of a pivot pin 120 and is utilized to prevent the fuel and air mixture within the housing 50 from being ignited due to the internal combustion engine (not shown) with which the carburetor 10 is operatively associated backfiring through the latter.

In operation, the choke butterfly valve 24 may be utilized in a conventional manner when the internal combustion engine with which the carburetor 10 is operatively associated is being started while cold. The connecting rod assembly 82 is of course adapted to be operatively connected to the throttle controls of the associated internal combustion engine and as air passes through the first and second air passage means 12 and 14, air passing through the first air passage means 12 will be caused to bubble up through the quantity 52 of fuel disposed below the partition 64 and then pass through the numerous apertures 66 formed in the partition 64 before bubbling up through the quantity 54 of fuel disposed above the partition 64.

Movement of air through the reservoir or housing 50 will of course cause quantities of the fuel to be atomized and pass upwardly through the upper portion of the housing 50 and out through the outlet section 46. Any large droplets of fuel being caught in a stream of air moving rapidly through the housing 50 will engage the partition

68 and thus fall back into the fuel in the lower part of the housing 50. The fuel enriched air entering the center section 22 from the outlet section 46 will then mix with the air passing through the second air passage means 14 and exit from the carburetor 10 through the outlet end section 20 of the body 16. The horizontal plan area of the interior of the housing 50 and the size and number of the apertures 66 may be varied to provide the desired optimum fuel air mixture passing outwardly through the outlet end section 20 of the body 16. In addition, the control rod assembly 82 may be utilized to adjustably position the butterfly valves 26 and 72.

When it is desired to increase the amount of air and fuel mixture produced by the carburetor 10, the connecting rod assembly 82 may be moved upwardly toward the left as viewed in FIGURE 3 of the drawings which will initially cause the butterfly valve 72 to be moved toward a further open position. This of course will effect the passage of a greater quantity of air through the air passage means 12 and thus more fuel to be atomized thereby. However, the dashpot assembly 102 will retard movement of the butterfly valve 26 to a corresponding further open position thereby enabling the associated internal combustion engine to receive an initially richer air fuel mixture which will be gradually leaned to the proper air fuel ratio as the dashpot assembly allows the second butterfly valve 26 to move toward a corresponding further open position by means of the expansion spring 114.

Therefore, it may be seen that the need for an accelerator pump to inject a given quantity of additional fuel into the stream of air passing through a carburetor in response to a sudden great increase of the flow of air passing through the carburetor such as is conventional is eliminated. Further, inasmuch as the carburetor 10 of the instant invention utilizes simplified methods of operation it may be constructed at a relatively low cost and maintained in an operative condition with a minimum of maintenance.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A fuel-air mixing device comprising first and second air passage means including first and second adjustable air flow regulating valve means, respectively, operatively associated therewith for controlling the flow of air there-through, said first and second air passage means including corresponding air inlet ends for receiving air into said passage means and air outlet ends merging together downstream of said second air flow regulating valve means to form a single outlet for discharging air and air and fuel mixtures therefrom, said first air passage means including fuel inlet means operative to admit fuel into said first air passage means in amounts increasing and decreasing as the flow of air through said first air passage means increases and decreases, respectively, said second air passage means being devoid of fuel inlet means, means operatively connecting said first valve means with said second valve means for opening and closing of the latter in response to opening and closing of the former, said means operatively connecting said valve means including a free lost motion connection with said second valve means affording for limited movement of said first valve means in both direction independent of movement of said second valve means but preventing movement of said first valve means toward a closed position past the corresponding closed position of said second valve means thereby assuring that the latter will close with said first valve means, means yieldingly urging said second valve means to an open position corresponding to the adjusted open

5

6

position of said first valve means, and double acting dash-pot means yieldingly resisting movement of said second valve means toward its open position.

2. The combination of claim 1 wherein said means operatively connecting said first valve means with said second valve means includes two relatively movable members defining said lost motion connection, said means yieldingly urging said second valve means to an open position comprising spring means operatively connected between said two relatively movable members.

3. The combination of claim 1 wherein said connecting means includes means independent of said lost motion connection for adjustably positioning said second valve means relative to said first valve means.

4. The combination of claim 1 wherein said means operatively connecting said first valve means with said second valve means includes means for slightly varying the rate at which said second valve means is moved toward the open position in response to movement of said first valve means toward its open position.

5. The combination of claim 1 wherein said fuel inlet means includes fuel reservoir means having liquid fuel disposed therein to a level between upper and lower prede-

termined levels, said fuel reservoir being disposed in said first air passage means in a manner such that air passing through said first air passage means is forced to bubble up through said liquid fuel.

6. The combination of claim 5 wherein said first air passage means includes check valve means disposed therein downstream of said fuel reservoir means and operative to prevent a reverse flow of air through said air passage means past said check valve means.

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