

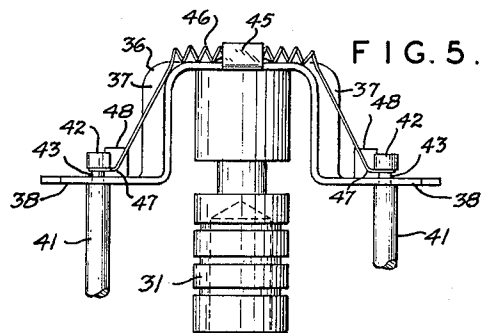
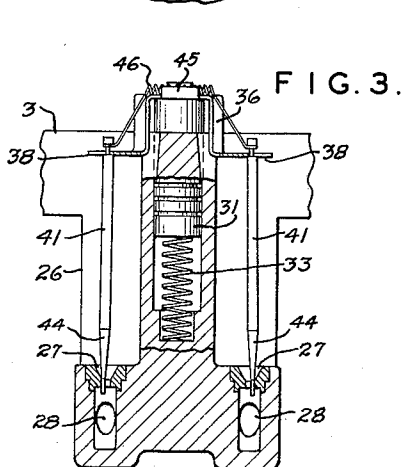
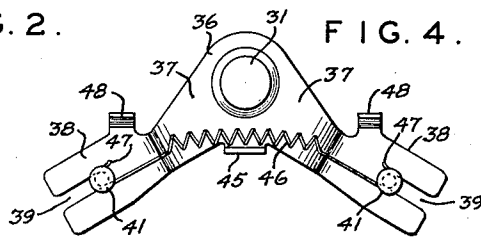
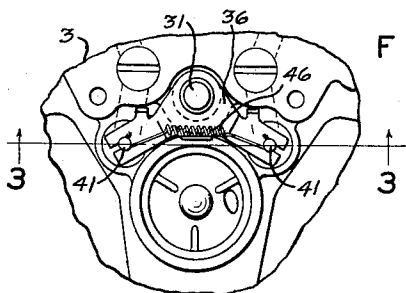
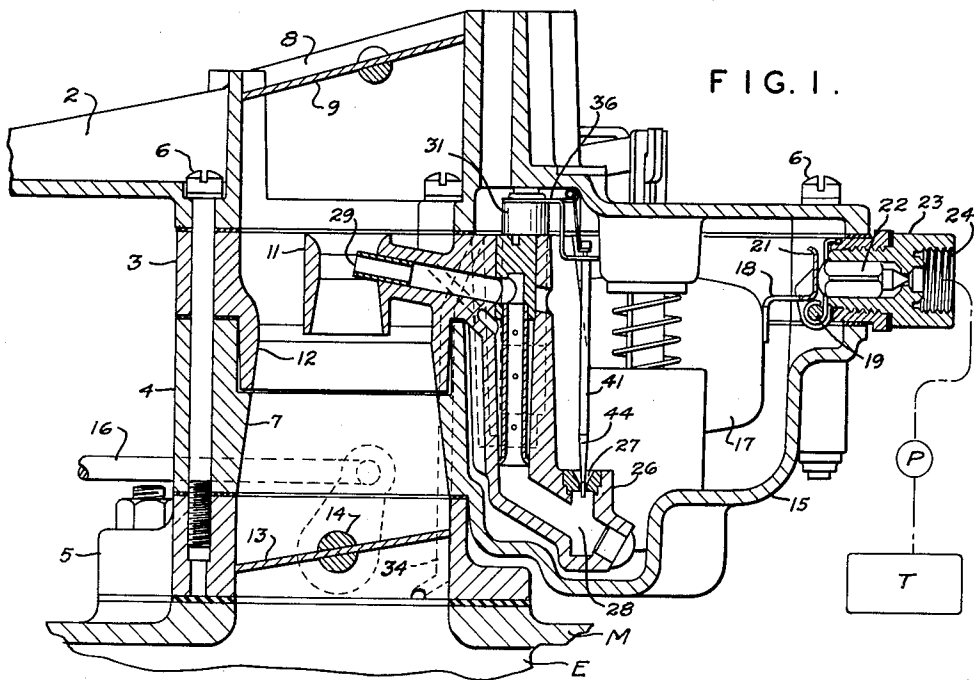
May 14, 1963

R. J. SMITH

3,089,684

CARBURETOR

Filed June 3, 1960



INVENTOR.
ROBERT J. SMITH

BY

Charles H. Bassett

ATTORNEY

1

3,089,684

CARBURETOR

Robert J. Smith, St. Ann, Mo., assignor to ACF Industries, Incorporated, New York, N.Y., a corporation of New Jersey

Filed June 3, 1960, Ser. No. 33,754
7 Claims. (Cl. 261—23)

This invention relates to carburetors for internal combustion engines and more particularly to step-up devices for two barrel carburetors.

Briefly, the present invention contemplates the provision of a carburetor provided with two mixture conduits and individual main fuel systems for supplying fuel from a fuel bowl to their respective mixture conduits. Each main fuel system comprises a fuel metering orifice leading from the fuel bowl into a passage provided with a nozzle to discharge fuel into a primary venturi in its respective mixture conduit. To control the flow of fuel through the main fuel systems, each fuel metering orifice is provided with a metering rod mounted on a piston for common reciprocative movement therewith responsive to variations in pressure posterior to throttle valves provided in the outlet ends of the mixture conduits.

An object of the invention resides in the provision of a step-up device for a dual carburetor having two independent main fuel systems for supplying fuel to their respective mixture conduits.

Another object of the invention resides in the provision of a carburetor having two main fuel systems provided with individual fuel metering orifices controlled by stepped metering rods, the rods being mounted on a piston for common reciprocative movement therewith responsive to variations in pressure posterior to the throttle valves.

A further object of the invention resides in the provision of a step-up device comprising means for detachably mounting two identical fuel metering rods on a piston to facilitate and reduce the cost of manufacture, assembly and replacement of rods.

Another object of the invention resides in the provision of mounting means for biasing the metering rods laterally toward one side of their respective fuel metering orifices to more accurately control the flow of fuel therethrough.

The invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims and illustrated in the accompanying drawing, forming part thereof, wherein:

FIG. 1 is a vertical section illustrating a dual carburetor embodying features of the invention.

FIG. 2 is a fragmentary top plan view illustrating the step-up device.

FIG. 3 is a fragmentary section taken along the line 3—3 of FIG. 2.

FIG. 4 is an enlarged top plan view illustrating the means provided for mounting the fuel metering rods on a step-up piston.

FIG. 5 is a front elevation of same.

Referring now to the drawings for a better understanding of the invention, the dual downdraft carburetor is adapted to be mounted upon the intake manifold M of an internal combustion engine E and is shown as comprising an air horn section 2, a fuel control section 3, a fuel bowl section 4, and a throttle section 5, the several sections being secured together in stacked relationship by means of mechanical fasteners, such as bolts and screws 6, to define two identical mixture conduits 7—7 having a common air inlet 8 controlled by a conventional butterfly choke valve 9.

2

The fuel control section 3 is formed with primary venturis 11—11 and main venturis 12—12 for their respective mixture conduits 7—7. Throttle valves 13—13 provided in the mixture conduits 7—7 are secured to a common throttle shaft 14 journaled in the throttle section 5 and adapted to be manually actuated through a suitable mechanical linkage 16.

The fuel bowl section 4 is formed with a fuel bowl 15 adapted to contain two floats 17—17 secured to a common float arm 18. The float arm is journaled on a fixed pivot pin 19 and provided with a finger 21 to engage a valve member 22 mounted in a valve body 23 having a fuel inlet 24. A pump P is adapted to transfer fuel from a fuel tank T through a conduit C and valve body 23 into the fuel bowl 17 under the control of the float actuated valve member 22.

A depending portion 26 is formed on the fuel control section 3 and provided with two main fuel systems leading from the fuel bowl 15 to their respective mixture conduits 7—7. Each fuel system is shown as comprising a fuel metering orifice 27 leading from the fuel bowl into a fuel passage 28 which extends upwardly through the depending portion 26 to a fuel discharge nozzle 29 in the primary venturi 11.

The flow of fuel through the metering orifices 27—27 is controlled by a vacuum step-up device which is shown as comprising a piston 31 mounted in a cylinder 32 formed in the depending portion 26, the piston being biased upwardly against a shoulder on the air horn section 2 by a compression spring 33. A suction passage 34 extends from the lower end of the cylinder 32 to the mixture conduits 7—7 posterior to the throttle valves 13—13.

A bracket 36 is secured to the upper end of the piston 31 and formed with arms 37—37 having laterally extending coplanar end portions 38—38 formed with slots 39—39. Identical fuel metering rods 41—41 are formed at their upper ends with head portions 42—42 and neck portions 43—43, the latter being slidably engaged in the slots 39—39. The lower ends of the metering rods are tapered at 44—44 and disposed within their respective metering orifices 27—27 to control the flow of fuel therethrough.

The metering rods 41—41 are engaged against displacement from their respective slots 39—39 by means of a tension spring 46 mounted on the bracket 36 against a boss 45 and having hook-shaped ends 47—47 engaging the neck portions 43—43 under the head portions 42—42, whereby the head portions are biased toward each other and the tapered end portions 44—44 are biased away from each other to slidably engage remote sides of the fuel metering orifices 27—27, as illustrated in FIG. 3. The bracket 36 is provided with guide lugs 48—48 for sliding engagement against vertical surfaces on the depending portion 26 during reciprocative movement of the piston 31.

During operation of an internal combustion engine, the step-up device is actuated responsive to opening and closing movement of the throttle valves 13—13. When the throttle valves are moved to closed position, suction posterior of the valves acts to move the piston 31 and metering rods 41—41 downwardly to reduce the flow of fuel through the metering orifices 27—27. When the throttle valves are moved to open position, the spring 33 acts to move the piston and metering rods upwardly to increase the flow of fuel through the metering orifices.

Certain structures have been described herein which will fulfill all the objects of the present invention, but it is contemplated that other modifications will be obvious to those skilled in the art which come within the scope of the invention as defined by the appended claims.

I claim:

1. In a carburetor for an internal combustion engine, two mixture conduits, throttle valves in said conduits, a fuel bowl, two main fuel passages leading from said bowl to their respective conduits, each passage having a fuel metering orifice therein, a step-up device comprising a piston operable responsive to variations in pressure posterior to said throttle valves, a bracket secured to said piston and having slots in opposite sides thereof, metering rods mounted in said slots and engaged in said orifices, and a tension spring interconnecting said rods.

2. In a carburetor for an internal combustion engine, two mixture conduits, throttle valves in said conduits, a fuel bowl, two main fuel passages leading from said bowl to their respective conduits, each passage having a fuel metering orifice therein, a step-up device comprising a piston operable responsive to variations in pressure posterior to said throttle valves, a bracket secured to said piston and having slots in opposite sides thereof, metering rods mounted in said slots and having tapered ends engaged in said orifices, and a tension spring interconnecting said rods to bias said rods laterally of said orifices.

3. In a carburetor for an internal combustion engine, two mixture conduits, throttle valves in said conduits, a fuel bowl, two main fuel passages leading from said bowl to their respective conduits, each passage having a fuel metering orifice therein, a step-up device comprising a piston operable responsive to variations in pressure posterior to said throttle valves, a bracket secured to said piston, two fuel metering rods mounted on said bracket and slidably engaged in their respective fuel metering orifices to control the flow of fuel therethrough, and resilient means interconnecting and biasing said rods toward remote sides of said orifices, said bracket having slots in opposite sides thereof, and said rods having neck portions engaged in said slots.

4. In a step-up device for a carburetor having two main fuel systems provided with individual fuel metering orifices, a cylinder, a piston in said cylinder operable responsive to a differential in pressure, a bracket secured to said piston, and two fuel metering rods secured to said bracket and slidably engaged in said orifices to control fuel flow therethrough, said bracket having arms formed with slots, said rods having neck portions engaged in said slots.

5. In a step-up device for a carburetor having two main fuel systems provided with individual fuel metering

orifices, a cylinder, a piston in said cylinder operable responsive to a differential in pressure, a bracket secured to said piston, and two fuel metering rods secured to said bracket and slidably engaged in said orifices to control fuel flow therethrough, said bracket having arms formed with slots, said rods having neck portions engaged in said slots, and a tension spring interconnecting the upper ends of said rods.

6. A carburetor for an internal combustion engine, said carburetor comprising fuel and air mixture conduit means, a throttle within said mixture conduit means, a fuel bowl structure, means forming two main fuel passages leading from said fuel bowl structure to said mixture conduit means, each of said main fuel passages having a different metering orifice therein, a step-up device including a cylinder, a piston within said cylinder and a passage connecting said cylinder to said mixture conduit means posterior to said throttle, a bracket having a pair of arms fixed to said piston, a pair of metering rods disposed with each metering rod thereof engaged in a different one of said orifices and having an end thereof loosely supported by a different one of said bracket arms, a spring connected between said metering rod ends to bias said metering rods against the sides of said orifices.

7. A carburetor for an internal combustion engine, said carburetor comprising fuel and air mixture conduit means, throttle structure within said mixture conduit means, fuel bowl structure, means forming two main fuel passages leading from said fuel bowl structure to said mixture conduit means, each of said main fuel passages having a different metering orifice therein, a step-up device including a cylinder, a piston within said cylinder and a passage connecting said cylinder to said mixture conduit means posterior to said throttle structure, a bracket having a pair of apertured arms fixed to said piston, a pair of metering rods disposed with one end of each metering rod engaged in a different one of said orifices and the other end of each of said metering rods extending loosely through a different one of said apertured bracket arms, a spring connected between said other metering rod ends to bias said one metering rod ends against the sides of said orifices.

References Cited in the file of this patent

UNITED STATES PATENTS

2,652,237	Boller	Sept. 15, 1953
2,711,885	Mosely et al.	June 28, 1955