Jan. 2, 1951 S. W. BONSER 2,536,716

DUAL CARBURETOR CONTROL

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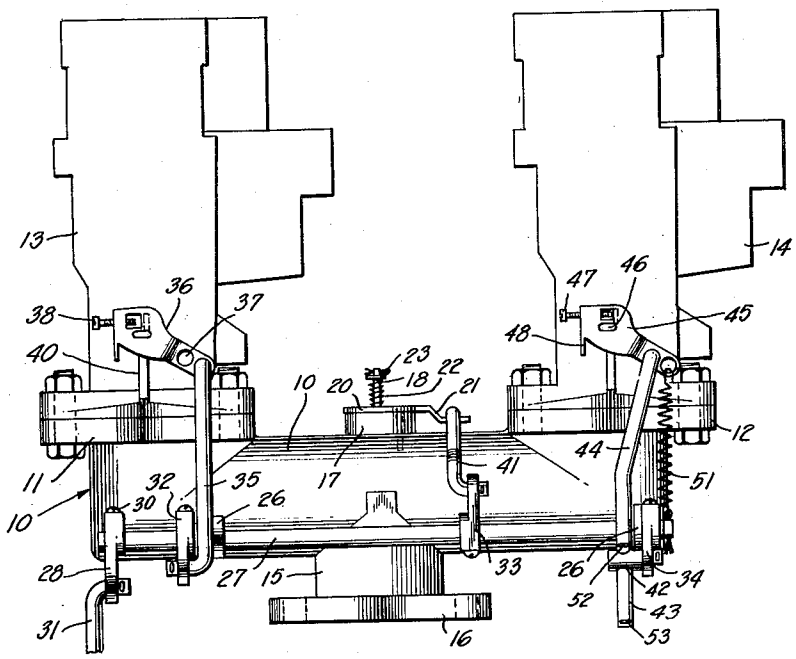


FIG. 1.

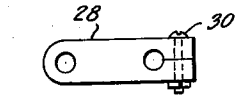


FIG. 3.

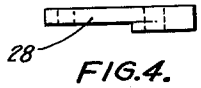


FIG. 4.

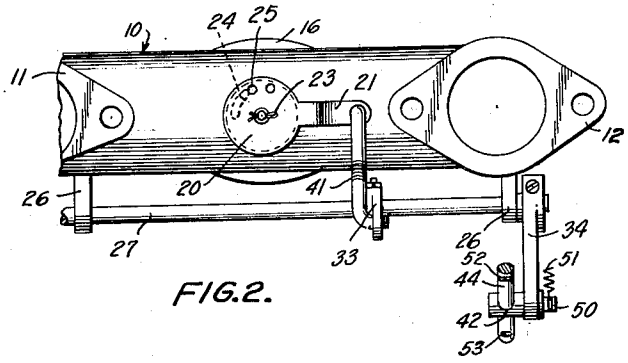


FIG. 2.

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DUAL CARBURETOR CONTROL

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6 Claims. (Cl. 123—127)

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This invention relates to a novel carburetor control mechanism and has for an object to provide an improved control means arranged for use with a multiple carburetor system to regulate the supply of fuel and air vapors from a pair of carburetors to an intake manifold.

Certain notable difficulties in the operation of modern types of multiple cylinder high speed gasoline engines have been encountered, and it is an object of this invention to overcome such difficulties. It has been found desirable to supply additional fuel to the engine during overload and high speed operating periods by using an auxiliary carburetor connected in a parallel fluid circuit with the customary gasoline engine carburetor. The control mechanism of this invention takes care of the flow of fuel vapors from both the customary and the auxiliary carburetors, and also arranges for an increase in the air supply on reaching and surpassing a certain critical speed of operation, thus providing a saving in gasoline consumption and increased power without motor ping.

A further object of this invention is to provide a dual carburetor control system that will provide a supply of fuel vapors and air supply in accordance with the normal and the high speed demands of the engine.

A further object of this invention is to provide an optimum economy of fuel supply throughout a much greater range of speed of operation than heretofore possible.

A further object of this invention is to provide a control means that cuts in the second carburetor at a desired speed, around 25 to 30 miles per hour, and simultaneously, or substantially so, operates an air injector that eliminates any over rich mixture and thus provides substantial economy of operation.

Other additional objects will more fully appear from the following description, and that the invention may be more fully understood, reference is had to the accompanying drawing forming a part of the present description and illustrating a preferred embodiment of the invention, in which:

Fig. 1 is a plan view of this invention applied to a dual carburetor and manifold.

Fig. 2 is an elevation view showing the air injector and lost motion mechanism details.

Fig. 3 is a plan view of a control link, and

Fig. 4 is an edge view of the control link.

There is shown at 10 a dual carburetor manifold having at each end a carburetor mounting flange 11 and 12 on which are mounted the dual carburetors 13 and 14. Intermediate the two

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carburetor flanges 11 and 12 there is provided an integrally extending tube 15 terminating in an engine mounting flange 16 for securing it to the usual engine manifold for distributing the carbureted mixture to the engine cylinders in the usual manner.

On the opposite side from the engine mounting tube 15 and preferably axially aligned therewith is provided an auxiliary air injection means in the form of a capped nipple 17. An upstanding axially extending stub shaft 18 on the cap of the nipple 17 provides a central pivot for a plate 20 having a radially extending finger 21. A compression spring 22 about the shaft 18 is biased between a diametrically extending cotter pin and washer 23 at the upper end of shaft 18 and the plate 20 to hold the plate 20 down against the cap of the nipple 17. The nipple cap is provided with an arcuate slot 24, while the plate 20 is provided with one or more apertures 25 located at the same radius as the slot 24. During operation, as hereinafter described, the plate 20 is rotated over the nipple cap, and the aperture 25 is so arranged with relation to the slot 25 that after the plate 20 has been rotated a prescribed amount, the aperture 24 will then commence to travel over the slot 25 and remain over the slot 25 for the balance of rotation that is permitted, thus permitting air to enter the manifold during the period that the aperture 24 coincides with the slot 24. Due to the limited total rotation of the plate 20, the aperture and slot may be duplicated at the diametrically opposite side if desired.

Projecting from the manifold 10 are a pair of stubs 26 having bearing apertures through which is journaled the throttle shaft 27. Limited rotation of this shaft 27 is provided by a throttle lever 28 adjustably secured thereto by a set screw 30 and actuated by a throttle link 31 operatively connected in the usual manner to the vehicle throttle (not shown). Three additional substantially identical levers 32, 33 and 34 are similarly mounted along the same shaft 27. The lever 32 is connected by a link 35 to an offset throttle arm 36 fixedly mounted on the shaft 37 for positioning a customary butterfly valve within the carburetor 13. The other end of throttle arm 36 is provided with an adjustable stop screw 38 arranged to abut against an abutment 40 on the carburetor 13.

Normal operation of the vehicle throttle will thus actuate and control the carburetor 13 in the usual manner.

The lever 33 is connected by a somewhat arcu-

ate link 41 to the extending finger 21 of air injection plate 20. Normal operation of the vehicle throttle will thus cause rotation of the plate 20, and the relative location of the nipple cap slot 24 and the plate aperture 25 is such that the aperture 25 will coincide with the location of the slot 24 when the vehicle speed has reached a minimum of twenty-five to thirty miles per hour, and will remain in such coincidence throughout the speed range thereabove. Obviously, the position of the slot and aperture may be reversed, i. e. the slot may be in the plate, and the aperture in the nipple cap.

The lever 34 has journaled in its end a stub rod 42 diametrically through which there is an aperture through which extends the end 43 of a link 44 whose other end is connected to an offset throttle arm 45 fixedly mounted on the shaft 46 for positioning a customary butterfly valve within the auxiliary carburetor 14. The other end of this offset throttle arm 45 is also provided with an adjustable stop screw 47 arranged to abut against an abutment 48 on the carburetor 14.

Extending between the link end of throttle arm 45 and the protruding end 50 of stub rod 42, is a resilient spring 51 which tends to pull the throttle arm 45 toward the closed position. The end 43 of link 44 slides through the stub rod 42 within the limits permitted by two cotter pins 52 and 53 extending diametrically through the link 44 on either side of stub rod 42, thus providing a lost motion mechanism. In idling position, the stub rod 42 is located adjacent the lower cotter pin 52, and as the vehicle throttle is operated, the stub rod 42 merely slides along the end 43 of link 44 until the vehicle has reached a speed of operation of about twenty-five to thirty miles an hour, at which time it abuts against the upper cotter pin 53. Further actuation of the vehicle throttle then causes the throttle lever 34 to actuate throttle link 44 and thus throttle arm 45 against the resistance of spring 51. As the vehicle throttle is retracted, the spring 51 causes progressive closing of the butterfly valve in carburetor 14 until it is completely closed at about the same speed at which it opened, and thereafter, throttle lever 24 slides on link end 43 until the carburetor also reaches idling speed.

In operation, the vehicle throttle is operated in a normal manner. At idling speeds and up to twenty-five to thirty miles an hour, only carburetor 13 supplies the necessary fuel. When this critical speed is passed, the auxiliary carburetor 14 comes into operation, and simultaneously the air aperture and slot 24 come into coincidence to feed extra air to the manifold, thus leaning out the mixture of fuels from the two carburetors and providing increase economy and increased power. Both carburetors 13 and 14 are substantially identical in construction, and the engine idles on both carburetors, but as a result of the construction set forth, the auxiliary carburetor 14 continues to idle until the set critical speed is reached, whereupon it commences to feed additional fuel, and the air injector simultaneously commences to feed in additional air.

It is possible that various changes and modifications may be made in my invention without departing from the spirit and scope thereof, and I do not wish to be understood as limiting myself to the specific construction nor the specific uses therein described.

What is claimed is:

1. A dual carburetor control mehanism comprising an engine intake manifold, a spaced apart pair of carburetor inlets on said manifold, each arranged to have a carburetor mounted thereon, each carburetor having a throttle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism fixedly connecting one throttle arm to said throttle shaft to transmit all motion of said throttle shaft to said one throttle arm, and a lost motion link mechanism slidably connecting the other throttle arm to said throttle shaft for advancement of said other throttle arm beyond idling or closed position only after a partial rotation of said throttle shaft has taken place, and resilient means connecting said throttle arm to said link mechanism to retract said throttle arm and permit lost motion of said link mechanism after said other throttle arm has reached idling or closed position, an auxiliary air injection means on said manifold comprising an air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated, and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence commencing at a predetermined speed of operation of the engine.

2. A dual carburetor control mechanism comprising an engine intake manifold, a spaced apart pair of carburetor inlets on said manifold each arranged to have a carburetor mounted thereon, each carburetor having a thottle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism fixedly connecting one throttle arm to said throttle shaft to transmit all motion of said throttle shaft to said one throttle arm, and a lost motion link mechanism slidably connecting the other throttle arm to said throttle shaft for advancement of said other throttle arm beyond idling or closed position only after a partial rotation of said throttle shaft has taken place, and resilient means connecting said throttle arm to said link mechanism to retract said throttle arm and permit lost motion of said link mechanism after said other throttle arm has reached idling or closed position, an auxiliary air injection means on said manifold comprising an air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated, and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence after an initial advancement of said auxiliary carburetor throttle arm.

3. A dual carburetor control mechanism comprising an engine intake manifold, a spaced apart pair of carburetor inlets on said manifold each arranged to have a carburetor mounted thereon, each carburetor having a throttle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism fixedly connecting one throttle arm to said throttle shaft to transmit all motion of said throttle shaft to said one throttle arm, and a lost motion link mechanism slidably connecting the other throttle arm to said throttle shaft for advancement of said other throttle arm beyond idling or closed position only after a partial rotation of said throttle shaft has taken place, and resilient means connecting said throttle arm to said link mechanism to retract said throttle arm and permit lost motion of said link mechanism after said other throttle arm has reached idling or closed position, an auxiliary air injection means on said manifold comprising an

air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated, and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence after an initial advancement of said auxiliary carburetor throttle arm, said auxiliary air injection means including a circular cap having the air aperture therethrough off center therein, said plate being pivoted on said cap and rotatable thereabout to bring its aperture into coincidence with the cap aperture.

4. A dual carburetor control mechanism comprising an engine intake manifold, a spaced apart pair of carburetor inlets on said manifold each arranged to have a carburetor mounted thereon, each carburetor having a throttle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism fixedly connecting one throttle arm to said throttle shaft to transmit all motion of said throttle shaft to said one throttle arm, and a lost motion link mechanism slidably connecting the other throttle arm to said throttle shaft for advancement of said other throttle arm beyond idling or closed position only after a partial rotation of said throttle shaft has taken place and an auxiliary air injection means on said manifold comprising an air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence after an initial advancement of said auxiliary carburetor throttle arm.

5. In a carburetor control mechanism including an engine intake manifold, a carburetor inlet on said manifold arranged to have a carburetor mounted thereon, the carburetor having a throttle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism connecting the throttle arm to the throttle shaft to transmit the motion of said

throttle shaft to the throttle arm; an auxiliary air injection means on the manifold comprising an air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence commencing at a predetermined speed of operation of the engine.

6. In a carburetor control mechanism including an engine intake manifold, a carburetor inlet on said manifold arranged to have a carburetor mounted thereon, the carburetor having a throttle arm for controlling the carburetor, a throttle shaft journaled alongside said manifold, link mechanism connecting the throttle arm to the throttle shaft to transmit the motion of said throttle shaft to the throttle arm; an auxiliary air injection means on the manifold comprising an air aperture therein, a movable plate closing said air aperture, an air aperture through said plate, one of said air apertures being elongated and link mechanism connecting said plate to said throttle shaft to move said air apertures into coincidence commencing at a predetermined speed of operation of the engine, said auxiliary air injection means including a circular cap having the air aperture therethrough off center therein, said plate being pivoted on said cap and rotatable thereabout to bring its aperture into coincidence with the cap aperture.

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