

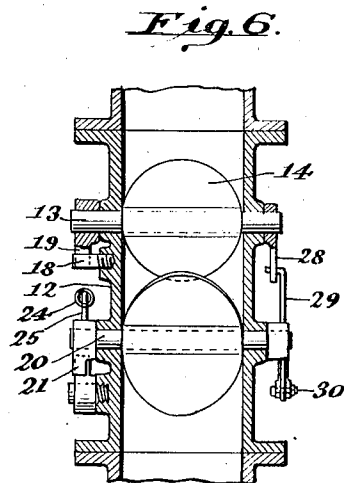
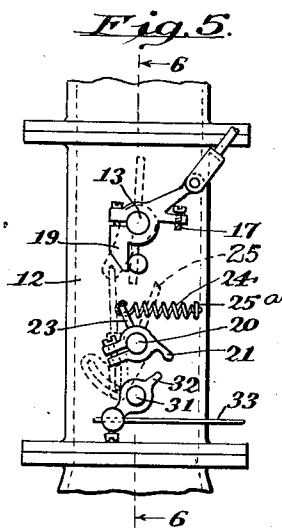
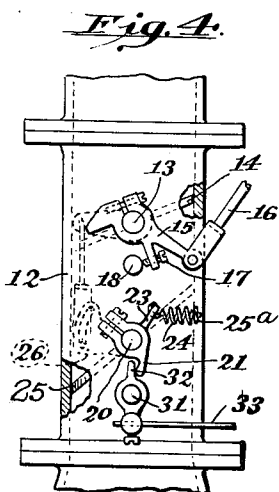
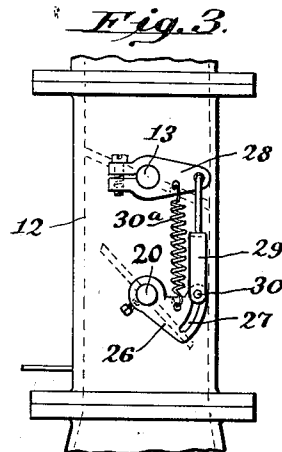
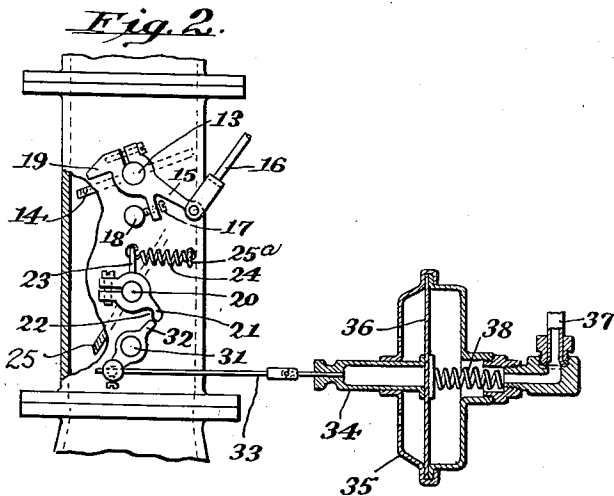
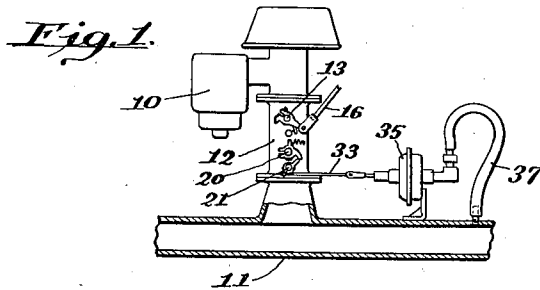
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2,017,878

AUTOMATIC DECELERATION CONTROL DEVICE

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UNITED STATES PATENT OFFICE

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AUTOMATIC DECELERATION CONTROL
DEVICE

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REISSUED

10 Claims. (Cl. 123—97)

My invention relates generally to carburetors and more particularly to an automatic deceleration control device for the conventional forms of carburetors, in order to materially increase the efficiency of the carburetor in controlling the flow of fuel vapor to the intake manifold of the internal combustion engine with which the carburetor is associated.

drawing which illustrates a preferred embodiment of my invention, 10 designates a conventional carburetor, 11 the intake manifold of the engine with which the carburetor is associated and 12 a tubular member that connects the carburetor with the manifold.

Extending transversely through the upper portion of the tubular member 12, is a shaft 13 and mounted thereon within tubular member 12, is a disc valve 14.

Mounted on the forward end of shaft 13, is a short crank arm 15, to the outer end of which is pivoted the end of a rod 16 that is actuated by the conventional accelerator pedal or lever.

Arm 15 carries a screw 17 that is adapted to engage a stop lug 18 that is formed on member 12 to limit the closing movement of the valve 14 and the opening movement of said valve is limited by a lug 19 that engages stop lug 18 when valve 14 is swung into full open position as illustrated in Fig. 5.

Screw 17 is adjusted so that when it engages stop 18, valve 14 is slightly open, as illustrated in Fig. 2, so as to permit sufficient gaseous fuel to pass from the carburetor to the intake manifold and permit the engine to run at idle speed.

The construction just described is conventional.

Extending transversely through the lower portion of tubular member 12, is a shaft 20 and secured to the forward end thereof, is a short arm 21 provided in its underface with a notch 22.

Projecting upwardly from arm 21, is a short arm 23, to which is connected one end of a retractile spring 24 and the other end thereof being secured to a pin or stud 25^a that projects from member 12.

Carried by shaft 20 within tubular member 12, is a disc valve 25, which when occupying a position of approximately forty-five degrees relative to a horizontal plane, completely closes the passageway through member 12 (see Fig. 4).

Carried by the rear end of shaft 20, is a short arm 26, in the outer portion of which is formed a slot 27. Carried by the rear end of shaft 13, is a short arm 28 and pivotally connected to the outer end of said arm, is the upper end of a link 29, the lower portion of which is bifurcated and carries a pin 30 that extends through slot 27. A retractile spring 30^a connects the arms 26 and 28 and said spring normally tends to draw said arms toward each other (see Fig. 3).

Mounted on a stud 31 that projects from member 12, just below shaft 20, is a finger 32, the upper end of which normally bears against the lower

The principal objects of my invention are, to provide the conventional carburetor with a secondary valve that cooperates with the main valve in controlling the flow of fuel vapor through the carburetor and further, to provide an attachment wherein the secondary valve will be automatically closed to cut off the flow of fuel vapor through the carburetor immediately following the decelerating action of the main valve of the carburetor, thereby preventing the vacuum that is built up in the intake manifold from sucking practically raw gas through the carburetor into the intake manifold and the engine cylinders, which action produces an objectionable discharge of smoke and noxious gases from the exhaust manifold of the engine.

A further object of my invention is, to provide a deceleration control device that is relatively simple in construction, inexpensive of manufacture and which is entirely automatic in operation.

With the foregoing and other objects in view my invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is an elevational view of a carburetor with which my improved deceleration control device is associated and showing the same connected to the intake manifold of an internal combustion engine.

Fig. 2 is an enlarged front elevational view of the carburetor and the deceleration control and showing the vacuum actuated means utilized for controlling the operation of the secondary valve of the carburetor.

Fig. 3 is a rear elevational view of the deceleration control device.

Fig. 4 is an elevational view of the device and showing the secondary valve in full closed position.

Fig. 5 is an elevational view of the device and showing both valves in full open position.

Fig. 6 is a vertical section taken on line 6—6 of Fig. 5.

Referring by numerals to the accompanying

portion of the side of arm 21 just below the notch 22.

Connected to the lower end of finger 32, below the stud 31, is one end of a rod 33, the opposite end of which is connected to a plunger 34 that is mounted for sliding movement through one wall of a housing 35.

Arranged within the housing 35, is a flexible diaphragm 36 and the inner end of plunger 34 is connected to the center of this diaphragm.

The chamber within the housing on the opposite side of the diaphragm is connected by suitably arranged tubular members 37 to the intake manifold 11 and arranged within the housing on the opposite side of the diaphragm from the plunger 34, is an expansive spring 38. The tension of spring 38 is greater than that of spring 24.

Under normal conditions or while the engine is running at idle speed, the operating parts of the carburetor and the attachment thereto occupy the positions as illustrated in Figs. 1, 2 and 3, with the valves 14 and 25 opened to such a degree as to permit sufficient gaseous fuel to pass from the carburetor into the engine cylinders to enable the engine to idle.

The usual spring associated with the accelerator rod 16, holds the screw 17 against stop 18 and spring 24 holds the end of arm 21 against finger 32.

When the foot pedal or hand lever is actuated to pull accelerator rod 16, arm 15 is swung so as to impart rotary movement to shaft 13 and valve 14 carried by said shaft will be correspondingly swung into open position to permit an increase in flow of gaseous fuel to the engine and thereby increase the speed thereof.

During this acceleration, arm 28 will swing downward and pin 30, carried by the lower end of link 29, will move downward through slot 27 in arm 26, which arm is held against swinging movement by the engagement of finger 32 against the lower end of arm 21.

If acceleration is continued until lug 19 on arm 15 engages stop 18, the pin 30 in the lower end of link 29 will engage the arm 26 at the lower end of slot 27 and swing the latter downward and consequently swinging secondary valve 25 into full open position, as illustrated in Fig. 5, and thus a maximum volume of gaseous fuel is permitted to flow through the carburetor attachment to the engine so that the same runs at high speed.

My improved attachment is designed to function so as to entirely cut off the flow of gaseous fuel to the intake manifold of the engine when deceleration takes place and particularly after the engine has been operating at high and intermediate speeds. When deceleration takes place accelerator rod 16 moves upward, thereby permitting valve 14 to return to its normal position under the influence of the spring associated with the accelerator rod and as this movement takes place the pin 30 at the lower end of link 29 moves upward through slot 27 without imparting movement to arm 26 and secondary valve 25.

Following sudden deceleration and the cutting off of the gaseous fuel to the intake manifold creates a substantial degree of vacuum within said manifold, which vacuum under present conditions or with the present types of carburetors draws raw gasoline through the carburetor and intake manifold and as this raw gasoline is ignited in the engine cylinders it creates a substantial volume of smoke and noxious gases that are discharged through the exhaust pipe. This result is very

undesirable, particularly in the heavier types of vehicles used as motor buses.

When deceleration takes place where my improved carburetor attachment is used, the vacuum produced in the intake manifold will act on flexible diaphragm 36 to draw the same toward the tubular connections leading to the intake manifold, which movement overcomes the resistance offered by spring 38 and the plunger 34 moves in to the housing 35 and rod 33 swings arm 32 upon its axis, thereby moving the upper end of said arm into the notch 22 and permitting arm 21 and shaft 20 to swing under the influence of retractile spring 24, so that secondary valve 25 will be shifted into full closed position as illustrated in Fig. 4, thereby completely cutting off the flow of gaseous fuel through the carburetor to the intake manifold.

As soon as the vacuum prevailing within the intake manifold is broken and normal pressures prevail in said manifold, diaphragm 36 will return to its normal position under the influence of spring 38, thereby swinging arm 32 on its axis and the upper end of said arm engaging the lower end of arm 21 will move the same and shaft 20 so as to return secondary valve 25 to its normal partly open position as illustrated in Fig. 2.

Inasmuch as my improved carburetor attachment is effective in preventing raw gasoline from being drawn into the intake manifold and the cylinders of the engine immediately subsequent to deceleration action, the development of heavy smoke, noxious gases and fumes is prevented and a material saving of gasoline is effected, which means greater mileage for the equipped vehicle during operation.

While I have shown the secondary valve arranged to cooperate with the main carburetor valve by mechanical means, it will be understood that the secondary valve may be arranged to cooperate with the main valve by suitable electrically operated means or by means actuated by gas or air pressure.

Thus it will be seen that I have provided a deceleration control device that is relatively simple in construction, inexpensive of manufacture, practically automatic in operation and which is very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved deceleration control device may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. The combination with a carburetor having a main valve for controlling the flow of gaseous fuel through said carburetor, of a secondary valve located in the outlet from the carburetor adjacent the main valve thereof operating connections between said valves whereby full opening movement imparted to the main valve imparts opening movement to said secondary valve, means for holding said secondary valve normally in partial open position and means for imparting full closing movement to said secondary valve when said holding means is released.

2. The combination with a carburetor having a main valve for controlling the flow of gaseous fuel through said carburetor, of a secondary valve located in the outlet from the carburetor adjacent the main valve thereof means connecting said valves whereby full opening movement imparted

to the main valve imparts full opening movement to said secondary valve, a pin and slot connection in said valve connecting means, means for holding said secondary valve normally in partially open position and means for imparting full closing movement to said secondary valve when said holding means is released.

3. The combination with a carburetor and the intake manifold of an internal combustion engine to which said carburetor is connected, of a main valve in the connection from the carburetor to the manifold, a secondary valve in the connection from the carburetor to the manifold operating connections between said valves vacuum actuated means connected to the intake manifold and an operating connection between said vacuum actuated means and said secondary valve.

4. The combination with a carburetor and the intake manifold of an internal combustion engine to which said carburetor is connected, of a main valve in the connection from the carburetor to the manifold, a secondary valve in the connection from the carburetor to the manifold operating connections between said valves and means actuated by the vacuum produced in the intake manifold when the flow of gaseous fuel thereto is decelerated for closing the secondary valve so as to completely cut off the flow of gaseous fuel from the carburetor to the manifold.

5. The combination with a carburetor and an intake manifold, of a tubular connection between said carburetor and intake manifold, a main valve located in said tubular connection for controlling the flow of gaseous fuel therethrough, a normally open secondary valve arranged for operation in said tubular connection, operating connections between said valves means actuated by the vacuum produced in the intake manifold when the flow of gaseous fuel thereto is decelerated for holding said secondary valve in its normal open position and means for closing said secondary valve when said holding means is released.

6. The combination with a carburetor and an intake manifold, of a tubular connection between said carburetor and intake manifold, a main valve located in said tubular connection for controlling the flow of gaseous fuel therethrough, a normally open secondary valve arranged for operation in said tubular connection connections between said valves, which connections include a spring and a pin and slot connection and means that is automatically actuated by vacuum produced in the intake manifold when the flow of gaseous fuel

from the carburetor to the manifold is decelerated for closing said secondary valve.

7. The combination with a carburetor and intake manifold, of a gaseous fuel duct leading from the carburetor to the manifold, a valve located in said duct, automatically operating means that is actuated by the vacuum produced in the intake manifold when the flow of gaseous fuel therethrough is decelerated for holding said valve in partial open position and means for causing said secondary valve to close and cut off the flow of gaseous fuel from the carburetor to said intake manifold when said vacuum actuated holding means is released.

8. The combination with a carburetor and intake manifold, of a gaseous fuel conduit leading from the carburetor to the intake manifold, a valve arranged for operation within said conduit, a spring connected to said valve and normally tending to close the same, means for normally holding said valve in partially open position and means actuated by the vacuum produced within the intake manifold when the flow of gaseous fuel thereto is decelerated, for releasing said valve holding means to permit said valve to close.

9. The combination with a carburetor and an intake manifold, of a gaseous fuel conduit connecting said carburetor and manifold, a pair of valves arranged for operation in said conduit for controlling the flow of gaseous fuel therethrough, an operating rod connected to one of said valves, operating connections between said valves whereby full opening movement imparted to one valve by the actuating rod connected thereto, imparts full opening movement to the other valve and means actuated by the vacuum produced in the intake manifold when the flow of gaseous fuel therethrough is decelerated for releasing one of said valves and permitting the same to close.

10. The combination with a carburetor and an intake manifold, of a gaseous fuel conduit connecting said carburetor and manifold, a pair of valves arranged for operation in said conduit for controlling the flow of gaseous fuel therethrough, an operating rod connected to one of said valves, operating connections between said valves whereby full opening movement imparted to one valve by the actuating rod connected thereto, imparts full opening movement to the other valve and means actuated by the vacuum produced in the intake manifold when the flow of gaseous fuel thereto is decelerated for permitting the other one of said valves to move into full closed position.

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