

Jan. 6, 1959

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2,867,422

CARBURETOR IDLING MECHANISM

Filed April 23, 1956

2 Sheets-Sheet 2

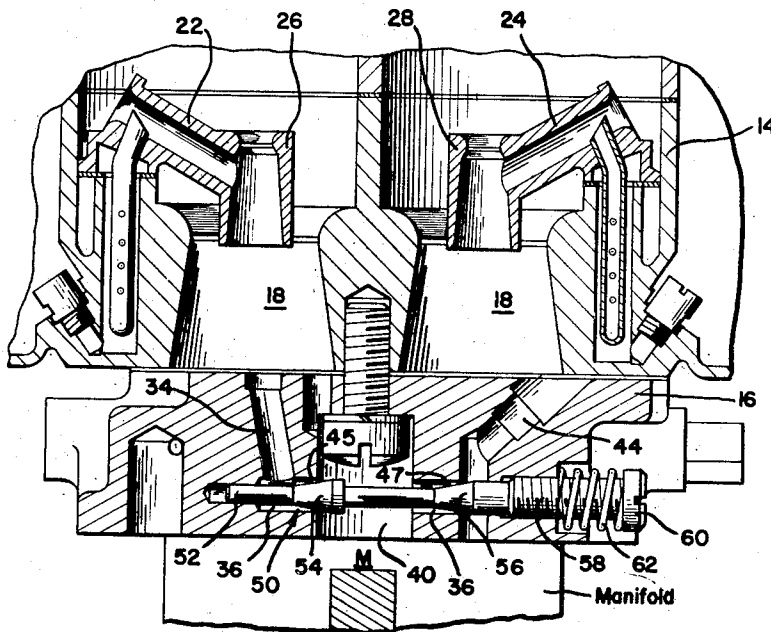
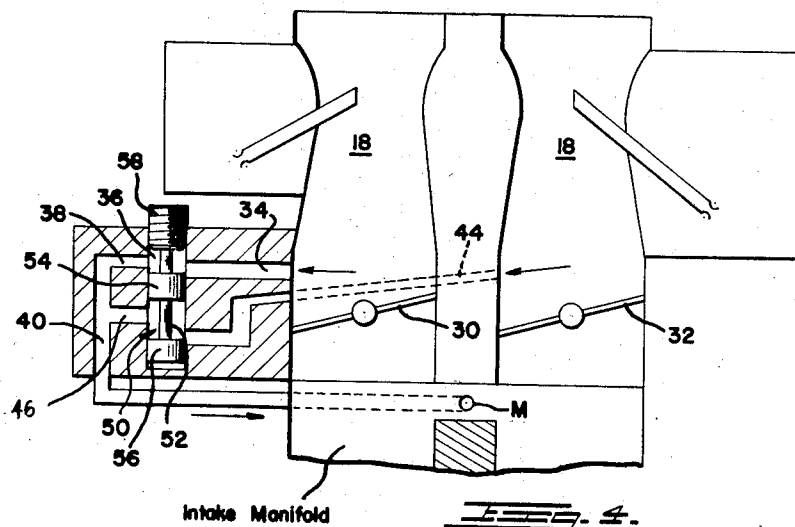


Fig. 3.



Intake Manifold

Fig. 4.

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2,867,422

CARBURETOR IDLING MECHANISM

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Application April 23, 1956, Serial No. 579,805

2 Claims. (Cl. 261—23)

The present invention relates generally to an improved type carburetor idling mechanism. More specifically, the invention relates to a carburetor utilizing a plurality of fuel mixture or induction passages each of which includes an idling by-pass. A limited amount of fuel will thus flow through the by-passes to provide each passage with an idling mixture for the intake manifold when the throttle valves otherwise completely close the induction passages.

It is normal practice in carburetors utilizing a plurality of fuel mixture or induction passages to provide an idling by-pass in or around only one of the induction passages. In carburetors of the type in which the throttle valve when fully closed completely closes the induction passages and where but one idling by-pass has been provided, it has been found that upon advancing from an idling condition toward a throttle open position an induction passage which does not have an idle by-pass lags behind in supplying a combustible mixture to the intake manifold relative to one supplied with an idling mixture. This unequal flow of combustible charge through the induction passages results in rough carburetor performance during the transition from idling to normal running conditions. When the remaining or non-idling induction passage begins supplying a combustible mixture to the intake manifold due to the flow of air therethrough, there is a noticeable surge in power output which causes the rough operation already eluded to.

It is, therefore, the purpose of the present invention to provide a carburetor idling mechanism in which idle by-passes are provided in a plurality of induction passages in an effort to render smooth the transition from idling to a normal running condition. Further in this regard, the present invention provides a common valve means for controlling the flow in all of the by-pass passages. In this way it is possible to insure that an equal quantity of idling mixture will flow through each of the induction passages.

While it is possible within the scope of the present invention to thus provide and control idling mixtures in any number of induction passages, the invention has been illustrated in relation to a pair of primary induction passages in a four-barrel type carburetor. It is apparent that the illustrated embodiment of the present invention may also be construed to be a dual type carburetor since for the purpose of this invention the pair of secondary induction passages is of no immediate pertinence.

The objects and advantages of the present invention will be apparent from a perusal of the more detailed description which follows.

In the drawings:

Figure 1 represents an elevational view of a four-barrel carburetor in which the subject invention has been embodied.

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Figure 2 is a plan view of the carburetor throttle body.

Figure 3 is a sectional view along line 3—3 of Figure 1 showing the disposition of one form of the present invention.

Figure 4 is a diagrammatic representation of the subject idling mechanism.

Referring to Figure 1, a four-barrel carburetor is shown generally at 10 and includes an upper casing 12, a float body and venturi casing 14 and a throttle body 16. The normal throttle and choke control linkages are provided on the carburetor 10 but inasmuch as they form no part of the present invention, no detailed description thereof will be provided. These components, as well as the remainder of the carburetor, except as specifically described herein, are essentially the same as those disclosed in Patent No. 2,771,282, issued November 20, 1956.

Referring briefly to Figure 2, it will be seen that the throttle body 16 includes the lower portions of the primary induction or mixture passages 18 and the secondary passages 20. As already noted, the subject idling mechanism has been illustrated only with relation to the primary induction passages 18.

In order to better visualize the relation of the present idling mechanism to the primary induction passages 18 it will be seen from the section line 3—3 in Figure 1 that the sectional view of Figure 3 is achieved by cutting through the primary induction passages 18, then transversely offsetting to cut through the throttle body intermediate the lower portions of the primary and secondary induction passages 18 in the throttle body 16 where, in the preferred form of the invention, the present idling mechanism has been disposed.

In Figure 3 fuel aspirator channels 22 and 24 project within the induction passages 18 and deliver fuel to the venturies 26 and 28 in the conventional manner. From this point the fuel and air mixture normally continues through the mixture passages past the primary throttle valves 30 and 32 and into the intake manifold M in quantities commensurate with the degree of throttle opening. As best seen in the diagrammatic representation of Figure 4, when the primary throttle valves 30 and 32 are closed, flow through the primary induction passages would be completely shut off if an idling fuel mixture was not provided. Accordingly, an idling by-pass is connected in parallel with each of the throttles and permits the flow therearound of an adjustably limited amount of idling fuel mixture when the valves are closed. To this end, a first idling passage 34 communicates with one of the primary induction passages 18 anterior of throttle 30. Passage 34 communicates with a first common passage 36, a branch passage 38 and a passage 40 which communicates, posterior of the throttle valves, with the intake manifold M.

Similarly, passage 44 communicates with the other primary induction passage 18 anterior of throttle 32, thence, communicating with common passage 36, branch passage 46 and passage 40, the latter which, as already noted, communicates with the intake manifold M. In this way, it will be seen that an idling fuel mixture will flow through each of the induction passages, via the by-passing system just described, when the throttle valves seats 45 and 47, infra.

The junctions of common passage 36 with passages 40 and 44 respectively defining axially spaced valve 30 and 32 are closed.

In order to adjust the quantity of idling mixture in the induction passages a valve 50 is provided and is disposed in the throttle body 16. Valve 50 is generally of the spool type and includes a spindle 52 having a

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pair of axially spaced lands 54 and 56 formed thereon which respectively coast with valve seats 45 and 47 to control flow through by-pass passages 34 and 44. Valve 50, in the preferred form shown, is disposed proximate the throttle valves and its axis is generally parallel to the axis of throttles 30 and 32. As seen in Figure 3 it is preferred that the valve lands 54 and 56 be tapered in order to more accurately regulate the flow of mixture through the by-passing passages. Thus, by providing a single valve through which both of the bypassing networks are controlled, it is possible to insure an exact and continuing quantitative flow relationship between the induction passages. Normally the lands will be so spaced on the spindle 52 to provide an equal flow of idling mixture through all of the induction passages. In the preferred form of the invention, as best shown in Figures 1 through 3, the by-pass passages and idling valve bore or passage 36 are formed in the throttle body. Further, as viewed in Figure 3 the valve bore 36 is counterbored and suitably threaded to receive an enlarged threaded portion 58 formed on the valve spindle 52. The end of the enlarged portion 58 of the valve spindle is formed with a slotted head 60 by means of which the by-pass valve may be rotated to adjust the amount of opening between the valve lands 54 and 56 and by-pass passages 34 and 44. A spring means 62 is disposed between the throttle casing and the slotted valve head 60 in order to retain the idle adjustment valve in a desired position.

Thus, the present idling by-pass control mechanism has provided a common valve means which contemporaneously and adjustably controls the quantity of idling mixture which may flow through a plurality of throttle by-pass networks in a manner which insures a smoother transition from an idling to a normal running condition.

I claim:

1. A carburetor disposed upon a manifold, said carburetor comprising a float bowl casing, a throttle body, a pair of induction passages extending through said casing and said body, a throttle in each of the induction passages, a pair of by-pass conduit means formed in the throttle body and each having ends respectively communicating with one induction passage anteriorly and

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posteriorly of the associated throttle to provide an idling mixture flow through each passage when the throttle otherwise closes the passage, said pair of bypass passage means including a common bore, a pair of axially spaced valve seats in said bore, a passage connecting the common bore intermediate said valve seats with the manifold, a valve member disposed in said bore and including a pair of axially spaced lands formed thereon, said lands respectively coasting with said seats to control the flow through each by-pass conduit means, and means on said valve member permitting unison adjustment of said valve lands with respect to the associated seats.

2. A carburetor disposed upon a manifold, said carburetor comprising a float bowl casing, a throttle body, a pair of induction passages extending through said casing and said body, a throttle in each of the induction passages, a pair of by-pass conduit means formed in the throttle body and each having ends respectively communicating with one induction passage anteriorly and posteriorly of the associated throttle to provide an idling mixture flow through each passage when the throttle otherwise closes the passage, said pair of by-pass passage means including a common bore, a pair of axially spaced valve seats in said bore, a passage connecting the common bore intermediate said valve seats with the manifold, a spindle valve member disposed in and having its axis concentric with said bore, said spindle axis being substantially parallel to the throttle axes, a pair of axially spaced lands formed on said spindle valve, each of said lands including a tapered end portion adapted to coast with one of said valve seats to control the flow through the associated conduit means, and means on said valve member permitting unison adjustment of the tapered portions of said valve lands with respect to the associated seat.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,867,422

January 6, 1959

Richard J. Brunner

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 64, for "seats 45 and 47, infra." read -- 30 and 32 are closed. --; line 67, for "30 and 32 are closed." read -- seats 45 and 47, infra. --.

Signed and sealed this 21st day of April 1959.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents