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CARBURETOR

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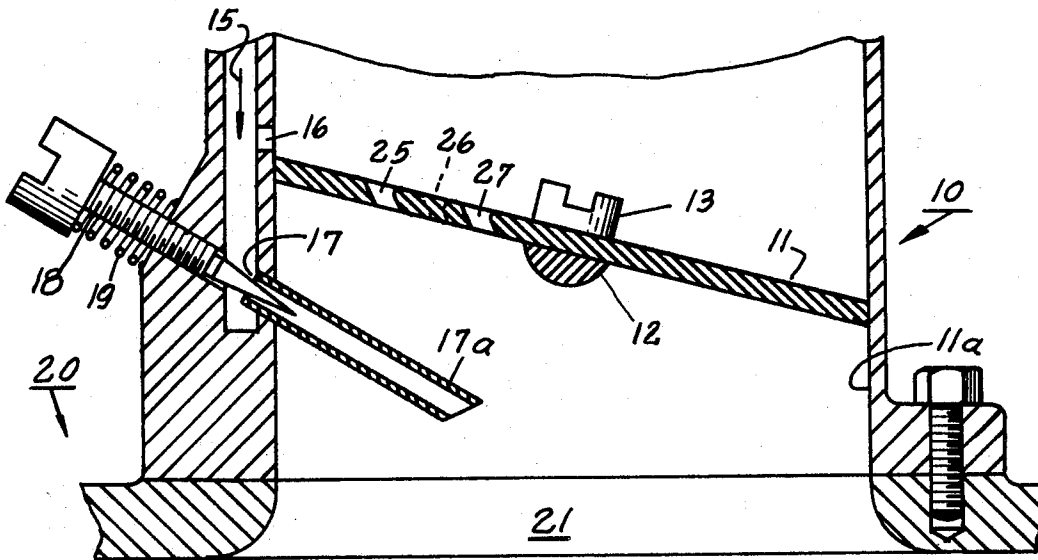


Fig. 1

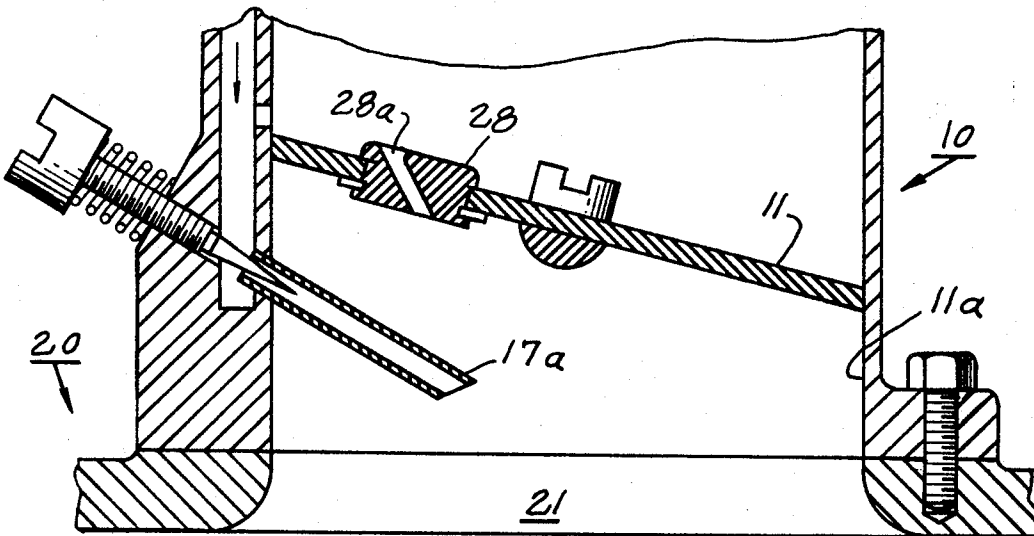


Fig. 2

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CARBURETOR

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6 Claims

ABSTRACT OF THE DISCLOSURE

A carburetor for reducing smog producing components in the exhaust of an internal combustion engine. The air for idling with a closed butterfly valve is provided by an opening through the valve having an axis directed toward the central zone of the throat of the carburetor. Rich idle fuel and air is delivered to the throat through a conduit having an exit end in said zone. In one form of the invention a plurality of openings are formed through the valve. In a second form of the invention an elongated conduit is supported in the valve.

This invention pertains to improvements in carburetors, particularly those designed for lower smog producing components, and more particularly, for a carburetor with lower smog producing components of the exhaust during the idle, low speed cruise, and possibly during deceleration at closed throttle.

In application, Ser. No. 550,862, now Patent No. 3,363,886, entitled, "Carburetor," there is disclosed a fixed venturi under the butterfly to mix the fuel and air to idle and low speed cruise better than spilling the main air to idle around the edge of the main butterfly.

One feature of this invention is to provide most of the air to idle through one or more holes in the throttle butterfly with a length to diameter ratio of at least one to 1.

Another feature is the aiming of such holes through the butterfly so that they point at or near the point of outlet of the rich idle fuel and air outlet on the engine side of the throttle butterfly.

Another object is the aiming of two or more holes for the idle air through the throttle butterfly so that air to idle with a closed butterfly will flow in a direction away from the walls of the main throat of the carburetor on the engine side of said butterfly and also so aim said air to idle so as to pass near the admission of rich idle fuel and air to the main air passage on the throttle side of said throttle butterfly.

Another feature of this invention is the use of a thicker plug in the high side of a down draft carburetor to provide a longer hole for the main air to idle to pass said butterfly and join the rich idle fuel and air that passes the normal idle needle valve.

Another feature is an extension tube or guide for the rich idle fuel and air that passes the idle fuel adjustment screw to deliver said rich idle fuel and air to an area in or near the path of the main air to idle which passes through said butterfly or a plug in said butterfly to achieve a better mixing of the air and fuel to idle than in a conventional carburetor.

Another feature is the aiming of the multiple holes through said butterfly for the main air to idle so that said holes direct the main air to idle so that it meets the rich fuel and air to idle that passes the idle adjustment screw.

Other features will be pointed out in the accompanying specification and claims.

We have illustrated our invention in the accompanying drawings, in which:

In FIG. 1 we have shown a side elevation view of

one form of the invention, partly in section and partly cut away.

In FIG. 2 we have shown a side view of another form of the invention, partly cut away and partly in section.

In both figures like numerals refer to corresponding parts.

In FIG. 1 we have illustrated a carburetor 10, a main butterfly 11, mounted on throttle shaft 12. A rich fuel and air passage 15 admits fuel to the transfer port 16 and to rich idle fuel and air port 17 past needle valve 18 which is retained by spring 19 in the usual manner. Extension 17a delivers the rich idle fuel and air to the end of extension tube 17a which is preferably in the line of the flow of the main air to idle which passes through multiple holes 25, 26, and 27 through butterfly 11. These holes 25, 26, and 27 are preferably longer than their diameter and chamfered at their upper edge for smoother flow of air therethrough. The chamfering may take the form of a smoother curve, like a small venturi at each hole. The direction of flow through each of said holes is preferably away from the walls 11a of the throat of said carburetor and past the end of the extension tube 17a that delivers the rich fuel and air to idle.

In FIG. 2 an insert 28 is secured to butterfly 11 in any suitable manner. A smooth curved entry for the main air to idle is provided at its upper edge and the angle of the hole 28a through plug 28 is such that idle air during idle passes past rich fuel and air delivery tube 17a and away from walls 11a of carburetor 10 on the engine side of said carburetor. Carburetor 10 is suitably secured to engine 20 and delivers fuel and air to intake manifold 21. The cruises and full speed or wide open operation of the carburetor 10 are more or less conventional except that at very light loads and slightly open throttle a better mixture of fuel and air is achieved than in many conventional carburetors.

These features are cheaper than a venturi attached to the butterfly with fuel delivered to said venturi as disclosed in said Walker's copending application Ser. No. 550,862, or the fixed venturi under a hole in the butterfly as disclosed in said Walker's same aforementioned copending application.

This construction has been found by experiment to have advantages in economy of manufacture, ease of converting carburetors on non-smog control engines and simplicity of operation over the construction shown in Walker's co-pending application Ser. No. 544,246, entitled, "Carburetor," filed Apr. 21, 1966.

This application involves a delicate distinction over said prior application, but embodies important though small differences which are important in reducing the smog producing emissions of the exhaust at idle, low speed cruises and probably during deceleration.

If trim for idle speed is needed, a partial cover for some or all of the holes through the butterfly may be used as shown in said prior Walker application, Ser. No. 544,246, or other suitable idle speed trim means may be employed.

This invention is also believed to be applicable to carburetor conversions for smog control on used vehicles at a modest cost by replacing the imperforate butterfly valves and insertion of the tubes 17a, etc.

Other features will be pointed out in the accompanying drawing and claims.

We have illustrated our inventions in these various forms; however, many other variations may be possible within the scope of this invention.

We claim as our invention:

1. A carburetor for an internal combustion engine having an air passage, a planar throttle valve pivotally mounted in said passage for pivoting from a position substantially closing the passage to flow of air to a posi-

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tion opening the passage for the flow of air therethrough, orifice means through said valve oriented along an axis at an acute angle to said valve and directed toward the central zone of said passage when the valve is in the closed position, and means for supplying a rich mixture of fuel and air to said zone.

2. A device as defined in claim 1 wherein the last mentioned means comprises a conduit connected to a source of a rich mixture of fuel and air and having an exit end in said zone.

3. A device as defined in claim 2 wherein said orifice means comprises a plurality of apertures.

4. A device as defined in claim 2 wherein said orifice means comprises an insert secured in an opening in the valve and a conduit extending through the insert.

5. A device as defined in claim 1 wherein said orifice means comprises a plurality of apertures.

6. A device as defined in claim 1 wherein said orifice

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means comprises an insert secured in an opening in the valve and a conduit extending through the insert.

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TIM R. MILES, *Primary Examiner.*

U.S. Cl. X.R.

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