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LIQUID FUEL COLLECTOR AND DISTRIBUTOR RING FOR CARBURETORS

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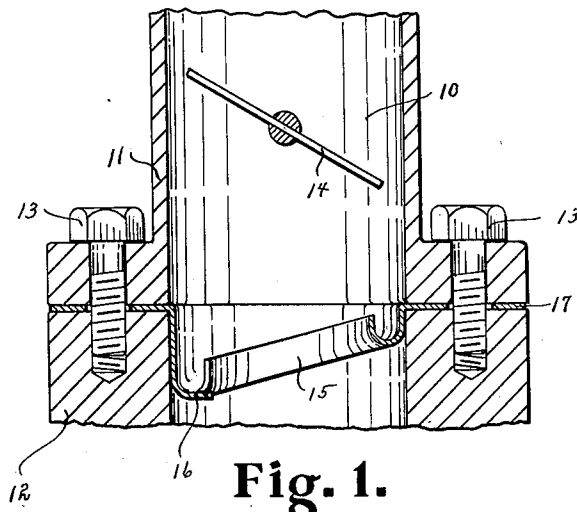


Fig. 1.

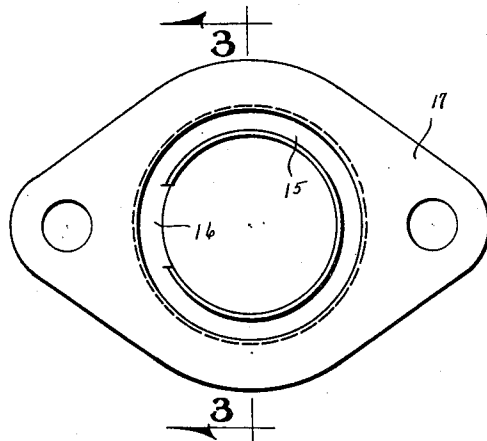


Fig. 2.

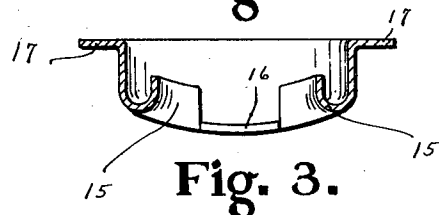


Fig. 3.

WITNESS

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1

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LIQUID FUEL COLLECTOR AND DISTRIBUTOR RING FOR CARBURETORS

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4 Claims. (Cl. 48-180)

This invention relates to fuel and air mixing means for internal combustion engines and more particularly to means for reducing the amount of liquid fuel entering the engine intake manifold.

Many types of draft carburetors have been developed. Substantially all such carburetors have a butterfly valve in the carburetor throat. However, the main problem is that of proper mixture, i. e., the complete atomization of the liquid fuel into an air stream so that the fuel mixture entering the internal combustion engine will be in a highly gaseous state. Where devices heretofore have fallen down is that although at one time in the procedure the fuel and air may have been properly mixed, the charge at a latter stage broke down to such an extent that a considerable amount of raw liquid fuel passed to the engine.

Therefore, one of the principal objects of my invention is to provide a carburetor means that collects raw unmixed liquid fuel in the carburetor throat, insures its later mixing with the air stream, and thus makes for fuel economy and engine power and smoothness.

A further object of this invention is to provide a carburetor auxiliary means for internal combustion engines that is easily installed and has no moving parts.

Still further objects of my invention are to provide an attachment for a standard carburetor that is economical in manufacture and durable in use.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical sectional view of the throat portion of an ordinary carburetor having my invention installed therein,

Fig. 2 is a top plan view of my device ready for installation and more fully illustrates its construction, and

Fig. 3 is a sectional view of my device taken on line 3-3 of Fig. 2.

The development of this invention resulted from the taking advantage of a fact not heretofore recognized by carburetor engineers. The basic laws of governing velocities of fluids vs. pressures of fluids have long been known. My first effort in evaluating the impact at various positions inside a carburetor throat related to the placement Pitot and Venturi tubes within the carburetor tube below the butterfly valve. The relative values of place locations are found in my application for United States Letters Patent, Serial No. 280,875, on an Automatic Ignition Advance, and filed April 7, 1952, now Patent No. 2,708,918. I found the presence of a high velocity air pattern in the area behind the leading edge of the butterfly valve or throttle plate during certain engine operations. Specifically, this high velocity air pattern

2

existed during part throttle operation. This pattern is related directly to engine speed at part throttle operation. Thus, a given fuel charge passing through the throat would experience different conditions at different locations relative to the butterfly valve and also at different engine speeds. It is for this reason that gasoline saving devices heretofore placed in carburetor tubes were not efficient at all speeds and conditions.

Most experts have assumed that the high velocity pattern was under the low side of the carburetor valve plate. My tests showed exactly the opposite. Next, I replaced the metal carburetor tube throat with a clear plastic one of visual observation. It was noted that fuel liquid was running down the inside wall of the plastic tube in the area of the low side of the butterfly valve, but in the area of the high side of the butterfly valve the tube was dry and complete fuel mixture was being maintained. The reason for this was the high velocity pattern under the high side of the butterfly valve. Therefore, the purpose of this invention is to collect this raw liquid fuel under the low side of the butterfly valve and conduit it to under the high side of the butterfly valve where it is attacked by the high velocity pattern and gasified.

To this end, in the drawings I use the numeral 10 to designate the fuel passageway created by the usual tubular members 11 and 12 of the carburetor. These two parts 11 and 12 are usually separate and detachably held together by cap screws 13. The numeral 14 designates the carburetor butterfly valve rotatably mounted within the passageway 10. In this passageway 10 I mount an angular open ended trough 15. This trough may be cast in the carburetor part or installed separately as shown in the drawings. It is closely adjacent the inside wall of the passageway 10 and has its two ends spaced apart and this space between its two ends is under the high side of the butterfly valve, as shown in Fig. 1. Also this trough, which is a liquid fuel collecting conduit ring is placed at an angle to the longitudinal plane of the passageway 10 with its high side under the low side of the butterfly valve. Therefore, unmixed liquid fuel running down on the inside of the wall of the passageway 10 in the area of the low side of the butterfly valve will pass into this trough 15, thence flow downwardly and to the left, out the ends of the trough, and out into the high velocity air stream, where it is immediately mixed and gasified into a properly mixed fuel charge. One reason for this is that the higher the velocity of a fluid, the less its pressure. A ledge 16 between the two ends of the circular trough may be used to further aid in directing the captured liquid into the high velocity area pattern.

The trough conduit may be installed in any suitable manner, such as by soldering, welding, bolting or like. However, in the drawings I have the walls of the trough extend upwardly and then bent outwardly to form a gasket flange 17. This flange 17 extends between the two parts 11 and 12 and makes for easy and quick installation.

The results of this method of carburation stems from my heretofore discovery that during all part throttle operation of an engine a localized high velocity pattern is developed below the high side of the throttle valve. This high velocity stream diminishes and disappears as the throttle is opened to full throttle position. By means of a Pitot tube, static tube and a mercury manometer, I have determined that the localized high velocity stream develops a velocity head of 1" Hg (approximately) per 10 M. P. H. cruising speed up to a maximum on the engine tested of 9" Hg. Positioning of the Pitot tube at other locations below the carburetor, below the low side of the throttle valve or at the center of the manifold throat failed to indicate appreciable or any velocity at these points.

Thus, my device operates when needed, thereby assuring proper fuel mixture at all times and under all conditions. This makes for economic and uniform engine operation.

Many carburetor means vary as to shape, design and arrangement of elements. In certain installations the member 12 is actually the intake manifold of the internal combustion engine. However, when I refer to the carburetor throat tube I have in mind any passageway leading from the carburetor proper to the inside of the combustion chamber of the engine.

It is submitted that the invention shown and described is aptly suited to achieve the purposes intended and is characterized by a combination of highly useful and mutually cooperating elements that combine their respective and proportionate functions in accomplishing the objects sought to be obtained.

I claim:

1. In combination with the throat tube of a carburetor having a butterfly valve, a split liquid collecting ring on the inside wall of said throat tube, below said butterfly valve and having its split located under the high side of said butterfly valve; said ring extending at an angle to the longitudinal plane of said throat tube with its high side under the low side of said butterfly valve and its low side under the high side of said butterfly valve.

2. In combination with the throat tube of a carburetor having a butterfly valve, a split liquid collecting ring having its two ends spaced apart and on the inside wall of said throat tube, below said butterfly valve and having its split located under the high side of said butterfly valve; said ring extending at an angle to the longitudinal plane of said throat tube with its high side under the low side of said butterfly valve and its low side under the high side of said butterfly valve, and a ledge extending between the bottom split ends of said collecting ring.

3. In combination with the throat tube of a carburetor having a butterfly valve, a split trough shaped liquid collecting ring on the inside wall of said throat tube, below said butterfly valve and having its split located under the high side of said butterfly valve; said ring extending at an angle to the longitudinal plane of said throat tube with its high side under the low side of said butterfly valve and its low side under the high side of said butterfly valve.

4. In combination with the throat tube of a carburetor having a butterfly valve, a split liquid collecting ring having its two ends spaced apart and on the inside wall of said throat tube, below said butterfly valve and having its split located under the high side of said butterfly valve; said ring extending at an angle to the longitudinal plane of said throat tube with its high side under the low side of said butterfly valve and its low side under the high side of said butterfly valve, and a substantially horizontal ledge extending between the bottom split ends of said collecting ring.

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