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H. W. HESS

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MIXING THROTTLE VALVE

Filed Feb. 9, 1927

Fig. 1

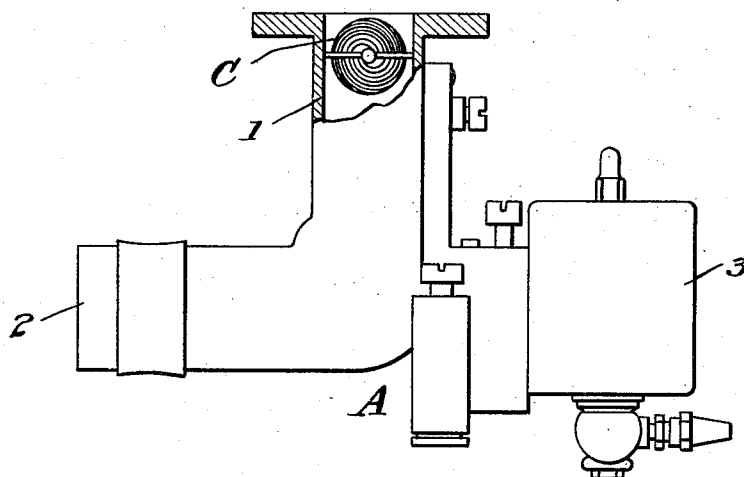


Fig. 2

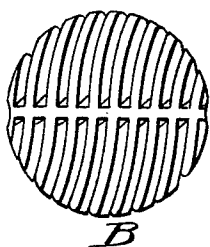


Fig. 3

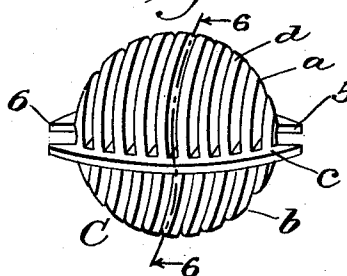


Fig. 4

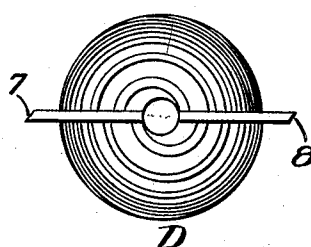


Fig. 5

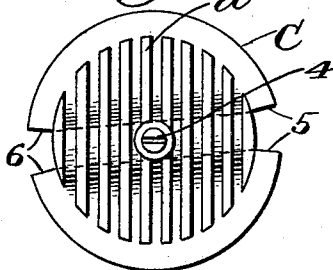
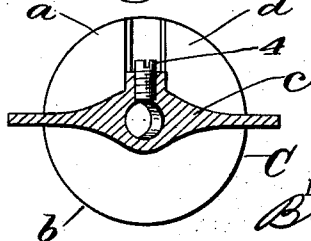


Fig. 6



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MIXING THROTTLE VALVE

Application filed February 9, 1927. Serial No. 166,958.

This invention relates to valves and particularly to a mixing throttle valve for use in carburetors.

At the present time in ordinary carburetors what is termed a riser is provided which is bolted to the intake manifold of an internal combustion engine. In this riser is a valve and actuation of this valve either accelerates or retards the engine. This valve is usually a disc and is sometimes termed a "butterfly". Opening and closing of the butterfly, however, does not maintain what may be termed a depression constant. It is understood that during reciprocation of the pistons within a motor a vacuum is created in the intake manifold, which tends to draw the volatile fluid in a gaseous form from the carburetor in accordance with the opening of the butterfly. This vacuum I term depression and the butterfly will not maintain at different openings what may be called a depression constant. It is essential that a depression constant be maintained because such a constant equalizes the distribution of the gaseous mixture, namely, a hydrocarbon plus air, to every cylinder of the engine. If the riser of the carburetor is left in a free or wide open state a depression constant cannot be maintained.

An object of my invention is to provide means whereby a depression constant may at all times be maintained.

It is generally known that in any gasoline both the lighter ends and the heavier ends of the oil are not completely disassociated. It is necessary that the gasoline be not too volatile, otherwise free ignition might occur prior to the volatilized fluid reaching the cylinders of the engine. However, the heavier ends of the fluid are always near the outer limits or boundary of the flowing stream with the lighter ends toward the center thereof. The result is that a certain amount of "raw" gasoline improperly mixed with air is delivered into the intake manifold and to the cylinders, which results in improper combustion and some times what is known as crank case dilution.

An object of my invention is to force both the heavy ends as well as the lighter ends of the fluid into certain paths with the result that when the fluid is delivered into the mani-

fold all parts thereof are finally divided with no raw gasoline present.

Other objects include the provision of a device which is simple of structure, easily installed, economical in operation, inexpensive in manufacture, and generally superior.

With the above and other objects in view the invention consists in the novel and useful provision, formation, construction, association, and relative arrangements of parts, members and features, all as shown in certain embodiments in the accompanying drawing, described generally, and more particularly pointed out in the claims.

In the drawing:

Figure 1 is an elevation of a carburetor, the riser being shown partly in section with one form of my invention;

Figure 2 is an elevation of one form of my carburetor control;

Figures 3 and 4 are further modifications of the carburetor control;

Figure 5 is a plan view of the showing of Figure 3; and

Figure 6 is a vertical sectional view on the line 6—6 of Figure 3.

Corresponding parts in all the figures are designated by the same reference characters.

Referring now with particularity to the drawing, at A I have shown a carburetor which may be of any form desired, the principles of construction of the carburetor not being of importance in the present invention. It is sufficient to state that some means is provided which will admix the gasoline with air to break the gasoline up into a vapor. 1 is the riser of the carburetor, 2 is the air intake of the carburetor, and 3 the fluid chamber member. Gasoline in the chamber member 3 is admixed with air drawn through the intake 2, the air drawing off the gasoline in what is termed the mixing chamber and such air and gasoline so admixed then passes upwardly through the riser 1 and thence to the intake manifold, not shown. It is usual to provide in the riser 1 a butterfly valve, and this butterfly valve regulates the quantity of vaporized fluid being delivered to the intake manifold in accordance with the opening or closing of the valve. However, as has been

pointed out, the ordinary form of butterfly valve does not maintain what may be termed a depression constant at all speeds of the motor, with the result that the distribution of the gaseous fluid is not properly delivered to the cylinders which results in motor inefficiency such as crank case dilution, improper vaporization and attendant ills. At this time it is well to state that this invention has nothing to do with the regulation of the percentage of air to gasoline or other volatile fluid, but solely relates to the control of the volume of the mixture delivered to the manifold. The invention is primarily adapted to force the heavy ends of the gasoline or other fluid along with the lighter ends in certain paths, with the result that the mixture is delivered into the manifold in a finely divided state and no raw gas results.

I have found that I best carry out my invention by providing some means, which, while not necessarily reducing the effective area within the riser, yet acts as an impedance or restriction to the passage of the vaporized fluid therethrough, the idea being to slow up the rate of speed of passage of the lighter fluids relative to the slower moving or more dense or heavier ends of the fluid so that both the heavy ends and the light ends are finely divided and admixed. I have illustrated three means for accomplishing the objects above outlined in Figures 2, 3 and 4, and which forms I have designated as entreties as B, C and D. The form C will first be described.

The device C is substantially spherical and has what may be termed hemispheres *a* and *b* separated by a central plane *c*. Both hemispheres *a* and *b* are made up of a series of spaced fins *d*, the fins of one hemisphere being at an angle to the fins of the other hemisphere, which is to say, if the fins of either hemisphere were to be projected into the other hemisphere such fins would cross or be at acute angles to one another. The central plane *c* is provided with an axial enlargement to form what may be termed a boss or hub portion, and as shown in Figure 6 this enlargement is centrally bored to receive an actuating pin and which device is locked to the pin by the screw shown in Figure 5 at 4. It is to be noted that the fins or vanes *d* are at angles to the axis of the hub or boss. The central plane *c* extends outwardly from the periphery of the sphere, which central plane *c* is interrupted at 5 and 6, thus providing two flanges, the peripheries of which are curved. The pin upon which the device is mounted extends between the interrupted portions 5 and 6. It will be noted that the angularity assumed by the fins or vanes of the upper and lower hemispheres is such as to give the vanes of both hemispheres, when taken together, the appearance of a single vane spirally wound about the hub or boss.

In Figure 2 I have illustrated the form B and the chief difference between this form and the form shown by C is that the central plane is not extended beyond the periphery of the sphere. There is this further difference, the hub or boss of the form B is more pronounced or defined with the central plane having its top and bottom surfaces substantially parallel until the boss is reached, while in the form C the top and bottom surfaces of the central plane are slightly convex, see Fig. 6.

In the form shown in Figure 4 the central plane member is substantially an ellipse and beveled as shown at 7 and 8. This latter type of device is useful in certain forms of risers which are not entirely cylindrical in shape.

The vanes or fins of the several devices just described may be given a cant, which is to say, in place of the vanes or fins being substantially vertically mounted with respect to the central plane, such fins may be inclined from the vertical.

The operation, while it has possibly been sufficiently described, will be made clear from the following statement: When the device, say, of the form C, is mounted within the riser 1, as shown in Fig. 1, then opened or tilted from the position shown in Fig. 1, the lighter ends of the gaseous vapor as well as the heavier ends of the gaseous vapor are forced in certain paths for the reason that gaseous vapor is forced between the different vanes of the upper and lower hemispheres. It is evident that because of the angularity that exists in the vanes relative to the normal path of flow of the gaseous vapor, such gaseous vapor would impinge upon the vanes, and one hemisphere would force this vapor in a given direction, while the other hemisphere would force the gaseous vapor in another direction. Different paths assumed by the gaseous vapor causes the lighter and heavier ends of such gaseous vapor to properly mix, for the reason that the several devices effect a whirling of the gaseous vapor after it has passed the valve. This type of device overcomes one of the notable objections in the present type of carburetor control, in that the heavier ends of the gaseous vapor tend to creep along the rising wall of the intake manifold, and this is overcome in the present device in the manner outlined.

It is obvious that various changes and modifications may be made in practicing the invention, in departure from the particular showing of the drawing, without departing from the true spirit of the invention.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. A gaseous fuel mixing throttle valve including a spherical member provided with a central plane member, and spirally arranged vanes extending from said central plane member.

2. A gaseous fuel mixing throttle valve including a spherical member provided with a central plane member, and spirally arranged vanes extending from said central plane member, said vanes having a cant.

In testimony whereof, I have signed my name to this specification.

HARRY W. HESS.

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