Oct. 31, 1933. M. E. CHANDLER 1,933,364

CARBURETOR

Filed July 22, 1930

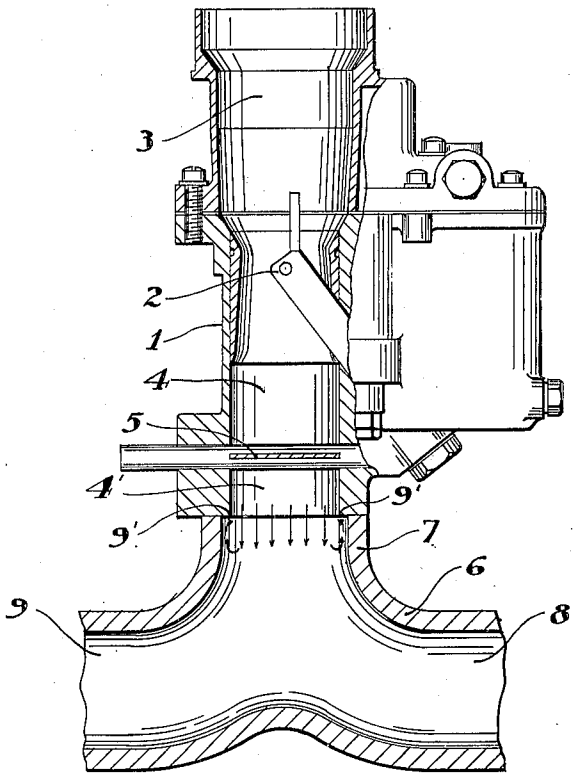


Fig. 1

Fig. 2

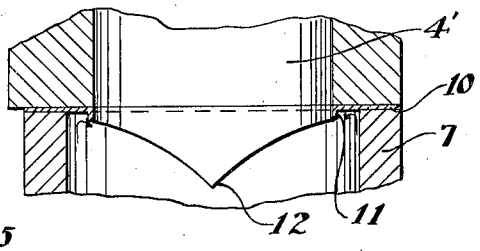
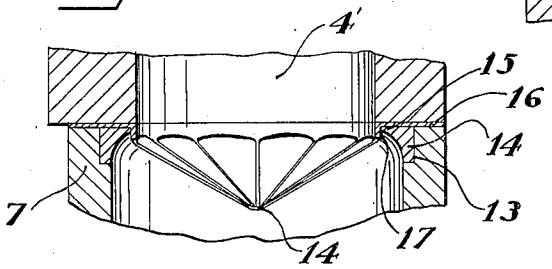


Fig. 3



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Patented Oct. 31, 1933 1,933,364

UNITED STATES PATENT OFFICE

1,933,364

CARBURETOR

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Application July 22, 1930. Serial No. 469,719

4 Claims. (Cl. 48—180)

This invention pertains to carburetors and more particularly has reference to carburetors of the down-draft type and to means for improving the distribution of liquid fuel in the air stream.

In the usual form of up-draft carburetor, any liquid fuel spray which falls out of the air stream in the vertical riser passage tends to drain back into the mixing chamber of the carburetor, whence it is caught up again into the air stream, there being thus an automatic recirculating action. With inverted or down-draft carburetors, however, this action does not take place, and any liquid fuel which gets to one side of the air stream tends to creep along that side to the point of subdivision of the intake manifold, whence it creeps along one passage only instead of dividing equally. There thus results unequal distribution of fuel to the different cylinders and irregular firing of the engine.

An object of this invention is to obviate the above difficulty by providing a means whereby stray fuel is automatically brought back to the center of the air stream with attendant improvement in distribution.

With this and other objects in view which may be incident to my improvements, my invention consists in the combination and arrangements of elements hereinafter described and illustrated in the accompanying drawing, in which:

Figure 1 is a central longitudinal section of an inverted carburetor and part of the intake manifold embodying my improvements;

Figure 2 is a fragmentary sectional view showing a modification of the construction in Figure 2; and

Figure 3 is a similar view showing still another modification.

In Figure 1, the reference numeral 1 denotes a down-draft carburetor having an upwardly inclined main jet nozzle 2, an air intake 3, a mixing chamber 4, and a mixture outlet 4' controlled by a butterfly throttle valve 5. The carburetor 1 is mounted upon an inverted intake manifold 6 having a vertical riser 7 connecting with the carburetor and a plurality of branches 8 and 9 leading to the several cylinders of an internal combustion engine (not shown).

With the main jet nozzle inclined as in Figure 1 and at low speed, there is a tendency for the liquid fuel to trickle and creep down along the nozzle to the adjacent (right hand) wall of the air passage. Also there is an eddy current behind the nozzle in the direction of flow into which the liquid fuel tends to be drawn, thus diverting it from the main stream. In order to prevent this liquid fuel from creeping along the wall of the intake manifold, I have provided a sharp corner 9' in the air passage where the carburetor joins the manifold. This sharp break or corner 9' is most readily provided by making the riser connection of the manifold of somewhat greater diameter (say ⅛" to ¼") than the mixture outlet of the carburetor, as clearly shown in Figure 1.

With a sharp corner 9', as shown in Figure 1, there is set up adjacent the walls at this point a reverse air flow or eddy current (as indicated by small arrows in Figure 1) which keeps the liquid fuel adhering to the wall on one side of the mixture outlet from creeping along the wall into the intake manifold in the same relative position; instead, it tends to spread around the sharp corner in a film from which small drops are torn off by the eddy currents and fall back into the air stream. By this simple and novel means I have secured the same recirculation of stray liquid fuel that automatically takes place in the up-draft type of carburetor and have found that the fuel distribution to the different cylinders of the engine is greatly improved.

Greater improvement may be obtained by the construction shown in Figure 2, in which a gasket 10 having an inturned and downwardly pointed lip 11, is interposed between the mixture outlet 4' and riser 7. The inner edge of lip 11 is cut into a plurality of scallops forming a plurality of points 12 from which the liquid fuel drips back into the passing air stream. I have found that a gasket, such as described, not only accentuates the eddy currents mentioned above, but also, because of its scalloped edge, causes the adhering liquid fuel to drain to one or more points on its periphery which are located centrally with reference to the points of subdivision of the manifold, and thus materially improves distribution.

Still greater improvement may be obtained by the construction shown in Figure 3, in which an annular rabbet 13 is cut in the end of the inner wall of the riser 7, providing a seat for an annular gasket support ring 14 having a sharp inturned, overhanging lip 15, which embraces and forms a support for a special gasket 16 interposed between riser 7 and the mixture outlet 4'. Gasket 16 has a downwardly pointed and scalloped lip 17 similar to gasket 10 and is provided with a plurality of radial wires which converge conically and are joined together at a central point 14 in the center line of the riser 7, as clearly shown in Figure 2. This, I have found is a somewhat more effective form than that shown in Figure 2, since the wires drain the adhering liquid fuel down

to a point in the actual center of the air stream.

While I am aware that it is old to use enlargements and gaskets at the mouth of a carburetor where it joins the intake manifold, in carburetors of the up-draft type, these constructions have been for other purposes and have nothing in common with the problem in down-draft carburetors, mentioned herein, which has been pressing for solution and which is solved by the simple and novel improvements disclosed.

While I have shown and described the preferred embodiments of my invention, I do not intend to be limited to the constructional forms shown, as changes in combination and arrangement of elements may be made by those skilled in the art without departing from the spirit of my invention or exceeding the scope of the appended claims.

I claim:

1. In a downdraft carburation system, a mixture outlet, and a riser of larger diameter connected to the lower end of said outlet, providing a sharp break in the continuity of the walls of said outlet and riser, whereby liquid fuel which adheres to the walls of said outlet is prevented from creeping along the walls of said riser.

2. In a downdraft carburation system, a mixture outlet, a riser of larger diameter connected to said outlet providing an annular shoulder, a gasket seated upon said shoulder and having a downwardly projecting annular lip whereby liquid fuel adhering to the walls of said outlet is prevented from creeping along the walls of said riser.

3. In a downdraft carburation system, a mixture outlet, a riser of larger diameter connected to said outlet providing an annular shoulder, a gasket seated upon said shoulder and having a downwardly projecting annular lip and a plurality of wires forming a cone with its apex down and its base secured to said lip whereby liquid fuel adhering to the walls of said outlet is prevented from creeping along the walls of said riser and is returned to the air stream passing through said riser.

4. In a downdraft carburation system, a mixture outlet, a manifold riser of larger diameter connected to the mixture outlet, and means positioned at the junction of the outlet and riser and forming a continuation of the outlet for providing a sharp annular shoulder to cause the fuel adhering to the walls of said outlet to be returned into the air stream passing through the riser.

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