May 31, 1955 A. H. SYKES 2,709,579

CARBURETOR

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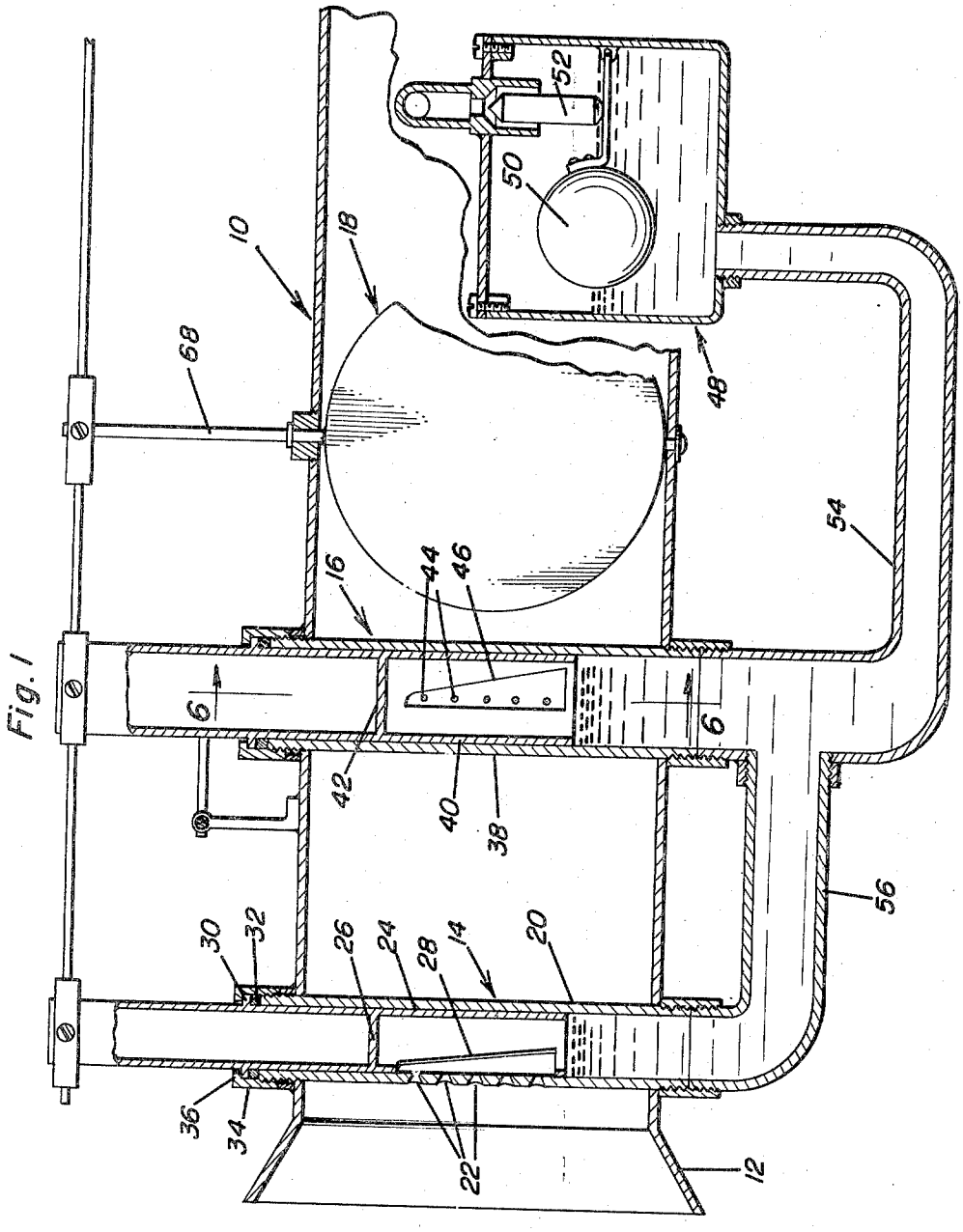


Fig. 1

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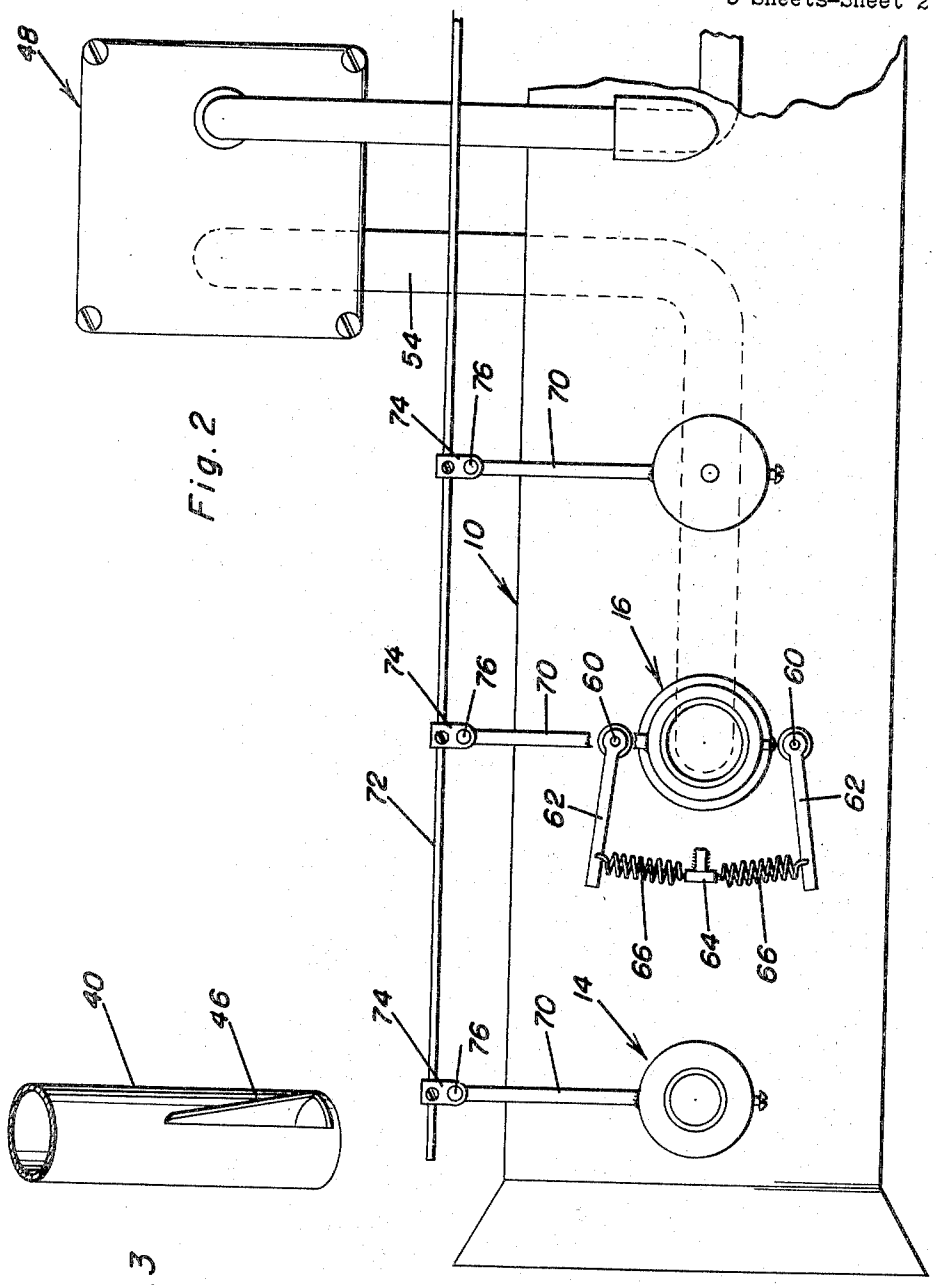


Fig. 2

Fig. 3

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3 Sheets-Sheet 3

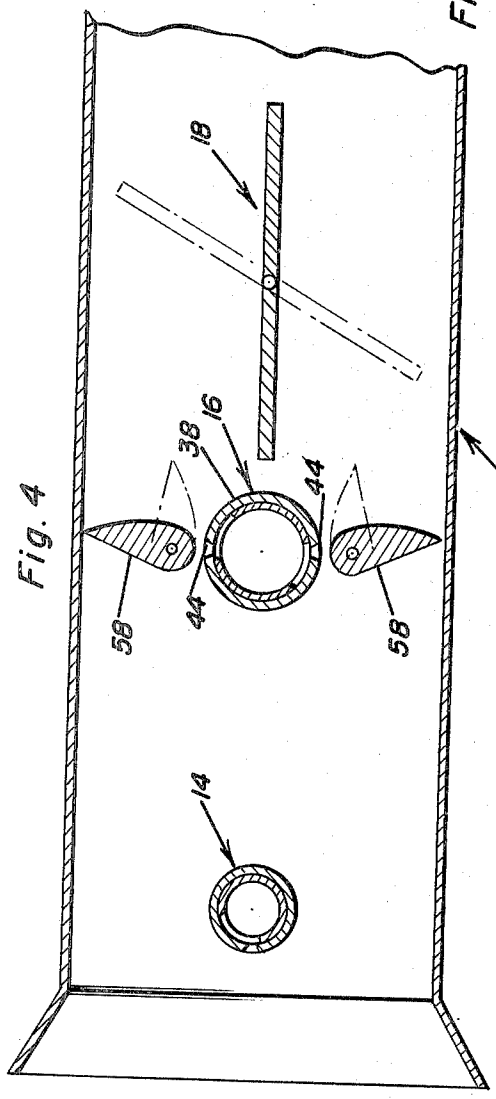


Fig. 4

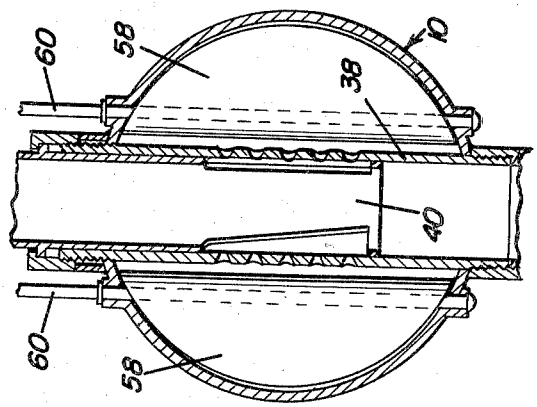


Fig. 6

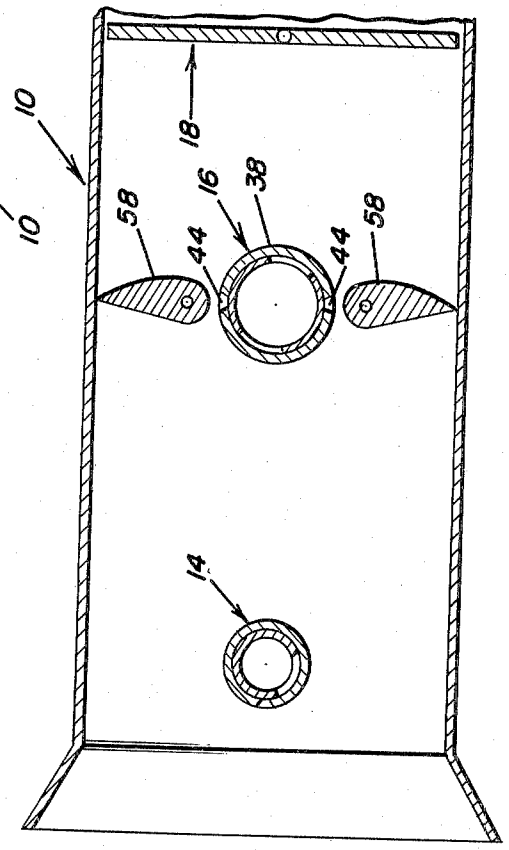


Fig. 5

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CARBURETOR

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Application August 3, 1953, Serial No. 372,053

6 Claims. (Cl. 261—41)

This invention relates to improvement in carburetors and pertains more particularly to a simplified and more readily accessible form of carburetor than is commonly in use in present day automobiles.

A primary object of this invention is to provide an improved carburetor device which incorporates a combined choke and Venturi mechanism in conjunction with a novel and improved form of main jet assembly whose discharge characteristics are effected by pressure, and consequently velocity characteristics at the air intake portion of the carburetor, these same resulting in a common system of carburetion which simultaneously operates to act as the idling, intermediate speed, high speed and power systems.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a longitudinal section taken through the improved carburetor and associated mechanism;

Figure 2 is a top plan view of the carburetor assembly shown in Figure 1;

Figure 3 is a perspective view of one of the valve assemblies;

Figure 4 is a longitudinal horizontal section taken through the carburetor assembly and showing various component parts in different positions of use;

Figure 5 is a view similar to Figure 4 but showing the position of the carburetor part during idling of an associated engine; and

Figure 6 is a vertical section taken substantially along the plane of section line 6—6 of Figure 1 showing details of the main jet and Venturi assembly.

Referring now more particularly to Figure 1, reference numeral 10 indicates generally a horizontal tubular member which constitutes the barrel of the carburetor and which may be provided with a belled end 12 constituting the air intake as indicated by the arrow and which incorporates a plurality of jet assemblies indicated generally by the reference characters 14 and 16 and a throttle valve assembly indicated generally by the reference character 18.

Considering first the jet assembly indicated generally by the reference character 14, it will be seen that this assembly includes a tube 20 which extends vertically, diametrically within the barrel 10 and which is provided on its upstream side with a plurality of apertures 22 for admitting air into the interior of the tube 20. A sleeve member 24 is rotatably received within the tube 20 and is provided at a point above the openings 22 with a baffle or partition plate 26 and whose side is provided with a triangular shaped opening 28 adapted, upon rotation of the sleeve 24, to progressively open the various apertures or openings 22. The upper end of the sleeve is provided with a radial shoulder 30 and a gasket 32 disposed between this flange and the upper end of the tube 20, taken in conjunction with the cap member 34 having the inwardly directed shoulder 36 not only seals the sleeve and tube against leakage but also prevents longitudinal movement of the sleeve with respect to the tube 20.

Likewise the main jet assembly 16 incorporates an outer sleeve or tube 38 and an inner sleeve 40 having the partition wall 42 and provided at its upper end with the sealed connection similar to the connection 30—36 previously described. However, the outer sleeve or tube 38 of the main jet assembly is provided with a series of apertures 44 in vertical alignment at opposite sides thereof transversely of the barrel 10 and the sleeve 40 is provided with two triangular openings 46 for effecting progressive opening of the apertures 44.

The float chamber 48 and associated float 50 and valve 52 connect to both the tube 20 and tube 38 through suitable conduit means 54 and 56 for maintaining a predetermined level of fuel within the tubes, these tubes being in direct communication as shown. As shown more clearly in Figures 4, 5 and 6, a pair of vane members 58 of semi-circular configuration are pivotally secured through the medium of the vertical pin members 60 in parallel relation with the main jet assembly 16 with their inner edges being disposed in closely spaced relation to the opposite sides of the sleeve or tube 38.

The inner edges of the vane members 58 are so formed that when these members are pivoted between the closed and open position shown in full and dotted lines respectively in Figure 4, a progressively smaller restriction will be presented between these vane members and the associated main jet tube 38, the purpose of this construction being presently apparent. As will be seen most clearly in Figure 2, the upper end of the pins 60 are provided with laterally extending arms 62 and a bracket 64 on the upper surface of the barrel 10 forms a common anchor point for the spring member 66 which extends therefrom to connect to the free ends of the arms 62 to normally urge the vane or Venturi members 58 to the closed position.

Each of the sleeves 24 and 30 as well as the throttle shaft 68 are provided with the laterally extending arms 70 adjustably connected at their free ends to a common actuating shaft 72, each connector 74 being pivotally secured as at 76 to the free end of the arm so that the two inner sleeves 24 and 40 as well as the throttle shaft 68 will be rotated simultaneously through equal degrees of rotation.

In operation, during the starting of the engine, for example, due to the extremely low velocity of the incoming air, the Venturi or vane members 58 will be substantially closer as shown in Figure 5, even should the throttle vale 18 be fully open. This produces a maximum choking effect on the carburetor and a relatively heavy suction will be introduced at the opposite sides of the main jet assembly in the region of its apertures 44, thereby effecting a rich air fuel mixture for starting the engine. Once the engine has started and is idling, the vane members 58 will still be substantially closed due to the low velocity of incoming air so that a relatively rich mixture will be fed to the engine as is necessary during idling operation. During intermediate or high speed operation of the engine, the vane members 58 will open a greater and greater amount due to the increased velocity of incoming air and throughout a substantially broad range of engine operation, the air fuel mixture will remain substantially constant until the vane members are fully open whereupon further speeding of the engine will effect a progressively richer mixture in the carburetor due to the increased velocity through the Venturi opening between the vane member and the main jet assembly 16, particularly due to the fact that the smallest restriction between

the vane members and the main jet assembly is effected with the former or in the fuller open position. Of course, at various throttle valve settings, more and more area of both the forward tubular assembly **14** and the main jet assembly **16** will be opened due to rotation of the inner sleeve members thereof, thus effecting a greater flow or discharge of fuel from the main jet **16** as the engine speed increases. In this respect, it will be noted that the upstream jet assembly **14**, being at the highest pressure will bleed air in in a greater or lesser amount depending upon the setting of its inner sleeve member through the conduit **76** and into the main jet assembly **16** and outwardly thereof through its apertures **44**, picking up fuel on the way and disbursing it within the interior of the tube **38**.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A carburetor comprising a horizontal barrel including an air intake end, a vertical tube disposed within said barrel adjacent the air intake end thereof, said tube having a plurality of openings in its upstream side, means for progressively uncovering said openings, a tubular main jet communicating with said tube and disposed vertically within said barrel inwardly of its air intake end, said main jet having openings at opposite sides transversely of said barrel, means for progressively uncovering the last mentioned openings, the first and second mentioned means being interconnected for common actuation, and a reservoir for maintaining liquid fuel at a predetermined height within said tube and said main jet.

2. The carburetor as defined in claim 1 wherein vane members are provided at the said opposite sides of said main jet, said vanes being of generally semi-circular configuration and being pivoted in spaced parallel relation to said main jet, resilient means urging said vane into closed position, said vanes being adapted to be moved into open position by the air stream flowing through said barrel.

3. The combination of claim 2 wherein a throttle valve is provided on the downstream side of said main jet.

4. The combination of claim 2 wherein said vane members are so formed as to provide a progressively smaller restriction between the main jet and the vanes as the latter are moved from a closed to an open position.

5. The combination of claim 1 wherein the means for progressively uncovering the openings in said tube and said main jet comprise a sleeve rotatably disposed within each said tube and said main jet, said sleeves being provided with triangular openings, and a lever arm connected to the free end of each sleeve for rotating the same.

6. The combination of claim 1 wherein a throttle valve is provided on the downstream side of said main jet, said throttle valve being interconnected with said first and second mentioned means for common actuation therewith.

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