Feb. 17, 1953 V. C. WORDEN 2,628,826

ANTISURGE CARBURETOR

Filed July 8, 1948 2 SHEETS—SHEET 1

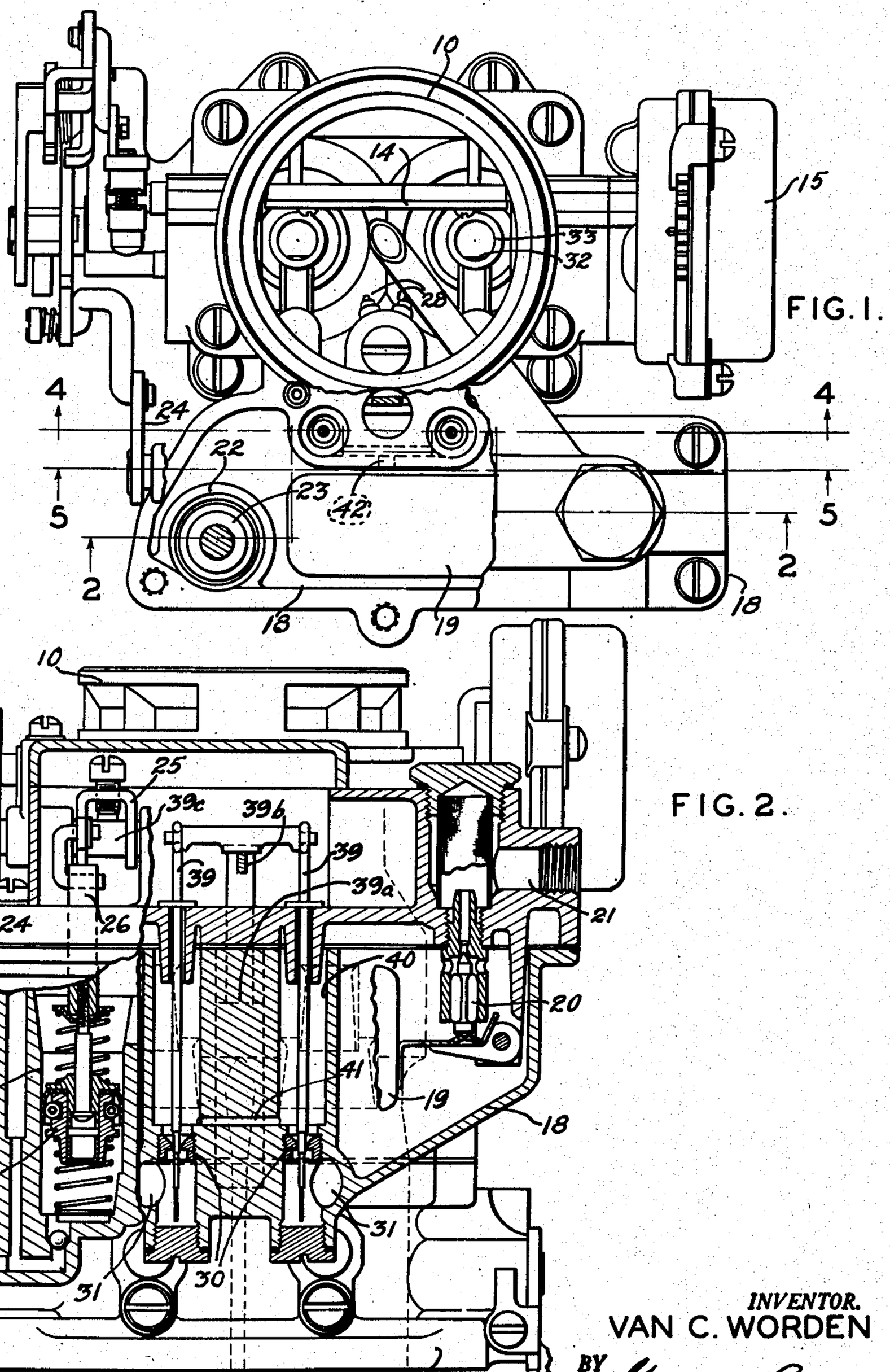

FIG. 1.

FIG. 2.

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2 SHEETS—SHEET 2

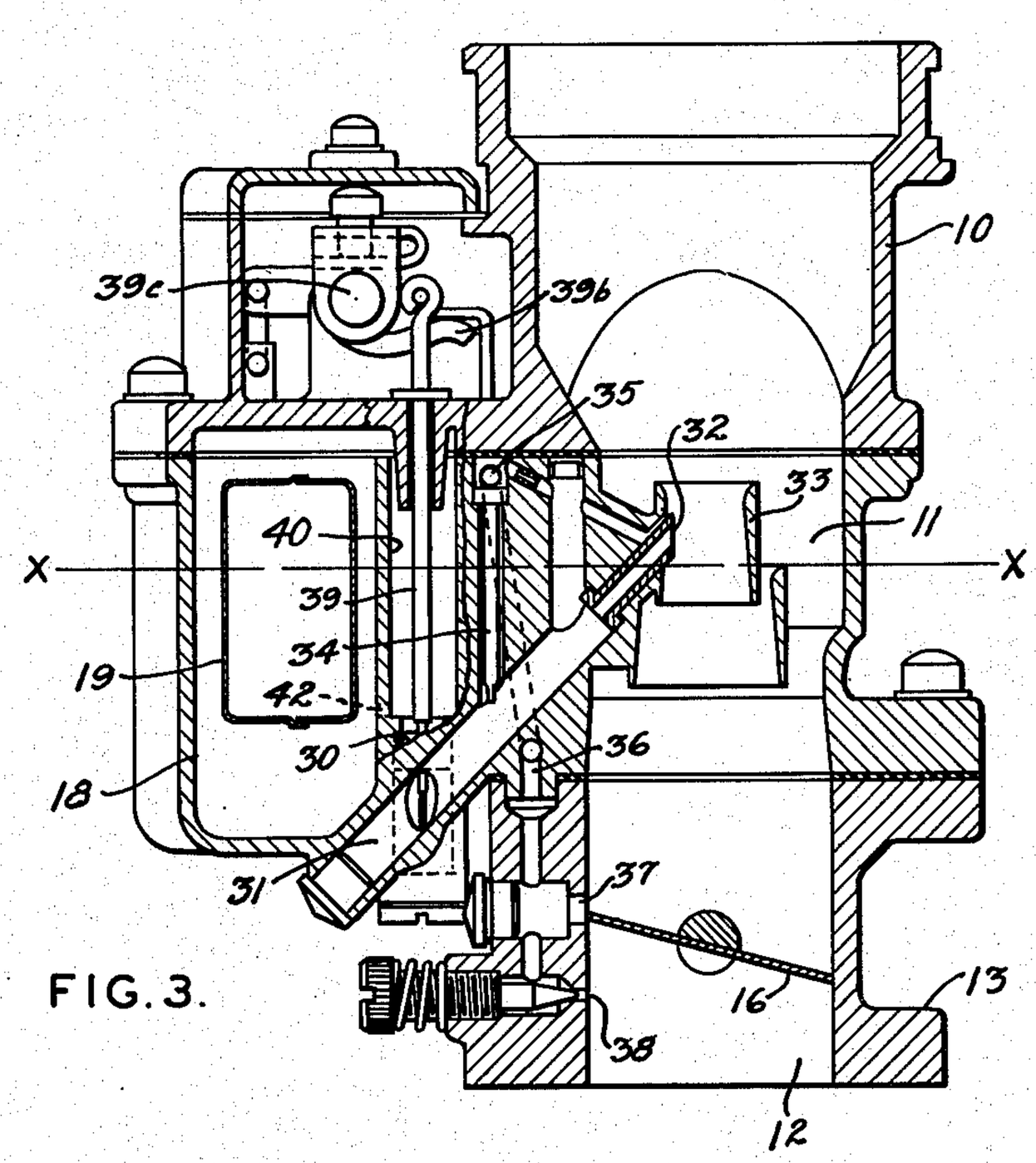

FIG. 3.

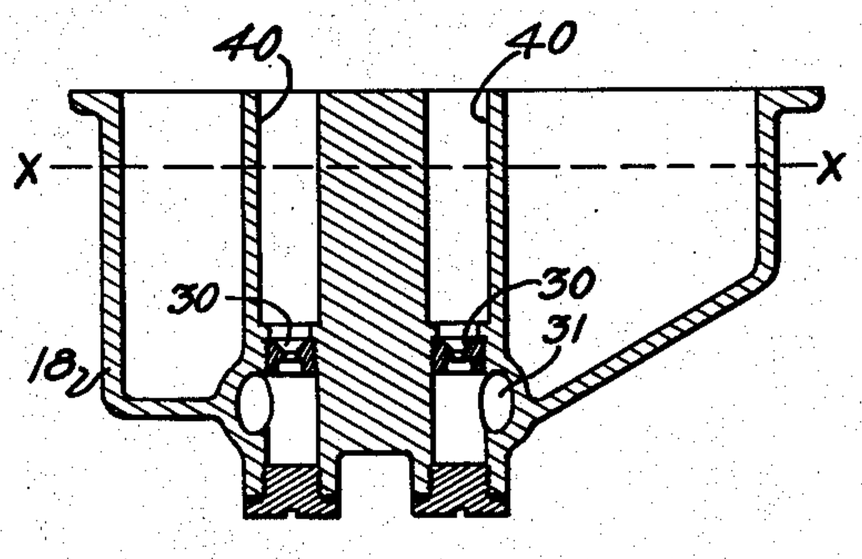

FIG. 4.

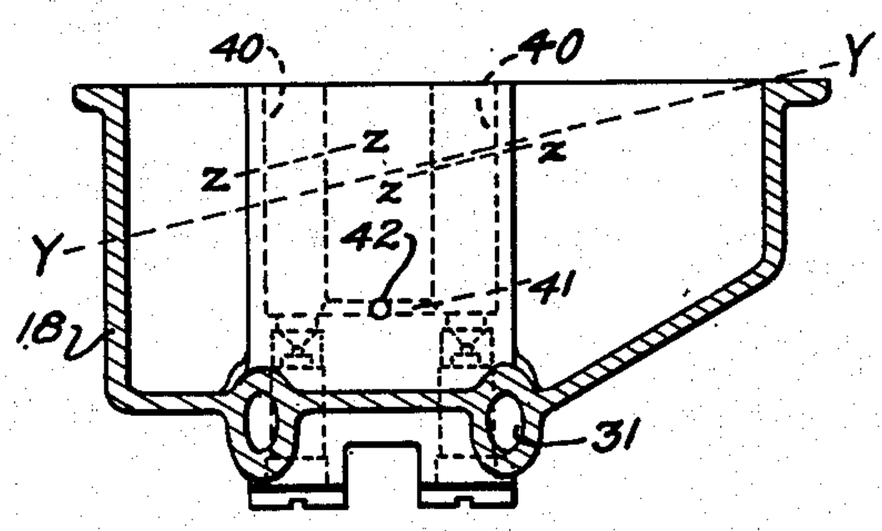

FIG. 5.

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UNITED STATES PATENT OFFICE

2,628,826

ANTISURGE CARBURETOR

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Application July 8, 1948, Serial No. 37,679

2 Claims. (Cl. 261—40)

1

This invention relates to fuel supply devices, particularly for automotive engines, which have fuel reservoirs from which fuel is fed to a consuming point.

An example of such a device occurs in a carburetor of the usual automotive type having a constant level chamber receiving fuel from the fuel pump and delivering it through one or more metering orifices and nozzles to the mixture conduit which connects with the engine intake manifold. In cases where the vehicle accelerates or decelerates or changes direction, a surge is produced in the fuel which may reduce the depth of fuel over the metering orifice and, consequently, cause the delivery of less liquid fuel than required. This condition can be aided, somewhat, by judicious positioning of the metering orifice and by the use of baffling.

The main object of the present invention is to provide a fuel supply device including a fuel storing chamber or reservoir with improved means for substantially reducing or eliminating the harmful effects of surging in the fuel.

Another object is to provide a fuel supply device or reservoir having a plurality of delivery ports together with individual means associated with each port for greatly reducing or eliminating variation in the fuel delivery resulting from surging of the stored fuel.

These objects and other detailed objects hereafter appearing are attained by the structure illustrated in the accompanying drawing in which:

Fig. 1 is a top view of an automotive carburetor with a portion of the bowl cover removed so as to illustrate the underlying construction.

Fig. 2 is a side view and vertical section taken substantially on the broken line 2—2 of Fig. 1.

Fig. 3 is a vertical central section taken approximately at 90° to Fig. 2.

Fig. 4 is a reduced vertical section taken substantially on line 4—4 of Fig. 1 and showing the float bowl only with the bowl cover removed.

Fig. 5 is a similar view, but taken on line 5—5 of Fig. 1 and showing the fuel surface in a surge condition.

The automotive carburetor shown is of the automatic choke, downdraft, dual type having a pair of mixture conduits with an air inlet horn 10 at the upper end, mixing chambers 11, and outlet portions 12 flanged as at 13 for attachment to the usual engine intake manifold (not shown). The admission of air to the top of the mixture conduit is controlled by a choke valve 14 with automatic control mechanism 15 of conventional type, and the discharge of mixture is controlled by butterfly throttle valves 16.

2

Adjacent the mixture conduits is a constant level chamber 18 which houses a float 19 for actuating a needle valve 20 in fuel inlet 21. The bowl also encloses a cylinder 22 within which works an accelerating pump piston 23 operated from the throttle valve by suitable linkage parts, as at 24, 25, and 26. The accelerating fuel is delivered through diverging pump jets 28 (Fig. 1).

Located in the lower portion of the constant level chamber are a pair of metering orifice elements 30, each connecting with a main fuel passage 31 and fuel nozzle 32 discharging into primary venturi 33 in the corresponding mixing chamber. Metering pins 39 are operated by suction piston 39*a* and from the throttle by lip 39*b* on throttle actuated shaft 39*c*. Idling fuel is supplied by means of metering tubes 34, each opening into one of the main fuel passages 31 and connecting with idling passages 35 and 36 discharging through ports 37 and 38 adjacent and posterior to throttle valve 16 when closed.

Projecting vertically above each metering orifice element 30 is a cylindrical wall 40 which completely surrounds and is located in close proximity to the periphery of the corresponding orifice element. These cylindrical walls extend substantially above the fuel level X—X so as to provide restricted, individual fuel chambers or wells in close juxtaposition to each orifice element. These chambers are connected at their lower extremities and just above the metering orifice elements by a cross-passage 41 which communicates with the main body of the constant level reservoir through a port 42. This port is of only slightly greater capacity than the maximum fuel delivery requirements of both metering orifice elements. Thus, the individual chambers formed by baffling walls 40 are isolated from the main body of fuel in the reservoir except for the relatively small port 42.

The result is most clearly shown in Figs. 4 and 5. Fig. 4 illustrates the fuel level standing at the broken line X—X in the outer main reservoir, as well as in the restricted individual chambers. Fig. 5 illustrates the disturbance created in the fuel level because of inertia of the fuel upon a change in speed or direction of the vehicle. It will be noted that, whereas the line Y—Y in the main chamber dips substantially at the left hand side and raises substantially at the right hand side, the level Z—Z in the individual chambers is subjected to much less variation. Of course, this moderating effect within the individual

chambers is only temporary since if the inertia or centrifugal forces continue, the levels will become correlated because of the transfer through port 42. However, at least temporarily, the feed through orifice elements 30 will remain substantially uniform and constant. Whereas, if the cylindrical chambers were omitted, a starving of one metering orifice would result promptly as a result of surging disturbance in the fuel level.

Various details may be modified as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. An automotive carburetor having a mixture conduit, a constant level chamber with a plurality of fuel metering orifices in its lower part, a float and a float valve in said chamber, walls surrounding said orifices in immediate proximity to the peripheries thereof and extending above the fuel level between said conduit and said float, said walls forming individual, restricted wells for initially confining surge effect thereto, a passage connecting the lower parts of said wells, and a supply port for said wells leading from said passage to said constant level chamber said wells being isolated from said reservoir except for the fluid connection through said passage and port.

2. Fuel supply means for an automotive engine

comprising a mixture conduit, a constant level reservoir located wholly at one side of said conduit, a float and a float valve for said reservoir, a pair of fuel supply ports in the lower part of said reservoir, vertical walls immediately adjacent and wholly surrounding said ports and forming individual, restricted wells thereabove, a restricted passage connecting said wells with each other, and a port connecting said passage with said reservoir, said passage between said wells and said port constituting the sole fluid connection between said wells and said reservoir and only slightly exceeding in capacity the maximum fuel demand of said ports.

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