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CARBURETOR COOLING STRUCTURE

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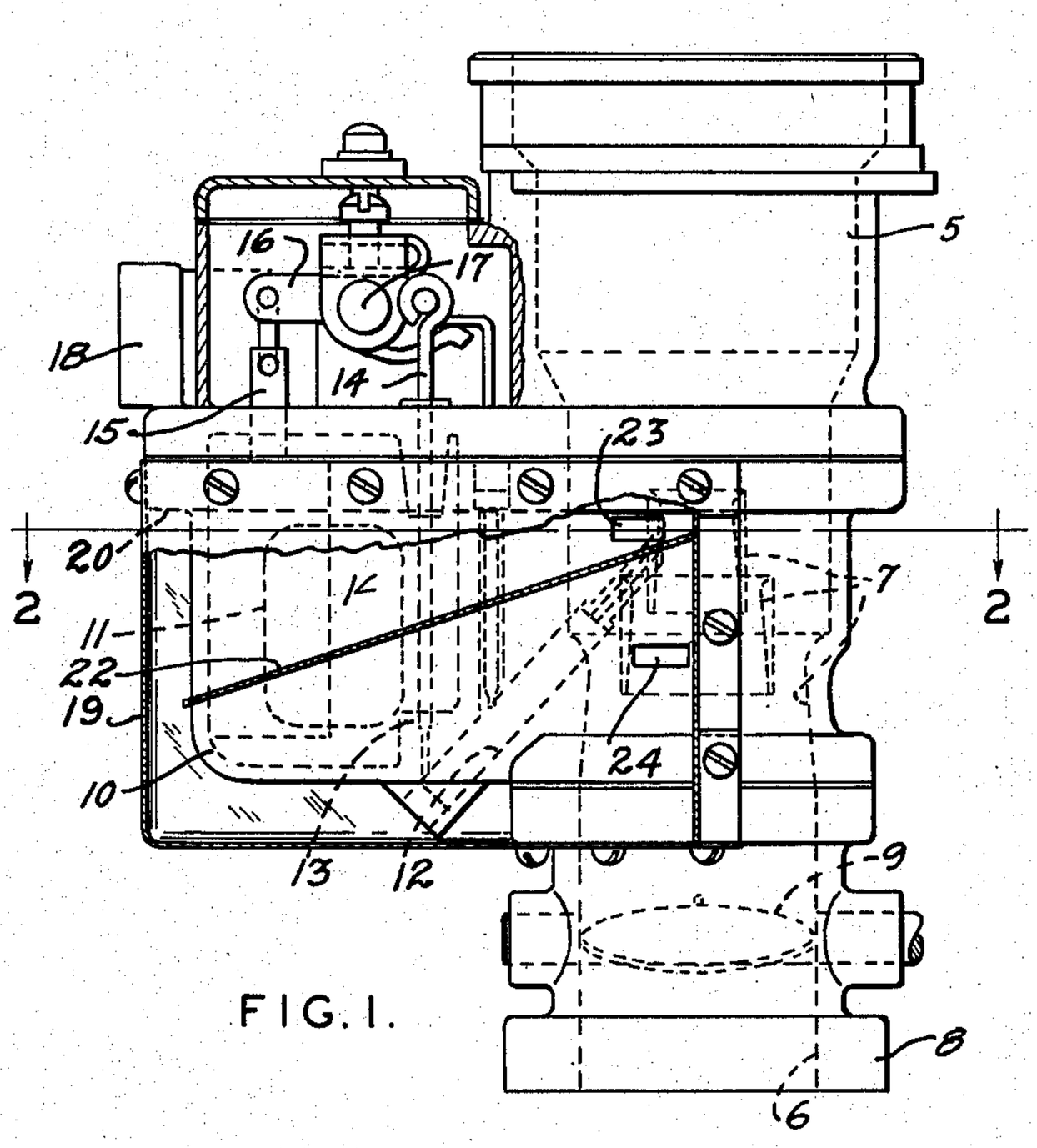

FIG. 1.

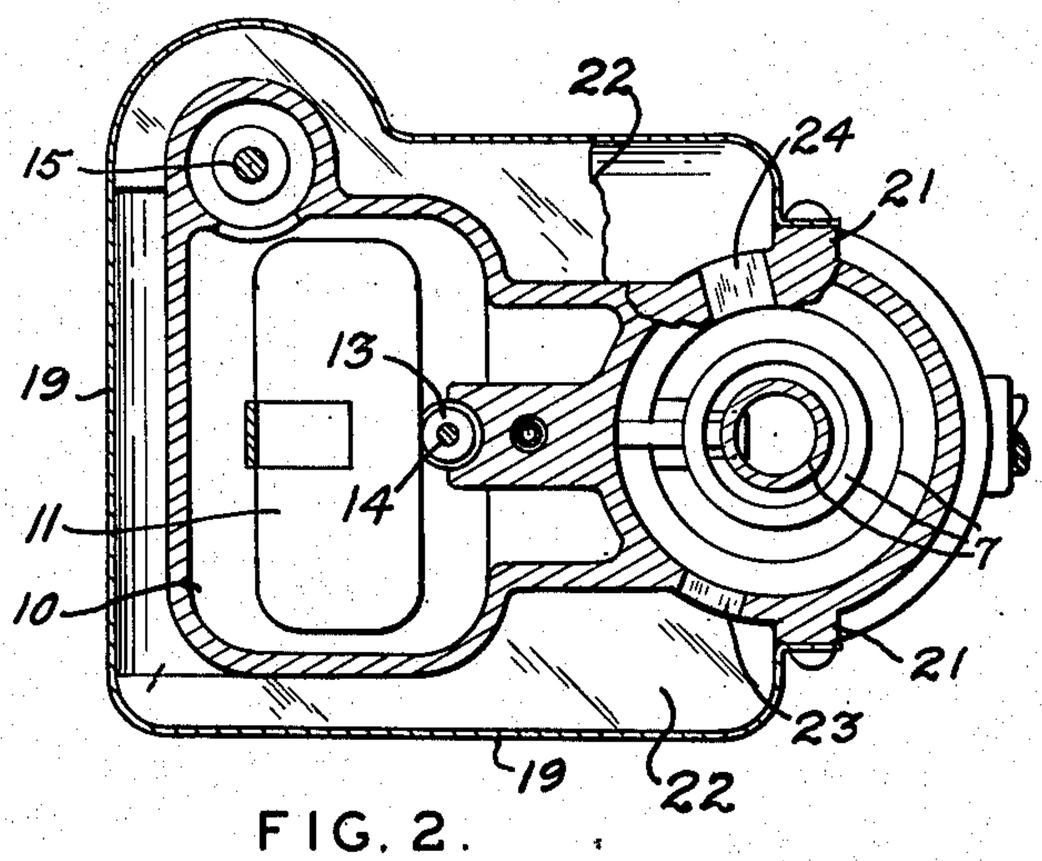

FIG. 2.

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CARBURETOR COOLING STRUCTURE

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5 Claims. (Cl. 261—9)

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This invention relates to carburetors for internal combustion engines and consists particularly in novel means for cooling the liquid fuel stored in the fuel chamber.

Heating of the fuel in the constant level chamber of a carburetor results in several disadvantages such as waste of vaporized light ends of fuel, percolation which causes excess fuel to be carried with bubbles of vapor into the carburetor and intake manifold, and surging, causing irregular operation of the engine during running. These disadvantages may be largely overcome by proper cooling of the fuel supplied to the carburetor mixture conduit.

Accordingly, it is the main object of the present invention to provide novel means for cooling the liquid fuel supply in proximity to its discharge into the carburetor mixture conduit.

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

Fig. 1 is a side view and section showing an automotive carburetor embodying the invention;

Fig. 2 is a horizontal section on line 2—2 of Fig. 1, a part being broken away to illustrate underlying structure.

The carburetor has a vertical, downdraft mixture conduit including an air inlet horn 5 at the upper end, a mixture discharge opening 6 at the lower end and a plurality of Venturi tubes 7 disposed intermediately therein. The lower end of the carburetor is flanged as at 8 for attachment to the engine intake manifold (not shown). The discharge of fuel mixture is controlled by the usual manually operated throttle valve 9.

At one side of the mixture conduit is a bowl 10 within which fuel is maintained at a substantially constant level by a needle valve in the fuel entrance 18 and operated by a float 11. A main fuel discharge passage 12 connects the lower part of the fuel bowl with the smallest Venturi tube 7 for discharging fuel into the carburetor mixture conduit and engine intake manifold according to engine suction. Supply of liquid fuel passes through a metering orifice 13 controlled by a metering pin 14. Also within the fuel bowl is an accelerating pump of known form and including a pump piston rod 15 connected by a crank 16 to a countershaft 17 to which metering rod 14 is also connected. The countershaft may be rotated in any suitable and well known manner, either by a connection to the throttle valve or by engine suction, which means are not illustrated in detail since they do not constitute any part of the present invention.

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A casing 19, shown as of relatively thin sheet metal, extends around both sides, the end, and the bottom of fuel bowl 10 and is bolted to pads 20 extending around the upper edge of the fuel bowl and a pad 21 formed on the center portion of the carburetor mixture conduit. An inclined baffle 22 extends along each side of the constant level bowl, depending from right to left in Fig. 1, so as to form upper and lower portions of the air chamber around the fuel bowl between the casing and bowl walls. The top of the air chamber is closed by the bowl cover. The upper and lower portions of the air chamber on both sides are connected by ports 23 and 24 to the interior of the mixture conduit at points spaced longitudinally therealong and also at points of varying restrictions. These ports, accordingly, are subjected to different suction conditions during operation of the carburetor, port 23 being subjected to less suction, that is, to higher pressure, than port 24, so that a flow of cooling air is induced into the upper air chamber portions, thence around baffles 22, back through the lower air chamber portions and returning to the mixture conduit through lower ports 24.

This air circulation means will have no effect upon the carburetor mixture since the air chamber is sealed from the atmosphere through the ports so that the total quantity of air passed through the carburetor is not varied. Thus, at any time during operation of the carburetor, the fuel stored in the constant level bowl will be cooled by a circulation of fresh air. This circulation and cooling will substantially reduce or eliminate the ill effects produced by vaporization of the fuel, as heretofore explained.

Of course, the actual shaping of the casing which forms the cooling air chamber, the baffling for directing the air flow, and the number and exact disposition of the connection ports may be varied in accordance with the requirements of the particular carburetor. The described structure is especially advantageous in connection with the type of carburetor having a fuel bowl at one side rather than the concentric type, though the invention is not limited to any particular type of carburetor.

The exclusive use of all such modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A carburetor comprising an induction conduit, a fuel storage chamber, a fuel discharge nozzle connecting said fuel chamber and said

conduit, an air chamber on the outside of said fuel chamber, and a pair of ports between spaced portions of said air chamber connecting the air chamber and the induction conduit, said ports being longitudinally spaced with respect to each other and about the circumference of the induction conduit.

2. A carburetor as specified in claim 1 further including baffling in said air chamber between said fluid connections, for directing cooling air along substantial portions of the wall of said fuel chamber.

3. In a carburetor, a mixture conduit having air entrance and mixture discharge portions and intermediate portions variably restricting the passage of air therethrough, a constant level fuel bowl, a fuel discharge passage connecting said bowl and said conduit, a casing extending at least partially around said bowl and forming an air chamber therewith, baffling dividing said air chamber, and spaced fluid connections between longitudinally spaced portions of said conduit and portions of said air chamber on opposite sides of said baffling for permitting circulation of cooling air through said air chamber.

4. Carburetor structure as described in claim 3 in which said air chamber forming casing extends around the exposed sides and the bottom of said bowl.

5. In a carburetor, a mixture conduit, a constant level fuel bowl at the side thereof, a fuel discharge passage connecting said bowl and said conduit, a casing extending around the exposed sides of said bowl and forming an air chamber therewith, baffling extending along opposite sides of said bowl and forming upper and lower portions of said air chamber with fluid connections around portions of said baffling, said fluid connections being spaced outwardly of said mixture conduit, and ports connecting the upper and lower portions of the air chamber and the mixture conduit for inducing flow of cooling air through said chamber.

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