July 15, 1952 J. T. W. MOSELEY 2,603,199

CARBURETOR DEICER

Filed Jan. 23, 1950 2 SHEETS—SHEET 1

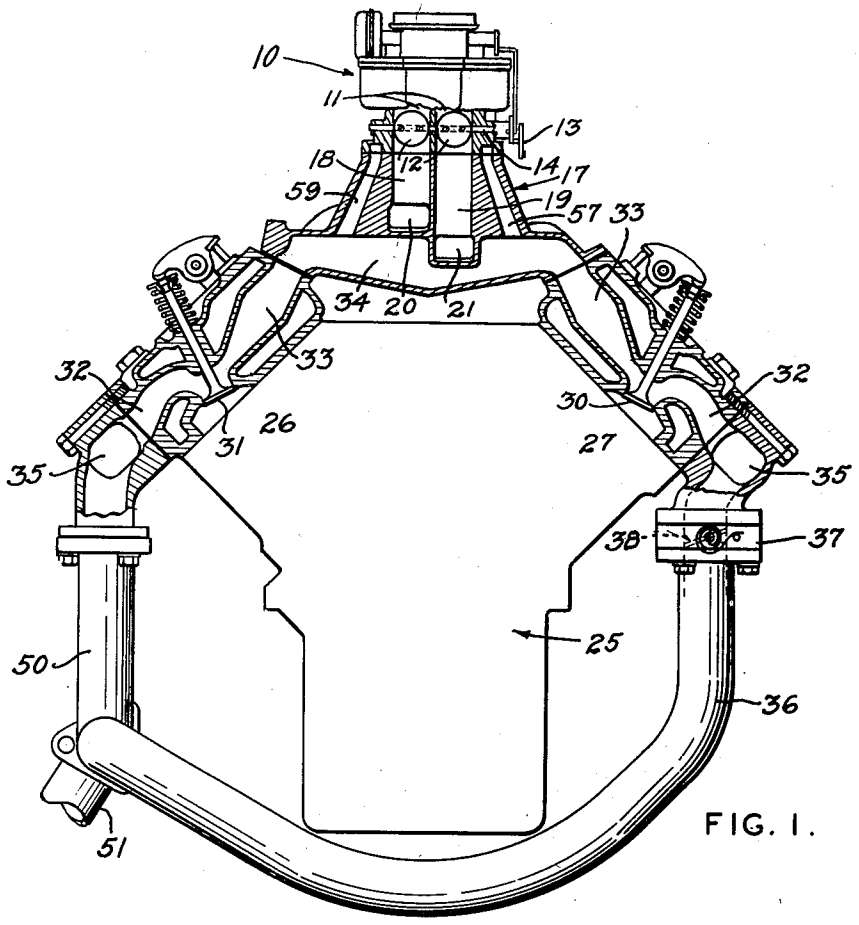


FIG. 1.

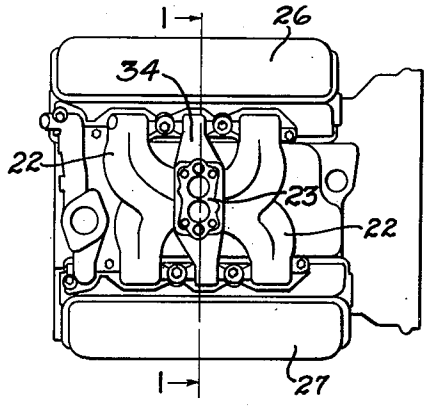


FIG. 2.

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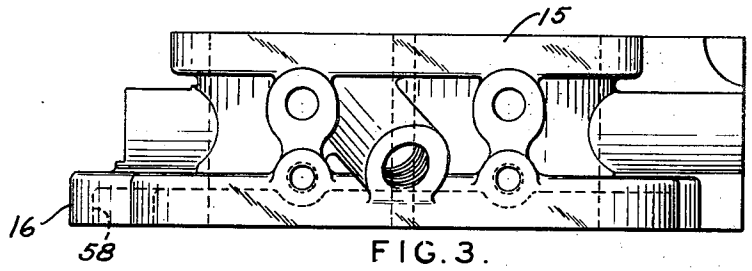


FIG. 3.

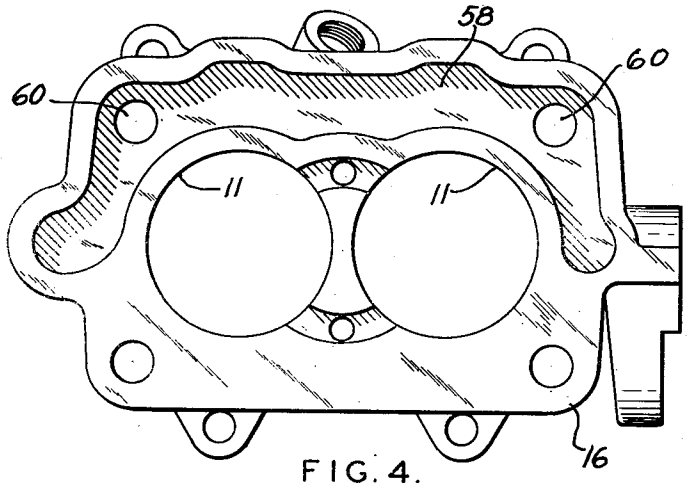


FIG. 4.

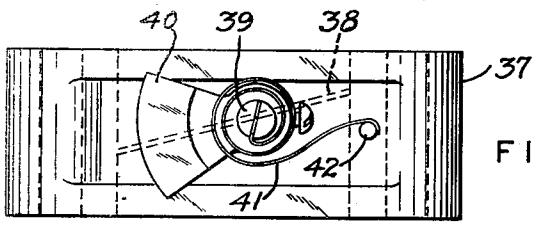


FIG. 5.

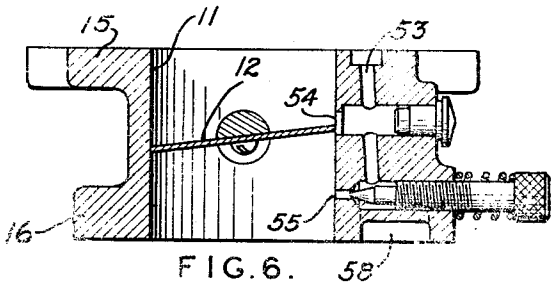


FIG. 6.

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UNITED STATES PATENT OFFICE

2,603,199

CARBURETOR DEICER

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Application January 23, 1950, Serial No. 139,988

1 Claim. (Cl. 123—122)

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This invention relates to internal combustion engines, particularly of the automotive type, and consists in a novel manifolding and fuel system arranged to counteract icing tendencies.

The invention is especially applicable to V-type engines of a known type in which the intake manifolding rests on the upper side of the cylinder block in the crotch of the V and exhaust passages extend both above and beneath the cylinder block. According to the present invention, a by-pass for hot exhaust gases extends from the portion of the exhaust manifolding which overlies the cylinder block up through the intake riser, thence across the carburetor flange and returns through the riser to the exhaust passage. This exhaust by-pass has been found to effectively counteract icing tendencies around the carburetor throttle and idling ports.

In the accompanying drawings which illustrate the invention,

Fig. 1 is an end view and section showing the engine and portions of the exhaust and intake manifolds and the carburetor;

Fig. 2 is a top view of the engine with the carburetor removed;

Fig. 3 is an enlarged side view of the throttle body portion of the carburetor disassembled;

Fig. 4 is a bottom view of the structure in Fig. 3;

Fig. 5 is an enlarged view of the exhaust gas diverting valve and mounting and operating structure;

Fig. 6 is an enlarged section through the throttle body portion only of the carburetor and taken at 90° to Fig. 1.

The carburetor 10 is of the dual type including a pair of downdraft mixture conduits 11 with throttle valves 12 in the outlet portions thereof. An arm 13 attached to the common throttle shaft 14 provides for manual control of the throttle valves. The lower portion of the carburetor which mounts the throttle valves is separately formed, as shown in Figs. 3–6, inclusive, and is known as the throttle body. This member has an upper flange 15 for attachment to the upper portion of the carburetor and a lower flange 16 which is bolted to the riser portion 17 of the intake manifold.

The intake manifold riser portion 17 includes a pair of intake passages 18 and 19, one longer than the other as shown, communicating at their lower extremities with ducts 20 and 21, forming part of the intake manifolding 22 leading to the intake valves (not shown) of the engine. The upper surface 23 of the riser conforms in shape

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with the lower surface of carburetor end flange 16 for accommodating a sealing gasket and for bolting attachment to the carburetor.

The engine block, generally shown at 25, is of the V-type having separate banks of cylinders 26 and 27 forming the legs of the V. Intake manifold 22 is of general H-shape and lies above the engine block in the crotch of the V. A pair of exhaust valves are shown at 30 and 31 controlling exhaust ports each leading to exhaust passages 32 and 33, leading oppositely. In an eight cylinder engine, there will be four cylinders in each bank and an intake and exhaust valve for each cylinder. The intake connections to the cylinder are not shown, in detail. Upwardly leading exhaust passages 33 connect with an exhaust cross passage 34 which extends beneath and abuts intake riser 17 to form a "hot spot" for heating intake mixture. Outwardly disposed exhaust passages 32 connect with longitudinal exhaust manifold branches 35. Branches 35 connect with the exhaust ports of the respective banks.

Right hand exhaust branch 35 connects with a cross passage 36 extending beneath the engine block. A spacer 37 between right hand manifold 35 and underlying cross passage 36 pivotally mounts an unbalanced butterfly valve 38 (Fig. 5) on a shaft 39. An unbalanced weight 40 rigid with the valve shaft tends to open the valve as does the force of the exhaust on the unbalanced valve, itself. A bi-metal thermostat coil 41 has one end secured to the valve shaft and the other end anchored to a pin 42 on the spacer and urges the valve closed when the engine temperature is low, while opening the valve when the temperature rises. Left-hand exhaust manifold branch 35 has a connection 50 to tail pipe 51 and thence to atmosphere. Underlying exhaust cross passage 36 also connects with tail pipe 51.

The arrangement of exhaust manifolding is such that exhaust gases may flow from the right hand cylinder bank both upwardly through exhaust passage 33, thence through overlying cross passage 34 and the hot spot, then through exhaust passage portions 33 and 32 of the left-hand cylinder bank and connection 50 to tail pipe 51. The exhaust gases from the right hand bank may also flow downwardly through exhaust passage 32 and underlying exhaust cross passage 36, if exhaust diverting valve 38 is open. This valve, however, will be urged towards its closed position at low temperatures so as to divert substantial portions of exhaust gases from the right

hand bank of cylinder through the overlying exhaust passage **34** and through the hot spot portion so as to heat the fuel mixture in the intake manifold.

Fig. 6 illustrates the idling fuel passage **53** and idle ports **54** and **55** formed in the throttle body portion of the carburetor adjacent and posterior to the edge of throttle valve **12** when closed. Fuel issuing from the idling ports and also air passing the throttle tends to expand, thus absorbing heat and, under certain conditions, ice may be formed which tends to block both the passage of air around the throttle and the issuance of fuel from the idling ports.

In order to counteract this tendency, an exhaust by-pass is provided, including a passage **57** extending upwardly along riser **17** from exhaust manifold cross passage **34**, thence through a recess **58** formed in the under surface of carburetor end flange **16** and then returning to exhaust passage **34** through passage **59** in the riser. During operation, significant quantities of hot exhaust gases will be directed through by-pass **57**, **58**, and **59**, particularly, when diverter valve **33** is closed. When valve **38** is open, less gases flow through the by-pass. A flow through the passage will result from the positioning of portions **57** and **59** at points substantially spaced along passage **34** so that pressure in passage **57** will be greater than that in passage **59**. The exhaust gases in the by-pass, and especially in recess **58**, will heat the wall of the carburetor mixture passage within the throttle body and around the throttle valve and idling ports so as to counteract icing tendencies.

As shown in Fig. 4, two of the carburetor attaching bolts pass through openings **60** in recess **58**. Consequently, it will be necessary to effectively seal these bolt holes by the use of gaskets.

Recess **58** may be easily formed in the casting process. Its exact configuration may be varied to obtain the best results. The invention also may be modified in other respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claim is contemplated.

I claim:

In an internal combustion engine, an intake manifold having a riser with a flange, a carburetor having an end flange abutting and bolted to said manifold flange, there being a hollow channel in said flange and extending thereacross, a fuel passage in the wall of said carburetor near said end surface, an exhaust manifold having a branch passing in proximity to said riser and a second branch leading to atmosphere, an exhaust by-pass leading from said first branch upwardly along said riser, thence along said channel and back to said first branch through said riser, and a valve in said second exhaust branch for directing at least substantial portions of the exhaust gases, respectively, through said second branch to atmosphere or through said first branch and said exhaust by-pass for heating said carburetor and fuel in said fuel passage.

JAMES T. W. MOSELEY.

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