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M. J. LORD, JR

2,093,918

ROTARY FUEL, GAS, AND AIR MIXER

Filed March 13, 1936

Fig. 1.

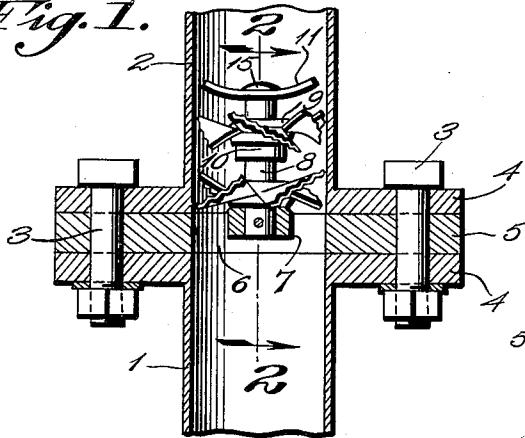


Fig. 2.

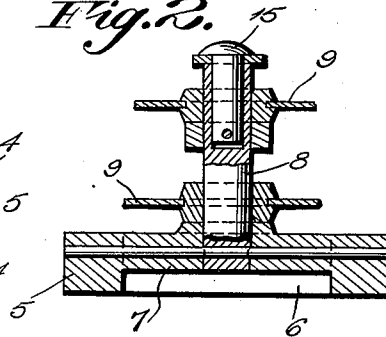


Fig. 3.

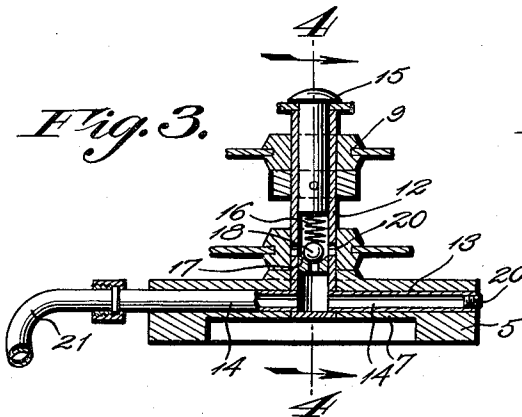


Fig. 4.

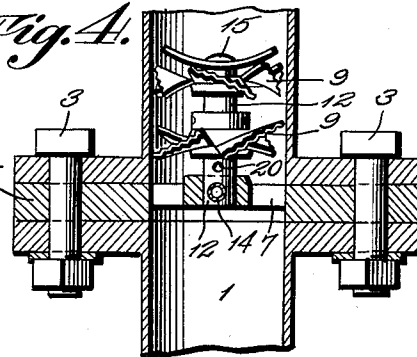
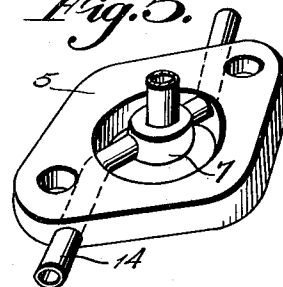


Fig. 5.



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WITNESS

UNITED STATES PATENT OFFICE

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ROTARY FUEL, GAS, AND AIR MIXER

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Application March 13, 1936, Serial No. 68,757

2 Claims. (Cl. 48—180)

This invention relates to fuel, gas and air mixers for internal combustion engines, and has for the primary object the provision of a device of this character which may be readily installed between a carburetor and an intake manifold of an engine whereby the passing of fuel from the carburetor to the engine will bring about rotation of bladed elements which in turn disrupt the flow of the fuel and thereby more thoroughly mix the fuel and break up the latter into small particles.

Another object of this invention is the provision of means whereby additional air or liquid may be admitted and mixed with the fuel passing into the engine.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawing, in which

Figure 1 is a fragmentary vertical sectional view showing a fuel gas and air mixer adapted to a portion of an intake manifold and a carburetor.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary vertical sectional view illustrating a modified form of my invention.

Figure 4 is a sectional view taken on the line 4—4 of Fig. 3 and showing the modified form of the invention adapted to portions of an intake manifold and a carburetor.

Figure 5 is a perspective view partly in horizontal section showing the means for admitting additional air or liquid through the employment of my invention in conjunction with an intake manifold and carburetor of an engine.

Referring in detail to the drawing, the numeral 1 indicates a discharge throat of a carburetor (not shown) and 2 a fragmentary portion of an intake manifold of an engine. The parts 1 and 2 are detachably connected by bolts 3 extending through flanges 4 formed on said parts. A plate 5 is interposed between the flanges 4 and has an opening 6 aligning with the parts 1 and 2. A spider 7 forms an integral part of the plate 5 and traverses the opening 6 and provides a bearing or support for the shaft 8 which extends upwardly into the part 2 of the intake manifold. Rotatable agitating elements 9 are journaled on the shaft 8 and each is capable of

a limited endwise movement on the shaft. The agitating elements 9 are disposed in superimposed relation and a spacing collar 10 is provided on the shaft for limiting the downward movement of the upper agitating element and for limiting the upward movement of the lower agitating element. A deflector 11 is secured to the upper end of the shaft 8 and is arcuately curved and tapers towards its end. The deflector while interrupting the flow of vaporized liquid fuel and air from the carburetor to the intake manifold also limits the upward movement of the agitating elements 9. The agitating elements are of the bladed type, the blades being disposed at a desired pitch and having their free ends serrated. The pitch of the blades of said agitating elements is such that by the flow of the fuel and air mixture past said agitating elements they will be caused to rotate in opposite directions. The rotation of the agitating elements disrupts the flow of the fuel and thereby brings about a thorough mixing of the vaporized liquid fuel and air, and aids in vaporizing liquid fuel particles in the mixture.

It is preferable that the lower agitating element have less blades than the upper agitating element.

Referring to my modified form of the invention, the shaft 12 is of hollow formation and the lower end thereof communicates with the passage 13 formed in the spider 7 and the plate 5 and which passage opens outwardly at opposite sides of the plate. Extending into the passage 13 are tubes 14, the outer ends of which are in communication with the atmosphere. The shaft 12 has journaled thereon the agitating elements 9 and the upper end of the shaft is closed by headed pins 15 forming the seat for one end of a coil spring 16. A valve seat 17 is located in the shaft and engaged by a ball type check valve 18. The spring 16 contacts the valve for urging the same in engagement with the seat 17. Outlet ports 20 are formed in the shaft and are normally overlaid by the hub of the lower agitating element 9.

When the suction in the intake manifold increases beyond a predetermined amount or becomes excessive, the ports 20 are uncovered by the lower agitating element 9 sliding upwardly on the shaft and the air under atmospheric pressure of the tubes 14 unseats the valve 18 and passes through the ports 20 and becomes mixed thoroughly with the vaporized fuel passing from the carburetor to the engine (not shown). While the tubes 14 have been described as being communi-

cative with the atmosphere, it is to be understood one of the tubes may be closed by a plug 20', as shown in Figure 3, and the other tube connected to a pipe 21 leading to a cut-off valve.

5 Having described the invention, I claim:

1. A fuel mixer comprising a supporting means, a hollow shaft carried by said means, means closing one end of the shaft, means for admitting air to the shaft, said shaft having outlet ports, 10 and an agitating element journaled on said shaft and capable of a limited endwise movement relative thereto, said agitating element including a hub rotatably engaging said shaft and blades secured to said hub, said hub engaging about and 15 closing said ports during relatively low suction, said agitating element moving longitudinally of said shaft during increased suction whereby said hub will uncover said ports to thereby admit air into the intake manifold.

2. A fuel mixer comprising a supporting means, a hollow shaft carried by said means, means closing one end of the shaft, means for admitting air to the shaft, said shaft having outlet ports, an agitating element journaled on said 5 shaft and capable of a limited endwise movement relative thereto, said agitating element including a hub rotatably engaging said shaft and blades secured to said hub, said hub engaging about and closing said ports during relatively 10 low suction, said agitating element moving longitudinally of said shaft during increased suction whereby said hub will uncover said ports to thereby admit air into the intake manifold, and a deflector carried by said shaft upwardly of said 15 agitating element.

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