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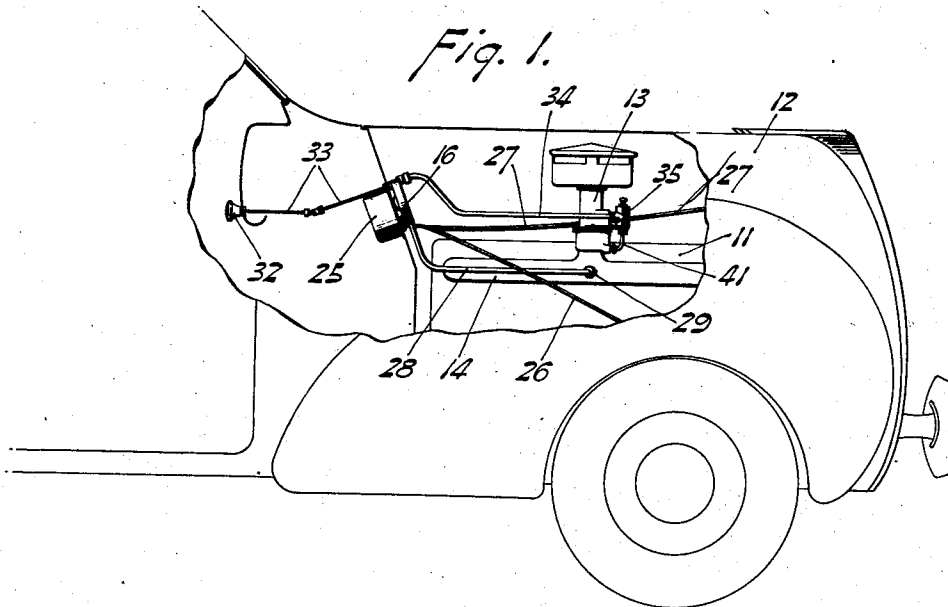
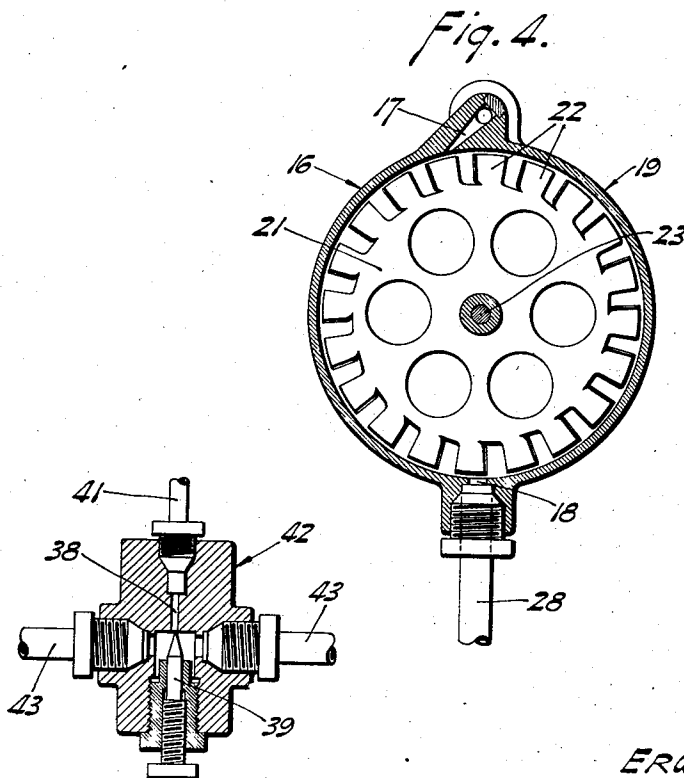
E. C. HORTON

2,272,037

ENGINE ACCESSORY SYSTEM

Filed April 1, 1939

2 Sheets-Sheet 1



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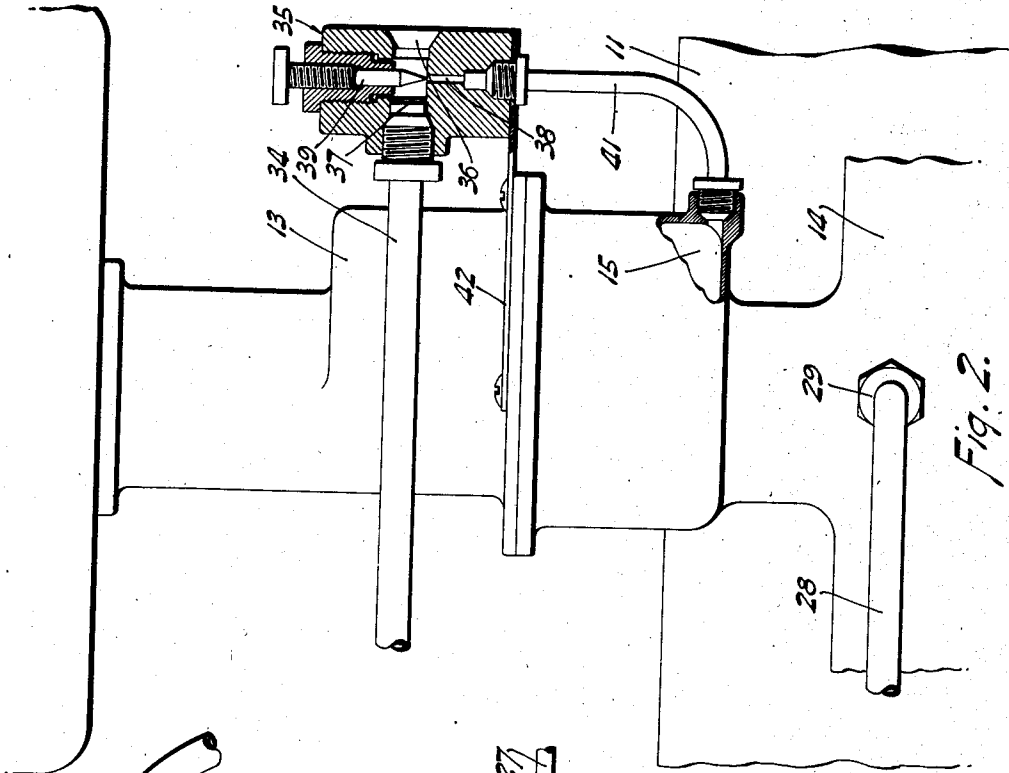
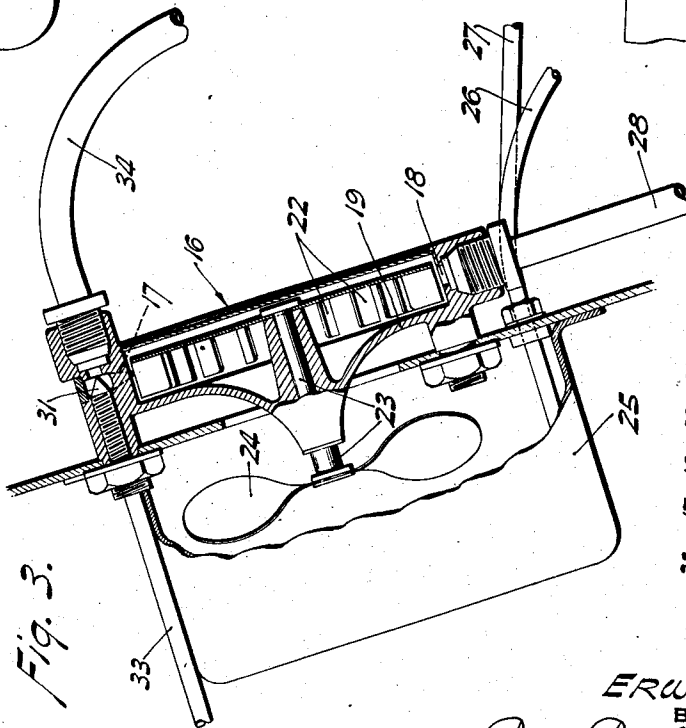
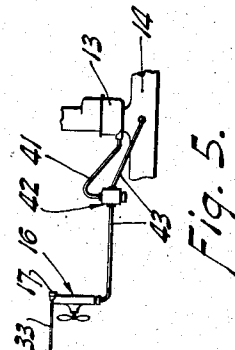
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,272,037

ENGINE ACCESSORY SYSTEM

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Application April 1, 1939, Serial No. 265,614

5 Claims. (Cl. 123—198)

This invention relates to an automotive or internal combustion engine accessory system, and has particular relation to systems depending for their operation upon fluid being drawn therefrom into the fluid intake of an engine.

Certain types of internal combustion engine and automotive accessories, such as suction operated fans, windshield cleaners, and pumps, employ for their operation the pressure differential between the atmosphere and the intake manifold of the engine. Air, under substantially atmospheric pressure, is taken into the accessory to therein act against the lesser pressure maintaining at the engine intake, and after so acting is discharged into the latter. Usually the discharge of such air into the engine intake is at a point therein beyond the carburetor or fuel mixing valve, so that the mixture of air and fuel normally received in the combustion chambers of the engine is diluted with air from the accessory when the latter is in operation.

This dilution of the mixture results in a loss of power produced by the engine, or, if compensated for by adjustment of the carburetor to increase the ratio of fuel, will cause waste of fuel when the accessory is not in operation.

According to the present invention, means are provided to carburet the air which operates the accessory before discharging the latter into the engine intake. Preferably the mixing valve used for carbureting such air is made adjustable so that the ratio of fuel to air produced thereby may correspond to the fuel to air ratio produced by the engine carburetor. In this way the engine will operate with the same efficiency whether or not the accessory is in operation.

These and other objects and advantages will become apparent from the following description of the typical embodiment of the invention illustrated in the accompanying designs, wherein:

Fig. 1 is a side elevation of the fore portion of a motor vehicle with parts thereof broken away to illustrate the application of the present invention;

Fig. 2 is a side elevational view, partly in section, illustrating the mixing valve of the invention mounted upon the carburetor and manifold assembly of the engine shown in Fig. 1;

Fig. 3 is a longitudinal sectional view of the suction operated accessory shown in Fig. 1;

Fig. 4 is a cross-sectional view of the suction operated accessory;

Fig. 5 is a diagrammatic view illustrating a modified embodiment of the invention; and

Fig. 6 is a sectional view of the mixing valve appearing in Fig. 5.

As shown in Fig. 1, the internal combustion engine 11 of the motor vehicle 12 has a carburetor or mixing valve 13 and an intake manifold 14. The carburetor has a float chamber or similar reservoir 15 wherein fuel preferably is maintained to a substantially uniform level. Mounted on the vehicle is a suction operated accessory 16 having a fluid inlet 17 and a fluid outlet or exhaust 18.

In the embodiment illustrated, the accessory is a turbine having a casing 19, a wheel 21 with impeller blades 22, and a shaft 23 upon which the wheel is mounted. A fan 24 carried by shaft 23 propels air through a heat exchange unit or radiator mounted within shell 25, water heated by the engine being circulated through the unit via tubes 26 and 27.

Fluid is exhausted from casing 19 through outlet 18, and through an outlet conduit 28 connected thereto, into the intake manifold 14, the connection between conduit 28 and the manifold being indicated at 29. Fluid under more nearly atmospheric pressure entering the casing 19 through the inlet 17 impinges upon turbine blades 22 for effecting rotation of the wheel, shaft and fan assembly. The rate of entry of fluid, and the speed of the fan, may be controlled, stopped or started by a valve 31 controlled by a knob 32 through the linkage 33.

Entering fluid is conducted to inlet 17 through an inlet conduit 34 extended from a mixing valve 35. The latter has an atmospheric intake opening 36, an outlet 37 opening into conduit 34, and a fuel inlet passage 38, the opening of the latter into the interior of the valve being adjustably controlled by a needle valve 39. Fuel is supplied to passage 38 from the reservoir 15 through a pipe 41. If desired, the mixing valve 35 may be mounted upon the carburetor by a bracket 42 or by other suitable means.

When during operation of the engine the valve 31 is closed so that the accessory system is not operating, no fluid will pass through the mixing valve. When the valve 31 is open, however, so that fluid is being drawn into the manifold from the accessory, air will enter the latter through the mixing valve and conduit 34. Passing through the mixing valve the air will be carbureted with fuel which is induced, by the air flow, into the mixing valve through conduit 41 and passage 38.

By suitably adjusting needle valve 39, the mixture of fuel and air effected by unit 35 can be

made to correspond with that produced by the engine carburetor 13, so that the engine will receive the same kind of fuel and air mixture regardless of whether or not the accessory system is in operation.

In the form of the invention illustrated in Fig. 5, atmospheric air enters directly into the accessory intake 17, and a mixing valve 42 (shown in detail in Fig. 6) is provided in the exhaust or outlet conduit 43 leading from the accessory outlet to the manifold 14. The mixing valve 42, like mixing valve 35, has a fuel inlet passage 38 communicating with the fuel reservoir through a pipe 41, and a needle valve 39 for regulating the proportion of fuel mixed with air discharging from the accessory into the intake manifold.

It will be understood that the apparatus herein shown and described is merely illustrative of the inventive principles involved, which principles may be otherwise embodied without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In combination with an internal combustion engine having an intake manifold and a carburetor with a float chamber, a device including a turbine having an inlet and an outlet for fluid for operating said turbine, an inlet conduit having one end thereof open to the atmosphere and the other end thereof opening into said inlet, a mixing valve in said conduit, means for conducting fuel from the float chamber to said mixing valve, and an exhaust conduit for conducting fluid from said outlet to the intake manifold.

2. In combination with an internal combustion engine having an intake with a carburetor, a prime mover in the form of a turbine having an inlet and an outlet for fluid operating the turbine, said outlet being connected to said intake of the engine as a source of less-than-atmospheric pressure, and means associated with said inlet of the turbine for applying fuel to the air entering therein, operation of said turbine serving to further admix the fuel and air passing therethrough.

3. In combination with an internal combustion engine having an intake with a carburetor, a

fluid pressure operated device having an outlet passage connected to said intake and having an air inlet passage, a mixing valve associated with said inlet passage for mixing fuel with air entering said fluid pressure operated device, the latter operating to agitate and further admix said fuel and air prior to discharge thereof into said intake.

4. In combination with an internal combustion engine having an intake with a carburetor having a float chamber, a suction operated device having an air inlet passage and having an air outlet passage connected to said intake of the engine, and a mixing valve in said air inlet passage for mixing fuel with air passing therethrough, said air inlet passage being open to the atmosphere at the end thereof opposite from the suction operated device and thereby being subject to atmospheric pressure when there is no substantial flow of air through said suction operated device, said mixing valve having a fuel discharge orifice opening thereinto and in constant communication with said float chamber, said mixing valve being disposed above the fuel level in said float chamber and fuel being induced into the mixing valve through said orifice by the passage of air therethrough.

5. In combination with an internal combustion engine having an intake with a carburetor, a fuel reservoir, a suction operated device having an air inlet passage and having an air outlet passage connected to said intake of the engine, and a mixing valve in said air inlet passage for mixing fuel with air passing therethrough, said air inlet passage being open to the atmosphere at the end thereof opposite from the suction operated device and thereby being subject to atmospheric pressure when there is no substantial flow of air through said suction operated device, said mixing valve having a fuel discharge orifice opening thereinto and in constant communication with said fuel reservoir, said mixing valve being disposed above the fuel level in said fuel reservoir and fuel being induced into the mixing valve through said orifice by the passage of air therethrough.

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