

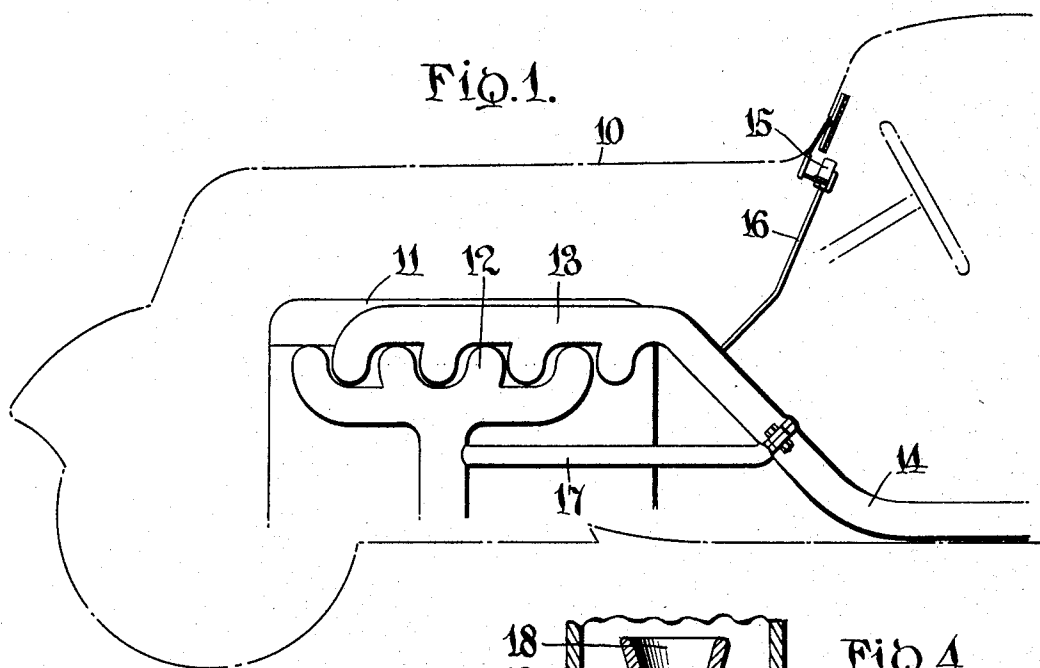
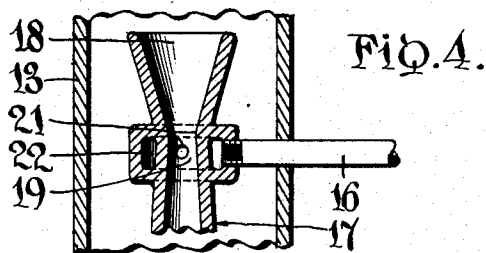
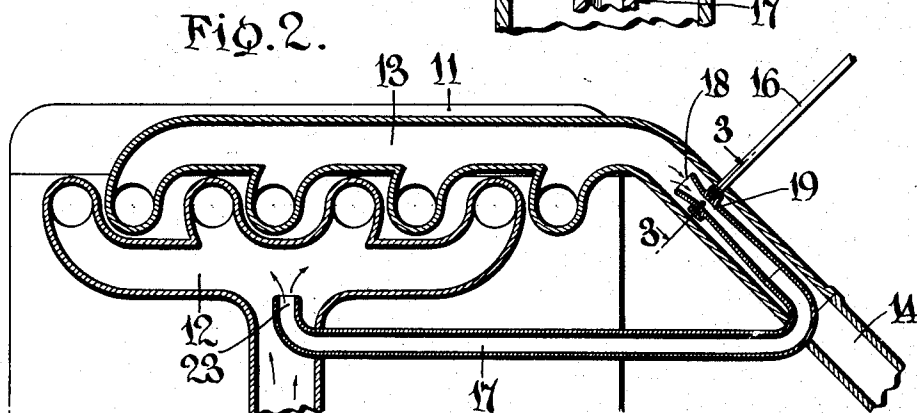
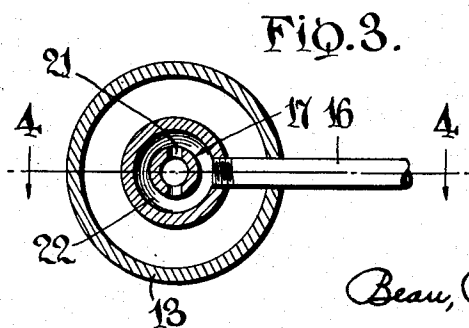
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SUCTION OPERATED ACCESSORY SYSTEM

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SUCTION OPERATED ACCESSORY SYSTEM

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2 Claims. (Cl. 123—198)

This invention relates to means for producing suction, and has particular reference to means associated with an engine, for example an internal combustion engine, for producing suction which may be utilized for operating devices, such as windshield cleaners on motor vehicles, or for other purposes.

According to conventional practice the suction used to operate the windshield cleaners and air horns of motor vehicles having internal combustion engines is obtained by tapping the intake manifolds or fluid inlet passages of the engines, since the pressure in such manifolds or passages is usually considerably less than atmospheric. However, such sub-atmospheric pressure varies from time to time in accordance with the conditions of speed and load of the engine, and the degree of opening of the engine throttle valve; and by reason of the large degree of such variation, this source of suction has been found to be not fully satisfactory.

According to the present invention a tube is extended from the exhaust manifold or passage of the engine to the intake manifold or passage of the engine in such manner that a portion of the exhaust fluid will pass from the exhaust passage into the intake passage, and Venturi means are associated with the tube so that such passing of fluid will effect the production of suction. Since the rate of flow and pressure of fluid in an engine exhaust passage is usually high when the suction influence in the inlet passage is low, and vice versa, the rate of flow of fluid through the tube in the present system is comparatively uniform, and hence the degree of the available suction is likewise comparatively uniform.

These and other objects and advantages of the invention will appear from a perusal of the following description, which is made in accordance with the accompanying drawing, wherein:

Fig. 1 is a diagrammatic view of the forward portion of a motor vehicle with the present invention applied thereto;

Fig. 2 is a vertical sectional view through the intake and exhaust manifolds of the vehicle engine shown in Fig. 1;

Fig. 3 is a cross-section taken along line 3—3 of Fig. 2; and,

Fig. 4 is a fragmentary sectional view taken along line 4—4 of Fig. 3.

As shown in Fig. 1, the motor vehicle 10 has an internal combustion engine 11 with a fluid inlet passage including intake manifold 12, and an exhaust passage including exhaust manifold 13 and the connected exhaust pipe 14. A wind-

shield cleaner 15 or other suction accessory or accessories upon the vehicle may operate by the withdrawal of air through a suction conduit 16. According to my invention, a tube 17 is extended from the exhaust manifold 13 to the intake manifold 12. The end of tube 17 within the exhaust manifold is preferably disposed, as illustrated, so that the flow of exhaust fluid from the engine cylinders will be directly into the open mouth 18 of the tube.

The tube 17, or at least a portion of it, is of Venturi form; that is, it has a restricted throat portion 19 with an aperture 21 extending through the wall thereof into a chamber 22 extending around the tube. Into this chamber 22 the suction conduit 16 opens.

During normal operation of the engine the velocity and pressure of the exhaust gases coming from the engine cylinders will force a portion of such gases into the tube 17. Simultaneously, a less-than-atmospheric pressure maintaining in manifold 12, or the effect of inflowing gases passing the open mouth 23 of the other end of tube 17, will effect a withdrawal of fluid from tube 17. The resulting flow of fluid through tube 17, by the well known and understood venturic action will effect withdrawal of air from chamber 22 and conduit 16 through aperture 21. Since the action of the exhaust gases in forcing themselves into tube 17 will usually be very effective when the action of the incoming fluid, in the intake manifold, is slight in its tendency to withdraw fluid from the tube, and vice versa, the quantity and velocity of fluid flow through tube 17 will be comparatively uniform, and hence the degree of suction maintaining in chamber 22 likewise will be comparatively uniform and constant.

It will be understood that the dimensions of the portion of tube 17 within the exhaust manifold will be made small enough that excessive back pressure will not build up in the exhaust manifold, and that the amount of exhaust fluid passed to the engine intake manifold will not materially interfere with operation of the engine. It will also be understood that the Venturi part of tube 17 may be placed in portions of the tube outside of the manifold 13, and that the extent of the ends of tube 17 into the manifold may be altered to any desired degree. Or, if desired, the tube 17 may be connected to parts of the inlet and exhaust passages of the engine other than the manifolds illustrated.

What is claimed is:

1. In combination with an internal combus-

tion engine having a fluid inlet passage and an exhaust fluid passage, a Venturi tube including a suction take-off, said tube being disposed within the exhaust fluid passage whereby a portion of the exhaust fluid may pass into the Venturi tube and the remaining exhaust fluid may pass around the Venturi tube, and a conduit from the discharge end of the Venturi tube to the fluid inlet passage.

10 2. In combination with an internal combustion engine having a fluid inlet passage and an

exhaust fluid passage, a Venturi tube disposed in the exhaust passage, said Venturi tube at the restricted portion thereof having a suction take-off within said exhaust fluid passage and having a continuation from the discharge end thereof into the fluid inlet passage, the Venturi tube having its inlet end disposed to receive a portion of the gases passing through said fluid exhaust passage, the remainder of said exhaust gases passing about the Venturi tube.

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