

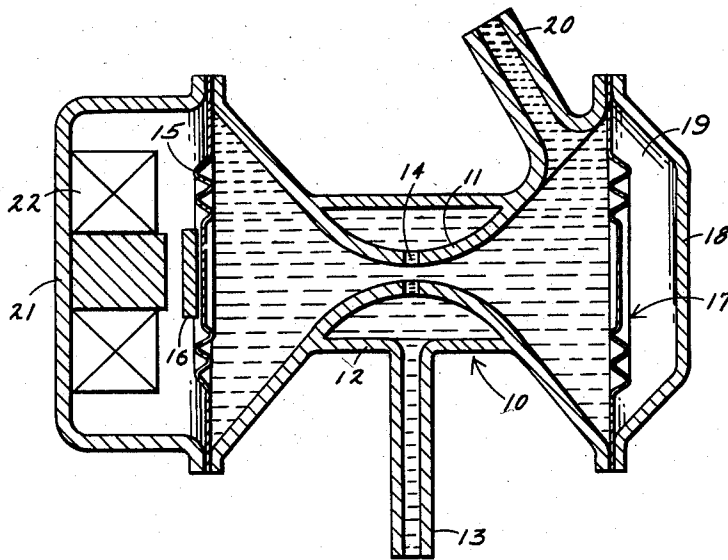
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FUEL PUMP

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FUEL PUMP

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3 Claims. (Cl. 103—258)

This invention relates to the field of fluid transfer and more particularly to a pump particularly adapted for use wherein small quantities of a liquid must be delivered reliably and economically against a comparatively low head. This pump has been primarily developed as a means for establishing a head of gasoline in the carburetor of an internal combustion engine when such carburetor is located above the level of the fuel in the fuel tank.

This invention should be considered in conjunction with the drawing which is a cross section of such a fuel pump.

In the drawing the venturi employed to accomplish the actual pumping is denominated as 10. The throat 11 of this venturi is surrounded by a sleeve 12 into which is connected suction conduit 13. The interior of sleeve 12 communicates with the interior of venturi 10 through openings 14 provided in throat 11 of venturi 10. The enlarged portion of venturi 10 is closed on one side by diaphragm 15 which supports magnet slug 16. The other side of the venturi is closed by surge diaphragm 17 which together with end piece 18 defines surge chamber 19. Discharge conduit 20 is connected to the enlarged portion of the venturi adjacent surge chamber 19.

Magnet slug 16 forms a portion of the magnetic circuit which includes frame 21. This magnetic circuit is energized by coil 22 which in turn is activated from any convenient source of electrical energy. When coil 22 is energized magnet slug 16 is attracted to frame 21 and carries with it diaphragm 15.

This action causes a flow of the fluid to be pumped through the throat 11 of orifice 10 and establishes in such orifice a zone of low pressure. Diaphragm 15 is sufficiently resilient to assume its original position when coil 22 is deactivated. When it returns to its original position it causes a reverse flow of liquid through throat 11 of venturi 10. Inasmuch as a venturi is not sensitive to the direction of flow, each of these flows causes an area of reduced pressure in venturi throat 11 and causes the liquid to be pumped to flow into the system through conduit 13, sleeve 12 and opening 14. It is apparent that there will be an intermittent integrated flow of liquid to the right through the venturi and out of the pump through discharge conduit 20. Surge diaphragm 17 and surge chamber 19 serve the obvious purpose of damping pulsations from the pump.

For the optimum operation the frequency with which coil 22 is energized should correspond to the natural frequency of the system including the liquid to be pumped. However, this is not essential to the operation of the invention and coil 22 may be activated at any frequency well below the system's natural frequency. For example,

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in an ordinary internal combustion engine the coil 22 may be activated by the same controls which energize the spark plug or any other means which will make the energization of coil 22 coextensive in time with the operation of the engine. Since this pump is not inherently self priming it should be located below the level of the liquid to be pumped. Diaphragm 15 has been particularly disclosed as driven electrically. However this has only been done for a convenience of illustration and it is obvious that this diaphragm may be driven by any convenient means. Such drive means may be mechanical, hydraulic or pneumatic.

It will be understood that the invention is not to be limited to the exact construction shown and described, but that various changes and modifications may be made without departing from the spirit and scope of the invention, as defined in the appended claims.

What I claim as my invention:

1. A fluid pump comprising a stationary venturi, closure means for the ends of said venturi, said venturi and closure means forming a chamber adapted to be filled with fluid, an intake conduit, a connection between the intake conduit and the throat of the venturi, a discharge conduit, a connection between the discharge conduit and the venturi at a location remote from the throat and fluid displacement means having a fluid connection with said venturi for causing an oscillating flow of fluid through the throat of the venturi when said chamber is filled with fluid whereby a pressure differential is generated between said intake and discharge conduits.

2. A fluid pump comprising a stationary venturi, closure means for the ends of said venturi, said venturi and closure means forming a chamber adapted to be filled with fluid, an intake conduit, a connection between the intake conduit and the throat of the venturi, a discharge conduit, a connection between the discharge conduit and the venturi at a location remote from the throat and fluid displacement means comprising a reciprocating member and having a fluid connection with said venturi for causing an oscillating flow of fluid through the throat of the venturi when said chamber is filled with fluid whereby a pressure differential is generated between said intake and discharge conduits.

3. A fluid filled pump comprising a stationary venturi, closure means for the ends of said venturi, said venturi and closure means forming a chamber adapted to be filled with fluid, an intake conduit, a connection between the intake conduit and the throat of the venturi, a discharge conduit, a connection between the discharge conduit and the venturi at a location remote from the throat and fluid displacement means having a fluid connection with said venturi for causing an oscillating flow of fluid through the throat of the venturi at a frequency of vibration which is essentially the natural frequency of vibration of the fluid filled pump whereby a pressure differential is generated between said intake and discharge conduits at such frequency.

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