March 26, 1935. G. W. HARRY ET AL 1,995,507

FUEL PUMP

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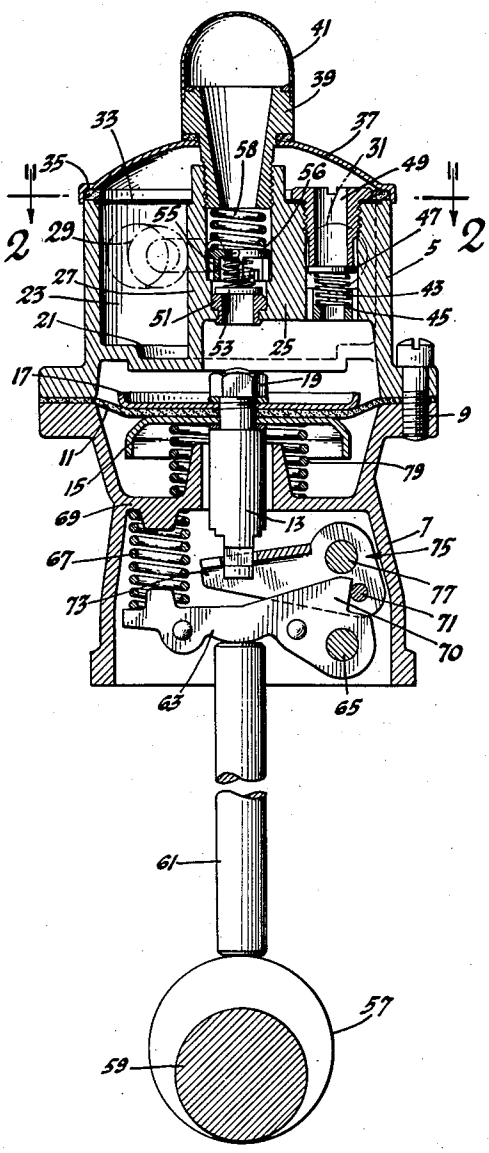


Fig. 1

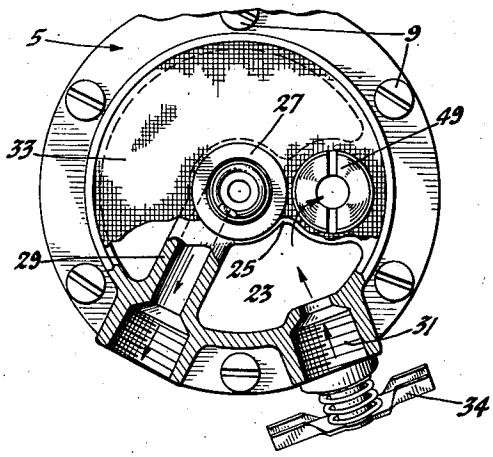


Fig. 2

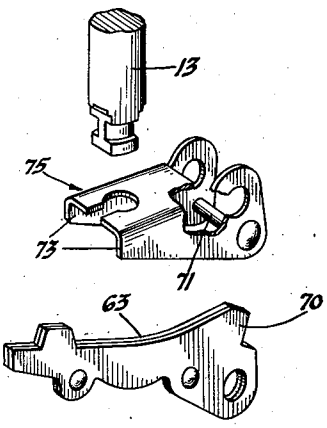


Fig. 3

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FUEL PUMP

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Application November 12, 1932, Serial No. 642,342

1 Claim. (Cl. 103—215)

This invention relates to pumping mechanism and has been designed for the purpose of supplying fuel to the engine of a motor vehicle from the reservoir.

An object of the invention is to provide an operating mechanism whereby the movement of the diaphragm in the direction to make the suction stroke must be effected by a rod reciprocating in the opposite direction.

Other objects and advantages will appear from the following description.

In the drawing:

Fig. 1 is a longitudinal section through our novel pump structure.

Fig. 2 is a view on line 2—2 of Fig. 1 with cover removed and parts in section.

Fig. 3 is an exploded perspective of certain parts of the assembly.

Referring by reference characters to the drawing, numeral 5 is the upper body member and 7 is the lower member, these two members preferably formed by die casting. Parts 5 and 7 are secured together by fastening means 9, and clamp between them the peripheral portion of a gasoline impervious diaphragm 11. The diaphragm is secured at its center to a pump stem 13 by means of discs 15 and 17 and a nut 19 threaded to the stem.

The upper part 5 is recessed to form a variable volume pump chamber between the diaphragm 11 and a partition 21. Above the partition the body 5 is formed into another chamber 23 which is segmental in shape, being closed by a radial wall 25 extending from a central boss 27 to the periphery. From the central boss there is also a radial extension constituting a conduit 29 which merely extends through the segmental chamber 23 but does not close it. An opening 31 in the wall of body 5 communicates with the chamber 23. A screen 33 engages a shoulder on the top of the peripheral part of body 5 and is held in place in the following manner. A ring 35 is located above the peripheral part of the screen as shown. A cover 37 is supported above the ring 35 and overlies its edge. An apertured cap 39 is threaded at its lower end into the central boss 27 and holds the cover in position. At the upper end of the cap 39 is a cup 41 constituting an air dome. The screen, near its center, is seated on a shoulder of the central boss. The radial wall 25 has a passage extending therethrough from a point above the screen to the pump chamber. Within the passage is a spring 43 seated on a shoulder 45 and pressing upwardly on a disc valve 47 which engages a valve seat constituted by the lower end of a hollow threaded plug 49. The fluid from opening 31 enters the chamber 23, is freed from foreign matter by the screen, flows through the hollow plug 49, passes the valve 47, and enters the pump chamber. This flow of fluid is produced by the suction stroke of the pump. Foreign matter which collects in the segmental chamber 23 beneath the screen 33 may be removed by a valve member 34.

The central boss is apertured as shown and carries a valve seat 51. The valve seat 51 is engaged by a valve 53 normally held to its seat by any suitable resilient means such as 55. The resilient means 55 engages a seat 56 held down by a spring 58. From the central boss an opening above the valve 53 permits the flow of fluid through the passage in part 29. From this outlet any suitable conduit may be provided to deliver the fuel to the carburetor of the engine. The outflow of fluid is produced by the discharge stroke of the diaphragm.

The cam 57, which is on an engine camshaft 59, operates to push upwardly on a rod 61. Rod 61 engages a lever 63 which preferably may be of laminated form as shown. The lever 63 is pivoted at 65 to the pump housing. A spring 67 in abutment with a housing wall 69 engages the lever 63 and operates to hold the ends of the rod 61 in contact with the lever and cam. It is through this partition 69 that the pump stem 13 extends. The lever 63 has a lug 70 which may engage a pin 71 extending between the arms 73 of a second lever 75 also pivoted to the pump casing at 77. The outer end of lever 75 has a known form of interlocking connection with the pump stem 13 whereby the assembly of these parts may be conveniently made.

By the construction described in upward movement of rod 61 produced by the cam rocks the lever 63 clockwise and when the lug 70 engages the pin 71 the lever 75 is rocked counterclockwise and the plunger and diaphragm execute a suction stroke. In this way the fuel is drown into the pump chamber from the reservoir through the inlet valve 47. The discharge stroke is made by a spring 79. This spring is in abutment with the partition 69 and the diaphragm disc 15. The pump therefore has a variable stroke depending upon the built-up pressure in the pump chamber and the strength of spring 79. When the built-up pressure in the pump chamber, resulting from a relatively small consumption of fuel, overcomes the spring 79, the lever 75 assumes a position such that its pin 71 is engaged by the lug 70 of lever 63 only at the latter part of the

stroke of lever 63. The pump therefore has a variable stroke to supply fuel in accordance with the demands of the engine without the provision of means for bypassing or overflow.

This pump has special utility in those installations where rotation of the cam is such that a rod reciprocated thereby moves in a direction the opposite of that required by the diaphragm in making the suction stroke. The use of the two levers 63 and 75 constitutes a very simple means whereby the necessary operation is effected. It will be understood that the lost motion present in this pump takes place between the lug 70 and the pin 71.

We claim:

In a pump, a pumping member, resilient means to cause said pumping member to make a discharge stroke, a tension connection adapted to cause the pumping member to make a positive suction stroke, a thrust member coaxial with the tension member, and lost motion mechanism adapted to cause a thrust of the thrust member to be converted into a pull upon the tension connection, whereby lateral thrust on the pump is avoided.

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