

June 4, 1940.

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2,203,464

PUMP

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2 Sheets-Sheet 1

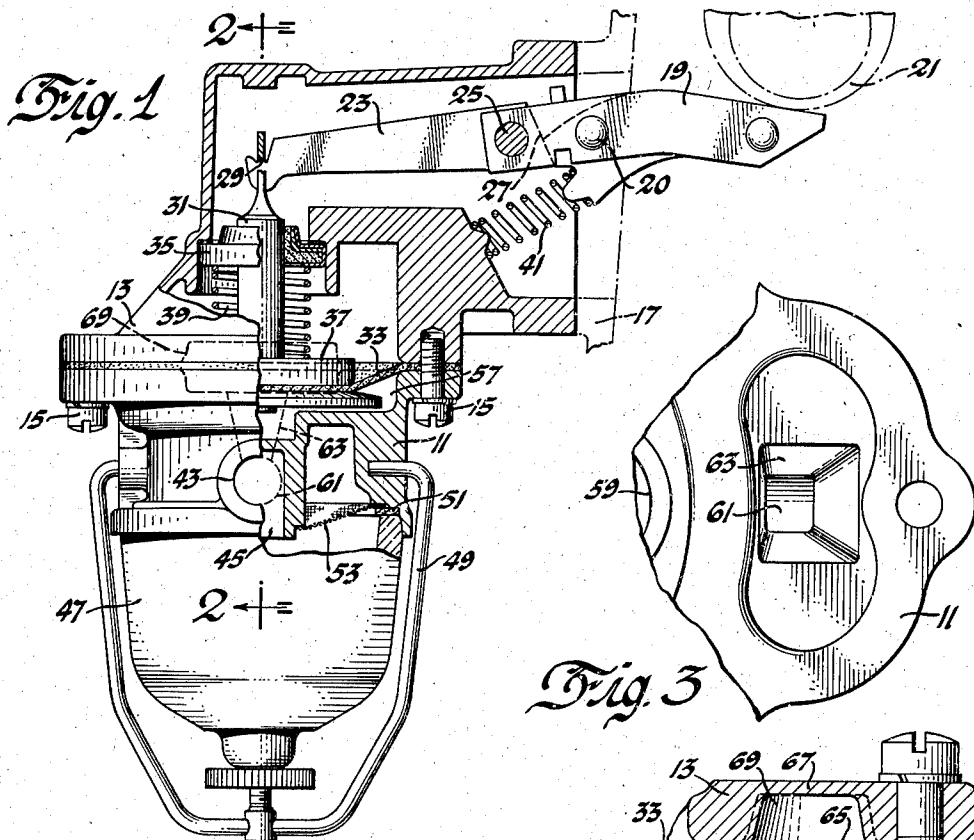


Fig. 3

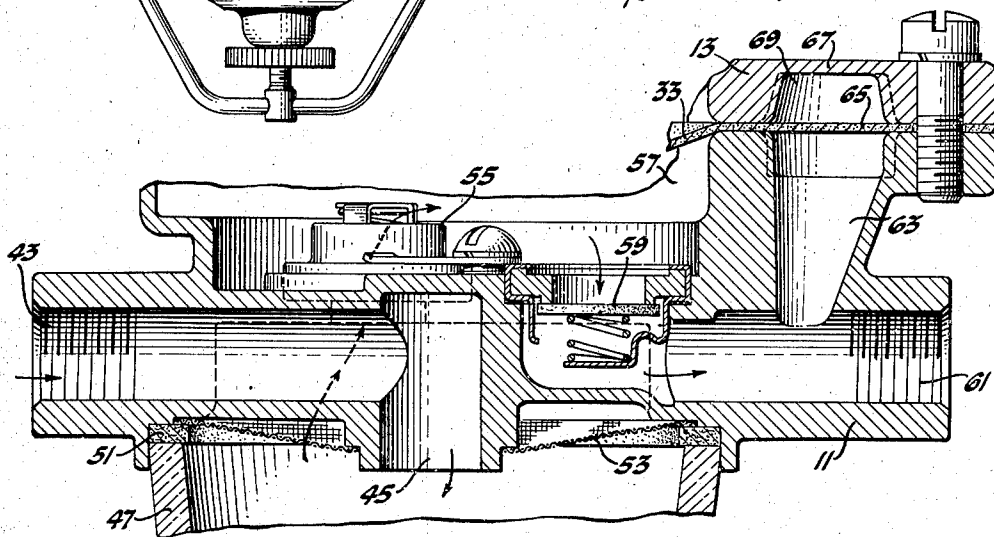


Fig. 2

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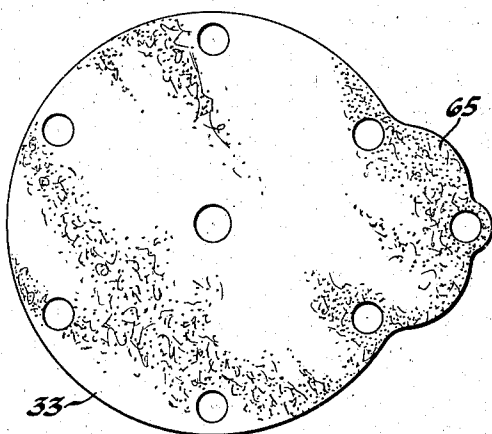


Fig. 4

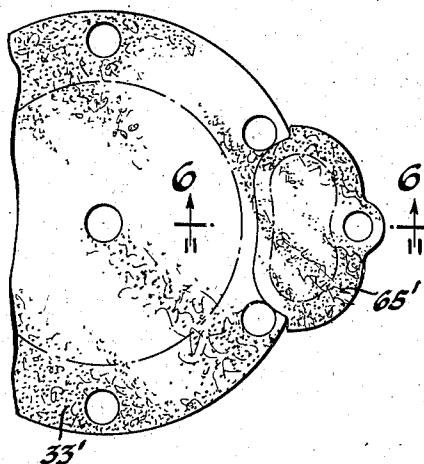


Fig. 5

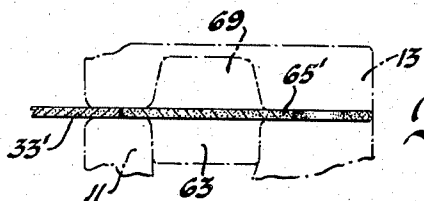


Fig. 6

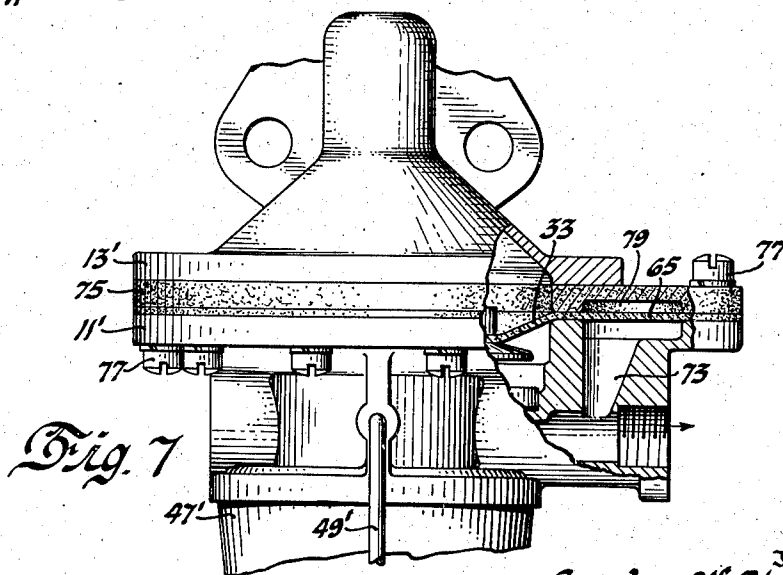


Fig. 7

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UNITED STATES PATENT OFFICE

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Application April 1, 1938, Serial No. 199,491

5 Claims. (Cl. 103—150)

This invention relates to pumps and has been designed particularly to serve as a fuel pump for gasoline engines.

An object of the invention is to provide such a pump with an improved pulsator to aid in producing a uniform discharge of fuel.

Another object is to incorporate the pulsator within the castings which constitute the housing members of the pump.

A still further object is to provide a pulsator having an insulating part.

Other objects and advantages will be understood from the following description.

In the drawings:

Figure 1 is a view of the pump partly in elevation and partly in vertical section.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a fragmentary detail in plan of the pump body.

Figure 4 is a plan view of a combined pump diaphragm and pulsator diaphragm.

Figure 5 is a plan view of the pump diaphragm associated with a separable pulsator diaphragm.

Figure 6 is a section on line 6—6 of Figure 5.

Figure 7 is an elevation partly in section of an installation employing an insulating ring.

Referring to Figures 1 to 4, numeral 11 represents the body of the pump and 13 is the top, the parts 11 and 13 being secured together by cap screws 15. When the pump is mounted on the casing 17 of the engine a lever 19 pivoted in the top 13 at 20 is adapted to be engaged by a cam 21 and rocked in a clockwise direction. A lever extension 23 pivoted to the end of lever 19 at 25 is adapted to be engaged with the lever along a wall 27. When so engaged the lever and extension rock as a unit. The lever extension 23 is connected as at 29 to a stem 31 which is secured to a flexible diaphragm 33, the diaphragm being secured between the body and top members by the fastening means 15. The stem passes through a suitable seal designated by numeral 35 and between the seal and the upper diaphragm plate 37 is a discharge spring 39. A spring 41 between the top member and the lever 19 holds the lever in contact with the cam, the rotary movements of the lever produced by the cam cooperate with the spring 39 in making the vibratory movements of the pump diaphragm thereby making the chamber beneath the diaphragm one of variable volume. Figure 2 shows the pump body provided with an opening 43 for the admission of fuel. This opening communicates by means of passage 45 with the interior of a filter and sediment collecting cup 47. This cup is held

in position beneath the body by means of a ball 49 as is customary in fuel pumps, leakage being prevented by gasket 51. A filtering screen 53 covers the top of the cup 47 and is held in position between the gasket and the body. After being freed from sediment the fuel passes upwardly through filter 53 and through an inlet valve 55 into the pump chamber, this pump chamber being the region immediately below the diaphragm as stated above and marked 57. From the chamber 57 the fuel passes through an outlet valve 59 and is discharged through an outlet passage 61. The body casting is formed with the opening or recess 63 communicating with the discharge passage 61. The diaphragm, instead of being circular, has a radial extension 65 (Figure 4) covering the opening 63. The pump top member has an extension 67 provided with a recess 69 registering with the recess 63. The extension of the diaphragm as shown in Figure 2 separates the recess 63 from the recess 69. When the fuel is being discharged through passage 61 the recess 63 with the flexible diaphragm 65 and the upper chamber 69 serves the purpose of a pulsator to aid in providing a uniform discharge of fuel.

It will be appreciated that the diaphragm extension 65 need not be an integral part of the diaphragm. Figures 5 and 6 show the flexible diaphragm of the pulsator as separable from the diaphragm of the fuel pump. In these figures the diaphragm for the fuel pump is marked 33' and the diaphragm for the pulsator is marked 65'.

In Figure 7 is shown a somewhat modified form. In this form the body is marked 11' and is not different in any essential way from the body of the pump shown in Figure 1. In this figure I have shown the equivalents of the filter cup and the ball designated by numerals 47' and 49'. The body portion of the pump is formed with a recess 73 corresponding to recess 63 of Figure 2. The diaphragm covering this recess is marked 65, inasmuch as it is shown as an integral part of diaphragm 33. It will be understood that the flexible diaphragm for the pulsator might be made separable instead of integral if desired and as shown in Figures 5 and 6. Between the body 11' and the top 13' is an annulus 75 of fibrous heat insulating material. Fastening means 77 are used to secure together the body part, the fibre annulus and the top. The fibre annulus, rather than the top, is in this embodiment of the invention, provided with a recess 79 registering with recess 73 and overlying the diaphragm 65. Two advantages are inherent in this modified form of

the invention. The fibre ring serves to prevent the transfer of heat between the top portion and the body of the pump. In many installations it is desired to secure the top and body portions

- 5 of the pump in changed positions of circumferential adjustment. This is not provided for in the form shown in Figure 1 where the recesses 69 and 63 in the top and in the body require a definite relative position of the top and body. In this
- 10 second form of the invention, however, it is only necessary to maintain the relative circumferential position of the fibre annulus with the body, the top 13' being capable of relative adjustment circumferentially as may be desired for any specific installation.

I claim:

1. In a fuel pump, a body member formed with a pump chamber and a valved outlet therefrom, a second member secured to said body member, a
- 20 flexible diaphragm between said body member and second member over said pump chamber to vary the volume of said pump chamber, said body member having a recess in communication with said outlet, said second member having a
- 25 pocket opposite said recess, a flexible diaphragm

clamped between said members and separating said recess and pocket, said diaphragm and pocket forming a sealed chamber to act as a pulsator.

2. The invention defined by claim 1, said second member including a first part of annular form for containing said pocket and a separable second part adapted to support said fuel pump and arranged to be secured to said first part and body member in circumferentially adjusted positions to facilitate assembly.

3. The invention defined by claim 1, said pump diaphragm and pulsator diaphragm being integral.

4. The invention defined by claim 1, said pump diaphragm and pulsator diaphragm being coplanar.

5. The invention defined by claim 1, said second member including a first part of annular form for containing said pocket and a separable second part adapted to support said fuel pump and arranged to be secured to said first part and body member in circumferentially adjusted positions to facilitate assembly, said annular part being composed of fibrous material.

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