

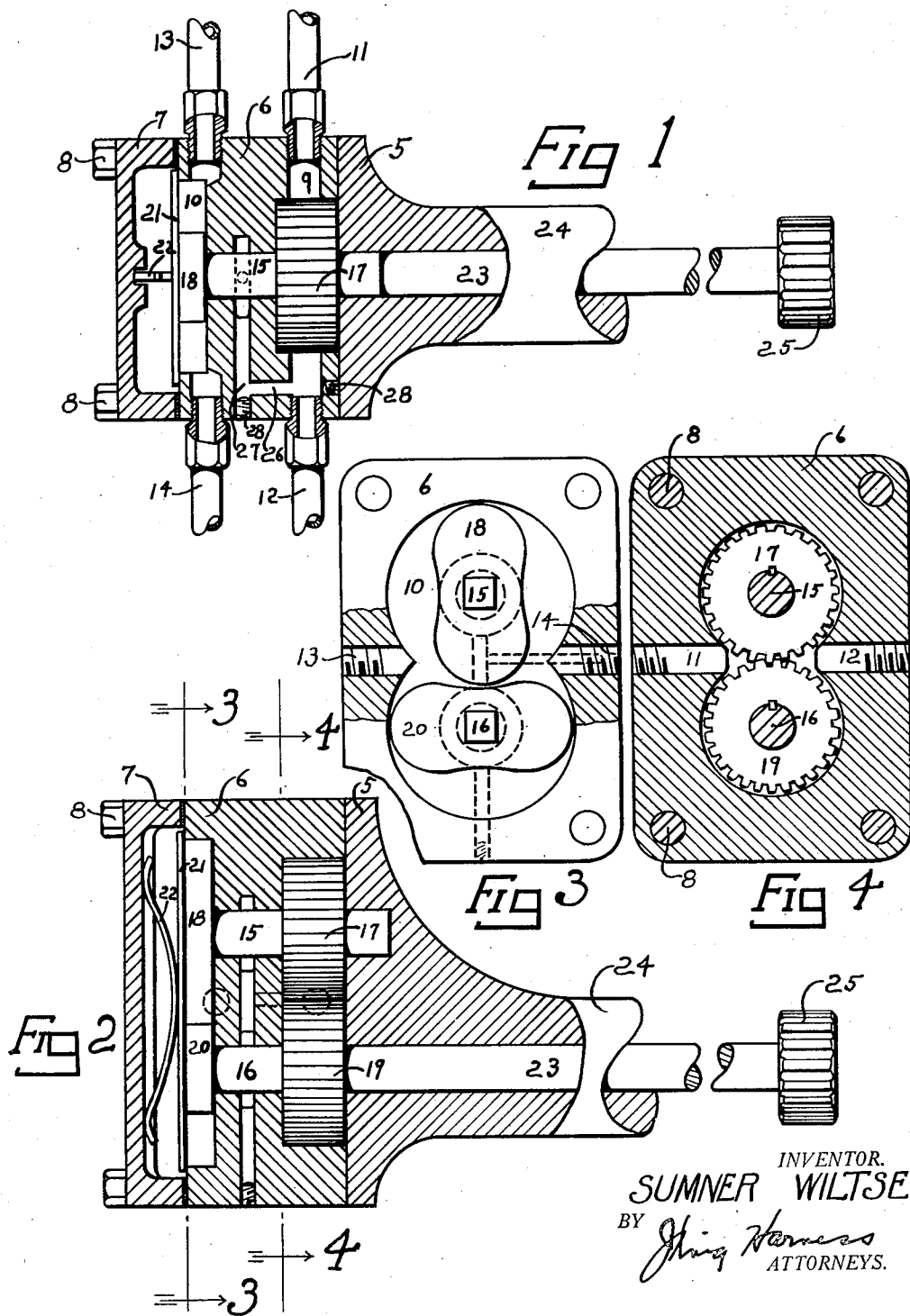
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S. WILTSE

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PUMP

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SUMNER WILTSE, OF DETROIT, MICHIGAN, ASSIGNOR TO WILTSE APPLIANCE CO., A CORPORATION OF MICHIGAN

PUMP

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This invention relates to pumps, and is an improvement of the construction shown and claimed in my application for Letters Patent of the United States filed April 1st, 1927, Serial No. 180,176, on improvements in pumps.

It is the primary object of my invention to provide a combined fuel and oil pump which may be utilized on internal combustion engines, and I have so arranged the parts thereof that the two pumps may be actuated through a single shaft and may be contained in a single housing.

A further object of my invention is to provide a simple and efficient means for sealing the shaft or shafts which extend between the two pump compartments so that the fluid from one compartment may not flow into the other. Specifically, I have provided a passage which communicates with the shaft or shafts at one end, and with the outlet passage from one compartment at the other, so that the pressure of the fluid in said compartment may be constantly applied to and around the shaft or shafts to prevent fluid from the other compartment passing along the shaft or shafts into the first compartment.

It is common practice in the building of internal combustion engines to supply therewith an oil pump for furnishing oil under pressure to the various parts of the engine, and I have made a unitary housing for such an oil pump which will also enclose a fuel pump for delivering fuel to the engine so that a minimum of extra parts for the second pump is necessary.

With the above and other objects in view, my invention consists in the arrangement, combination and construction of the various parts of my improved device, as described in the specification, claimed in my claims and shown in the accompanying drawing, in which:

Fig. 1 is a sectional view of a pump utilizing my device.

Fig. 2 is a sectional view taken at right angles to that of Fig. 1.

Fig. 3 is a view taken on line 3—3 of Fig. 2.

Fig. 4 is a view taken on line 4—4 of Fig. 2.

I have shown a unitary pump housing

which is composed of the three major portions 5, 6 and 7 secured together by a plurality of studs 8. The member 6 acts as a partition dividing the housing into compartments 9 and 10. The compartment 9 is provided with an inlet pipe 11 and outlet pipe 12. The compartment 10 is provided with an inlet pipe 13 and outlet pipe 14.

Positioned in the partition are shafts 15 and 16. The shaft 15 has secured thereon a gear 17 and a rotor 18, while the shaft 16 has secured thereon a gear 19 and rotor 20. The gears 17 and 19 are constantly in mesh and are adapted to act as pumping elements for drawing oil through the inlet 11 and forcing it out through the outlet 12, while the rotors 18 and 20 are constantly meshed and adapted to draw fuel through the inlet 13 and force the same out through the outlet 14. A relief for the fuel pump is provided by the plate 21 which closes one end of the pump chamber 10 and is yieldingly held in place by the spring 22 which bears at its center against the plate and at its ends against the face of the member 7.

A shaft 23 is extended through projection 24 on the member 5 of the housing, the said shaft either being integral with the shaft 16 or secured thereto at one end and being provided with a gear 25 or some other suitable means for connecting the same to a rotating part of the engine. It will be readily apparent that rotation of the shaft 23 will produce rotation of the shaft 16 and its gear 19 and rotor 20. Rotation of the gear 19 will cause rotation of the gear 17 and shaft 15 to thereby rotate the rotor 18 in uniformity with the rotation of the rotor 20 so that both sets of pumping mechanism will be simultaneously operated.

In order to prevent the leakage of gasoline from the compartment 10 into the compartment 9, I have provided a passage 26 communicating with the outlet passage of the compartment 9 and leading through passage 27 to and around each of the shafts 15 and 16 so that the pressure from the gear 19 may be exerted through the passages 26 and 27 against the shafts 15 and 16 to react against any pressure of the fuel in the chamber 9 and

thereby prevent the passage of fuel along the shafts 15 and 16 into the compartment 9. The passages 26 and 27 may be drilled into the center portion 6 after the formation of the same and closed with suitable plugs such as 28.

It will be obvious that various changes may be made in the arrangement, combination and construction of the various parts of my improved device without departing from the spirit of my invention, and it is my intention to cover by my claims such changes as may be reasonably included within the scope thereof.

What I claim is:

1. A device of the class described comprising a unitary housing, a partition dividing the housing into two compartments, an inlet and outlet passage for each compartment, pumping mechanism in each compartment, a shaft connecting the mechanism in one compartment to that in the other for operating the two simultaneously, said shaft bearing in said partition, and a lead extending from the discharge side of one of said mechanisms to said shaft bearing.

2. A device of the class described comprising a unitary housing, a partition dividing the housing into two compartments, an inlet and outlet passage for each compartment, a shaft extending through the partition and outside the housing, said shaft bearing in said partition pumping mechanism in each of said compartments adapted to be actuated by said shaft, and an auxiliary passage connecting the outlet of one of said mechanisms with said shaft bearing.

3. A device of the class described comprising a unitary housing, a partition dividing the housing into two compartments, an inlet and outlet passage for each compartment, pumping mechanism in each compartment, a shaft extended through the partition for operating the mechanism, and a passage communicating with the outlet of one compartment and leading to said shaft at a point within said partition for applying the pressure of said outlet to said shaft.

4. A device of the class described comprising a unitary housing, a partition dividing the housing into two compartments, an inlet and outlet passage for each compartment, pumping mechanism in each compartment, a shaft extended through the partition for operating the mechanism, and a passage communicating with the outlet of one compartment and leading to a point intermediate the end of said shaft for applying the pressure of the outlet to said shaft, said latter passage being formed in the partition and communicating with the shaft within the partition.

5. A device of the class described comprising a unitary housing, a partition dividing the housing into two compartments, an inlet and outlet passage for each compart-

ment, a pair of shafts extended through the partition into said compartments, a pair of meshing gears adapted to act as pump elements mounted in one compartment on said shafts and a pair of pumping rotors mounted in the other compartment on said shafts, means for rotating one shaft to cause it, through the intermeshed gears, to rotate the other shaft and thereby rotate the pumping mechanism in each compartment, and a passage formed within said partition encircling said shafts and connected to the outlet side of the gear compartment.

6. In combination, a casing provided with a pair of recesses, a partition between said recesses, a pair of spaced shafts extending through said partition into said recesses, a multi-lobed pump rotor secured to each of said shafts in one of said recesses, a gear secured to each of said shafts in the other of said recesses, said gears meshing with each other whereby to constrain said rotors to move in a predetermined relationship with respect to each other, inlet and outlet passages for the first mentioned recess, inlet and outlet passages for the second mentioned recess and a passage connecting the outlet of the second mentioned recess with said shafts within said partition whereby the liquid transmitted through said passage to said shafts will seal said shafts against the passage of liquid from the first mentioned recess to the second mentioned recess.

7. In combination, a casing provided with a recess in each end thereof, separated by a partition, a pair of spaced parallel shafts extending through said partition into each of said recesses and bearing in said partition, a bi-lobed rotor secured to each of said shafts in one of said recesses, a gear secured to each of said shafts in the other of said recesses, said gears meshing with each other whereby to constrain said rotors to proper relative movement with respect to each other, a fuel inlet and a fuel outlet opening for the recess in which said rotors are positioned, an oil inlet and an oil outlet opening for the recess in which said gears are positioned, and means for conveying oil from the outlet side of the recess in which said gears are positioned to said shafts within said partition.

8. In combination, a casing provided with a recess in one face thereof, a recess in the other face thereof, a partition separating said recesses, a fuel inlet and a fuel outlet passage for the first mentioned recess, an oil inlet and an oil outlet passage for the second mentioned recess, a pair of spaced parallel shafts extending through said partition and into each of said recesses, said shafts bearing in said partition, a rotor secured to each of said shafts in the first mentioned recesses, said rotors co-acting with each other and the walls of the first mentioned recess to form a fuel pump, a gear secured to each of said

shafts in the second mentioned recess, said gears meshing with each other to constrain said rotors to a predetermined movement with respect to each other and co-acting with the walls of said second mentioned recess to form an oil pump, a lead extending from the outlet side of said second mentioned recess to said shafts within said partition, and yieldable means actuated by the pressure of the fuel for preventing the pressure of fuel in the first mentioned recess from exceeding the normal pressure of oil in the second mentioned recess.

9. In combination, a pump comprising a housing provided with a pair of recesses enclosing a pair of pump elements, said pump elements being separated by a wall and being connected together for equal rotation by a shaft extending through and having bearing in said wall, a fuel inlet and a fuel outlet for one of said recesses, an oil inlet and an oil outlet for the other of said recesses, and means for conducting oil from said oil outlet to said bearing for said shaft whereby to form a liquid seal for said bearing to prevent entrance of fuel to said bearing and to provide lubrication therefor, said bearing being otherwise free of packing.

10. In combination, a pump comprising a housing provided with a pair of recesses enclosing a pair of pump elements, said pump elements being separated by a wall and being connected together for equal rotation by a shaft extending through and having bearing in said wall, a fuel inlet and a fuel outlet for one of said recesses, an oil inlet and an oil outlet for the other of said recesses, means for conducting oil from said oil outlet to said bearing for said shaft whereby to form a liquid seal for said bearing to prevent entrance of fuel to said bearing and to provide lubrication therefor, said bearing being otherwise free of packing, and means for preventing the pressure of said fuel from being equal or greater than the pressure of said oil at said bearing during normal operation of said pump.

SUMNER WILTSE.