

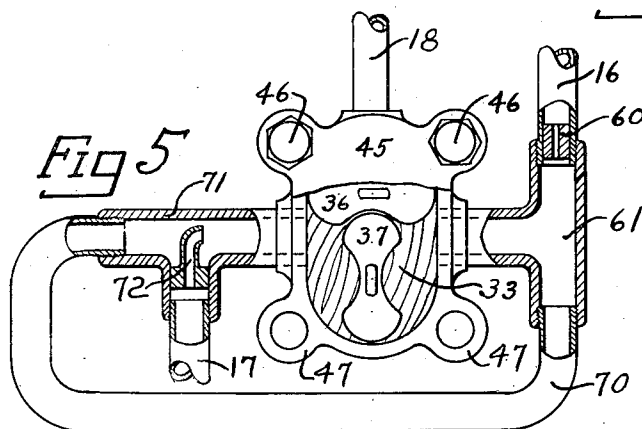
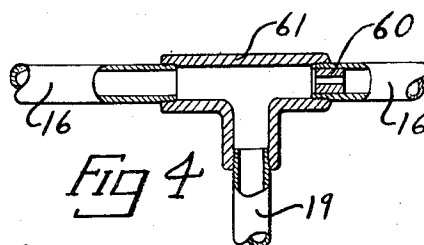
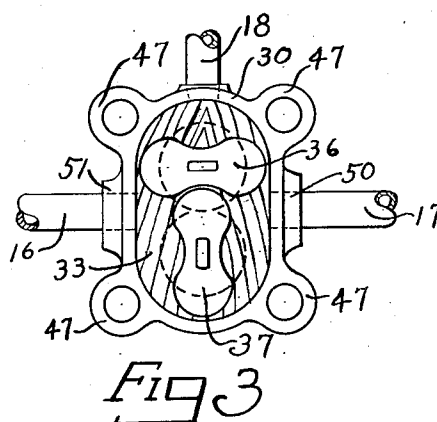
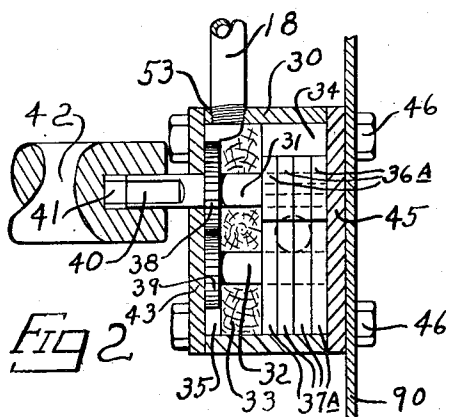
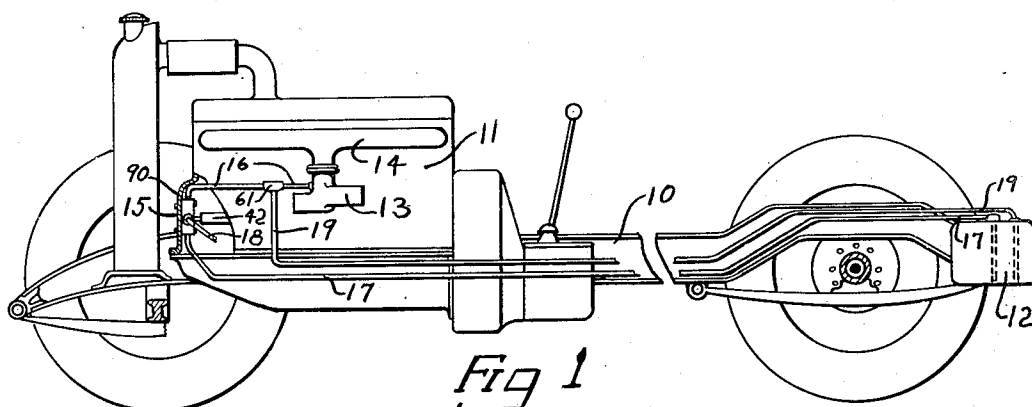
Jan. 14, 1930.

S. WILTSE

1,743,582

FUEL PUMP

Filed April 1, 1927



INVENTOR.
SUMNER WILTSE.
BY
J. H. Harness
ATTORNEYS.

UNITED STATES PATENT OFFICE

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

FUEL PUMP

Application filed April 1, 1927. Serial No. 180,177.

One of the objects of my invention is to provide an efficient fuel pump for internal combustion engines.

Another object of my invention is to provide a fuel pump for an internal combustion engine having a minimum of moving parts.

A further object of my invention is to provide a fuel pump for internal combustion engines which may be effectively sealed against leakage.

With these 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 drawings, in which:

Fig. 1 is an elevation of an automobile chassis having an engine and fuel tank thereon to which my device is applied.

Fig. 2 is a sectional view of my device.

Fig. 3 is an end elevation of my device with cover plate removed showing the disposition of pumping rotors therein.

Fig. 4 is a detail, having parts broken away, of the joint between my fuel return line and the carburetor feed line.

Fig. 5 is a view of my device with parts broken away, showing modified means of disposing of excess fuel.

I have shown an automobile chassis 10 having an engine 11 and fuel tank 12 mounted thereon. A carburetor 13 is disposed adjacent and connected to intake manifold 14 of the engine 11. Secured to the forward part of the engine crankcase 90 adjacent the end of the camshaft and within the crankcase is my pumping mechanism 15 which is connected with the carburetor 13 by the pipe 16 and with the fuel tank 12 by the pipe 17. Oil is carried from the engine crankcase into my device by the pipe 18, and excess fuel is conveyed from the pipe 16 by the pipe 19 to the fuel tank 12. The pumping mechanism of my fuel supply system comprises a casing 30 within which are positioned two parallel shafts 31 and 32 which are journaled in a partition 33, which divides casing 30 into two separate compartments 34 and 35, and which may preferably be of wood suitably treated to form bearings. I prefer to use wood bear-

ings because of their tendency to tighten in the presence of liquid.

Secured to the adjacent ends of shafts 31 and 32 in compartment 34 are rotor blades 36 and 37 which are of the shape shown in Fig. 3, and each of which is composed of a plurality of plates 36^a and 37^a (Fig. 2). Secured to the shafts 31 and 32 in compartment 35 are gears 38 and 39 which mesh with each other. Shaft 31 is extended through a suitable opening in the cover 43 of the casing 30 and is flattened at its end 40 and fitted in a suitable slot 41 in the end of camshaft 42. The shafts 31 and 32 are so positioned and the rotor blades 36 and 37 are of such dimension as to just clear each other in rotation and clear the sides of the casing 30, so as to avoid undue wear from gritty particles in the fuel. A cover plate 43 is provided for compartment 35 and a cover plate 45 is provided for compartment 34, both of which are secured to casing 30 by bolts 46 which are extended through apertures 37 in casing 30 and into suitable apertures in the crankcase 90 of the engine 11, adjacent the front end of the camshaft 42. In order to secure a tight joint between covers 43 and 45 and casing 30, lead gaskets may be used and clamped therebetween.

An aperture 50 is provided in one side of casing 30 leading into chamber 34, and is fitted with a fuel inlet pipe 17 which leads from the fuel tank 12. The opposite side of casing 30 is provided with an aperture 51 which leads from chamber 34 and in which is fitted a pipe 16 leading to the carburetor 13. Casing 30 is also provided with an aperture 53 leading into chamber 35 which is fitted with a pipe 18 leading from the oil pump of the engine (not shown).

The pipe 16 adjacent the carburetor 13 is provided with a restriction valve 60 which regulates the amount of gasoline carried to the carburetor. The pipe 16 between the pump 15 and carburetor 13 is provided with a T coupling 61 in which is fitted a pipe 19 which leads to the fuel tank 12 and which serves to return to the fuel tank 12 excess gasoline refused by the restriction valve 60. The intake pipe 17 and the return pipe 19 are both inserted through the top of the gasoline tank

12 and extended to a point adjacent the bottom thereof in order to prevent all gasoline from draining from the intake and return lines when the pump is not operating.

5 In operation, the camshaft 42 drives the shaft 31 carrying the gear 38 which meshes with gear 39, thereby driving shaft 32. Thus, the rotors 37 and 36 are operated in compartment 34 and will draw gasoline through the
10 pipe 17 from the tank 12 into the chamber 34 and force it out through pipe 16 to the carburetor 13 whence it proceeds through the intake manifold 14 to the cylinders of the engine 11. The oil pump of the engine to
15 which is connected the pipe 18, will force oil into the chamber 35 around the gears 38 and 39, and will maintain the same therein under a greater pressure than is built up in the chamber 34, and will therefore effectually
20 prevent any seepage of gasoline through the partition 33 around shafts 31 and 32. Any oil which will escape around the extended end 40 of the shaft 31 will drop back into the crankcase of the engine.

25 The restriction valve 60 will prevent overloading the carburetor, and the return line 19 will convey excess gasoline back to the fuel tank 12. By inserting the inlet and return lines 17 and 19 into the top of the fuel tank 12
30 and then carrying said lines forward on a level below the top of the tank, I have insured a constant supply of gasoline in the lines when the pump is not operated, and which will assist the pump 15 in priming itself.

35 In order to avoid the wear produced by the abrasive quality of gasoline I have arranged the rotors 36 and 37 so that they do not contact with each other or with the sides of the chamber 34 in rotating. Thus wear is elimi-
40 nated and the seepage space which is provided as a result of spacing the rotors so that they do not bear against each other or in the casing remains constant at all times, and the rotors being driven directly from the cam-shaft,
45 the gasoline delivered thereby to the carburetor will be in direct proportion to the engine speed.

In Fig. 5 I have shown a modified means of caring for surplus gasoline which com-
50 prises a return by pass 70 connected with coupling 61 and leading to a coupling 71 into which the inlet pipe 17 leads and which is connected with the inlet side of the chamber 34. A restriction valve 72 is provided at the
55 end of the intake pipe 17 where it joins coupling 71. The restriction valve 72 will prevent the fresh intake from interfering with the returned excess.

It will be obvious that various changes may
60 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
35 reasonably included within the scope thereof.

What I claim is:

1. A fuel pump comprising in combination, a pair of adjacent chambers divided by a partition, a pump element in one chamber, a shaft extended through the partition and connected with said element, a lubricant
70 lead connected with the second chamber, and means for producing a greater pressure on the lubricant in the second chamber than in the pump chamber to prevent leakage of fluid
75 therefrom around said shaft.

2. A pump for a lubricant destructive liquid comprising, in combination, a pair of adjacent chambers divided by a partition, a pump element in one chamber for moving
80 said liquid, a shaft extended through the partition and connected with said element, a lubricant lead connected with the second chamber, and means for producing a greater pressure on said lubricant in the second chamber
85 than in the pump chamber to prevent leakage of fluid therefrom around said shaft and for maintaining lubrication of said shaft.

3. A pump for a lubricant destructive liquid for use in connection with an internal
90 combustion engine having a pressure lubricating system comprising, in combination, a pair of chambers divided by a partition, a shaft extended through the partition into both chambers, a pump element on the shaft
95 in one chamber, inlet and outlet connections for said liquid leading to and from said chamber, a connection from the pressure lubricating system leading into the second chamber, and means for rotating the shaft
100 to cause the pump element to function, the greater pressure of the lubricant in the second chamber tending to offset the pumping pressure in the other chamber to prevent leakage of fluid from the first to the second
105 chamber and to prevent said fluid from destroying the lubrication of said shaft.

4. In combination, a fuel supply tank and a fuel pump having an inlet connected with the tank, a pump outlet having less capacity
110 than the inlet, a constantly open relief passage to the supply tank, the connection of the relief passage with the supply tank being positioned above a substantial part of said pas-
115 sage.

5. In combination, a fuel supply tank and a fuel pump having an inlet connected with the tank, a permanently restricted pump outlet having less capacity than the inlet, a relief passage having a fixed opening lead-
120 ing to the supply tank, the connection of the relief passage with the supply tank being positioned above a substantial part of said passage, said passage leading back to the inlet passage.
125

6. In combination, a fuel supply source and a fuel pump having an inlet connected with the source, a pump outlet having less capacity than the inlet, a relief passage to the supply source, the connection of the relief
130

passage with the supply source being positioned above a substantial part of said passage, said passage leading back to the inlet passage, and a baffle being positioned at the juncture of the inlet and relief passages to prevent conflict of liquid in the two passages.

up on said liquid by said element whereby to prevent leakage of said liquid from said housing about said shaft, said shaft being otherwise free of packing.

12. In a pump for a lubricant destructive liquid, in combination, a housing having a chamber therein, a displacing element for said liquid in said chamber, a rotatable shaft extending into said housing and having a bearing therein operatively connected to said element for driving the same, said housing being provided with an inlet and an outlet for said liquid leading to and from said chamber, and means for introducing lubricant to said shaft bearing under a pressure greater than the pressure which said element builds up on said liquid whereby said bearing is kept free of said liquid and liquid is prevented from escaping from said housing past said shaft.

13. A fuel pump for internal combustion engines comprising, in combination, rotative fuel displacing means, a housing for said means, a rotatable shaft journaled in said housing for driving said rotative fuel displacing means, a lubricant chamber in said housing surrounding said shaft, and means whereby lubricant from said engine under pressure greater than the pressure of said fuel is introduced into said chamber for sealing said housing against fuel leakage about said shaft and maintaining the lubrication of said shaft.

14. In a liquid fuel pump, in combination, a housing provided with a pumping chamber, a fuel inlet and a fuel outlet for said chamber, a rotatable pump element in said chamber, a rotatable shaft extending into said housing and connected to said element for driving the same, said shaft having a bearing in said housing, and means for introducing lubricant to said bearing for said shaft at a pressure greater than the pressure built up on the fuel in said chamber, said shaft having sufficient clearance with respect to said bearing to permit a limited flow of lubricant about said shaft into said chamber.

15. In combination, a pump for a lubricant destructive liquid comprising a casing, a pump element in said casing, a shaft extending through said casing and drivingly engaging said pump element, a bearing for said shaft in said casing, and means for subjecting said bearing to lubricating oil under a pressure superior to any pressure simultaneously built up by said pump during operation of said pump.

SUMNER WILTSE.

7. A fuel pump comprising in combination, a casing provided with a recess in one face thereof, a recess in the other face thereof, a partition dividing said recesses, an inlet and outlet passage for the first 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 recess, 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 and constraining said rotors to a predetermined movement with respect to each other, means for introducing oil under pressure to the second mentioned recess to lubricate said bearings and to seal said pump against leakage of fuel through said partition, and relief means for preventing the pressure of fuel in said first mentioned recess from exceeding the normal pressure of oil in said second mentioned recess.

8. In combination, a pump, a fluid circuit between the inlet and outlet thereof adapted to be maintained constantly open, a supply means connected with said circuit adjacent said inlet, and a discharge means connected with said circuit, said supply means including a duct opening in the direction of flow within said circuit.

9. In combination, a pump, a fluid circuit between the inlet and outlet thereof adapted to be maintained constantly open, a supply means connected with said circuit adjacent said inlet, and a discharge means connected with said circuit, said discharge means including a fixed restriction of materially less capacity than said circuit.

10. In a pump for lubricant destructive liquids, in combination, a housing, a liquid displacing element in said housing, a rotatable shaft extending into said housing for driving said element, a liquid inlet and a liquid outlet in said housing, and means for subjecting the exterior of said shaft to a lubricant under a superior pressure than the pressure built up on said liquid by said element whereby to prevent leakage of said liquid from said housing about said shaft.

11. In a pump for lubricant destructive liquids, in combination, a housing, a liquid displacing element in said housing, a rotatable shaft extending into said housing for driving said element, a liquid inlet and a liquid outlet in said housing, and means for subjecting the exterior of said shaft to a lubricant under a superior pressure than the pressure built

70

75

80

85

90

95

100

105

110

115

120

125

130

4

CERTIFICATE OF CORRECTION.

Patent No. 1,743,582.

Granted January 14, 1930, to

SUMNER WILTSE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 114, claim 15, for the misspelled word "destructure" read "destructive"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of February, A. D. 1930.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.