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L. CHEVROLET ET AL

1,866,083

FUEL PUMP

Filed Jan. 16, 1930

FIG. 1

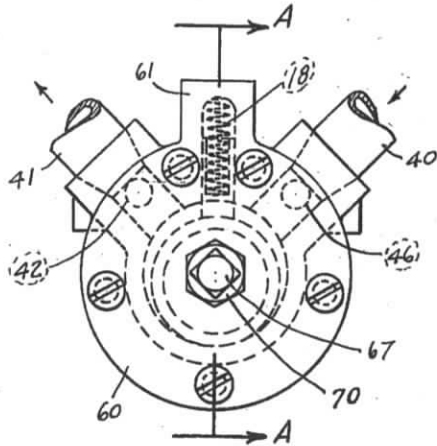


FIG. 2

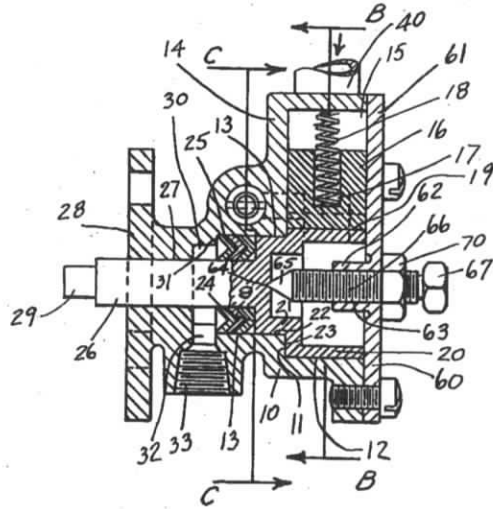


FIG. 3

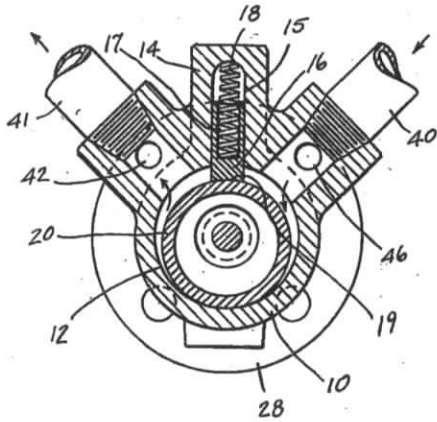


FIG. 4

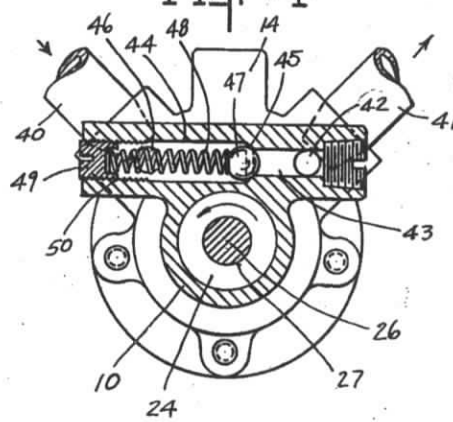
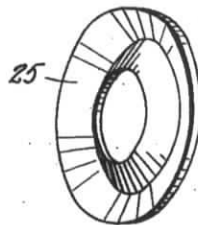


FIG. 5



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LOUIS CHEVROLET AND CHARLES L. CHEVROLET, OF INDIANAPOLIS, INDIANA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE GLENN L. MARTIN CO., OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND

FUEL PUMP

Application filed January 16, 1930. Serial No. 421,093.

This invention relates to a fuel pump construction.

The principal object of this invention is to produce a fuel pump of but few parts, these simple in design and compactly arranged so that accessibility for assembling and maintenance of position with a minimum of wear after assembly is attained.

The main feature of the invention is the provision of a single vane normally constrained for continuous engagement with a cylindrical rotor type piston which is mounted for eccentric rotation within a cylindrical chamber, the vane being positioned between the intake and outlet of the pump construction and the rotor being provided with a plurality of thrust bearings, one of which is in opposition to a pressure lubricated bearing support.

Another feature of the invention is the provision of an effective means for preventing the entry of pressure-fed lubricating oil into the fuel chamber.

The accompanying drawing is briefly described as follows:

Fig. 1 is an end view of a pump construction embodying the invention herein set forth.

Fig. 2 is a longitudinal section taken on line A—A of Fig. 1.

Fig. 3 is a transverse section taken on line B—B of Fig. 2.

Fig. 4 is a transverse section taken on the broken line C—C of Fig. 2.

Fig. 5 is a perspective view of a packing washer for the shaft in Fig. 2.

In the drawing, 9 indicates a rotor, 10 indicates a pump body having a flat wall 11 surrounded by a cylindrical wall 12 and provided with a central bore or opening 13 coaxial with the cylindrical chamber. The body includes a lug 14 recessed as at 15 in which is slidably mounted a vane 16 recessed as at 17 and interposed between the backs of the recess 15 and the recess 17 is a spring 18

that normally projects vane 16 outwardly into the cylindrical chamber of the pump. Face 19 of vane 16 is substantially arcuate in transverse section so that it has an appreciable area for making intimate contact with a cylindrical piston rotor 20, which comprises a hollow cylindrical piston 20, in eccentric relation to a hollow portion 21, having a plurality of bearing faces 22—23—24 and a co-axial shaft portion 26, is rotatably mounted within body 10 in operative relation to vane 16. Face 23 bears against wall 11 for sealing piston 20 against leakage of fuel from the chamber, and face 24 abuts a plurality of ridged annular washers 25 for sealing against leakage of oil into the chamber. Washers 25 are fabricated from suitable packing material such as leather. Body 10 is provided with a relatively elongated bearing portion 27 for shaft 26. The end of shaft 26 projects through an anchoring plate 28 and end 29 is squared or otherwise fashioned so that it may mount a gear or the like which is adapted to engage a gear or the like of an engine so that the pump can supply liquid fuel to the carburetor of the engine.

The rotor and shaft bearing portion 13—27 are connected by an intermediate portion which includes lubricant passage 30 and shoulder portion 31 encircling the shaft. Wedge faced packing washers 25 encircle shaft 26 and are confined between face 24 and shoulder 31. Passage 30 to which the adjacent of washers 25 is exposed communicates at 32 with a threaded inlet 33 that is adapted to connection with a pressure source of lubrication for the shaft bearings and for forcing washers 25 into an oil tight relation with the surface of bore 13, face 24 and shaft 26 whereby the lubricant is sealed from the fuel in the pumping chamber.

The cylindrical chamber includes an intake 40 and an outlet 41. The intake 40 is connected to a suitable source of fuel and outlet 90

41 can be connected to the carburetor of the engine. A by-pass is provided to prevent flooding the carburetor. By-pass 44 is provided with a valve seat at 45 and communicates with outlet 41 at 42 and with intake 40 at 46. A ball 47 bears upon the seat 45 and constitutes a relief valve, the ball being restrained to seat 45 by spring 48, the relief pressure of which is governed by adjusting plug 49 in the threaded end 50 of the enlarged portion of by-pass 44. Excessive pressure in outlet 41 will force ball 47 from seat 45 to thereby open by-pass 44 for return flow of fluid to intake 40 until the outlet pressure reduces to a value less than the adjusted pressure of spring 48.

The cylindrical chamber and recess 15 are closed by a single cover construction 60 having the extension 61. Cover 60 includes a boss 62 which is apertured and internally threaded at 63 in co-axial alignment with shaft 26. The cylinder exposed portion of the shaft proper includes a central seat portion 64 that receives a conical end 65 of a threaded screw bolt 66 having threaded engagement with the interiorly threaded portion 62 carried by the cover. The head 67 of the screw bolt 66 insures proper adjustment so that the face 23 of the piston is maintained in intimate contact with face 11 of the cylinder. A lock nut 70 retains the thrust bearing screw bolt 66 in the adjusted position.

The construction as set forth provides a fuel pump of few parts, one of which is rotative and another of which is reciprocative, and lubrication for the shaft is effectually attained in a manner whereby the lubricant is protected against dilution by fuel and the fuel is protected against contamination by the lubricant. Wearing away of moving parts is reduced to a minimum and compensation for inevitable wear is provided.

The invention claimed is:

1. A pump device including in combination, a pump body having a cylindrical chamber; a co-axially mounted rotor including an eccentrically supported cylindrical piston; a radially movable vane supported by the body and normally constrained toward piston engagement; said rotor being hollow, open at one end and having a shaft extension at the opposite end; and a thrust bearing interiorly mounted within the rotor.

2. A pump device including in combination, a pump body having a cylindrical chamber; a co-axially mounted rotor including an eccentrically supported cylindrical piston; a radially movable vane supported by the body and normally constrained toward piston engagement; said body including an elongated co-axial bearing extending from one side and passaged for shaft lubrication; a shaft in said bearing and supporting said rotor; said rotor being hollow, open at one end and connected at the other end to said shaft; and a

thrust and centering bearing interiorly mounted within the rotor.

3. A pump device including in combination, a pump body having a cylindrical chamber; a co-axially mounted rotor including an eccentrically supported cylindrical piston; a radially movable vane supported by the body and normally constrained toward piston engagement; said body including an elongated co-axial bearing extending from one side and passaged for shaft lubrication; a shaft in said bearing and supporting said rotor, said rotor being of greater diameter than the shaft and less than the piston; said rotor being hollow, open at one end and connected at the other end to said shaft; and a thrust and centering bearing interiorly mounted within the rotor.

4. A pump device including in combination, a pump body having a cylindrical chamber; a co-axially mounted rotor including an eccentrically supported cylindrical piston; a radially movable vane supported by the body and normally constrained toward piston engagement; said pump body including an elongated co-axial bearing extending from one side and passaged for shaft lubrication; a shaft in said bearing and supporting said rotor; said rotor being of greater diameter than the shaft and less than the piston; said shaft bearing being enlarged adjacent the shaft and rotor connection; and a sealing construction mounted within the enlarged portion of said bearing; said rotor being hollow, open at one end and connected at the other end to said shaft; and a thrust and centering bearing interiorly mounted within the rotor.

5. A pump device including in combination, a pump body having a cylindrical chamber; a co-axially mounted rotor including an eccentrically supported cylindrical piston; a radially movable vane supported by said body and normally constrained toward piston engagement; said pump body including an elongated co-axial bearing extending from one side and concentrically passaged for pressure lubrication; a shaft in said bearing and supporting said rotor, said rotor being of greater diameter than the shaft and of less diameter than the piston, said bearing being enlarged adjacent the shaft and rotor connection; and wedge faced packing washers mounted upon said shaft within said enlarged portion and abutting said rotor, said washers being exposed to and expanded by said lubrication pressure into sealing relation to said shaft, said passage and said rotor.

6. A pump device including in operative relation, a pump body having a cylindrical chamber and a lubricant passage; a co-axially mounted rotor including a shaft and an eccentrically related cylindrical piston; a radially movable vane supported by said body and normally constrained into engagement with said piston; means associated with said

rotor and said body for preventing leakage of fluid in either direction between said chamber and said passage, said means comprising a plurality of walls intermediate said rotor and said chamber, said walls being constrained into abutting relation when pressure is developed within said chamber, and an expansible washer abutting said shaft and the wall of said passage, said washer being expanded when pressure is developed within said lubricant passage.

In witness whereof, we have hereunto affixed our signatures.

LOUIS CHEVROLET.
CHARLES L. CHEVROLET.

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