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FUEL PUMP

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2 Sheets-Sheet 2

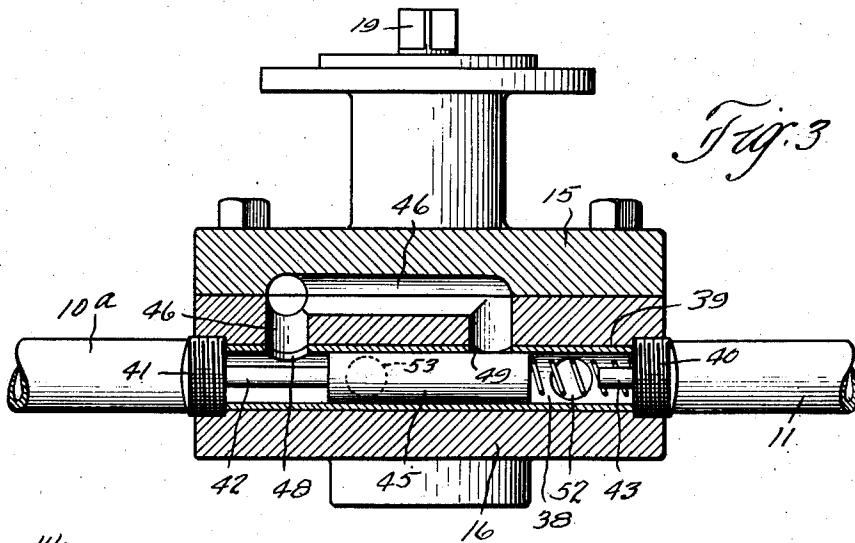


Fig. 3

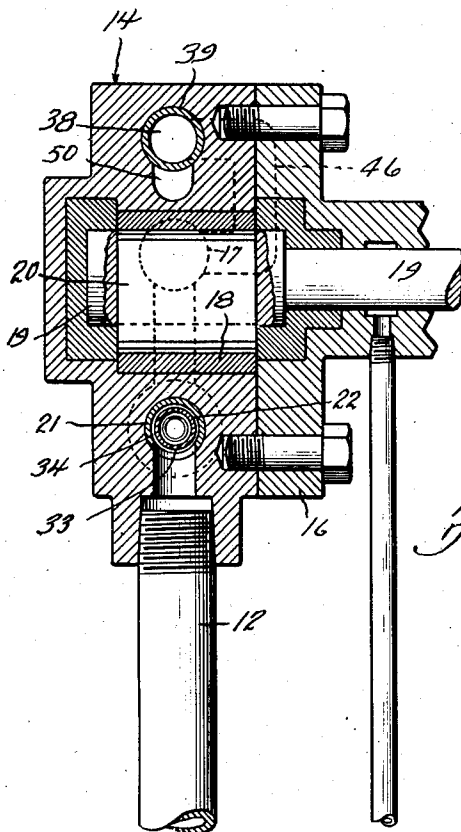


Fig. 4

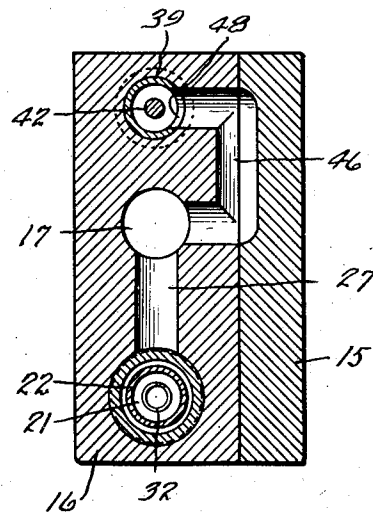


Fig. 5

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FUEL PUMP

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This invention relates to a pumping system especially adapted for pumping fuel from a supply tank to a carburetor. One object of this invention is to provide such a pumping system in which the safety feature of an auxiliary hand pump in addition to the power operated pump can be embodied by use of a hand pump connected in tandem with the power pump, and by use of a single system of pipes and passages.

A further object is to provide a power pump assembly which can be installed in a way to operate with either end thereof functioning as the fuel intake and the other end functioning as the fuel delivery or exhaust.

A further object is to secure these results by the use of a novel, efficient and simple form of mechanism which shall have the fewest possible number of parts consistent with most efficient operation and which will operate satisfactorily under the conditions to which it is likely to be subjected in use. Other limited objects will become apparent from the following description taken in connection with the drawings.

Fig. 1 is a partial longitudinal sectional view through my pumping system; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a section on the line 4—4 of Fig. 1; and Fig. 5 is a section on the line 5—5 of Fig. 1.

In the drawings, the numeral 10 represents a conduit adapted to be connected to a fuel supply tank, 11 a conduit adapted to connect with a carburetor and 12 an over-supply return pipe which may be connected either directly to the tank or with the conduit 10 at a point between the tank and the pumping assembly. The said assembly comprises a hand pump 13 which includes means (not shown) which will allow the passage of liquid toward the delivery side thereof when not operating and a motor pump assembly connected in tandem with the hand pump 13 between the conduits 10 and 11 and having a connection with the conduit 12. The power pump assembly includes a block indicated generally by the numeral 14 and being divided into two complementary sections 15

and 16. Extending longitudinally through the block is a main passage 17 which is modified centrally to accommodate or constitute the stationary portions of a rotary pump, including in the embodiment shown a cylindrical portion 18 and a rotary portion including a shaft 19 and a blade 20. Each end of this passage is internally threaded to receive the externally threaded end portions of conduit members 10^a and 11.

Extending entirely through the block 14 parallel to the main passage 17 is an over-supply return passage 21. In this passage I prefer to insert a sleeve 22 which engages the walls of such passage through a portion of the length thereof but not at the ends, said ends being enlarged and internally threaded as shown at 23. One end of the sleeve 22 may be attached to a removable plug 24 or may abut the same closely. In either case a notch 25 is provided adjacent the end of such sleeve to allow the passage of liquid into the interior thereof. The two ends of the passage 21 are similarly threaded for a considerable distance and ports or passages 26 and 27 are provided communicating with the main passage 17 on the two sides of the power pump and also communicating with the threaded portions of the passage 21 as shown. At one end of the passage 21 I provide a plug 28 which extends substantially the full length of the threaded portion 23 and is adapted to seal the passage 27 against the flow of liquid therethrough. Inserted and sealed through the end of the plug 28 is an adjusting screw 29 provided with a lock nut 30 and against a reduced end 31 of which a spring 32 may seat, said spring at its other end being received in and tensionally positioning a piston valve 33. Said piston valve is provided with an annular depression 34 and small ports 35 for allowing escape of any liquid which may find its way behind such valve. It is evident that the plugs 24 and 28 are interchangeable, since the parts of the passage 21 are the same at both ends of the block 14. A cover member 37 may be provided to protect and house the outer end of the plug 28.

In addition to the passages just described

I provide an inset block and a by-pass mechanism including a valve and a plurality of passages. A longitudinally extending passage 38, hereinafter termed a by-pass bore, extends entirely through the block 14. A sleeve 39 is provided on the interior of said bore and a pair of plugs 40 and 41 close the ends of such bore. The plug 41 is provided with a short pin 42 while the plug 40 is provided with a shorter spring positioning pin 43 over which is adapted to seat a spring 44 which tensionally hold the elongated piston valve 45 against the end of the stop pin 42. A by-pass canal 46 communicates with the main passage 17 at one point 47 and with the interior of the sleeve 39 at a plurality of spaced points 48 and 49. These preferably are spaced a distance equal to the length of the valve body 45. A second by-pass canal 50 communicates with the main passage 17 at a point 51 and with the interior of the sleeve 39 at a plurality of spaced points 52 and 53 which bear the same functional relation to the exhaust side of the power pump assembly as do the points 48 and 49 to the intake side thereof. These points are also preferably spaced apart a distance equal to the length of the valve member 45. It is evident that the plugs 40 and 41 may be interchanged and the valve 45 made to operate in the other direction just as in the case of the valve 22 above described.

When it is desired to install the device in such a manner that fuel is forced by the power pump from the conduit 10 to the conduit 11 the plugs 24 and 28 and those 40 and 41 are inserted as shown in the drawings. When, however, it is desired to reverse the block 14 so that the power pump must be rotated in the opposite direction and the liquid forced also in the opposite direction the plugs 24 and 28 will be interchanged and those 40 and 41 likewise.

Operation

With the valves and block arranged as shown in the drawings liquid is drawn by the power pump past the hand pump through the conduit 10^a and delivered through the conduit 11 to the carburetor. When a sufficient amount of fuel has been delivered to the carburetor to cause the float valve to seat a back pressure will be set up which will tend to force liquid through the passage 26. Such liquid will enter the sleeve 22 and cause a pressure on the piston valve 33 which when sufficient to overcome the action of the spring 32 will allow passage of the over-supply liquid through the conduit 12 to return to the tank.

When the hand pump 13 is operated and the power pump is stationary the liquid cannot pass the rotary element of such power pump and consequently will enter the port 47 and cause a pressure against the valve 45

due to the fact that the port 49 is closed by such valve. This pressure will cause the valve 45 to move to the right against the action of the spring 44 until the port 53 is opened. Liquid will then pass through the passage 50 and port 51 to the conduit 11.

When the block 14 is reversed end for end to provide for installation on the other side of the motor the valves will also be reversed. Liquid will then be drawn through the right hand opening of the main passage 17 through the power pump and be delivered through the left hand end of the main passage. As soon as the carburetor valve closes the liquid will pass through the port 27 opening the now reversed valve and escape to the return pipe 12.

In a similar manner when the hand pump is operated liquid will pass the power pump by passing through the port 51 and moving the piston 45 to the left until the port 49 is uncovered allowing liquid then to flow through the canal 46 and port 47 into the main passage for delivery to the carburetor.

It will be understood that suitable packing 55 may be provided in connection with the shaft 19 of the power pump.

For the purpose of this specification the term "in tandem" refers to the connection of the two pumps in such a way that the pipe into which one of them delivers is the same which supplies the other, and not to any particular relative position or alignment of the two pumps.

Having thus described my invention, what I claim is:

1. A pumping system including a power pump assembly and an emergency hand pump in tandem with said power pump, said power pump assembly including a block, a main passage through said block modified in one region to form the stationary portion of said power pump, a second passage in said block, a spring pressed piston valve in said second passage, ports establishing communication between the main passage and said second passage and a tank return pipe communicating with said second passage between said ports, one of said ports being normally closed and the tank return pipe being controlled by said valve, said second passage extending entirely through said block, one end thereof being closed by a sealing plug and the other end receiving a plug adapted to seal the end thereof and the adjacent port.

2. A pumping system including a power pump assembly and an emergency hand pump in tandem with said power pump, said power pump assembly including a block, a main passage through said block modified in one region to form the stationary portion of said power pump, a second passage in said block, a spring pressed piston valve in said second passage, ports establishing communication between the main passage and said

second passage and a tank return pipe communicating with said second passage between said ports, one of said ports being normally closed and the tank return pipe being controlled by said valve, said second passage extending entirely through said block and the ends thereof being threaded, said ports communicating with said second passage intermediate the ends of said threaded portions, one of said threaded portions receiving a plug of sufficient length to close the adjacent port, the other end being closed by a plug too short to close its adjacent port.

3. A pumping system including a power pump assembly and an emergency hand pump in tandem with said power pump, said power pump assembly including a block, a main passage through said block modified in one region to form the stationary portion of said power pump, a second passage in said block, a spring pressed piston valve in said second passage, ports establishing communication between the main passage and said second passage and a tank return pipe communicating with said second passage between said ports, one of said ports being normally closed and the tank return pipe being controlled by said valve, said second passage extending entirely through said block and the ends thereof being threaded, said ports communicating with said second passage intermediate the ends of said threaded portions, one of said threaded portions receiving a plug of sufficient length to close the adjacent port, the other end being closed by a plug too short to close its adjacent port, said first mentioned plug embodying adjustable means for controlling the back pressure at which said valve will open to allow return of liquid through the tank return pipe.

4. A pumping system including a power pump assembly and an emergency hand pump in tandem with said power pump, said power pump assembly including a block, a main passage through said block modified in one region to form the stationary portion of said power pump, and a by-pass mechanism in said block including a by-pass bore, a piston valve in said bore, a first by-pass canal communicating with said main passage on the intake side of said pump and with said by-pass bore at spaced points, a second by-pass canal communicating with said main passage on the exhaust side of said pump and likewise communicating with said by-pass bore at spaced points, one of which is located between the first mentioned spaced points and between which one of said first mentioned spaced points is located, the two innermost of said points of communication being spaced apart a distance less than the length of said piston.

5. A pumping system including a power pump assembly and an emergency hand pump in tandem with said power pump, said power

pump assembly including a block, a main passage through said block modified in one region to form the stationary portion of said power pump, and a by-pass mechanism in said block including a by-pass bore, a piston valve in said bore, a first by-pass canal communicating with said main passage on the intake side of said pump and with said by-pass bore at spaced points, a second by-pass canal separate from the first and communicating with said main passage on the exhaust side of said pump and likewise communicating with said by-pass bore at spaced points, the distance between the two innermost said points of communication being less than the length of said piston valve.

In testimony whereof, I hereunto affix my signature.

AMANDUS C. ROESSLER.

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