March 7, 1939. E. J. LATTNER 2,149,969

PUMP

Filed May 4, 1936

FIG. 1

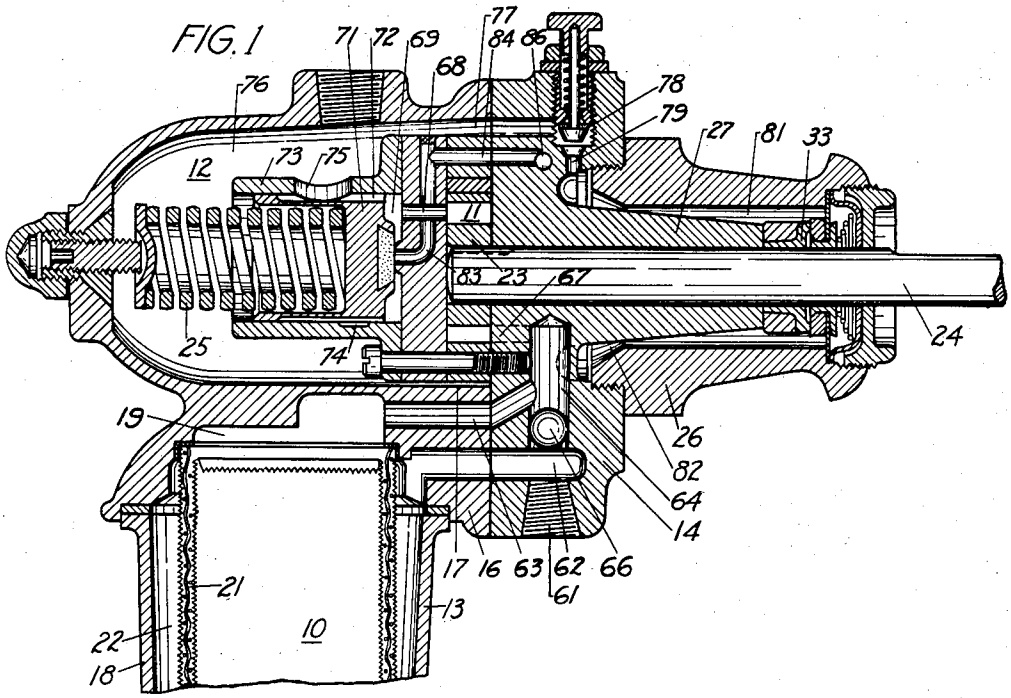
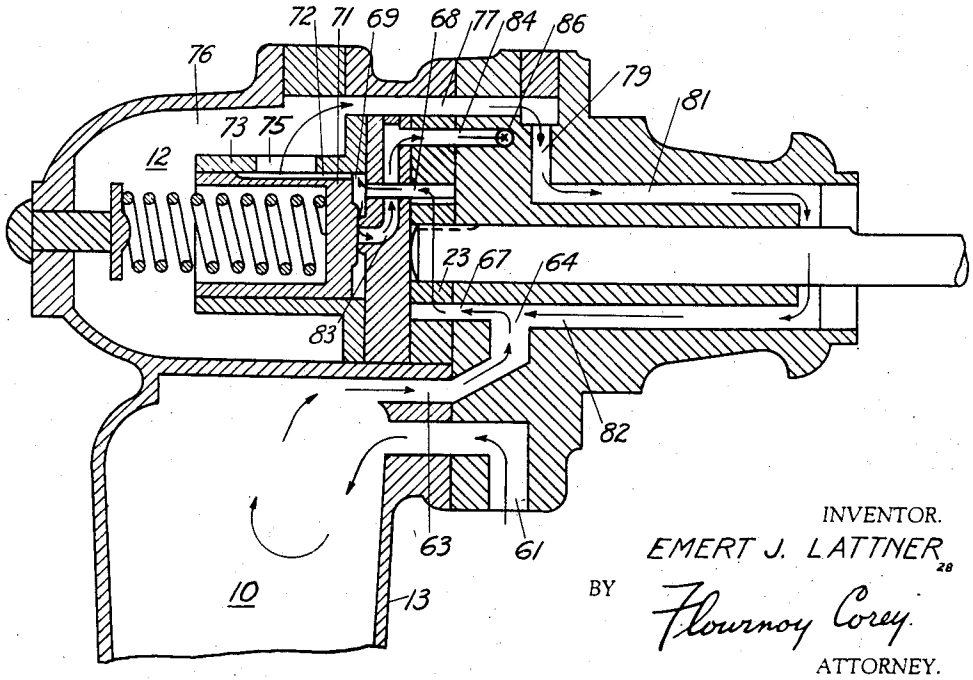


FIG. 2



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PUMP

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1 Claim. (Cl. 103—42)

This invention relates to oil burners and has particular relation to the fuel feeding means of such burners.

In oil burners of the gun type in which fuel under pressure is discharged from a nozzle and atomized and mixed with a blast of air, it is the usual practice to provide a pump, the capacity of which is greater than the capacity of the discharge nozzle. Therefore, means is furnished for carrying a portion of the fluid fuel discharged from the pump back to the strainer or other inlet means leading to the intake of the pump. In this way the fuel which is discharged from the pump but which cannot be taken care of by the nozzle is returned and recirculated. In the past it has been the practice to provide separate units comprising a strainer, a pump, and a valve structure for the portion of the fuel supply means by which fuel is furnished to the nozzle of the burner and to then connect the interior of the valve chamber with the strainer to furnish a return or recirculation line.

It has been suggested, however, that the strainer, pump, and valve structure be combined in a single unit. This combination, however, results in several difficulties among which are that of providing means for the return line from the valve to the strainer or pump inlet and that of packing the shaft of the pump to prevent leakage or otherwise taking care of the leakage along the pump shaft.

It is one object of my invention to combine the return line with means for taking care of leakage along the shaft of the pump and thus eliminate two difficulties at the same time.

Another object of my invention is to provide, in a combined strainer, pump, and valve structure for oil burners, a return passage or conduit for returning excess fuel from the exhaust side of the pump to the intake side.

Another object of my invention is to provide a return passage or conduit so arranged as to carry off any leakage of fuel through the pump shaft and bearing.

Another object of my invention is to provide an improved pump unit for oil burners.

Other and further features and objects of the invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and following specifications, wherein is disclosed a single exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims, without departing from the spirit of the invention.

In said drawing:

Figure 1 is a view in section of a pump unit constructed according to one embodiment of my invention.

Figure 2 is a view corresponding to the view illustrated in Figure 1 but with the various parts of the mechanism modified to illustrate diagrammatically the various channels in the pump unit.

Referring now to the drawing, the structure there shown represents a fuel supply unit including a strainer, indicated generally at **10**, a pump indicated at **11**, and a control valve structure indicated at **12**. These various units are mounted on a roughly cylindrical base structure **14** which is adapted to be secured to the blower housing (not shown) or air flow regulating means (not shown) or to a base structure (not shown) of the oil burner (not shown) in any manner so the shaft of the pump may be rotated by an electrical means or otherwise.

A housing **16** is mounted upon the base **14** and is chambered at **17** to receive the gear pump, which is indicated at **11**, and a dual control valve indicated at **12**. The housing enclosing the pump **11** and the control valve **12** also serves as a means for mounting the bowl **18** of the strainer **10**. The housing **16** is chambered as indicated at **19** to receive the cylindrical strainer **21** which projects down into the chamber **22** within the bowl **18**.

The gears **23** of the pump **11** are adapted to be driven by a shaft **24**. The shaft **24** is rotatably mounted within a cylindrical shaft housing **26** which is threadedly engaged with the base **14**, the bearing for the shaft being provided as an elongated collar portion **27** of the base **14**. The outer end of the shaft is substantially sealed by the sealing means indicated generally at **33**. This sealing means may be any rotating sealing member of conventional design, either of metal seal or stuffing box construction.

It is obvious, however, that any fuel leaking along the shaft and by the sealing means **33** will first fill the chamber **81**, where it joins the fuel by-passed by the valve control means **12** and is led to the intake side of the pump.

The base **14** is drilled and taper threaded, as indicated at **61**, to receive the coupling (not shown) of the fuel supply line (not shown). The fuel enters through this opening **61** and passes through the conduit **62** into the chamber **22** on the outside of the strainer **21**. The fuel then passes through the strainer into the central portion of the chamber **22** and up into the cham-

ber 19. It then passes through a conduit 63 and into a bore 64 which is a continuation of the opening 61, the bore 64 being closed between the opening 61 and the point where the channel 63 enters the bore by means of the plug 66. Fuel then passes upwardly through the bore 64 and to the conduit 67 into the teeth 23 of the pump 11. Fuel from pump 11 is expelled forcibly to the conduit 68 into the chamber 69 beneath the piston 71. A portion of the fuel from the pump is by-passed past the piston by means of the by-pass port 72 and passes out through the cylinder wall 73 and the port 75 and into the chamber 76. The fuel in the chamber 76 may escape through the passageway 77 beneath the valve 78 into the passageway 79 and from the passage 79 into the chamber 81 surrounding the bearing 27. From this point the fuel may pass back along the passageway 82 between the housing 26 and bearing 27 and into the bore 64. Any leakage from the point which passes the sealing means 33 will pass into the chamber 81 and thus joins the fluid from the chamber 76 and passes again into the intake side of the pump.

In operation, when the pressure of fluid from the pump reaches a certain value, the piston 71 is lifted from its seat and fuel may flow from the chamber 69 into the conduit 83 and into the conduit 84 and out through a port 86 which is connected with the supply line leading to the nozzle (not shown) of the unit. Inasmuch as the quantity of fuel pumped by the pump per unit of time is greater than the quantity which may flow from the nozzle, the piston 71 will be further raised until the port 74 is uncovered and at that point the excess fuel passes around the wall of the cylinder and out through the port 75 into chamber 76 and through the channels 77, 79, 81 and 82 and back into the bore 64 which leads to the intake of the pump.

Although I have shown and described a certain specific embodiment of my invention I am fully aware that many modifications thereof are possible. My invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claim.

I claim as my invention:

In a fuel feeding unit for use with an oil burner, a roughly cylindrical base structure having a cylindrical collar portion extending therefrom to form a bearing for a pump shaft rotatably mounted therein, a shaft housing surrounding the collar and pump shaft for a portion of its length and spaced therefrom to form a shaft chamber, said shaft housing threadedly attached to the base structure, a sealing means near the outer end of the shaft to prevent leakage between the shaft and the shaft housing, said shaft chamber arranged to receive any leakage between the collar and the shaft, pump gears operatively connected with the inner end of the shaft, a conduit connecting the intake side of the pump gears with the shaft chamber, a cone shaped main housing attached to the base structure, a body portion within the main housing having a gear chamber formed therein to enclose the gears, a pressure regulating valve also within the main housing and attached to the body portion and including a cylinder, a conduit through the body portion connecting the cylinder with the outlet side of the pump gears, a piston in the cylinder adapted to be moved against the pressure of a spring, by the pressure of oil forced by the pump gears through the last mentioned conduit, a means threadedly engaged in the main housing to vary the pressure of the spring on the piston, an outlet conduit leading from the cylinder, the piston adapted by the aforementioned pressure of the spring to close the outlet conduit except when the pump gears force oil under sufficient pressure into the cylinder to counteract the spring pressure, the cylinder also having a by-pass port arranged to be opened to relieve excess pressure within the cylinder, said by-pass port exhausting into the interior of the main housing, a conduit connecting the main housing to the shaft chamber, a cup shaped strainer housing removably sealed against the lower portion of the main housing, a strainer therein, an intake conduit connecting with the strainer, and an outlet conduit therefrom connecting with the shaft chamber and with the inlet side of the pump gears.

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