

March 3, 1936.

T. W. MURPHY ET AL

2,032,886

OIL BURNER PUMPING AND CONTROL UNIT AND MEANS FOR MOUNTING SAME

Filed June 18, 1935

2 Sheets-Sheet 1

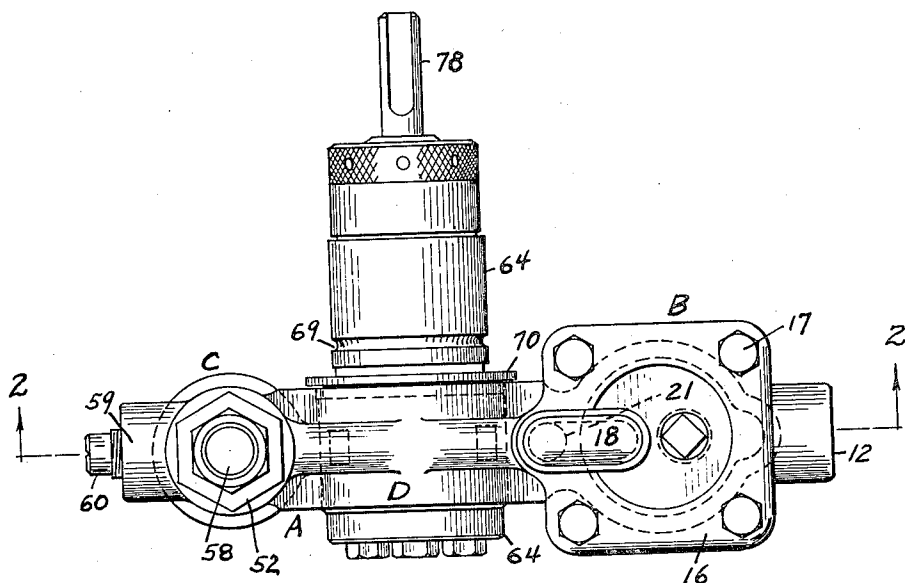


FIG. 1.

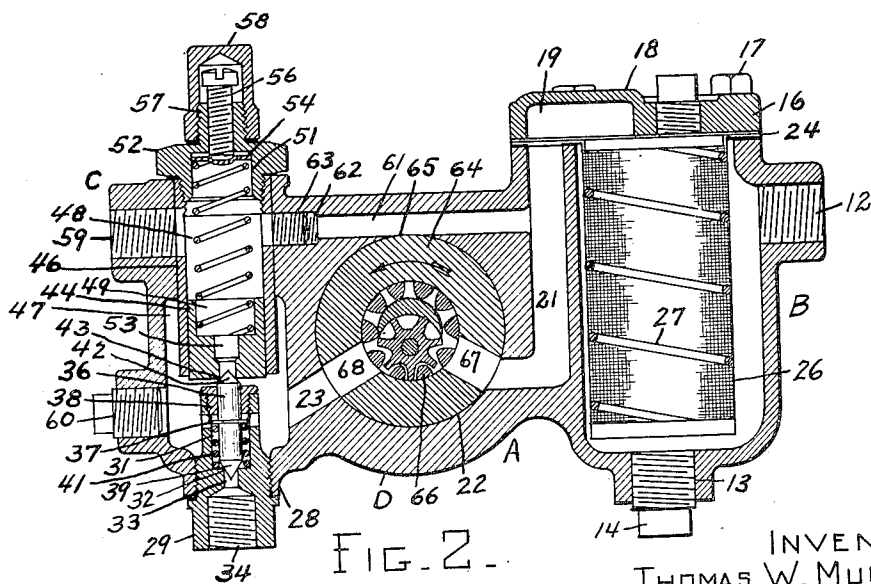


FIG. 2.

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2 Sheets-Sheet 2

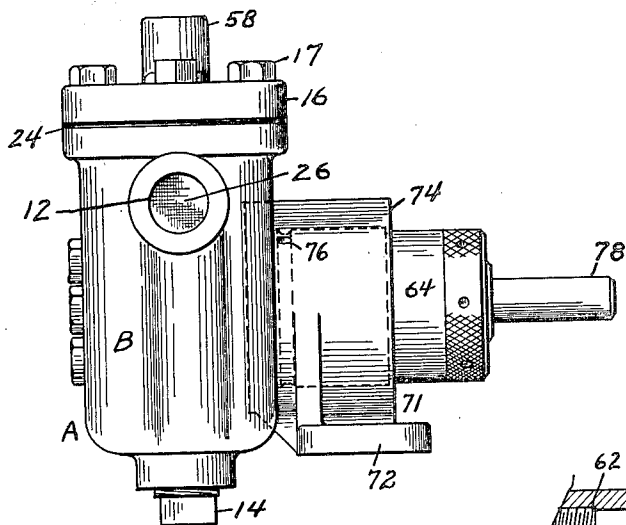


FIG. 4.

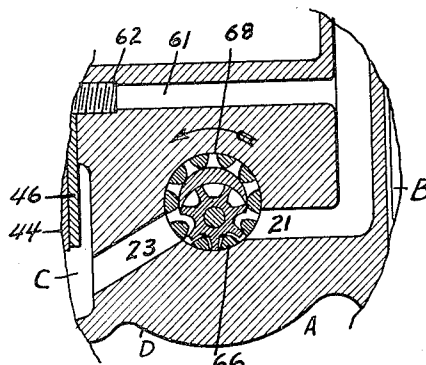


FIG. 3.

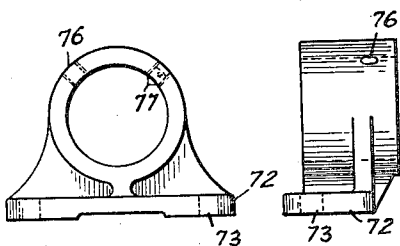


FIG. 5. FIG. 6.

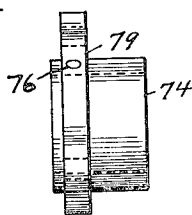


FIG. 7.

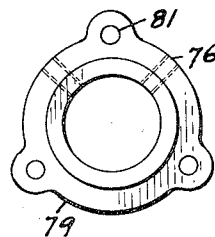


FIG. 8.

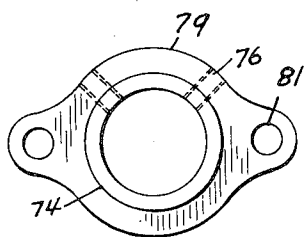


FIG. 9.

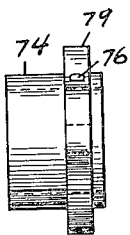


FIG. 10.

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2,032,886

OIL BURNER PUMPING AND CONTROL UNIT
AND MEANS FOR MOUNTING SAME

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Application June 18, 1935, Serial No. 27,162

3 Claims. (Cl. 103-42)

This invention relates to oil burner pumping and control units and particularly to such a unit as may be used interchangeably for pumps of either direction of rotation, and for installations requiring the inlet on either side of the unit.

While units embodying the separate devices incorporated in the present unit have been manufactured and installed in the past, these units embody features which prohibit the interchangeability of the parts to accommodate each installation, and the present invention is designed for flexibility in installation so that the unit completed by the disclosures herein is universal in character and designed to take care of every condition without requiring separate patterns to meet each individual change in conditions.

The object of this invention is to provide an oil burner pumping and control unit interchangeably adapted to efficiently provide for incorporation with any oil burner unit.

Another object is to provide an oil burner pumping and control unit wherein the pump may be rotated in either direction, and such changes in rotation provided for in the unit casing.

Another object is to provide for the efficient coupling of the supply and the burner lines without unnecessary piping.

Still another object is to provide means for mounting the pumping and control unit on any type of oil burner unit.

According to the invention, the oil burner pumping and control unit comprises a casing embodying a vacuum chamber having a strainer therein, a regulating valve chamber having operative mechanism for supplying oil to the burner and for discharging excess oil, a circular opening between said chambers, passages leading from said opening to said chambers, and a pump casing adapted to be pushed into said opening to register its vacuum port with the passage to the vacuum chamber, and its pressure port with the passage to the valve chamber. Said pumps may be pushed into said opening from either side of said casing in order to locate the chambers on the desired side. Said passages may also be located 120 degrees apart and the pump ports made to correspond so that the pump may be inserted in the opening to provide for a reverse rotation.

The drawings illustrate an embodiment of the invention and the views therein are as follows:

Fig. 1 is a top plan view showing the unit incorporating the push-in pump,

Fig. 2 is a vertical sectional view of the same taken on the line 2-2 of Fig. 1,

Fig. 3 is a fragmentary sectional view of a structure wherein the pump casing is integrally formed with the unit casing,

Fig. 4 is an end view of the device of either Figs. 2 or 3 associated with a demountable bracket,

Fig. 5 is a front view of the bracket employed in Fig. 4,

Fig. 6 is a side view of the same,

Fig. 7 is an end view of another type of demountable bracket,

Fig. 8 is a front view of same,

Fig. 9 is a front view of another type of demountable bracket, and

Fig. 10 is an end view of the same.

The casing A embodies a vacuum or strainer chamber B, a regulating valve chamber C and an intermediate part D. Communicating with the vacuum chamber is the inlet port 12, while the bottom of said chamber is provided with a screw-threaded opening 13 into which a plug 14 normally fits and which may be removed for cleaning sediment and dirt from said chamber.

The chamber is closed at the top by a cover 16 held thereon by bolts 17 and said cover has a hollow rib 18 providing a passage 19 which communicates with a passage 21 in the casing A.

This passage 21 communicates with a circular opening 22 in the intermediate part D of said casing, while a passage 23 in said intermediate part communicates with the pressure chamber of regulating valve C.

The entrances of these passages into the circular opening 22 are located at an angle of 120 degrees apart.

Between that part of the casing containing the vacuum chamber B and the cover 16 there is a gasket 24 for sealing the connection.

The vacuum or strainer chamber B is provided with a basket filter or screen 26 which is formed of fine wire gauze and supported by means of the spiral spring 27.

The regulating valve chamber C has a screw-threaded opening 28 at the bottom of same and into which a seat member 29 is screwed. This seat member has a central bore 31, which terminates in a seat 32 at the upper end of a restricted opening 33 which leads into a threaded outlet 34. Within this bore 31 is a valve stem 36 having a collar 37 which restricts the movement of said valve stem by engaging a lock nut 38 screwed into the upper end of said seat mem-

ber. This valve stem has a needle valve 39 on its lower end and a spiral spring 41, resting on the bottom of the bore 31 and engaging the collar 37, tends to move said needle valve from its seat 32.

The upper end of the valve stem 36 has a needle valve 42 normally resting on the seat 43 on the bottom of a piston 44. This piston is movable in a sleeve 46 in said chamber and the lower end of this sleeve forms with that part of the casing providing the regulating valve chamber and annular recess 47.

The piston 44 is normally depressed by the spiral regulating spring 48 whose lower end rests in a counter-bore 51 in the bonnet 52.

The spiral spring 48 has such tension that it will normally overcome the tension of the spiral spring 41 so that the needle valve 39 will normally rest in the seat 32 to close the restrictive opening 33 and the needle valve 42 will rest in the seat 43, thereby closing the opening 53 which extends through the piston 44. The upper end of the spiral spring is provided with a spring guide 54 which is engaged by a regulating screw 55, screwed into the internally and externally threaded nipple 57 on the bonnet 52, and a cap or cover 58 screws on to the threaded nipple 57 to seal the same and to prevent any maladjustment of the regulating screw 56.

The upper end of the valve chamber C is provided with a by-pass opening 59 which extends through said sleeve and which when desired may be connected with the source of liquid supply and when not so connected may be closed by a pipe plug. (Not shown.)

The lower end of the regulating valve casing may, if desired, be provided with a threaded opening normally closed by a plug 60, which said opening may be utilized for connecting a pressure gauge with said chamber when desired.

Passageway 61 extends horizontally through the intermediate part D of the casing communicating with the passage 21 leading to the vacuum chamber B and also with the valve chamber C at a point above the piston 44. At the point where this passage 61 communicates with the regulating valve chamber C the passage is drilled and tapped as at 62 to receive an Allen plug 63, which may be removed when the by-pass opening 59 is closed by means of a pipe plug, as described.

The passage 61 is so cored or drilled as to break through the wall of the intermediate part D and form an opening 65 leading into the circular opening 22 in said part.

The circular opening 22 in the intermediate part D of the casing A is of smooth bore and may receive a pump casing 64, which is pushed into place and presents an appearance such as shown in Fig. 1. The opening 22 in the part D of the casing is about one to three-thousandths of an inch smaller in diameter than the outside diameter of the pump casing, so that the pump casing must be pressed into position and when so placed there can be no relative movement between the same. This pump casing as shown in Fig. 2 has its rotor 66 so arranged that its rotation will be in the direction shown by the arrow in Fig. 2. That is to say, the suction or vacuum port 67 of the pump is aligned with the entrance to the passage 21 leading to the vacuum chamber, while the discharge or pressure port is aligned with the entrance to the passage 23 leading to the regulation valve chamber.

The ports 67 and 68 are located 120 degrees

apart with respect to the periphery of the pump casing 64.

It will of course be readily seen that if the pump were caused to rotate in a direction contrary to the direction of the arrow shown in Fig. 2, that upon rotating the casing 64 clockwise through an angle of 120 degrees that the port 67 would communicate with the passage 23 leading to the regulating valve chamber, while the port 68 would communicate with the opening 65 leading into the passage 61 extending between the passage 21 and the upper part of the pressure regulating chamber C.

The pump casing 64 is provided with a lateral collar or flange 70 which abuts the intermediate part D of the casing so that when said pump has been pushed into that position the ports 67 and 68 are aligned with the passages 21 and 23, or in case of the rotation of the pump in the opposite direction, with the passage 23 and opening 65.

In some instances the pump rotor 66 may be built into the intermediate part D of the casing A, which will therefore form the pump casing insofar as its inclusion in the unit casing is concerned, so that in that design the rotor 66 will operate within a reduced circular opening 68. This is shown in Fig. 3 and the passages 21 and 23 are located 120 degrees apart in order to supply the rotor with liquid from the passage 21 and which said liquid under pressure is discharged from the passage 23.

The pump casing 64 has an annular groove 69 in that part of the same which extends beyond the unit casing A.

In Fig. 4, which shows an end view of the unit, there is a mounting bracket 71 incorporated with the unit for the purpose of mounting the same on an oil burner base. This bracket has a base or foot 72 with holes 73 (see Figs. 5 and 6) for fastening the same to the oil burner bed plate and a collar 74 for encircling the pump casing. This collar is provided with tapped holes 75 for receiving set screws 77 which secure the casing A in position on said bracket. The pump shaft 78 is connected with the usual flexible shaft or through a flexible coupling with the driving motor in the blower housing and since this is standard no attempt has been made to illustrate the same. However, different manufacturers provide different means for mounting the pumping and control unit in connection with the oil burner unit or the motor and blower housing, and while means have heretofore been provided on the unit casing for mounting the said unit with the blower housing, separate patterns and castings were necessary with the different blower housings of different manufacturers.

Figs. 7 and 8 show another type of demountable bracket in which the collar 74 is provided with a flange 79 and with three holes 81 either drilled or drilled and tapped for what is known as a three-point suspension. Figs. 9 and 10 show another type of demountable bracket providing for a two-point suspension either vertical or horizontal.

It will readily be seen that with the use of these demountable brackets the bracket itself may first be properly set into position on the oil burner unit bed plate or on the blower housing and the pumping and control unit mounted thereon by merely pushing the pump casing through the collar of the bracket and then swinging the unit into the desired position and then tightening the set screws 77 into the groove 69 on the oil burner casing.

While we have shown three different designs of demountable brackets it will be understood that a bracket demountable in character for the unit shown in Figs. 1, 2, 3 and 4 may be provided which will permit said unit to be incorporated with any type of blower regardless of the location of the mounting holes or the arrangement by which the pumping and control unit is to be associated with the operating mechanism.

The type of valve shown in Fig. 2 is of course optional and other valves incorporating pistons or diaphragms may be used in connection with the control unit.

In the type shown, oil under pressure is admitted through the passage 23 to the valve casing C and when a certain predetermined pressure has been attained the piston 44 will be pushed upward by overcoming the tension on the spring 48, whereupon the small spiral spring 41 will lift the valve stem 42 so that the needle valve 39 will be withdrawn from the seat 32 and oil will be delivered through the restrictive opening 33 and through the outlet 34 to the burner.

Upon the building up of a higher pressure, predetermined of course, the piston 44 will be further raised and as the valve stem 42 is restricted in its upward movement by its collar 37 engaging the lock nut 38, the said piston will move away from said valve stem and the needle valve 42 will be drawn from the seat 43 and the excess oil will pass through the opening 53 in said piston, and with the arrangement shown in Fig. 2, it will pass up through the sleeve 46 and out through the opening 59 which is supplied with a pipe leading back to the source of supply.

In such instances as it is desired to return the excess oil back to the vacuum chamber rather than to the source of supply the hole 59 will be plugged and the plug 63 removed from the screw-threaded part 62 in the passage 61 and therefore the excess oil passing up through the passage or opening 53 in the piston will be bypassed through the passage 61 back to the vacuum chamber, where it will again be drawn down through the passage 21 into the port 67 on the suction side of the pump.

When the pump rotates in a direction opposite to that shown by the arrow in Fig. 2 the pump casing will be so located that its port 67 communicates with the passage 23 and since these ports are 120 degrees apart and since the openings of the passages 21 and 23 and the opening 65 are each 120 degrees apart, the opening 68 will then communicate with the opening 65 leading into the horizontal passage 61.

Of course the oil burner pumping and control

unit and the demountable bracket for mounting the same may be modified and changed in various ways without departing from the invention herein set forth and hereafter claimed.

The invention is hereby claimed as follows:

1. An oil burner pumping and control unit comprising a casing embodying a vacuum chamber having a strainer therein, a valve chamber having operative mechanism for supplying oil to the burner and for discharging excess oil, an opening between said chambers, and passages leading from said opening to each of said chambers, said opening providing a smooth bore, and a completely assembled pump and its casing pressed into same from either side of the casing, said pump casing having inlet and discharge ports which align with said passages respectively.

2. An oil burner pumping and control unit comprising a casing embodying a vacuum chamber having a strainer therein, a regulating valve chamber having mechanism for supplying oil to the burner and for discharging excess oil, a horizontal passage between said chambers, a smooth circular opening between said chambers, passages leading from said opening to said chambers and to said horizontal passage and located 120 degrees apart, a pump having a casing provided with intake and discharge ports located 120 degrees apart, said pump and its casing adapted to be pressed into said opening from either side of the casing and aligned, regardless of direction of rotation, so that the pump discharge port will communicate with the valve chamber and the intake port will communicate with either the passage to the vacuum chamber or to the horizontal passage depending upon the direction of rotation of the pump, while the remaining passage will be blocked off by the pump casing.

3. An oil burner pumping and control unit comprising a casing embodying a vacuum chamber having a strainer therein, a valve chamber having operative mechanism for supplying oil to the burner and for discharging excess oil, an opening between said chambers, and passages leading from said opening to each of said chambers, said opening providing a smooth bore, a completely assembled pump and its casing pressed into same from either side of the casing, said pump casing having inlet and discharge ports which align with said passages respectively, and a demountable bracket comprising a collar encircling said pump casing and provided with means for mounting the same.

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