Jan. 10, 1928. 1,656,093

A. R. BAKER

CIRCULATING PUMP

Filed June 9, 1926

Fig. 1.

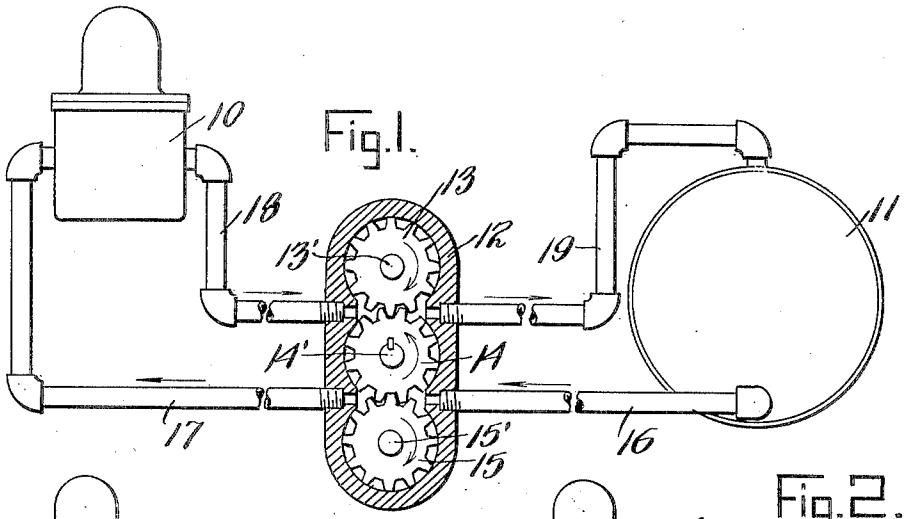


Fig. 2.

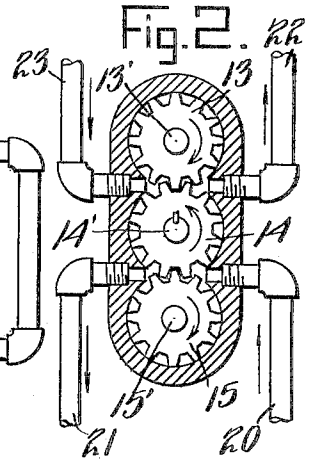


Fig. 3.

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UNITED STATES PATENT OFFICE.

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CIRCULATING PUMP.

Application filed June 9, 1926. Serial No. 114,853.

My said invention relates to a circulating pump and it is an object of the invention to provide a pump which will supply liquid under pressure through a supply line and return a portion of said liquid to a receptacle from which it was originally drawn.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a diagrammatic view illustrating the application of my invention,

Figure 2, a detail, and

Figure 3, a modified form.

In the drawings reference character 10 indicates a liquid fuel atomizing nozzle, 11 a tank containing liquid fuel and 12 a pump for supplying liquid fuel from the tank to the nozzle and for returning excess fuel from the nozzle to the tank. The pump 12 consists of gears or rotary pistons 13, 14 and 15 which are mounted upon shafts 13′, 14′ and 15′ one of which, preferably the intermediate, is driven and serves to drive the adjacent gears. An intake line 16 leads from the bottom of the supply tank 11 into the gear casing 12 at a point intermediate the gears 14 and 15 and a pressure line 17 leads from a similar point on the opposite side of the casing into one side of the nozzle 10. A return line 18 leads from the opposite side of the nozzle to the pump casing 12 to a point intermediate the gears 13 and 14 and in the same side of the casing as the pressure line 17. A return line 19 is connected with the casing on the opposite side from the line 18 and connects with the tank at its opposite end for returning excess fuel to the tank.

In the operation of the foregoing structure oil or other fuel will be supplied through the feed line 16 into the casing where it will be taken between the teeth of the gears 14 and 15 and carried in the direction of the arrows away from the end of the pipe 16 around gear 15 and discharged under pressure into the pipe 17 and then into the nozzle 10 where a portion of it will be used and the surplus will pass through the line 18 into the casing of the pump substantially midway between the gears 13 and 14 where some of said fuel will enter between the gear teeth and be carried by the gear 13 around and discharged into the pipe 19 and returned to the tank 11 while at the same time some of the fuel between the teeth of the gear 14 will be carried by said gear and discharged into the line 17. By this construction a sufficient amount of fuel is supplied to the nozzle 10 while any excess fuel is by-passed through the same pump back to the tank which forms a storage reservoir or receptacle for the fuel.

It is obvious that a pump of this type may be used in various capacities or in various places where the same may be needed, however I have illustrated the same in connection with an atomizing nozzle of a fuel oil burner.

Instead of the arrangement of the lines relative to the pump shown in Figure 1 a slightly different arrangement may be employed and instead of leading the oil into the pump at one side of a pair of gears 14 and 15 and discharging it on the opposite side of said gears to the oil nozzle the arrangement shown in Figure 2 may be used wherein a pump similar to that shown in Figure 1 is used in which liquid is supplied to the pump through a pipe 20 and excess liquid is returned to said tank through a pipe 21. The intake passage from said pump being between the gears 14 and 15 and the supply to and return from the atomizing nozzle being respectively pipes 22 and 23. Either of the foregoing arrangements or connections to and from the pump may be employed according to the arrangement of the respective parts with which the pump is associated.

In Figure 3 I have illustrated a pump 24 for supplying a pair of nozzles 10 said pump comprising gears 29, 30 and 31 identical with gears 13, 14 and 15 (Fig. 1), and a fourth gear 25 meshing with the gear 31, said gears being mounted upon shafts 29′, 30′, 31′, and 25′. Fuel or other liquid is supplied from the reservoir 11 through pipe 26 into the pump casing intermediate the gears 30 and 31. The oil supplied through pipe 26 will enter the spaces between the gear teeth of the gears 30 and 31 and will be carried around with said gears and discharged through pipes 32 and 33 to the right and left hand burners respectively. Surplus fuel will be returned from the burners through return pipes 34 and 35 to the pump casing, the pipe 34 entering the casing intermediate the gears 29 and 30 and the pipe 35 entering the casing between the gears 25 and

31. Some of the oil entering the pump casing through the pipes 34 and 35 will be forced by the oppositely rotating gears around the ends of the casing and where it will again be forced through the pipes to the burners while surplus oil will be forced out of the casing between the gears 30 and 31 through the return line 36 to the reservoir 11.

It will be obvious that by adding gears to the pump additional fuel atomizing nozzles or the like devices may be supplied with fuel and each nozzle will be independently supplied any normal stoppage in one nozzle being dislodged by accumulation of pressure within the line as a result of the operation of the pump. Various other changes will be apparent to those skilled in the art without departing from the spirit of my invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is:

1. The combination of a reservoir, a pump associated with said reservoir, a device adapted to be supplied by said pump with liquid from said reservoir, a supply line from said reservoir to said pump, a second supply line from said pump to said device, a return line from said device to said pump, and a second return line from said pump to said reservoir said pump having three gears, the supply from said reservoir leading into the pump between a pair of said gears, the return to said reservoir leading from between a pair of gears of said pump said supply and return lines to the device leading from different pairs of gears, substantially as set forth.

2. In a heating system for liquid fuel, a reservoir, a pump for supplying said fuel to the reservoir in excess of the demands of the system, an overflow pipe leading back to said pump, and means in connection with said pump for returning the excess under pressure to the source of supply, substantially as set forth.

3. The combination of a reservoir, a pump associated with said reservoir, devices adapted to be supplied by said pump with liquid from said reservoir, a supply line from said reservoir, to said pump a return line from the pump to the reservoir, a supply line from said pump to devices adapted to be supplied with liquid, and a return line from said devices to said pump, substantially as set forth.

4. The combination of a reservoir, a pump associated with said reservoir, devices adapted to be supplied by said pump with liquid from said reservoir, a supply line from said reservoir to said pump, a return line from the pump to the reservoir, independent supply lines from said pump to devices adapted to be supplied with liquid, and independent return lines from each of said devices to said pump, substantially as set forth.

In witness whereof, I have hereunto set my hand at Washington, District of Columbia, this twenty-eighth day of May, A. D. nineteen hundred and twenty-six.

ARTHUR R. BAKER.