The present invention relates to oil burner apparatus of the type wherein a gaseous pressure medium is utilized for driving a pumping device adapted to supply fuel oil to the burner.

The invention has for its object to provide an improved oil burner apparatus of the above kind. The main characteristic of the invention is that said pressure medium consists of a combustible gas, means being provided for feeding to the burner the combustible gas which has been utilized for the pumping.

Said pumping device may comprise a piston pump, in which case the oil burner apparatus, according to the invention, that chamber of the pump cylinder which is connected to the pressure gas source is also connected to the burner by means of a conduit provided with a mechanically operated valve.

One embodiment of the invention is illustrated in the accompanying drawings, wherein:

The drawing numeral 1 indicates an open top fuel oil container secured to the top of a sheet metal casing 31 enclosing pump means which will be described in detail hereinafter. Numeral 2 indicates a pressure container containing a hydrocarbon (e.g. propane) compressed into liquid state, and 19 is the oil burner.

The pump means within the casing 31 comprises two pump cylinders 5 and 6 with pistons 7 and 8, respectively. The piston rods 32 and 33 of the pistons 7 and 8, respectively, have their free ends pivotally connected to the opposite ends of a double armed lever 10 which is pivoted centrally between its ends on a shaft 9 secured to a vertical support 34 provided in the casing 31. By means of the lever 10 the pistons 7 and 8 are interconnected in such a manner that when one of the pistons is moving downwardly the other one moves upwardly. The cylinders 5 and 6 are connected at their lower ends by means of conduits 3 and 4, respectively, each containing a slide valve 22 and 24, respectively, to a pressure gas supply pipe 35 which extends through the wall of the casing 31 and is connected via a shut-off valve 36 to a conduit 37 connected to the top of the pressure container 2. The upper ends of the cylinders 5 and 6 are connected by means of conduits 11 and 12, respectively, each containing a check valve 13 and 14, respectively, to a fuel supply pipe 38 connected to the bottom of the fuel oil container 1. The upper ends of the cylinders 5 and 6 are further connected to a fuel outlet pipe 39 by means of conduits 17 and 18, respectively, each containing a check valve 15 and 16, respectively. The fuel outlet pipe 39 extends through the wall of the casing 31 and is connected by means of a shut-off valve 40 to a conduit 41 which supplies fuel to the oil burner 19. The lower ends of the cylinders 5 and 6 are also connected by means of conduits 20 and 21, respectively, which contain slide valves 23 and 25, respectively, to a gas outlet pipe 42 which extends through the wall of the casing 31 and connects via a shut-off valve 43 to a conduit 44 which is connected to the oil burner 19 for supplying gas thereto.

The slide valves 22, 23, 24 and 25 provided in the conduits 3, 20, 21, respectively, each have an open position and a shut-off position, and means are provided for operating the valves in interlocked relationship in such a manner that when the valves 22 and 25 are in the shut-off position the valves 23 and 24 are in the open position, and vice versa. The means for simultaneously operating the four valves 22–25 comprises a double-armed lever 27 which is pivoted on a shaft 26 secured to the vertical support 34 a distance above and in the same vertical plane as the pivot shaft 9 of the lever 10. To each arm of the lever 27 there is pivotally connected, by means of a pin 49 engaging in a slot 50 in the lever arm, one end of a rod 28 and 29, respectively, which has its other end connected to the valve body of the slide valve 22 and 25, respectively. The valve bodies of the valves 22 and 25 are rigidly interconnected by means of a connecting rod 45, and a similar rod 46 is connected between the valve bodies of valves 24 and 25. The lever 27 is capable of swinging between the inclined position shown in the drawing and a position correspondingly inclined in the other direction, thereby switching the valves 22–25 from one position to the other. The lever 27 is disposed in the path of movement of the lever 10 in such a manner that during swinging of the lever 10 the arms thereof will abut the arms of lever 27 and thereby cause the swinging of the latter. To provide a rapid switching of the valves 22–25 from one position to the other by means of the lever 27, there is provided a draw spring 127 which has one end connected to a projection 47 on the upper side of the lever 27 and which has its other end connected to the vertical support 34 at 48 below the pivot shaft 9 for the lever 10. It will be seen that the swinging of the lever 27 from one inclined end position towards the opposite end position will first be resisted by the spring until a dead center position is reached after which the spring will rapidly pull the lever over to the other end position, thereby reversing the valves 22–25.

The pump mechanism described above operates in the following manner:

In the position shown in the drawing the valves 23 and 24 are in the open position and the valves 22 and 25 are in the closed position. The gas from the container 2 will then be supplied via the open valve 24 to the cylinder 6 and will push the piston 8 upwardly and consequently cause the piston 7 to be displaced downwardly, so that the fuel oil in the cylinder 6 will be fed to the burner 19 while at the same time fuel oil will be sucked into the upper portion of the cylinder 5 and combustible gas which is present in the cylinder chamber below the piston 7 and which has already been utilized for the pumping will be fed to the burner via the open valve 23. During the continued upward movement of the piston 8 from the position shown in the drawing, the lever 10 will swing the lever 27 past the dead center point so that the spring 127 will rapidly move the lever 27 to the other end position thereby causing the valves 22 and 25 to open and the valves 23 and 24 to close, whereat the piston 7 will be pushed upwardly by gas from the pressure container supplied to cylinder 5 via the open valve 22. The fuel oil previously sucked into the cylinder 5 will then be fed to the burner, and at the same time fuel oil will be sucked into the cylinder 6 and the combustible gas present therein will be fed to the burner via the valve 25, whereafter the described cycle will be repeated.

In the embodiment shown in the drawing the two sides of each piston have substantially equal areas, although the piston rod slightly reduces the effective area on one side.

It is to be understood that the embodiment hereinbefore described and shown in the drawing is for explanatory purposes only and is not to be taken as limiting with respect to the details of the invention which may be varied within the scope of the appended claim.

What I claim is:

An oil burner utilizing a fuel oil and a combustible gas comprising a piston pump including a pump cylinder and piston slideable therein, a source of a combustible gaseous pressure medium, a first conduit connected to
said source of combustible gaseous pressure medium and to said cylinder on one side of said piston, a source of fuel oil connected to said cylinder on an opposite side of said piston, an oil burner, a second conduit connected to the same side of said cylinder as said source of fuel oil and also to said oil burner for supplying fuel oil thereto, a third conduit connected to said cylinder on the same side thereof as said source of combustible gaseous pressure medium and also to said oil burner for supplying said combustible gaseous pressure medium thereto, mechanically operated valve means for alternately opening and closing said first and third conduits whereby said piston is raised and lowered and one way valve means each interposed in said second conduit and the connection of said source of fuel oil to said cylinder.

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