

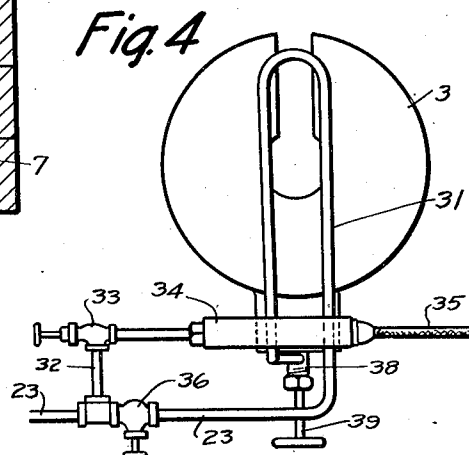
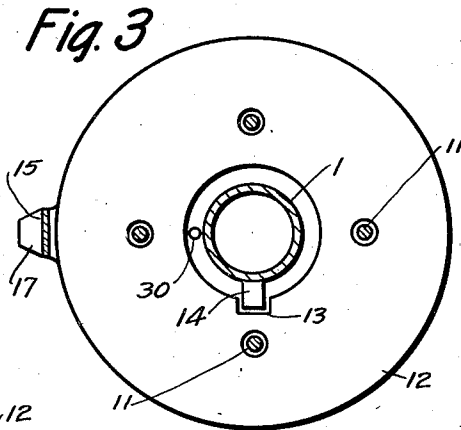
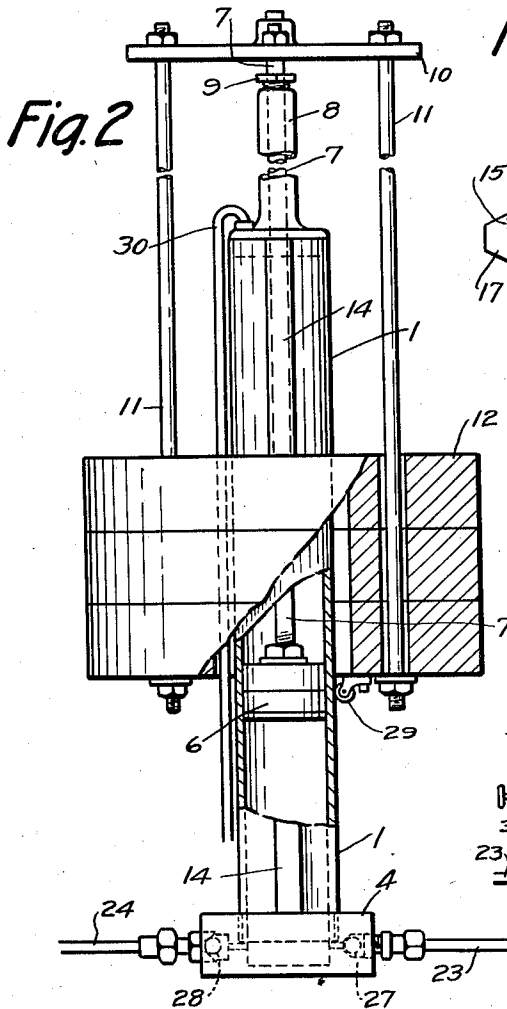
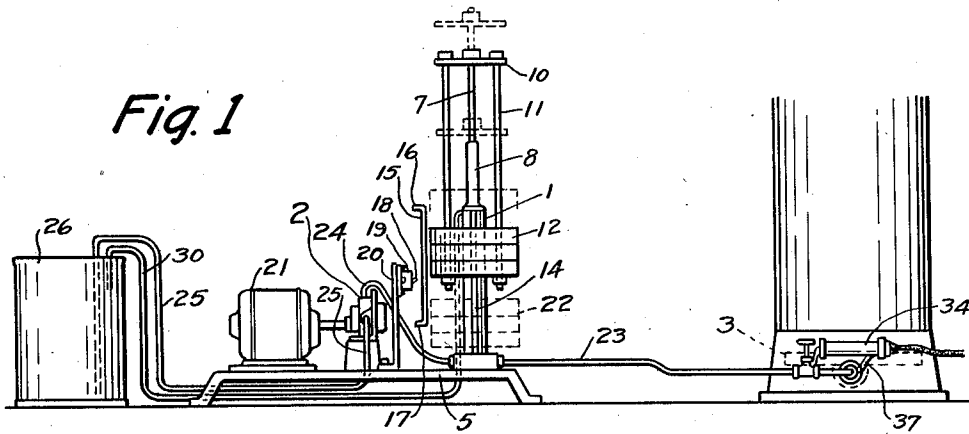
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GRAVITY FEEDER

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GRAVITY FEEDER

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1 Claim. (Cl. 103—222)

The purpose of this invention is to provide an oil burner in which the fuel is fed mechanically, thereby eliminating the necessity for feeding the fuel by air pressure.

5 The invention is an apparatus for momentarily applying pressure to liquid fuel by means of an accumulator as the fuel is injected into the burner.

10 Many oil burners of different types have been invented and to some of these burners the fuel is fed by gravity, or without pressure, however, in most burners the fuel is fed by, or in combination with, air pressure, and some States have passed laws prohibiting the use of air under pressure in combination with fuel burners. It has
15 been found advantageous, however, to feed the fuel to the burner under pressure as, in doing so, the fuel is volatilized and burned more effectively.

20 The object of this invention is, therefore, to provide means for momentarily applying pressure to the fuel as it is burned without the use of air pressure and in which only a very small quantity of the fuel is under pressure.

25 Another object is to provide means for applying pressure to fuel by means of an accumulator in which substantially all of the fuel under pressure is used with each operation.

30 Another object is to provide automatic means for periodically applying pressure to fuel as it is burned.

A further object is to provide a feed for fuel oil in which the operating mechanism operates for very short periods of time.

35 A further object is to provide a feed for fuel oil which may be remotely situated from the electrical means by which it is operated.

40 And a still further object is to provide means for feeding fuel oil by means which is of a simple and economical construction.

45 With these ends in view the invention embodies a cylinder having a plunger therein with counter weights for the plunger, a connection from the lower end of the cylinder to an oil burner, another connection from the lower end of the cylinder to a motor driven pump, a supply connection from the pump to a fuel supply container, an overflow return connection from the cylinder to the fuel supply container and means
50 automatically starting and stopping said pump as the plunger in the cylinder reaches the ends of its stroke.

55 Other features and advantages of the invention will appear from the following description taken in connection with the drawing, wherein:

Figure 1 is a view showing the general arrangement of the apparatus.

Figure 2 is a detail showing the accumulator feed cylinder.

Figure 3 is a cross section thru the cylinder. 5

Figure 4 is a detail showing the plan of the burner with the connections thereto.

In the drawing the device is shown as it would be made wherein numeral 1 indicates the cylinder, numeral 2 the pump, and numeral 3 the 10 burner.

The cylinder 1 is preferably made with a tubular casing having a base 4 which may be mounted upon a stand 5 and in the interior of the cylinder is a piston 6 which may be provided 15 with packing rings of any type or description. The piston is connected to a rod 7 which extends upward and out of the upper end of the cylinder thru a bearing 8, which is comparatively long in order to form a guide for the rod 7, and the 20 upper end of the bearing may be provided with a packing gland 9 which may be of any type or description, or any means may be used for packing the upper end of the cylinder. A disc 10 is mounted on the upper end of the rod 7 having 25 bolts 11 extending downward therefrom, on the lower ends of which are counter weights 12 which may be held by nuts as shown, or by any other means. The counter weights may be provided with a continuous slot 13 forming a keyway and 30 a projection 14 may be provided on the surface of the cylinder, forming a key to locate the position of the counter weights in order to hold them in one position. It will be understood, however, that any other means may be used for locating 35 and holding the counter weights in any position in relation to the cylinder, and the member 14 may be made integral with the cylinder or attached thereto, or held in any manner.

A member 15 may be attached to one side of 40 the counter weights and this may be formed with a projection 16 at the upper end and a similar projection 17 at the lower end, and the relative positions of these projections may be arranged so that they will engage a button 18 of 45 a switch 19 on a bracket 20, as shown in Figure 1, and this switch may control a motor 21 which operates the pump 2. It will be observed that with the counter weights moving downward from the position shown in Figure 1 the projection 50 16 will engage the button 18 when the counter weights arrive at the lower position, as indicated by the dotted lines 22, which will reverse the position of the switch in order to complete a circuit thru the motor so that the motor will op- 55

erate the pump, and as the pump operates it will pump fuel into the lower end of the cylinder, thereby raising the piston and counter weights until the projection 17 engages the button 18 and reverses the position of the switch, thereby stopping the motor. As soon as the motor stops the weight of the counter weights will rest upon the oil in the cylinder so that the oil will be forced thru an outlet connection 23 to the burner 3, thereby supplying fuel under pressure with the pressure resulting from gravity, and it will be noted that as soon as the piston reaches the lower position the pump will operate to again fill the cylinder 1 with fuel, and during the operation the fuel will be under pressure from the pump so that a continuous supply of fuel will be fed to the burner and this will not be interrupted by the operation of returning the piston to the upper position. The pump is connected to the lower end of the cylinder thru connection 24 and the intake port thereof may be connected by connection 25 to supply container 26 and it will be noted that the container 26 may be located at a remote point, or wherever desired. The connections 23 and 24 are provided with ball check valves 27 and 28 which are oppositely positioned, as shown in Figure 2. The valve 28 will permit the fluid to flow into the cylinder and the valve 27 will permit the fluid to flow from the cylinder. It will be understood, however, that these check valves may be of any other type or design and may be arranged in any other manner. Casters 29 may be provided on the lower side of the counter weights which will contact the surface of the cylinder 1 to prevent friction between cylinder and weights. It will also be understood that any other means may be used for locating or holding the counter weights in relation to the cylinder. The upper end of the cylinder may be provided with an overflow connection 30, which extends back to a supply container 26, so that any leak or drip will pass back to the supply container.

The connection 23 extends from the base of the cylinder, as shown in Figures 1 and 2, and is connected to the upper end of the burner, as shown in Figure 4. It may be directly connected to a generator 31, however, this may also be provided with an auxiliary connection 32 having valve 33 therein which may pass thru a heater 34 positioned at the front of the burner, as shown in Figure 4, or located in any position. In the design shown, the heater 34 is formed with an electric heating element which may be supplied with electric current by a wire 35, which may be connected to any source of supply and it will be noted that when starting the burner a valve in the connection 23 may be closed and the valve 33 opened so that the fuel may directly pass into the heater 34 and from the lower side thereof to the burner through a connection 37, as shown in Figure 1, and after the burner and generator 31 are hot the valve 33 may be closed and the valve 36 opened, so that fuel will pass directly thru the generator 31 and into the burner thru a connection 38, which is provided with a regulating valve 39. It will be understood, however, that these connections may be formed in any other manner and the valves may be located in any other position, and also that any other means may be used for heating the fuel when starting the burner.

It will be understood that changes may be made in the construction without departing from

the spirit of the invention. One of said changes may be in the use of a container of any other type or design for holding the fuel, another may be in the use of other means or exerting pressure on the fuel by gravity, another may be in the use of other means for elevating the gravity acting pressure producing means, another may be in the use of other means of feeding the fuel to the burner, and still another may be in the use of the device with a burner of any other type or design.

The construction will be readily understood from the foregoing description. In use the device may be used as shown and described and it will be noted that the cylinder may be located at any remote point and connected to the burner by any means and the fuel supply pipe may extend to a container or supply tank which may be situated at any point. When it is desired to light the burner the heat is turned on and the oil or fuel is first passed thru the heater and the burner lighted, and after the generator is sufficiently hot to atomize the fuel, the heater is turned off and the oil passed directly to the generator. With this apparatus the oil is, therefore, fed to the generator under pressure without the use of air under pressure and the amount of fuel in the cylinder is comparatively small, so that there is no possible danger of an explosion of any kind. The device may also operate continuously or may be turned on and off as may be desired. The device may be made of any size and arranged in any manner to accommodate a burner of any type.

Having thus fully described the invention what we claim as new and desire to secure by Letters Patent, is:

An accumulator for oil burners comprising a vertically positioned cylinder of considerable height, a base in which said cylinder is mounted, inlet and outlet connections in said base and communicating with said cylinder, a check valve in said inlet connection preventing fluid from said cylinder flowing backward therethrough, a check valve in said outlet connection preventing fluid flowing from the connection back into the cylinder, said valves positioned in close proximity to the lower end of the cylinder eliminating storage of fluid in said connections, a piston in said cylinder, a closure for the upper end of said cylinder having a relatively long bearing extending upward from the upper end of said cylinder, an overflow connection for leakage past said piston communicating with the upper end of said cylinder through said closure, a piston rod connected to said piston and extending upward through said bearing, said piston rod being comparatively smaller than the piston and cylinder, a packing gland at the upper end of said bearing, a spider on the upper end of said piston rod positioned a sufficient distance from the upper end of the bearing to permit the piston to travel to the lower end of the cylinder, rods extending downward from said spider, and weights removably supported on said rods, said weights provided in sections and adapted to be removed and replaced to adjust the load on the piston, said cylinder having a key on the outer surface thereof corresponding with a groove in the weights to locate the position of the weights, and said weights having projections extending therefrom adapted to engage a starting and stopping switch.

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