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LUBRICATOR FOR PUMPS

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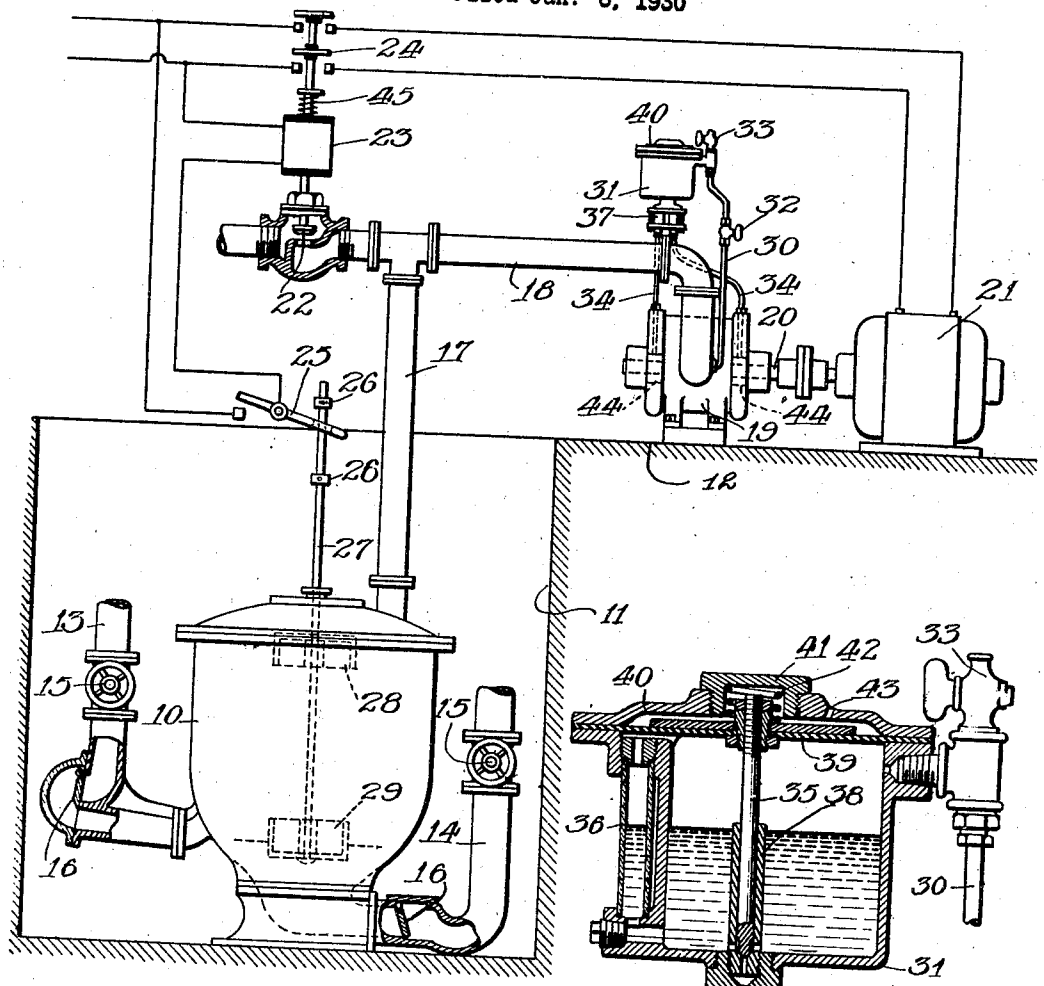


Fig. 1

Fig. 2

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LUBRICATOR FOR PUMPS

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The invention relates to pumps which are automatically thrown into and out of operation at more or less frequent intervals and thus intermittently actuated. The present improvement provides means for supplying lubricant to the pump, such means being automatically thrown into and out of operation with the pump so that lubricant is not wasted when the pump is idle.

The present invention also provides improved means for supplying lubricant to an intermittently operated air pump of a sewage pumping system and which is employed for forcing sewage from a receptacle in which the sewage is collected.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings, which show the present improvement as applied to a sewage pumping system—

Fig. 1 is a view in elevation with certain parts shown in section.

Fig. 2 is a vertical section of the lubricant receptacle, supply valve and valve-operating means.

The sewage pumping system illustrated comprises a receptacle 10 arranged within a pit 11 below the floor level 12. The receptacle is provided with an inlet pipe 13 for the sewage or the like and with a discharge pipe 14, these pipes being provided with suitable cut-off valves 15 and non-return check valves 16. The receptacle is closed and its upper end is connected by pipes 17 and 18 to the discharge outlet of a rotary air pump 19. The pump shaft 20 is directly connected to the shaft of an electric motor 21, and the discharge outlet pipe 18 of the air pump is provided with a normally open relief valve 22. The latter is adapted to be closed by a solenoid 23 which also, when energized, is arranged to close a starting switch 24 interposed in the motor circuit. The coil of the solenoid is connected to the supply conductors through the medium of a switch 25. The latter is operated by lugs or buttons 26 adjustably mounted on a float rod 27 which extends through a stuffing box in the top of the receptacle and is provided with upper and lower bells 28 and 29 within the receptacle.

The discharge outlet of the air pump is also connected by a small pipe 30 to the upper end of an oil tank or receptacle 31, this pipe being provided with a cut-off valve 32 and also a relief valve 33. Pipes 34 lead from the lower end of the oil receptacle to the pump shaft bearings and a vertically movable, normally closed valve 35 within the receptacle controls the flow of oil through the pipes 34. Preferably, as shown, the oil receptacle 31 is provided with a gauge glass 36 and the pipes 34 are provided with sight-feed glasses 37.

The lower portion of the valve extends within a guiding sleeve 38 fixed within the oil receptacle and its upper end is connected to a diaphragm 39, that closes the top of the receptacle and is secured in place by a cover plate 40. A cap 41 is threaded into a central opening in the cover 40 and a spring 42 interposed between the cap and the diaphragm 39 normally holds the valve 35 closed. The cover 40 as shown is provided with a vent opening 43.

As the sewage flows into the receptacle 10, air is vented from its upper end through the pipe 17 and the relief valve 22. When the receptacle is filled, air trapped within the upper bell 28 lifts the float rod 27 and closes switch 25 to energize the solenoid 23. The latter then closes the motor circuit to start the pump and also closes the vent valve 22, so that air under pressure is forced through the pipes 18 and 17 into the receptacle to thereby force the contents of the receptacle out through the discharge pipe 14. Also, air under pressure passes through the pipe 30 into the upper end of the receptacle 31 above the oil level therein and beneath the diaphragm 39. Thereby the valve 35 is opened and oil flows through the pipe 34 to the pump shaft bearings 44.

When the receptacle 10 is nearly empty, liquid collecting in the lower bell 29 depresses the float rod 26, opens the switch 25 and de-energizes the solenoid 23. A spring

45 then serves to open the motor switch and the valve 22 to stop the motor and the pump and also to relieve the pressure in the pump outlet and in the receptacle 10, so that sewage will again flow into the latter. The air pressure within the upper end of the oil reservoir is also relieved so that the valve 35 is closed by the spring 42 to cut off the flow of oil to the pump.

The pumping system or apparatus operates automatically and intermittently without attention, and lubricant is supplied, without waste, only when the pump is in operation. It is also noted that air under pressure supplied to the upper portion of the oil tank to open the supply valve, also serves to force lubricant to the pump bearings.

Changes may be made in the details set forth without departure from the scope of the invention as defined in the claims.

I claim as my invention:

1. In a lubricating apparatus, the combination of a pump and means for effecting the automatic, intermittent operation thereof, an oil receptacle connected to the pump shaft bearings, a normally closed valve for controlling the flow of oil from said receptacle, and a pressure device subject to the discharge pressure of the pump for opening said valve, substantially as described.

2. In combination, with a pump, an oil receptacle connected to the pump shaft bearings, a valve controlling the flow of oil from said receptacle, a pressure actuated device connected to the stem of said valve and means for subjecting said device to the discharge pressure of the pump to open said valve.

3. In combination with an air pump, an oil reservoir, oil supply pipes connecting the lower portion of said reservoir to the pump shaft bearings, a vertically disposed valve in said reservoir controlling the flow through said pipes, a diaphragm connected to the stem of said valve, a spring for holding said valve closed, and a pipe connected to the pump outlet for subjecting the lower face of the diaphragm to the pump discharge pressure to open the valve against the tension of the spring, substantially as described.

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