Oct. 16, 1934. R. DE LONG 1,977,377

HYDROSTATIC SIGHT FEED LUBRICATOR

Original Filed June 21, 1930 2 Sheets-Sheet 1

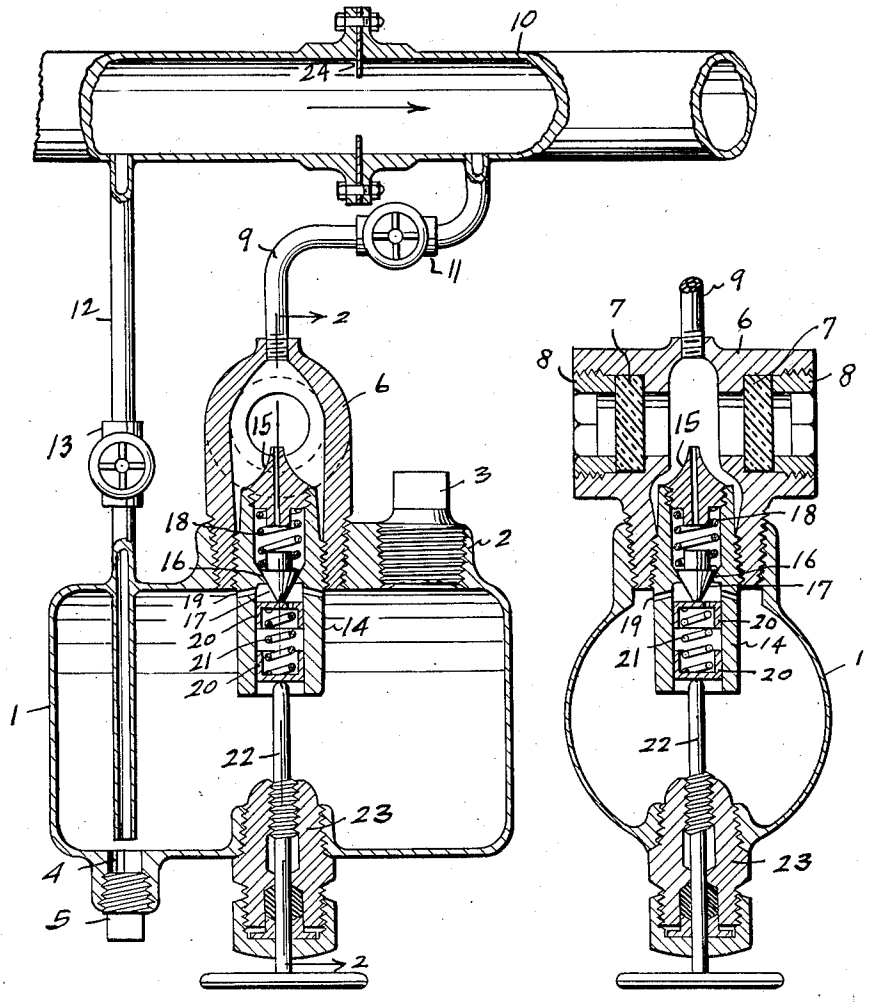


Fig. 1.

Fig. 2.

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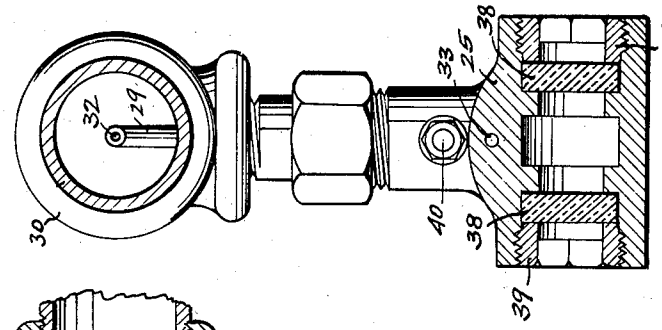


Fig. 4.

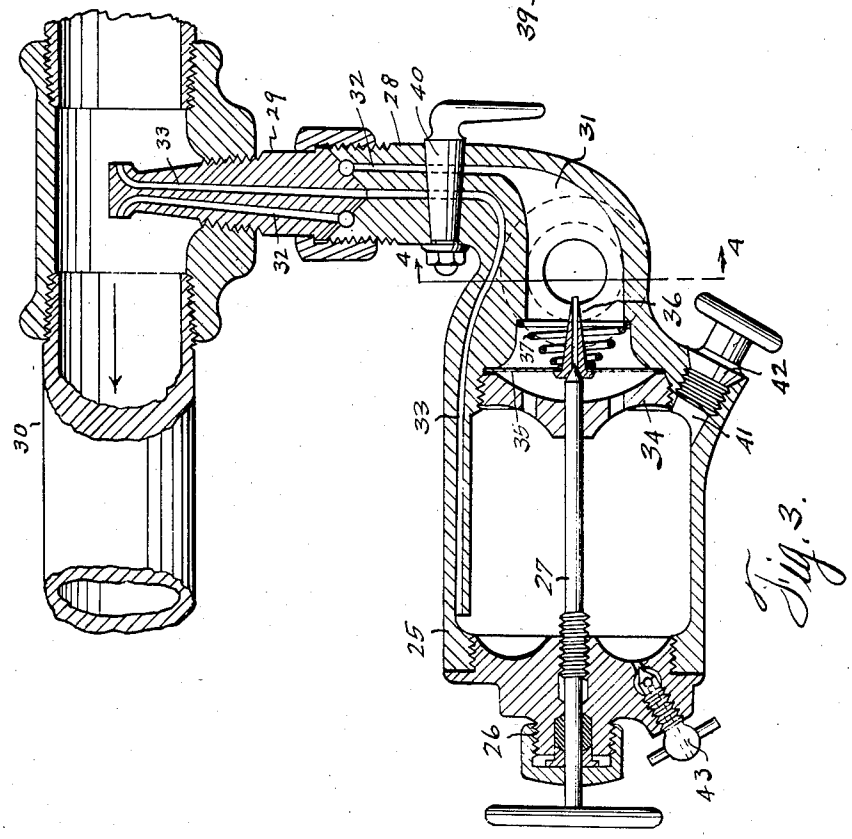


Fig. 3.

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HYDROSTATIC SIGHT FEED LUBRICATOR

Raleigh De Long, Houston, Tex.

Application June 21, 1930, Serial No. 462,829
Renewed March 10, 1934

4 Claims. (Cl. 184—55)

This invention relates to new and useful improvements in a hydrostatic sight feed lubricator.

One object of the invention is to provide a lubricator of the character described specially adapted for the purpose of lubricating the relatively movable parts of prime movers, compressers and the like, and a more particular object of the invention is to provide a lubricator designed to lubricate the wearing surface of cylinders, valves and bearings without the waste of the lubricant and without the necessity of frequent repairs.

Another object of the invention is to provide a lubricator of the character described which will work effectively when located remote from the parts to be lubricated and which consequently might be located at any convenient place.

A still further feature of the invention is to provide a lubricator of such construction as to utilize in its operation the difference in velocity head, created in different locations in the steam or other conducting line with which the lubricator is connected.

With the above and other objects in view, the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings wherein:

Figure 1 shows a vertical sectional view of the lubricator.

Figure 2 shows a vertical sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a vertical sectional view of another form of the lubricator and

Figure 4 shows a sectional view thereof taken on the line 4—4 of Figure 3.

In the drawings, the numeral 1 designates a lubricant container having the filling opening 2 closed by the plug 3 and the drain outlet 4 closed by the plug 5. Screwed into the top of the container 1 and upstanding therefrom there is a hood 6 which is made in the form of a tube extending transversely with respect to the container as shown in Figure 2, and whose ends are closed by the transparent lenses 7, 7, retained in place by the glands 8, 8, and spaced apart and leading upwardly from the space between said lenses there is a tube 9 which is connected into a main steam pipe 10 and which is controlled by suitable cut-off valve 11. Leading from the pipe 10 down into the container 1 there is a tube 12 which is controlled by the shut off valve 13 and whose lower end terminates near the bottom of the container 1.

Screwed into the lower end of the hood 6 and depending down into the container 1 there is a cylinder 14 whose upper end carries a discharge nozzle 15 which terminates in the space between the lenses 7. The cylinder 14 has an internal downwardly converging valve seat 16 which is controlled by an inverted conical shaped valve 17. There is a coil spring 18 interposed between said valve and nozzle which normally holds the valve closed. The cylinder 14 has one or more inlet ducts 19 leading from the container 1 into the cylinder 14 beneath said valve seat.

Within the lower end of the cylinder 14 beneath said valve there is a plunger having the cup shaped ends 20, 20 with a coil spring 21 between them and there is an adjusting rod 22 threaded upwardly through the gland 23, secured to the bottom of the container, and the upper end of this adjusting rod works against the lower end of this plunger. In the steam line 10 between the tubes 9 and 12, there is a transverse diaphragm 24 having a restricted central opening. The steam travels under pressure in the direction indicated by the arrow and after passing through the diaphragm opening, will travel at a greater velocity thus creating a suction through the tube 9 and the condensation in the tube 12 will collect in the bottom of the container thus taking the place of the lubricant as the latter is drawn out of the container 1, under the influence of said suction. The lubricant as it is drawn out will pass between the lenses 7. By a suitable adjustment of the rod 22 the plunger above it may be maintained in the desired position to permit the valve 17 to only partly close and the feed of the lubricant may thus be regulated. In Figures 3 and 4 the numeral 25 designates the lubricant container which is formed at one end with a stuffing box 26 through which the needle valve 27 works and at its other end is formed with an upturned neck 28 to which is attached a nozzle 29 which terminates in the steam pipe 30. In this form of the device the steam will travel through the line 30 in the direction indicated by the arrow. The neck 28 has an enlarged throat 31 which gradually contracts and terminates in the channel 32 which leads on out through the nozzle 29 and terminates in a discharge end which is turned in the direction of the travel of the steam. The container 25 has another channel 33, leading from the upper portion thereof and continuing on through the nozzle 29 and having an inlet end turned toward the oncoming steam.

Within the container 25 there is a perforated

transverse partition 34 which serves to clamp the flexible diaphragm 35 in place across the throat 31. This diaphragm carries a discharge nozzle 36 which discharges into said throat and said diaphragm works against a coil spring 37. The inner end of the needle valve 27 controls the passageway through the nozzle 36. The throat of the container 25 is of tubular formation as shown in Figure 4 having the spaced transparent lenses 38, 38 spaced apart therein through which the feed of the lubricator may be observed. Said lenses may be secured in place by the glands 39, 39.

The ducts 32, 33 may be opened and closed by a conventional valve 40 provided for the purpose.

The container 25 may be filled through the filling opening 41 which is normally closed by the plug 42.

The steam passing through the steam pipe 30 under pressure will partly pass into and through the channel 33 condensing in the lubricant chamber as well as applying pressure to the lubricant therein to force the same out through the channel 32. The condensate will collect in the lubricant chamber and take the place of the lubricant that is fed out. The steam passing through the line 30 under high velocity also creates a zone of lower pressure in the discharge end of the channel 32 thus causing a flow of the lubricant through said channel from the lubricant chamber which lubricant will be discharged into the steam and thereby carried to the parts to be lubricated.

The lubricant from the lubricant chamber as fed out will pass through the perforated partition 34 and through the nozzle 36, the flow being controlled by the adjustment of the needle valve 27.

In both forms of the lubricator the space or chamber between the transparent lenses 7, 7 and 38, 38 respectively is filled with water and the lubricant passes therethrough in bubbles so that it can be readily ascertained by inspection whether the lubricator is properly operating or not. When the lubricant chamber becomes filled with water it may be drained by removing the plug 5 of the form shown in Figure 1, or the plug 43 of the form shown in Figure 3.

The drawings and description disclose what is now considered to be the preferred form of the invention by way of illustration only, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. The combination with a line for conducting fluid under pressure, of a lubricant container having a nozzle which extends into said line, there being channels leading from said container through said nozzle and terminating in said line, said terminating ends facing one toward and the other from the oncoming fluid flowing through said line whereby the lubricant is caused to flow from said container through one of said channels into said line and flow controlling means in said last named channel comprising a nozzle having a flow duct therethrough and a valve seat, a valve arranged to cooperate with said seat to control the flow of lubricant through said duct, said last mentioned nozzle and said valve being mounted one yieldingly relative to the other and said other being manually adjustable to regulate the amount of lubricant passing through said duct.

2. The combination with a line for conducting fluid under pressure, of a lubricant container having a nozzle which extends into said line, there being channels leading from said container through said nozzle and terminating in said line, said terminating ends facing one toward and the other from the oncoming fluid flowing through said line whereby the lubricant is caused to flow from said container through one of said channels into said line, and means for regulating such flow said regulating means comprising a flexible diaphragm spanning said last mentioned channel, a nozzle mounted on said diaphragm and having a flow duct for the lubricant therethrough which is formed with a valve seat and a valve adjustably mounted on the container and accessible outside of the container and manually adjustable to control the flow through the nozzle.

3. The combination with a line for conducting fluid under pressure, of a lubricant container having channels leading therefrom and terminating in said line, means for restricting said line between said terminating ends to cause unequal pressures in the line adjacent said ends whereby the lubricant is caused to flow from the container through one of said channels into said line, a movable partition spanning said last mentioned channel, a nozzle on one side of said partition and having an axial duct through which the lubricant may flow from said container, a yieldable seat against which said partition acts, means adjustably connected to the container walls and manually operable from outside of the container and arranged to control the flow of lubricant through said duct a section of the walls of said last named channel being transparent.

4. The combination with a line for conducting fluid under pressure, of a lubricant container having channels leading therefrom and terminating in said line, means for restricting said line between said terminating ends to cause unequal pressures in the line adjacent said ends whereby the lubricant is caused to flow from the container through one of said channels into said line, means for controlling said flow, said controlling means comprising a nozzle in said last mentioned channel having a restricted axial duct for the flow of lubricant from said container, a valve seat and a valve arranged to control the flow of the lubricant through said duct, said valve and nozzle being mounted one yieldingly relative to the other and means for adjusting the valve relative to said seat to control the volume of lubricant flowing through the duct.

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