

C. C. LEAGUE.
CYLINDER LUBRICATOR.
APPLICATION FILED AUG. 28, 1908.

948,455.

Patented Feb. 8, 1910.

Fig. 3.

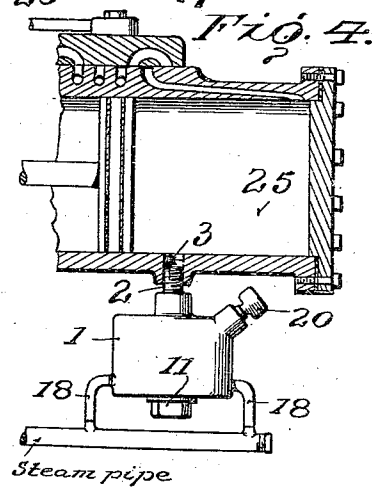
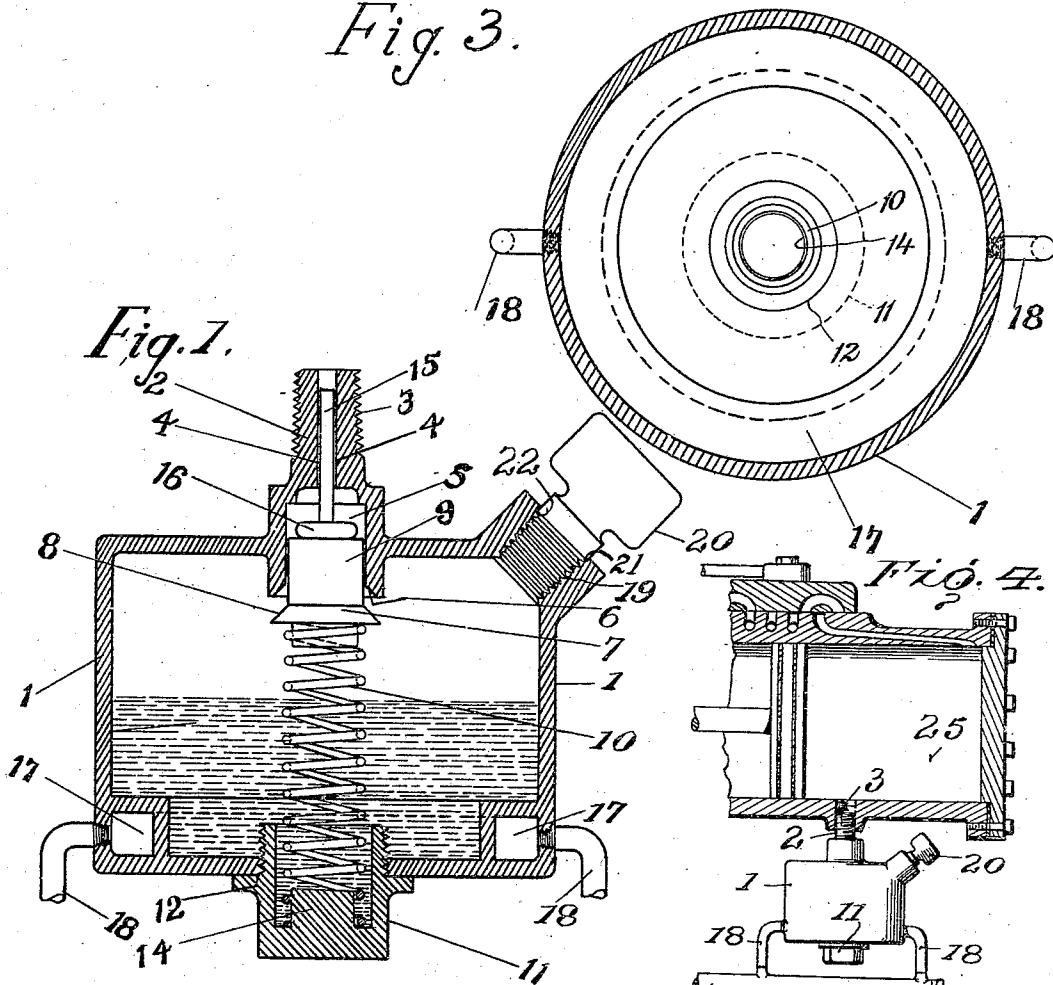
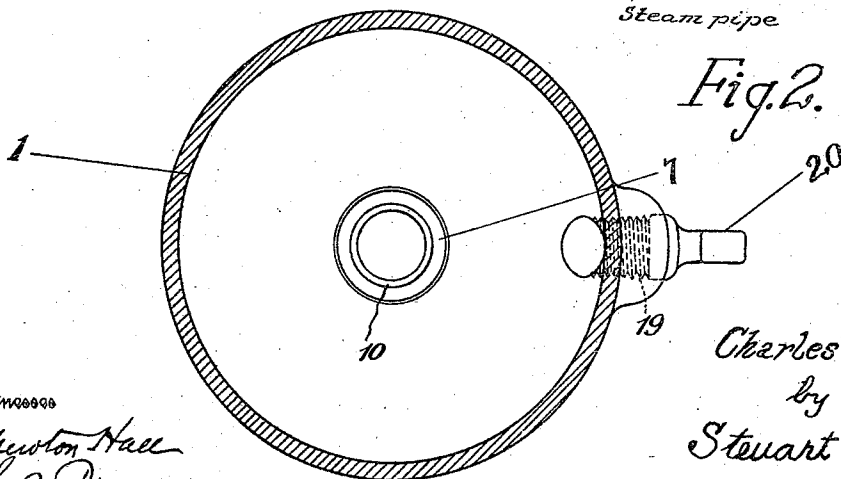


Fig. 2.



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CYLINDER-LUBRICATOR.

948,455.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed August 28, 1908. Serial No. 450,602.

To all whom it may concern:

Be it known that I, CHARLES C. LEAGUE, citizen of the United States of America, residing at the town of Renovo, State of Pennsylvania, have invented certain new and useful Improvements in Cylinder-Lubricators, of which the following is a specification.

This invention relates to an apparatus for feeding oil or other lubricant into the cylinder of a pump for gaseous fluid or a steam engine or the expansion chamber of any motor actuated by the expansion of a gas or vapor.

The apparatus embodying the invention consists of a closed container for lubricant adapted to withstand pressure from within and to be partly filled with lubricant. A passage leads from the chamber at a point above the surface of the lubricant to the cylinder to be lubricated. This passage may be enlarged adjacent the chamber, forming a cylinder; in this case a valve seat surrounds the mouth of the passage. Co-operating with the valve seat is a valve which may have a projection or piston which, when the valve is seated, extends into the passage, substantially filling the enlarged portion. The piston fits loosely in the passage, so that when the valve is open steam or other actuating fluid may pass from the cylinder to the container. The container is preferably heated by suitable means. A spring or other suitable yielding means maintains the valve normally seated.

In the accompanying drawings,—Figure 1 is a vertical axial cross section of the lubricator. Fig. 2 is a horizontal section of the same looking upward. Fig. 3 is a horizontal section looking downward. Fig. 4 shows the application of the lubricator to an engine cylinder.

As shown in the drawings, there is a container 1, for lubricant, cast in a single piece. This container is provided at its upper extremity with a neck or extension 2, screw-threaded on its external surface at 3, to engage a suitable tapped hole in the wall of the cylinder or any connection. The neck 2 is pierced longitudinally by a passage 4. This passage is enlarged adjacent the inside of the container to form a cylinder 5, opening into the container. The opening is encircled by a valve seat 6, disposed toward the inside of the container. Coöperating with this valve seat is a valve 7, having a seat surface 8, to engage the valve seat 6.

The valve is provided with an extension or piston 9, which extends into the cylinder 5, filling a large portion thereof when the valve is seated. A suitable spiral spring 10 engages the valve and maintains it normally seated. The spring is supported at its lower extremity by a plug 11, which closes an aperture 12, in the lower wall of the container. Both the plug and the valve are provided with suitable lugs 14, to hold the spring in alinement. In the passage 4, is a pin 15, the length of which is somewhat in excess of the length of the passage. The lower extremity of the pin is provided with a head 16, by which the traverse of the pin is limited.

Encircling the inner surface of the container near its lower portion is a passage 17, connected by a suitable pipe 18, to a supply of steam or other hot fluid. Near the upper surface of the container is an opening 19, closed by a plug 20. The opening 19 is tapped and the plug is screw-threaded to engage the threads of the opening. A valve seat 21, surrounds the opening 19, and is engaged by a valve surface 22, on the screw.

In Fig. 4, the lubricator is shown in operative position in connection with a portion of a steam engine. The cylinder 25 is tapped near its lower portion and the neck 2 of the lubricator is screwed into the hole thus formed. The container in its operative position is placed upright as shown in this figure and in Fig. 1.

In the operation of the device it is preferably placed as shown in Fig. 1, with the passage 4 above the surface of the liquid, with the object that the oil is atomized or vaporized or in some other way mixed with the gas which enters the container at high pressure, and carried by the gas from the chamber of the container to the cylinder whenever the pressure in the cylinder is reduced. It will be noted that the passage leading from the container to the engine cylinder necessarily opens into the container above the surface of the liquid lubricant therein, and wherever the passage is referred to as opening into the upper portion of the container, the meaning intended to be conveyed is that the opening is above the surface of the liquid lubricant. The neck 2, is connected to the engine or pump cylinder, so as to provide a continuous passage for the steam or other fluid from the cylinder to the container when the valve 7

is open. Normally, the spring 10 holds the valve 7 against its seat, closing the passage, but as the pressure in the cylinder rises during admission or compression, the pressure on the top side of the valve overcomes the tension of the spring and the valve is opened. The gas or steam at high pressure passes between the piston 9 and the walls of the cylinder and is admitted to the container. The gas or steam under these conditions mixes with the oil. As the pressure in the pump or engine cylinder drops during expansion or at the time of exhaust the tension of the spring again overcomes the pressure of the actuating fluid and the valve is closed. It is important to note that at the opening of the valve the piston 9, is withdrawn to a greater or less extent from the cylinder 5, increasing the space therein which can be occupied by the vapor, and that when the valve is closed this piston is advanced, filling this space and expelling the vapor through the opening 4. Thus, at each stroke of the engine a quantity of the steam or the gas used is admitted to the container and becomes mixed with the lubricant. This mixture, on becoming diffused, enters the cylinder 5, and on the closing of the valve during expansion or exhaust a large proportion of the mixture in the cylinder 5 is expelled therefrom and injected into the cylinder.

The facility with which the lubricant is taken up is much increased by raising its temperature. This is accomplished in the embodiment shown by passing steam through the annular chamber 17, provided for that purpose.

It will be noted that the opening of the passageway 4 is necessarily small. In order to secure such an opening and keep it clear the device illustrated has been provided. The passage is made of much larger cross section than the desired opening and is partly closed by means of the loose pin 15. This pin is given a reciprocating motion *i. e.*, is raised by the piston 9 and follows the latter in its downward stroke, propelled by gravity.

I have described above in minute detail an apparatus embodying my invention, but I do not limit myself to the details shown and described.

What I desire to secure by Letters Patent is defined in the following claims.

1. In a device for feeding liquid lubricant, a closed container for the lubricant having a passage opening into the upper portion of the container and leading from the container to the cylinder of an engine or pump, whereby some of the fluid is led from the cylinder to the surface of the liquid lubricant and returned during each cycle, and means for heating the lubricant.

2. In a device for feeding liquid lubricant,

a closed container for the lubricant having a passage opening into the upper portion of the container and leading from the container to the cylinder of an engine or pump, whereby the actuating fluid is applied to the surface of the lubricant, means for heating the lubricant, and means actuated by the variations of pressure in the cylinder to return the actuating fluid and the lubricant suspended thereby to the cylinder.

3. In a lubricating device, a container for lubricant having a passage opening into the container above the predetermined level of the surface of the lubricant and leading to an engine or pump cylinder, a valve seat encircling the passage, a valve coöperating with the seat and yielding means tending to maintain the valve on its seat.

4. In a lubricating device, a container for lubricant having a passage opening into the upper portion of the container, that is, above the surface of the lubricant, and leading to an engine or pump cylinder, a valve seat encircling the passage, a valve coöperating with the seat and opening toward the container, yielding means tending to maintain the valve on its seat, and means for heating the lubricant.

5. In a lubricating device, a container for lubricant having a passage opening into the container above the level fixed for the surface of the lubricant, a valve seat encircling the passage adjacent its mouth, a valve coöperating with the seat and provided with a piston extending into the passage and fitting loosely therein, and yielding means tending to maintain the valve on its seat and the piston in the passage.

6. In a lubricating device, a container for lubricant having a passage opening into the upper portion of the container, a valve seat encircling the passage adjacent its mouth, a valve coöperating with the seat, opening toward the container and provided with a piston extending into the passage and fitting loosely therein, yielding means tending to maintain the valve on its seat and the piston in the passage, and means for heating the lubricant in the container.

7. In a lubricating device, a container for lubricant having a passage leading from the container to the cylinder of an engine or pump, the passage being enlarged near the container, the valve seat adjacent the mouth of the passage, the valve coöperating with the seat and having a piston extending within the passage when the valve is seated, and yielding means tending to maintain the valve on its seat.

8. In a lubricating device, a container for lubricant having a passage leading from the upper portion of the container to the cylinder of an engine or pump, a valve seat adjacent the mouth of the passage, a valve coöperating with the seat, opening toward

the container and having a piston extending within the passage when the valve is seated, and yielding means of tension less than the pressure exerted upon the valve by the actuating fluid during compression and greater than the pressure on the valve during exhaust, tending to maintain the valve on its seat against the cylinder pressure.

9. In a lubricating device, a container for lubricant having a passage leading from the container above the surface of the lubricant to the cylinder of an engine, a valve seat in the passage, a valve cooperating with the seat and having a piston extending within the passage when the valve is seated, and a pin in the passage beyond the piston and extending into the path of the latter.

10. In a lubricating device, a container having a passage leading from the upper portion of the container to the cylinder of the engine, the passage being enlarged near the container, a valve seat adjacent the mouth of the passage, a valve cooperating

with the seat and having a piston extending within the passage when the valve is seated and fitting loosely therein, and yielding means tending to maintain the valve on its seat.

11. In a device for feeding liquid lubricant, a closed container for the lubricant having a passage opening into and leading from a point in the container over the surface of the lubricant to the cylinder of an engine, whereby the actuating fluid is applied to the surface of the lubricant when pressure in the cylinder is high, and means for returning the fluid with the suspended lubricant to the cylinder when pressure therein is reduced.

Signed by me at Baltimore city and State of Maryland this 17th day of August 1908.

CHARLES C. LEAGUE.

Witnesses:

JAMES T. HARLAN,
H. C. McCARTY.