Dec. 19, 1933. J. W. ARNOLD 1,940,481

AUTOMATIC LUBRICATOR

Filed April 25, 1930

Fig. 1.

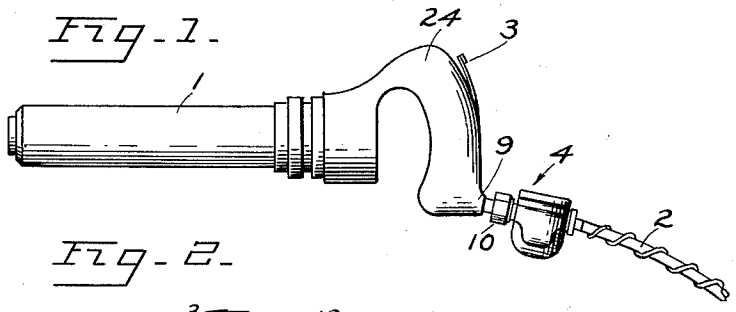


Fig. 2.

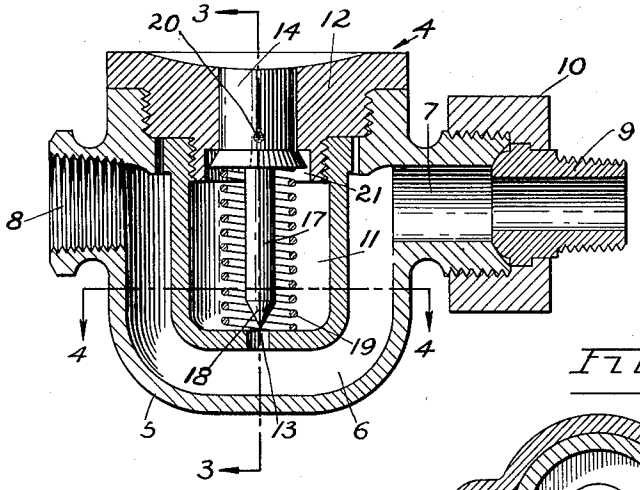


Fig. 4.

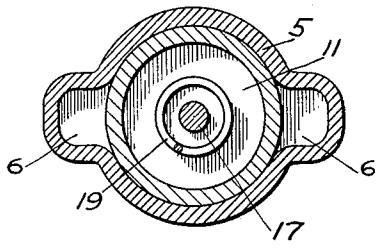


Fig. 3.

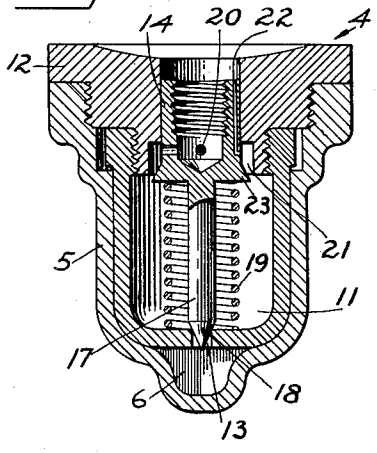
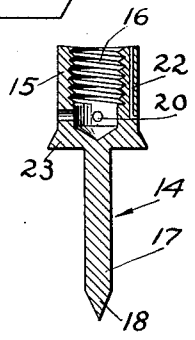


Fig. 5.



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AUTOMATIC LUBRICATOR

John W. Arnold, San Francisco, Calif.

Application April 25, 1930. Serial No. 447,274

6 Claims. (Cl. 184—55)

My invention relates to improvements in automatic lubricators, and it consists in the combinations, constructions and arrangements hereinafter described and claimed.

An object of my invention is to provide an automatic lubricator that is an improvement over my automatic lubricator shown in my Patent No. 1,582,368 issued April 27, 1926.

In the present device I have simplified the parts and have reduced them to five main parts. Furthermore, the device is designed so as to be filled by an oil gun, and during the filling the outlet to the oil reservoir is closed while an air outlet is opened for permitting excess air to leave the reservoir while the reservoir is being filled with oil.

The device makes use of a removable reservoir, and a number of different ones may be used each having openings of a different size, and in this way a predetermined quantity of oil may be delivered to the gun over a certain time period. If a light oil is used, the opening may be small, and vice versa if the oil used is heavy. Also temperature conditions may be taken into account and the outlet openings of the reservoir may be varied in size in accordance with working conditions.

I provide novel means for causing all of the air delivered to the hammer or other air tool to pass by the oil outlet opening, and in this way the air is used for carrying all of the oil to the working parts.

Other objects and advantages will appear as the specification proceeds, and the novel features of the device will be particularly pointed out in the claims hereto annexed.

My invention is illustrated in the accompanying drawing, in which:

Figure 1 is a side elevation of an air tool showing my device operatively applied thereto,

Figure 2 is a longitudinal section through the device,

Figure 3 is a section along the line 3—3 of Figure 2,

Figure 4 is a section along the line 4—4 of Figure 2, and

Figure 5 is a vertical section through a part of the device.

In carrying out my invention I make use of an air tool such as an air hammer indicated generally at 1. An air hose 2 leads from the source of air supply (not shown) to the hammer, and the flow of air into the hammer is controlled by a trigger 3.

Between the air hose and the hammer I dispose my automatic lubricator which is indicated generally at 4. Figure 2 shows the construction of the lubricator. A casing 5 is provided, and this has a U-shaped air passageway 6 that leads from an inlet 8 to an outlet 7. The outlet is threaded upon the air inlet 9 of the air gun, and is connected thereto by a coupling 10. The coupling 10 permits the lubricator 4 to remain in a vertical position while permitting the gun 1 to be swung into any angle about its longitudinal axis that is convenient for the operator. The vertical positioning of the lubricator assures a uniform flow of the oil from a receptacle 11 into the passageway 6. The air hose 2 is connected to the inlet 8.

It will be noted from Figures 2 and 3 that the oil receptacle 11 is threaded onto a cover member 12 that in turn is threaded into the top of the casing 5. The receptacle has an outlet opening 13 for permitting oil to flow from the receptacle into the passageway 6. The rate of flow of the lubricating fluid from the receptacle can be regulated by the size of the opening 13. It is for this reason that I provide a number of receptacles all identical in construction except for the size of the openings 13. The receptacles may be quickly changed, and by this change the amount of lubricating fluid admitted to the gun can be regulated.

A novel double valve member indicated generally at 14 (see Figure 5) is provided. This member has a cup-shaped portion 15 threaded interiorly at 16 for receiving an oil gun, and the double valve also has a plunger portion 17 provided with a conical-shaped valve 18 at its bottom.

A spring 19 (see Figure 2) normally holds the valve 14 in the position shown. When in this position, oil inlet openings 20 (see Figures 3 and 5) are uncovered while the conical valve 18 closes the opening 13. The operator, in order to uncover the openings 20, applies the oil gun (not shown) to the cup-shaped member 15 and then presses downwardly so as to move the double valve 14 into the position shown in Figure 3. An annular recess 21 in the under-surface of the cover 12 permits the lubricating fluid from the oil gun to pass through the openings 20 and on into the receptacle 11. The conical valve 18 prevents the lubricant from flowing out of the bottom of the receptacle. Figure 3 shows an air passageway 22 that allows the air in the receptacle 11 to exhaust therefrom as the receptacle is filled with the lubricating fluid.

The removal of the oil gun from the cup 15 permits the spring 19 to move the cup-shaped member 15 upwardly and to close the openings 20 and 22. A conical-shaped projection 23 limits

the upward movement of the double valve 14 and acts as an additional seal for closing the openings 20 and 22.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

The air hammer or tool is held in the position shown in Figure 1 when in use, and the oil in the receptacle 11 will slowly feed into the passageway 6 where it will be conveyed by the air flowing through the passageway into the tool. All of the air passes by the opening 13, and the speed of the air in passing this opening will tend to mix the oil leaving the opening 13 and to emulsify the oil while conveying it to the gun. This affords a perfect lubrication of the working parts.

When the gun is not in use, it is normally laid so that the handle 24 (see Figure 1) occupies a horizontal position. The lubricator is also swung into a horizontal position and will swing the axis of the outlet opening 13 into the same position for preventing the flowing of any oil from the receptacle into the passageway 6. As soon as the tool is again used, the flow of oil to the passageway 6 will start. It should also be remembered that there is a pulsation of air through the passageway 6 due to the rapid opening and closing of the air exhaust in the gun caused by the operative mechanism. This pulsation of air I have found increases the uniformity of flow of oil from the receptacle 11 into the passageway 6. The pulsating air flowing through the passage 6 entrains oil through the opening 13 and when the pressure in the cup 11 is less than that in the passageway due to a depleting of the oil, the air will enter the cup through the opening 13.

Although I have shown and described one embodiment of my invention, it is to be understood that the same is susceptible of various changes, and I reserve the right to employ such changes as may come within the scope of the invention as claimed.

I claim:

1. A lubricating device for an air tool comprising a casing having a U-shaped air passageway therein, a receptacle for a lubricant and having an opening in its bottom communicating with the passageway, a valve for the opening, a spring for normally keeping the valve open a cover for the receptacle and casing, said valve having lubricant inlet openings and an air exhaust opening normally closed by the cover, said valve when closed moving said valve openings where they will be uncovered by said cover, said casing being adjustable with respect to the air tool for positioning the axis of the receptacle outlet opening in substantially a vertical position during the use of the tool.

2. A lubricating device for an air tool comprising a casing having a U-shaped air passageway therein, a receptacle for a lubricant and having an opening in its bottom communicating with the passageway, a valve for the opening, a spring for normally keeping the valve open a cover for the receptacle and casing, said valve having lubricant inlet openings and an air exhaust opening normally closed by the cover, said valve when closed moving said valve openings where they will be uncovered by said cover.

3. In a lubricating device, a casing having a U-shaped groove with an inlet and an outlet, a removable receptacle forming the groove into a passageway and having an opening communicating with the passageway, a cover for the casing and for holding the receptacle in position, and a valve for the opening and having a fluid passageway uncovered by the cover when the opening is closed for filling the receptacle with oil.

4. In a lubricating device, a casing, an oil receptacle receivable in the casing and forming a passageway therewith, said receptacle having a port for conveying oil to the passageway and a cap threaded into the casing and bearing on the receptacle for closing the same.

5. In a lubricating device, a casing having an opening, an oil cup receivable through the opening, the casing and the oil cup forming a passage therebetween, said cup having a port connecting the oil cup and the passage, a common closure for the casing and the cup and having an oil inlet opening therein and a valve controlling the opening and the port.

6. A valve for a lubricating device having a valve opening, comprising a valve body adapted to be slidably received in the opening and to close the same from the inside, spring means tending to close the valve, a conduit in the valve body adapted to be uncovered when the valve is moved inwardly for admitting a lubricant into the device and a relief passage in the valve body uncovered by the same movement for allowing air to escape.

JOHN W. ARNOLD.