Oct. 29, 1929. A. KIRCHHOFER 1,733,157

AUTOMATIC LUBRICATOR

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Fig. 1.

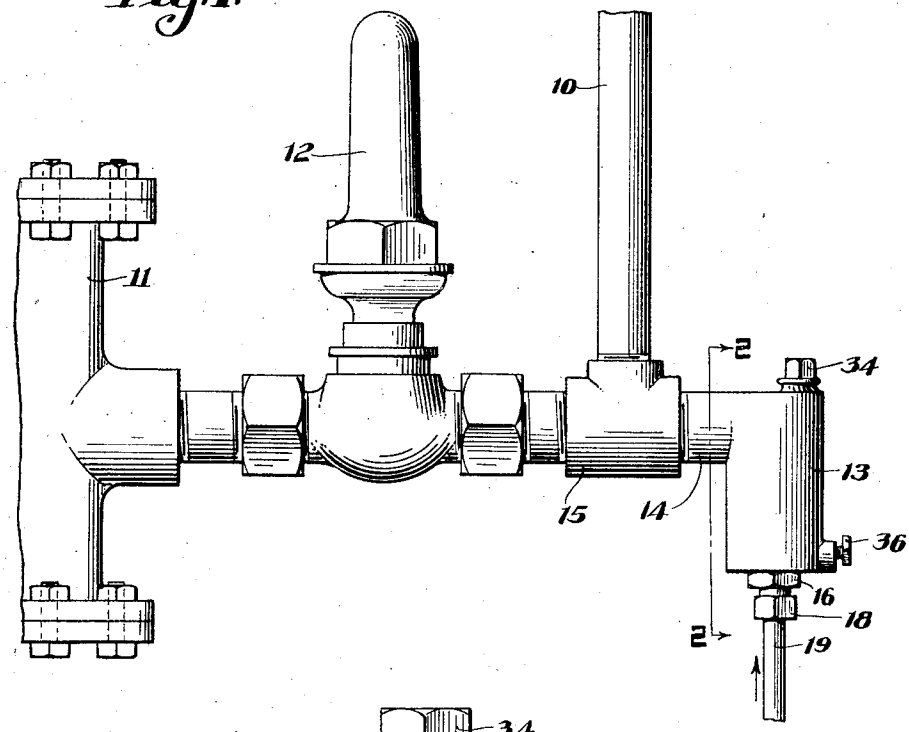
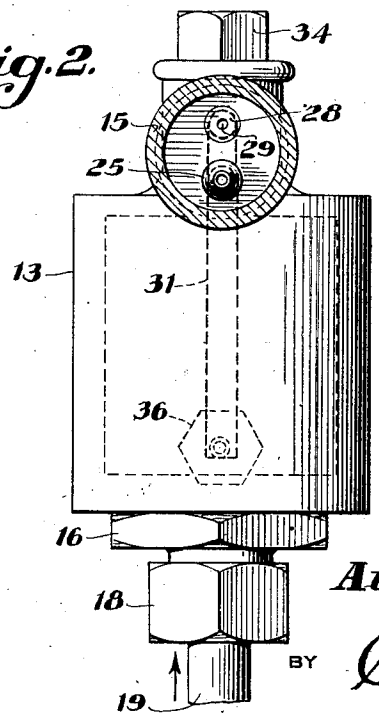


Fig. 2.



WITNESSES

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Fig. 3.

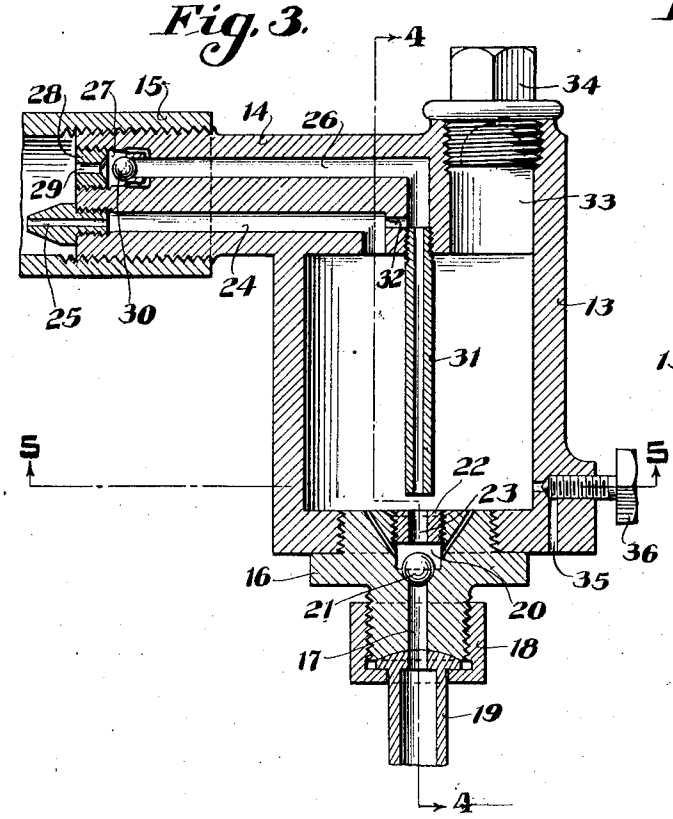


Fig. 4.

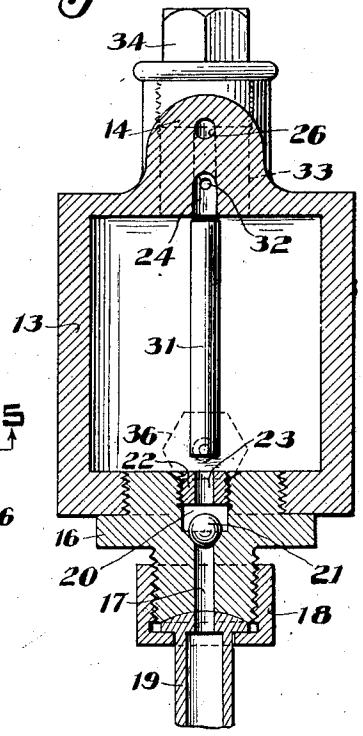
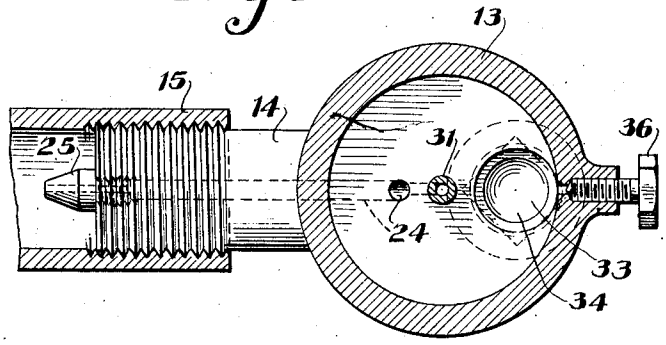


Fig. 5.



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UNITED STATES PATENT OFFICE

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AUTOMATIC LUBRICATOR

Application filed March 28, 1925. Serial No. 19,082.

This invention relates to an automatic lubricator, especially adapted to be used on locomotives for lubricating the steam cylinder of the air pump, feed water heater, or other auxiliary steam operated devices which may be used on locomotives.

Every modern locomotive is equipped with a mechanical lubricator which operates automatically when the locomotive is running, but, when the locomotive is standing still, these auxiliary devices must be lubricated by means of a hydrostatic lubricator located in the cab.

The object of the present invention is to provide a device of simple construction which is adapted to be connected respectively to the mechanical lubricator, and to the steam pipe leading to the air pump, or other part to be lubricated, so as to maintain a constant supply of oil to the latter when the locomotive is running, and which is also provided with means for utilizing the steam from said pipe, and the water of condensation, to automatically discharge oil into the steam pipe when the locomotive is standing still. Not only is the usual hydrostatic lubricator in the cab eliminated, but the lubrication is performed entirely by automatic means whether the locomotive is running or standing still.

The construction of the invention and its manner of operation will be more specifically described in connection with the accompanying drawings, which illustrate one embodiment thereof.

In the drawings:

Figure 1 is a side elevation of the invention and the parts to which it is connected.

Figure 2 is an enlarged view taken on the line 2—2 of Figure 1.

Figure 3 is a central longitudinal section of the invention.

Figure 4 is a section taken on the line 4—4 of Figure 3.

Figure 5 is a section taken on the line 5—5 of Figure 3.

The selected embodiment of the invention is shown as being connected to a steam pipe 10, which supplies steam to an air pump 11, or other steam operated device, the operation of which is controlled by a governor 12. There is shown a closed oil receptacle 13, which is preferably of cylindrical shape, and provided at its upper end with a laterally extending nipple 14 connected with the steam line 10 through a T 15.

The lower end of the receptacle 13 is provided with a plug 16 having a central passageway 17 therethrough, and connected by a suitable union 18 to a pipe 19 through which oil is forced, preferably by means of a mechanical lubricator of the usual construction. The inner end of the passageway 17 is enlarged to form a valve cage 20, which contains a ball check valve 21 adapted to prevent a return flow of the oil when the mechanical lubricator is idle. The ball valve 21 is retained in the cage by a small plug 22, having a passageway 23 for the oil to pass through. The upper end of the receptacle 13 is provided with an outlet passageway 24 which extends longitudinally through the nipple 14, and is provided at its outlet end with a choke plug 25, through which the oil is fed into the steam pipe line 10.

While the locomotive is running, therefore, the oil is forced upwardly by the mechanical lubricator through the pipe 19 into the chamber 13, and thence through the passageway 24 and choke plug 25 into the steam line, and when the locomotive stops, the check valve 21 will close, preventing a return flow of the oil. The air pump, or other auxiliary device to be operated through the steam pipe 10, will then be lubricated in a manner which will now be described.

The nipple 14 is provided with a second longitudinal passageway 26, located above the passageway 24 and communicating with the steam line 10 through a valve cage 27, which is closed by a small plug 28 having an opening 29 therethrough. The cage 27 contains a ball check valve 30, which normally closes the opening 29 when the locomotive is running and the mechanical lubricator operated. When, however, the locomotive stops and the mechanical lubricator ceases to operate, the ball check valve 21 closes, and the pressure in the pipe line 10 opens the valve 30 and steam enters the chamber 13 through the passageway 26. A con-

densation pipe 31 is secured in the inner end of the passageway 26, and extends downwardly within the chamber 13, terminating near the bottom thereof, so that the water of condensation is discharged underneath the oil, forcing the latter upwardly into the passageway 24 and through the choke plug 25. A bypass 32 is preferably provided between the inner ends of the passageways 24 and 26, through which the steam may enter and mix with the oil, passing out through the choke plug 25. Thus, it will be understood that when the mechanical lubricator is idle, oil will continue to be supplied automatically to the pump due to its displacement by the water of condensation formed from the steam which enters through the passageway 26. Without the opening in the bottom of the receptacle, the device may be used without the mechanical lubricator as an automatic lubricator for a booster engine, or other auxiliary engine on the locomotive, and may also be used on stationary plants.

The chamber 13 is provided at its upper end with a filler opening 33, which is normally closed by a plug 34. The water may be drained out of the chamber through a duct 35, the operation of which is controlled by a drain plug 36. The usual means may also be provided for observing and regulating the oil feed.

From the foregoing description, it will be seen that I have provided a lubricating device which is entirely automatic in its operation, and will continue to supply oil whether the locomotive is running or standing still.

While I have shown and described the essential features of the invention in what is at present the preferred form thereof, it will be understood that these may be considerably modified without sacrificing any of the advantages thereof. It is my intention, therefore, to include all such modifications within the scope of the appended claims.

What is claimed is:

1. A lubricator comprising a closed oil chamber provided with a nipple adapted to be connected to a steam pipe and having an oil discharge passageway therethrough, an inlet port in the bottom of said chamber, an inwardly opening check valve controlling said port, a steam inlet passageway through the nipple above said oil discharge passageway, and an inwardly opening check valve controlling said steam inlet passageway.

2. A lubricator for steam engines, comprising a closed chamber provided with a nipple adapted to be connected to a steam pipe of the engine and having an oil passageway therethrough, an inlet passageway opening into said chamber and adapted to be connected to a mechanical lubricator, an inwardly opening check valve controlling said inlet passageway, a steam inlet passageway through the nipple above said oil discharge passageway, and an inwardly opening check valve controlling said steam inlet passageway.

3. A lubricating device comprising an oil chamber with a discharge passageway leading therefrom, means for connecting said passageway to a steam pipe, an inlet passageway through which oil may be forced into said chamber, an inwardly opening check valve controlling said inlet passageway, and means for admitting steam to the chamber when said check valve is closed and forming water of condensation below the oil level to displace a portion of the oil and force the latter into the steam pipe.

4. A lubricator comprising a closed chamber provided near its upper end with a laterally extending nipple adapted to be connected to a steam pipe and having an oil discharge passageway therethrough, an inlet port in the bottom of said chamber, an inwardly opening check valve for said port, a steam inlet passageway through said nipple above said oil discharge passageway, a condensation pipe forming an extension to said steam inlet passageway and terminating near the bottom of the chamber, and an inwardly opening check valve controlling said steam inlet passageway.

5. A lubricator comprising a closed chamber provided near its upper end with a laterally extending nipple having an oil discharge passageway therethrough, means for connecting said nipple to a steam supply pipe, an inlet port in the bottom of said chamber, an inwardly opening check valve for said port, a steam inlet passageway through said nipple above said oil discharge passageway, a condensation pipe forming an extension to said steam inlet passageway, an inwardly opening check valve at the entrance to said steam inlet passageway, and a bypass connecting the inner ends of the steam inlet passageway and the oil discharge passageway.

6. A lubricator comprising a closed chamber provided near its upper end with a laterally extending nipple having an oil discharge passageway therethrough, means for connecting said nipple to a steam supply pipe, a steam inlet passageway through said nipple above said oil discharge passageway, a condensation pipe forming an extension to said steam inlet passageway, an inwardly opening check valve at the entrance to said steam inlet passageway, and a bypass connecting the inner ends of the steam inlet passageway and the oil discharge passageway.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

AUGUST KIRCHHOFER.