Aug. 20, 1935. M. WILEY 2,012,227

FLANGE LUBRICATOR

Filed Aug. 10, 1934

Fig. 1.

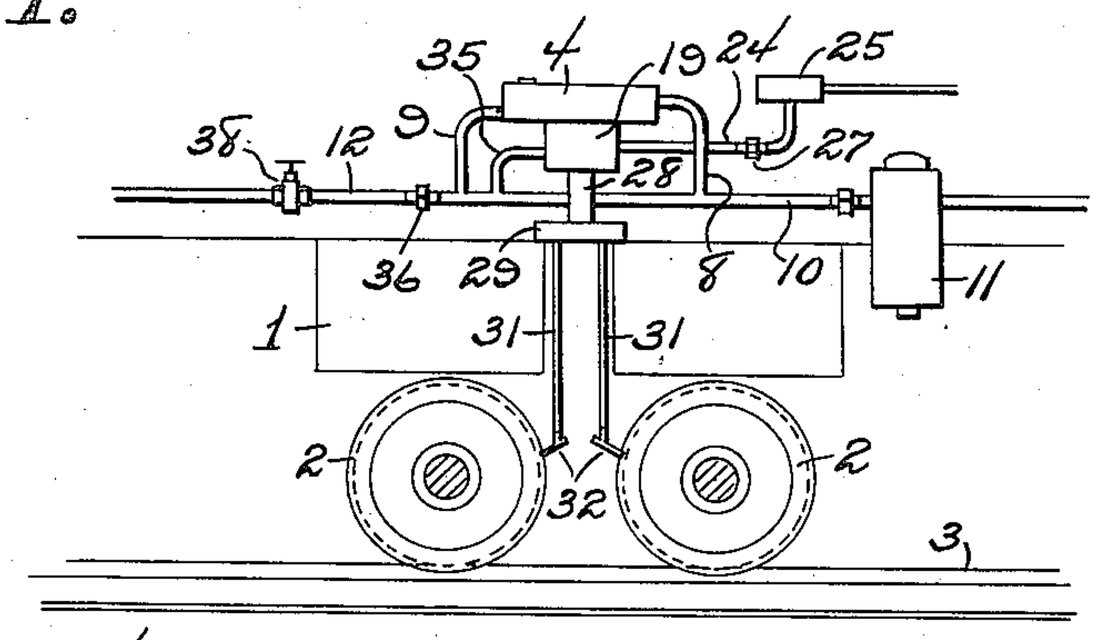


Fig. 5.

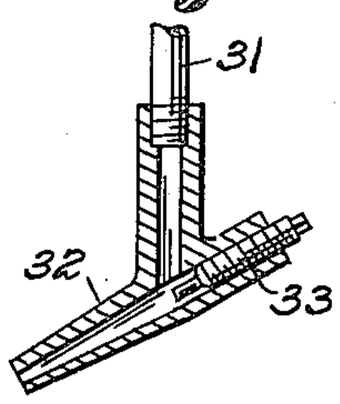


Fig. 2.

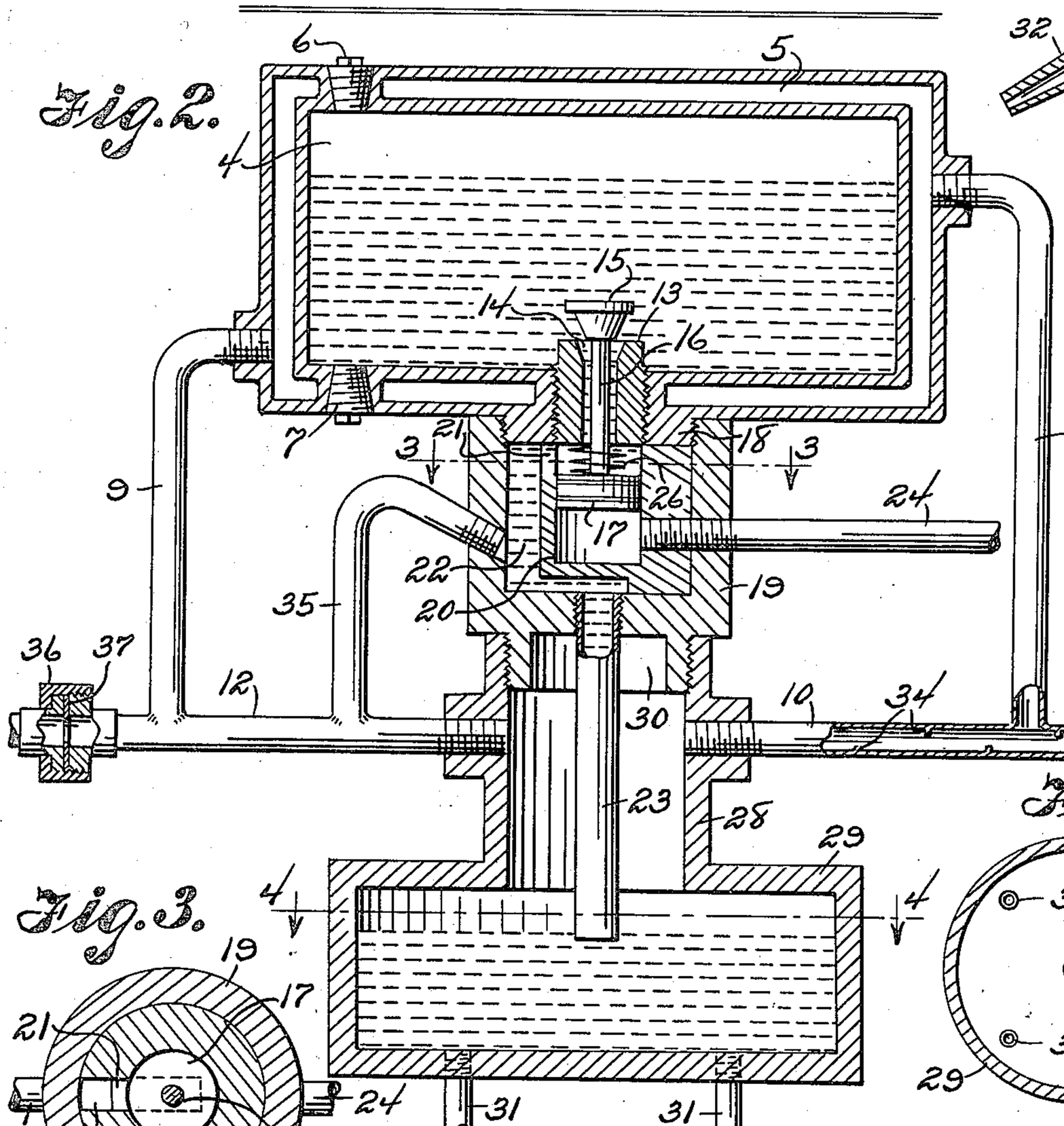


Fig. 4.

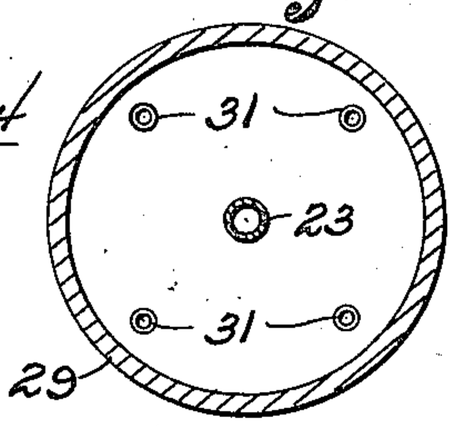


Fig. 3.

Mark Wiley INVENTOR

BY Victor J. Evans & Co.

ATTORNEY

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## FLANGE LUBRICATOR

Mark Wiley, Chicago, Ill.

Application August 10, 1934, Serial No. 739,320

6 Claims. (Cl. 184—3)

This invention relates to mechanisms for applying lubricant to the flanges of locomotive or car wheels and one object is to provide means whereby exhaust steam from the air pump upon the locomotive will be utilized to convey oil to the wheel flanges and to heat the oil in cold weather. Another object is to provide mechanism for the stated purpose which will operate automatically and will require little, if any, attention. It is also an object to reclaim from the steam any oil which may be carried therein and to condense a substantial portion of the steam and apply the water of condensation to the wheel flanges. These stated objects and other objects which will appear as the description proceeds are attained in such an apparatus as is illustrated in the accompanying drawing, and the invention resides in certain novel features which will be particularly defined in the appended claims.

In the drawing:

Figure 1 is a diagrammatic elevation showing the apparatus in operative position.

Figure 2 is an enlarged longitudinal section.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 2.

Figure 5 is a longitudinal section through one of the nozzles provided to direct the lubricant onto a wheel flange.

The numeral 1 indicates a vehicle supported on flanged wheels 2 which are adapted to run upon a track 3. Supported in any convenient manner upon the vehicle is a tank or reservoir 4 having a hollow wall or jacket 5 entirely surrounding it and provided in its top with a filling opening normally closed by a plug 6. There is also a drain opening in its bottom normally closed by a plug 7. Branch steam pipes 8 and 9 lead into and from the jacket 5 to provide for a circulation of steam around the reservoir, so that the oil will be heated and will flow freely even in very cold weather. The inlet 8 rises from the exhaust pipe 10 of a steam pump 11 and the outlet pipe 9 is connected to a discharge pipe 12 which will be more fully referred to later.

In the bottom of the oil reservoir, preferably at the center, is an internally threaded opening in which is engaged and held a short outlet tube 13 having the upper end of its bore flared, as shown at 14, said flared portion and the upper end portion of the tube forming a double seat for a valve 15. Said valve consists of a disk of a proper diameter to extend over the entire area of the end of the bore and rest on the end of the tube, and a downwardly tapered body adapted to seat in the flared mouth of the bore. A stem 16 depends from the tapered body of the valve and carries a piston 17 at its lower end. An externally threaded boss 18 is formed on the under side of the oil reservoir concentrically about the outlet opening and the tube 13, and engaged on and carried by said boss is an upper cylindrical trap body 19 within which is a cylinder 20, the piston 17 working in said cylinder 20. The cylinder 20 is provided with a port 21 in its side at its upper end and a free space 22 between the cylinder and the trap body constitutes a conduit through which the oil may flow from said port 21 to a discharge and intercepting pipe 23 depending from the bottom of the trap body. An air supply pipe 24 is shown entering the cylinder 20 through the side of the same and the side of the trap body below the piston. This pipe is shown as leading from an air reservoir 25 but it must be understood that it may be connected with a steam supply as its purpose is to deliver pressure fluid below the piston to raise the same and thereby open the valve. When the pressure drops, the valve will be closed by reason of its own weight and the weight of the piston and stem aided by the action of an expansion spring 26 between the piston and the boss 18. The pipe 24 is provided with a reducing valve 27 of any approved form which will facilitate setting the apparatus to operate at a desired pressure.

The pipe 23 is housed by a coupling nozzle 28 rising from a lower trap body 29 and threaded onto a flange or rim 30 on the under side of the upper trap body, as shown, the exhaust steam pipe 10 entering and being secured in one side of the nozzle and the waste or discharge pipe 12 being secured in the opposite side of the nozzle in alinement with the pipe 10. From the bottom of the trap body 29 distributing pipes 31 lead to the several wheels and on the end of each distributing pipe is a nozzle 32 which is preferably of the form shown in Figure 5, in which the nozzle body has two branches with the outlet bore extending obliquely downward across the inlet bore. In the upper end of the outlet bore is fitted a screw plug 33, the inner lower end of which projects more or less across the end of the inlet so that by adjusting the plug the discharge of the oil may be regulated as desired.

The steam pump receives oil for lubrication and the excess oil passes out with the exhaust steam. In flowing through the exhaust pipe 10, the steam and waste oil will be interrupted by the fins 34 so that the steam will be partly condensed and

the oil retarded to slowly pass into the trap 29 and eventually flow to and be discharged onto the wheel flanges, the water of condensation going with the oil. Issuing from the pipe 10 within the nozzle 28, the steam will be intercepted by the pipe 23 upon which more of the steam will be condensed to run down the pipe and carry the contained oil into the trap 29. The steam and oil not condensed will pass into the discharge pipe 12 and some of the steam will rise through the gooseneck pipe 35 to enter the conduit 22 and expedite the flow of oil to and through the pipe 23. By thus feeding steam into the upper trap, back pressure from the lower trap is neutralized so that stoppage in the pipe 23 is avoided. The steam which does not rise in the pipe 35 continues through the discharge pipe to mingle with the steam from the pipe 9 and be ultimately discharged through the smoke stack of the locomotive. Beyond the pipe 9, a union coupling 36 is interposed in the discharge pipe and fitted in this coupling is a metal washer 37 which extends into the bore of the pipe and serves as a baffle to intercept any oil remaining in the steam and prevent said oil passing to the stack. When the pump governor throttles the pump, the oil thus intercepted will flow back to the trap 29, the pressure in the discharge or waste pipe then being very low. Beyond the baffle, a gate valve 38 is fitted in the discharge pipe in order to control the steam pressure in the system and to blow out condensation in winter when the engine may be left outside the roundhouse with the pump shut off. When the pump is again started, the valve 38 is closed and the pump will then force steam through the entire system to drive all condensate to and through the nozzles 32 into the atmosphere. After all condensate has been driven out, the valve 38 is opened and normal operation will be resumed.

From the foregoing description, taken in connection with the accompanying drawing, it will be seen that I have provided a simple and compact mechanism in which there are few moving parts so that it is not apt to get out of order. The apparatus is automatic and will operate whenever steam is turned into the pump to drive the same and the air reservoir may be the reservoir forming a part of the air brake system and supplied from the pump. The exhaust steam which heats the main oil supply carries some oil and, therefore, constitutes one lubricating agent as well as a means of effecting circulation of the main body of oil. The utilization of steam in the manner described permits the use of very low grade crude oil, and waste oil from journal boxes, which cannot be employed for any other purpose, may be used.

Having described my invention, what I claim is:

1. A flange-lubricating apparatus comprising an oil reservoir having an outlet in its bottom, an inwardly-opening valve in said outlet and having a stem depending therethrough, pressure controlled means acting on the lower end of the stem for opening said valve, a trap below the reservoir receiving oil therefrom, and means for conveying oil from the trap to the flange to be lubricated.

2. A flange-lubricating apparatus comprising an oil reservoir, an inwardly-opening valve in the bottom of the reservoir, a cylinder on the under-side of the reservoir, a piston in the cylinder connected to the valve, means for delivering pressure fluid to the cylinder below the piston, a trap around the cylinder in spaced relation thereto, the cylinder having a port in its side at its upper end and the trap having an outlet in its bottom, and means to convey oil from said outlet to a flange to be lubricated and including nozzle means.

3. A flange-lubricating apparatus comprising an oil reservoir, a trap under the reservoir, a pressure-operated valve controlling flow from the reservoir to the trap, a discharge pipe depending from the trap, a lower trap into which said pipe delivers, means for conveying oil from the lower trap to a flange to be lubricated, and steam supply and waste pipes secured in the sides of the trap, the discharge pipe intercepting the flow between the steam pipes.

4. A flange-lubricating apparatus comprising an oil reservoir, a jacket surrounding the reservoir, means for admitting steam to said jacket, means for carrying steam from the jacket, means to reclaim oil from the outgoing steam, and pressure-controlled means for establishing flow of oil from the reservoir to a flange to be lubricated, said last-mentioned means being in communication with the oil-reclaiming means.

5. A flange-lubricating apparatus comprising an oil reservoir, a trap on the under-side of the reservoir, pressure-operated means controlling flow from the reservoir to the trap, a discharge pipe depending from the trap, there being a conduit in the trap leading from the pressure controlled means to the discharge pipe, a lower trap into which the discharge pipe delivers, steam delivery and exhaust pipes secured in opposite sides of the lower trap, and a branch pipe leading from the exhaust steam pipe into the conduit in the upper trap.

6. A flange-lubricating apparatus comprising an oil reservoir, a trap on the under-side of the reservoir, pressure-operated means controlling flow from the reservoir to the trap, a discharge pipe depending from the trap, there being a conduit in the trap leading from the pressure-controlled means to the discharge pipe, a lower trap into which the discharge pipe delivers, steam delivery and exhaust pipes secured in opposite sides of the lower trap, and baffles in the steam delivery pipe.

MARK WILEY.