Oct. 30, 1934. J. SIMS 1,979,056

FLANGE LUBRICATOR

Filed April 13, 1933 3 Sheets-Sheet 1

Fig. 1

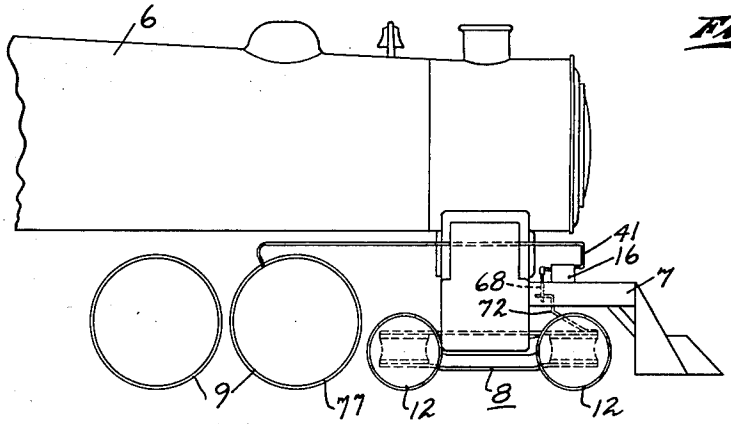


Fig. 2

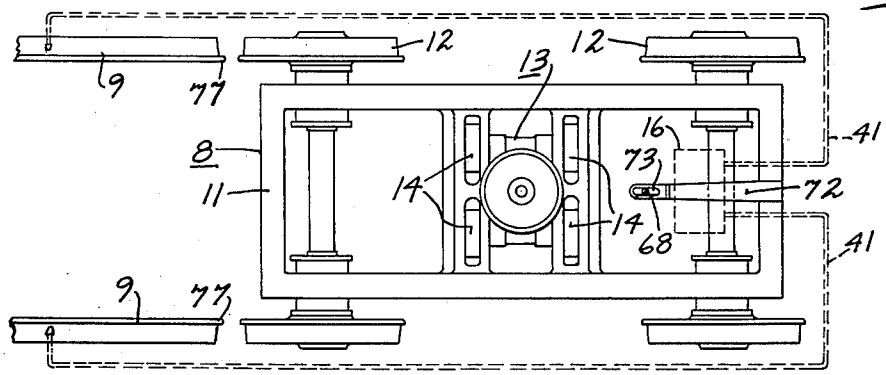
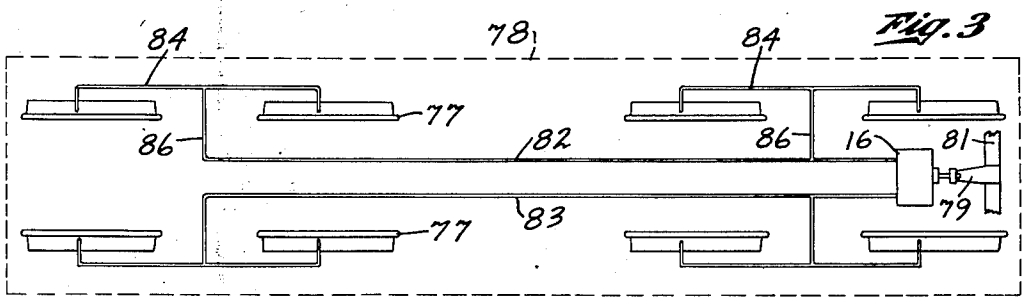


Fig. 3



INVENTOR

Joseph Sims

BY

Johnston & Jennings

ATTORNEYS

Oct. 30, 1934. J. SIMS 1,979,056

FLANGE LUBRICATOR

Filed April 13, 1933 3 Sheets-Sheet 2

Fig. 4

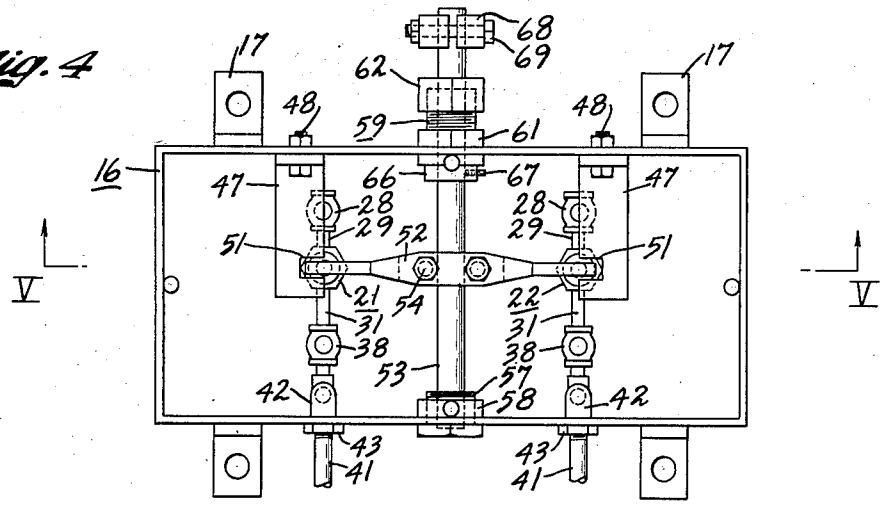
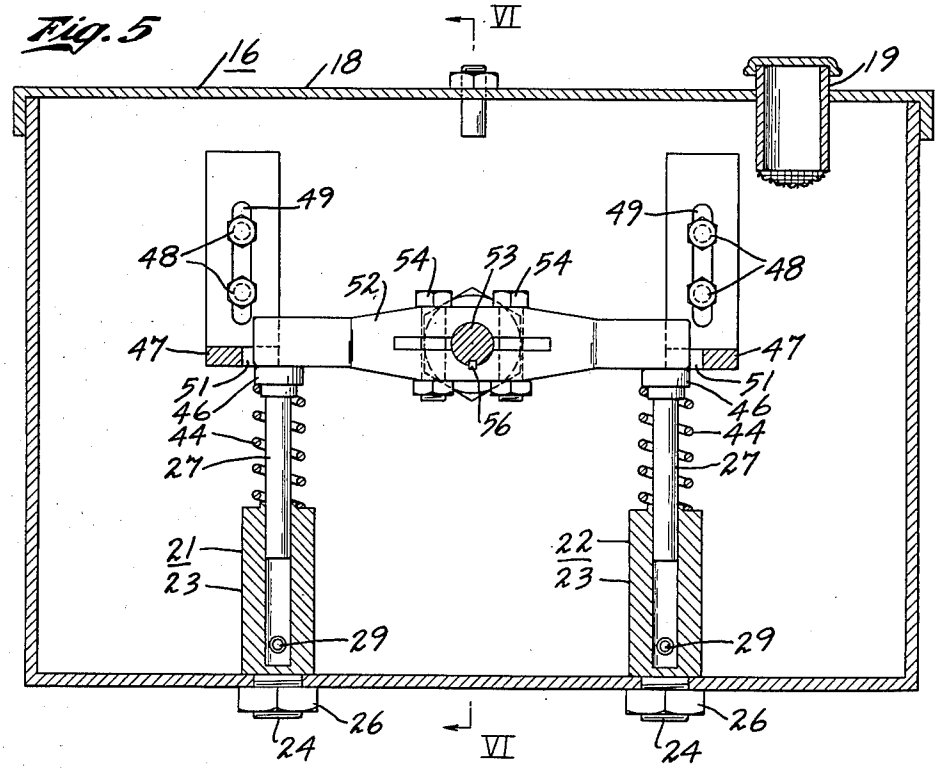


Fig. 5



INVENTOR

Joseph Sims

BY Johnston & Jennings

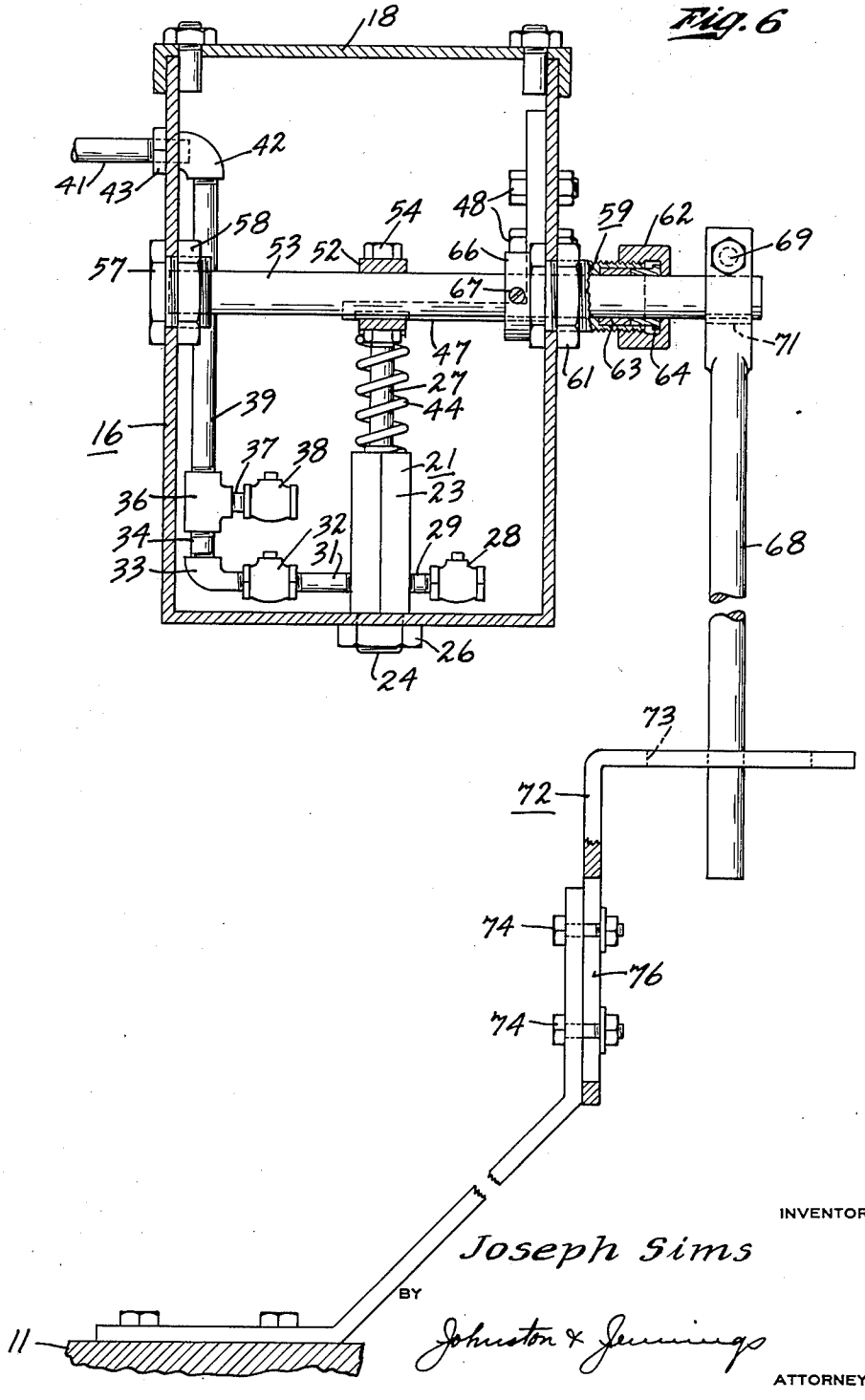
ATTORNEYS

Oct. 30, 1934. J. SIMS 1,979,056

FLANGE LUBRICATOR

Filed April 13, 1933 3 Sheets-Sheet 3

Fig. 6



INVENTOR

Joseph Sims

BY

Johnston & Jennings

ATTORNEYS

Patented Oct. 30, 1934 1,979,056

UNITED STATES PATENT OFFICE

1,979,056

FLANGE LUBRICATOR

Joseph Sims, Birmingham, Ala.

Application April 13, 1933, Serial No. 665,849

8 Claims. (Cl. 184—3)

My invention relates to railway vehicle flange oilers, more particularly to a positive feed oiler actuated by relative movement between the vehicle and its trucks, and has for its object the provision of apparatus of the character designated which shall be simple and inexpensive in its design, reliable in operation, and which shall operate only when a lubricant is required on the flanges.

A further object of my invention is to provide a railway vehicle flange oiler including a pump actuated by relative movement between the frame of the vehicle and its trucks when rounding curves.

My invention further contemplates the provision of a device embodying a pair of pumps which are immersed and operated in a reservoir of oil to insure that the moving parts thereof receive adequate lubrication at all times.

My invention further contemplates employing a pair of pumps, each of which acts independently of the other to supply oil to the wheel flanges along one side of the vehicle.

Another object of my invention is to provide means adapted to regulate the quantity of oil leaving the pumps for distribution upon the wheel flanges.

While many different devices have been provided to lubricate the wheel flanges of railway locomotives and cars, they are dependent in most cases upon the use of air or steam, and in some cases mechanical working parts are exposed to the weather, thereby requiring constant attention to insure their proper functioning. Other objectionable features to be found in devices of this class, as heretofore known to me, consist in the great expense incurred in installing same, and the large amount of oil which is, in some devices, sprayed upon the flanges when it is not needed.

In my device the working parts are enclosed in an oil reservoir to protect them from the weather and dirt, and direct mechanical connections are actuated to pump oil to the flanges only when there is a relative movement between the vehicle body and its truck which occurs particularly in rounding curves. The devices is adapted to be secured to a vehicle body, such as a locomotive or car, by means of bolts and can be readily removed for inspection. One of my improved devices as shown and described in this application has operated continuously on a locomotive which traveled more than seventy-five thousand miles on a railroad division where the longest tangent is only two miles without the necessity of removing and turning the tires on the locomotive. The moving parts of my improved device at the end of the period showed no appreciable wear.

Briefly, my invention comprises a pair of pumps mounted within a reservoir filled with oil and actuated by means of a rocker arm secured to a rocker shaft. A crank arm is secured on the rocker arm for engagement with an arm secured on a truck frame of the vehicle. When the vehicle is rounding a curve, the frame moves relative to the truck and the flanges on the outside of the curve bear heavily against the rail. The relative movement between the vehicle and its truck causes the rocker arm to actuate one of the pumps and force oil through a conduit to the wheel flanges on the outside of the curve. When rounding a curve in the opposite direction the other pump is likewise operated to supply oil to the flanges on the opposite side of the vehicle. Suitable valves and adjustments are provided which will be described later during the description of the drawings.

Apparatus embodying features of my invention is illustrated in the accompanying drawings forming a part of this application, in which:—

Fig. 1 is a fragmentary view in side elevation of the front end of a locomotive and showing my flange lubricating device positioned thereon;

Fig. 2 is a plan view of a locomotive front truck and front driving wheels showing the actuating arm secured to the frame of the front truck, the oil reservoir and conduits being shown in dotted lines;

Fig. 3 is a diagrammatic plan view illustrating my device as applied to lubricate the wheel flanges on a pair of trucks;

Fig. 4 is a plan view of the oil reservoir with the cover removed to show the pumps and other parts located therein;

Fig. 5 is a sectional view taken along the line V—V of Fig. 4; and

Fig. 6 is a sectional view taken along the line VI—VI of Fig. 5.

Referring now to the drawings for a better understanding of my invention, I show in Fig. 1, the front end of a conventional type locomotive comprising a boiler 6 mounted on a frame 7 and having a front truck 8 and driving wheels 9. The front truck which is shown more clearly in Fig. 2 comprises a frame 11 mounted on wheels 12 and carrying thereon a laterally movable swing bolster 13 suspended on the usual swing links 14. The locomotive frame 7 is pivotally connected at 15 to the swing bolster 13 and is

adapted to move laterally relative to the truck frame 11 on the swing links 14. As the locomotive and its front truck are of standard construction, it is not believed necessary to describe them further. Also, it will be understood that the type shown is for illustrative purposes only and that my invention is equally applicable to any type of locomotive where there is relative movement between the locomotive frame and its trucks.

My improved device comprises an oil reservoir 16 which is secured by clips 17 and bolts (not shown) to the engine frame 7 and may be conveniently attached beneath the forward end of the boiler 6. The reservoir is provided with a suitable cover 18 provided with an oil filler plug 19. A pair of pumps 21 and 22 are mounted within the oil reservoir and are completely submerged in the oil when the reservoir is full.

The pumps comprise cylinders 23 which are provided with threaded portions 24 extending through apertures in the bottom of the reservoir 16 and held in position by nuts 26. Each cylinder is provided with a piston 27 which is adapted to draw oil contained in the reservoir 16 into the cylinder through an intake check valve 28 and a conduit 29 which is threaded into an opening in the wall of the cylinder. Each pump outlet comprises a nipple 31 which is threaded into an opening formed in the wall of the cylinder and receives on its other end an outlet check valve 32. An elbow 33 is threaded into the other end of the check valve and connected to a nipple 34 which in turn is threaded into a T 36. Threaded into the side outlet of the T is a nipple 37 which carries a relief pressure valve 38. A nipple 39 is threaded into the T 36 and is connected to a conduit 41 by an elbow 42. Each of the conduits 41 pass through apertures formed in the wall of the reservoir and are threaded for engagement with an elbow 42. Lock nuts 43 are employed to hold the conduits 41 in position and to seal the apertures in the wall of the reservoir.

A compression spring 44 encircles the shank of each piston 27 and seated on the top of a cylinder and under the head portion 46 of the pistons to hold or return the pistons into engagement with stop members 47. The stop members are secured to a wall of the reservoir by means of bolts 48 which pass through slots 49 provided in the stop members for vertical adjustments. The stop members are slotted at 51 to permit the ends of a rocker arm 52 to pass therethrough for engagement with the head portion of the pistons 27.

The rocker arm 52 is secured to a rocker shaft 53 by means of bolts 54 and a key 56. The rocker shaft is journaled at its inner end in a blind bearing 57 which passes through an aperture in the wall of the reservoir and is held in position by a nut 58. The outer shaft bearing 59 is mounted in an aperture formed in the opposite wall of the reservoir and is held in position by a nut 61. The outer end of the bearing 59 is threaded to receive a cap 62 and is recessed to receive suitable packing material 63 which is held in position by a bushing 64 and cap 62. A lock collar 66 is secured on the shaft 53 by means of a set screw 67 to prevent longitudinal movement of the shaft.

A crank arm 68 is secured at the outer end of the rocker shaft 53 by means of a bolt 69 and key 71 for engagement with an actuating arm 72 secured to the truck frame 11. The arm 72 is slotted at 73 to receive the end of the crank arm and is formed in two parts, which are secured together by bolts 74 which are mounted in a slot 76 to adjust the length of the arm.

In operation, the pumps are actuated to lubricate the flanges 77 when relative movement occurs between the vehicle body and truck frame due to lateral swaying of the body, or when the truck pivots in turning a curve. When such movement occurs, the actuating arm 72 engages the crank arm 68 to cause one end of the rocker arm 52 to move downwardly through the openings 51 and into engagement with the head portion of one of the pistons 27. The engaged piston is then moved downwardly into its cylinder 23 to force oil through the outlet opening, check valve 32, and conduit 41 to lubricate the flanges on one side of the vehicle. As one end of the rocker arm 52 moves downwardly, its other end will move upwardly out of engagement with its respective piston which is then held in engagement with its stop member 47 by its compression spring 44 until it is re-engaged by the rocker arm.

As the vehicle body and truck assume their normal position after passing a curve, the rocker arm 52 is returned to its horizontal position by the actuating arm 72 and the spring 44 then acts to move the piston 27, just actuated, upwardly into engagement with its stop member 47. During the upward movement of the piston, the outlet check valve 32 is closed and the intake check valve 28 is opened to permit oil to be drawn into the cylinder 23 from the reservoir.

The safety valves 38 are interposed in the pump outlet conduits to bypass the oil back into the reservoir if the pressure within the conduits becomes too great, as woud occur if the conduits become stopped up.

It will be observed that a pump and conduit is provided for each side of the vehicle in order that only the flanges moving along the outer rail of a curved section of track will be lubricated, as the flanges adjacent the inner rail do not come into contact therewith and do not require lubication.

By loosening the bolts 74, the upper portion 75 of the arm 72 can be adjusted vertically to change the point of its engagement with the crank arm 68 to increase or decrease the arc of its travel, and thereby regulate the stroke of the pistons 27.

In Fig. 3 I have diagrammatically illustrated my flange lubricator applied to a vehicle equipped with two trucks such as are used on street and railroad cars. In this form the reservoir 16 is secured to the vehicle body 78 in any suitable manner and the pumps are actuated as hereinbefore described by an actuating arm 79 secured to the truck frame 81. Conduits 82 and 83 leading from their respective pumps are each connected to a pair of conduits 84 by means of flexible connections 86. The conduits 82 and 83 are secured to the vehicle body 78 and the conduits 84 are mounted on the truck frames 81.

I have found it desirable to locate the nozzle of the outlet conduits about 30 to 45 degrees in back of the vertical plane of the wheel axles, or near the upper back eighth, as shown in Fig. 1, in order that any oil draining from the conduits while the locomotive is stationary will pass down the back side of the wheels and not cause the wheels to slip on the rails when starting. Also by locating the nozzles as described, any excess oil will be removed from the flanges by centrifugal force and will not get on the rails and cause slippage.

As all the vital moving parts are enclosed in an oil bath, they are protected from dust and dirt

and therefore do not require constant attention. By placing the pump cylinders and intake conduits adjacent the bottom of the reservoir, it is not necessary to prime the pumps and practically all of the oil can be used before refilling. In the event the device is to be removed for overhauling, it is only necessary to remove the bolts holding the reservoir to the body frame and uncouple the conduits 41.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:—

1. In a railway vehicle flange lubricator, the combination of a vehicle body, a truck movable relative thereto, an oil reservoir, a pair of pumps mounted in said reservoir, a rocker shaft journaled above the pumps, a rocker arm secured to said shaft to actuate the pumps, a crank arm secured to the rocker shaft, an arm secured to the truck to actuate the crank arm responsive to relative movement of the vehicle body and truck, and means adapted to adjust the arm secured to the truck to regulate the stroke of the pumps.

2. In a railway vehicle flange lubricator, the combination of a vehicle body, a truck movable relative thereto, an oil reservoir, a pair of pump cylinders mounted in the reservoir, pistons in the pump cylinders, stationary stop members for the pistons, rocker means for forcing the pistons into the cylinders, means responsive to relative movement between the vehicle body and truck for actuating the rocker means, spring means for forcing the pistons outwardly of the cylinders into engagement with the stop members, and means to adjust the positions of the stop members relative to the cylinders.

3. In a railway vehicle flange lubricating device, the combination of a vehicle frame, an oil reservoir mounted on the frame, a truck frame movable relative to the vehicle frame, a pair of pump cylinders mounted in the lower part of the oil reservoir, pistons in the pump cylinders, spring means for forcing the pistons outwardly of the cylinders, adjustable stop means for limiting the outward movement of the pistons, a pair of rocker arms disposed within the reservoir and adapted to contact alternately with and force the pistons inwardly of the cylinders, said stop means being formed to permit passage of the rocker arms past the stop means, and an operating connection between the rocker arms and the truck frame for actuating the rocker arms.

4. In a railway vehicle flange lubricator, an oil reservoir, a pair of pump cylinders mounted in the reservoir, pistons in the pump cylinders, rocker arms for actuating the pistons, stationary adjustable stop members mounted above the pistons and formed to permit passage of the rocker arms thereby, and springs adapted to force the pistons outwardly against the stop members.

5. In a lubricating device for a railway vehicle having a body and a truck laterally movable relative thereto, an oil reservoir mounted on the body above the truck, a pair of pumps mounted in the reservoir, a crank shaft for actuating the pumps, a crank arm extending downwardly from the crank shaft toward the truck, and an actuating arm rigidly secured to the truck and connected to the crank arm to operate said crank arm by the relative lateral movement of the truck.

6. In a lubricating device for a railway vehicle having a body and a truck laterally movable relative thereto, an oil reservoir mounted on the body above the truck, a pair of pumps mounted in the reservoir, a crank shaft for actuating the pumps, a crank arm extending downwardly from the crank shaft toward the truck, and an actuating arm rigidly secured to the truck frame and having a slot therein through which the crank arm extends to operate said crank arm by relative lateral movement of the truck.

7. In a lubricating device for a railway vehicle having a body and a truck laterally movable relative thereto, an oil reservoir mounted on the body above the truck, a pair of pumps mounted in the reservoir, a crank shaft for actuating the pumps, a crank arm extending downwardly from the crank shaft toward the truck, an actuating arm rigidly secured to the truck and extending upwardly therefrom and terminating in a horizontal portion extending under the oil reservoir, said horizontal portion having a slot therein within which the crank arm loosely fits to operate said crank arm by relative lateral movement of the truck.

8. In a lubricating device for a railway vehicle having a body and a truck angularly movable relative thereto, an oil reservoir mounted on the body above the truck, a pair of pumps mounted in the reservoir, a crank shaft for actuating the pumps, a crank arm extending downwardly from the crank shaft toward the truck, an actuating arm rigidly secured to the truck and extending upwardly therefrom and terminating in a horizontal portion extending under the oil reservoir, said horizontal portion having a slot therein within which the crank arm loosely fits, and means to vary the length of the actuating arm.

JOSEPH SIMS.