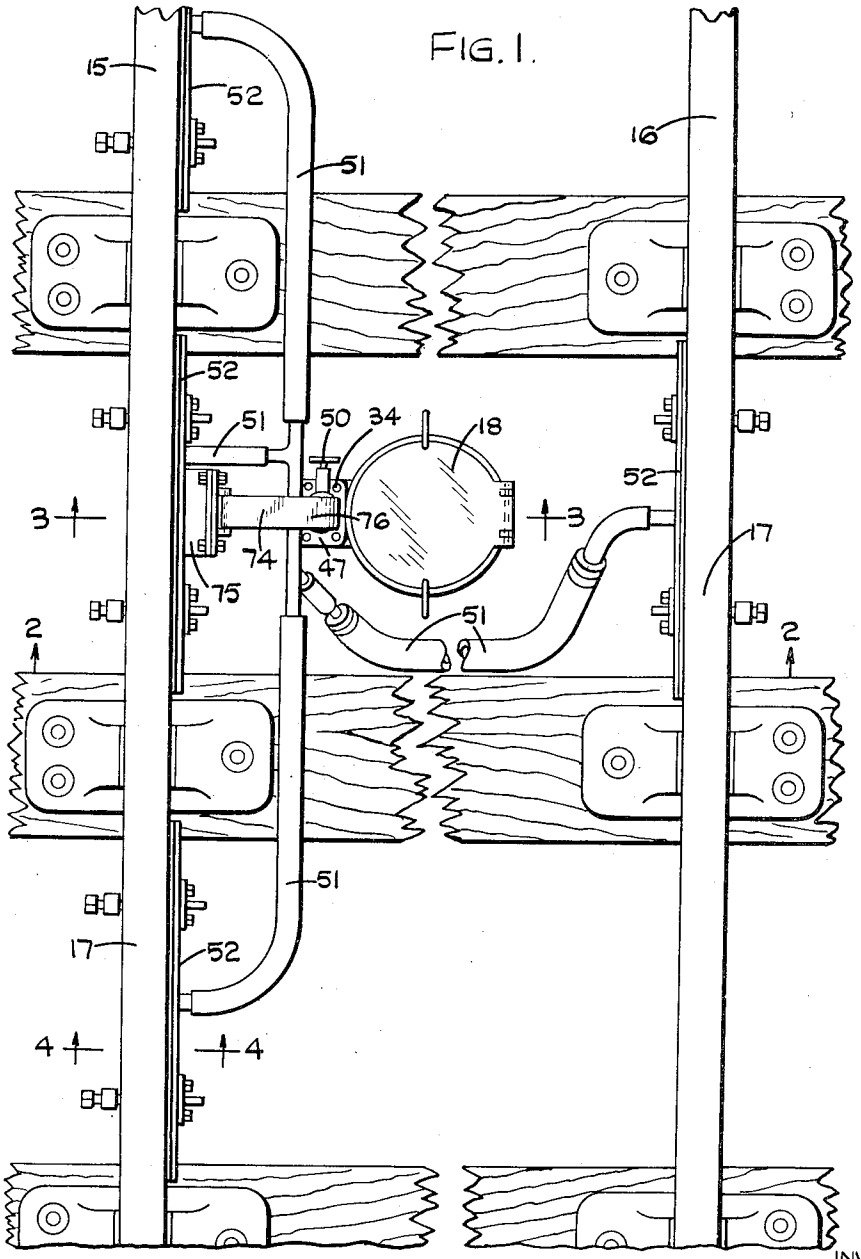
Sept. 20, 1955 G. C. HURRELL 2,718,280

RAIL AND WHEEL FLANGE LUBRICATOR

Filed March 24, 1953 4 Sheets-Sheet 1

FIG. 1.



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RAIL AND WHEEL FLANGE LUBRICATOR

Filed March 24, 1953 4 Sheets-Sheet 2

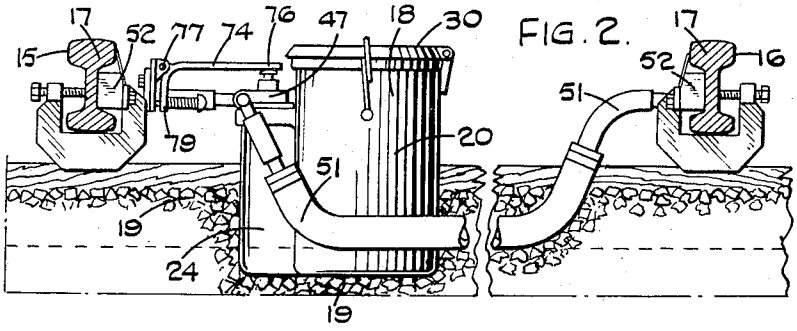


FIG. 2.

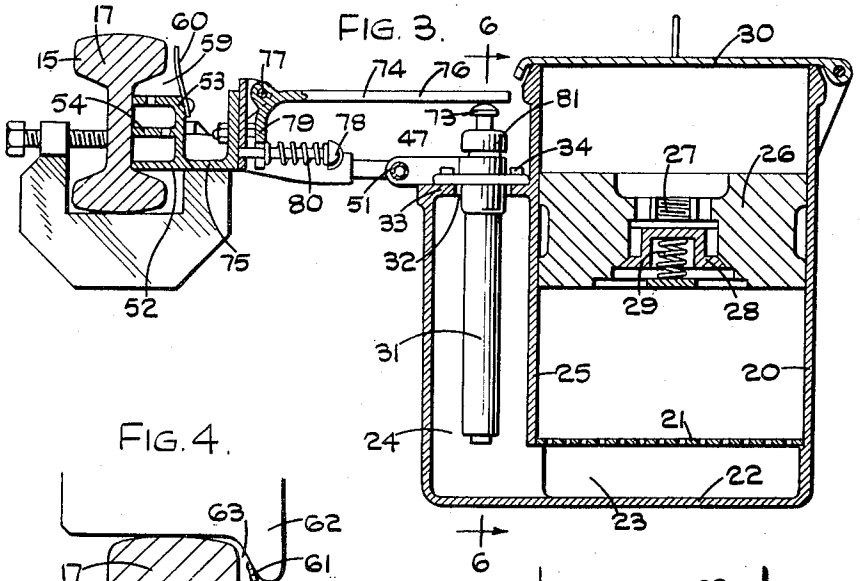


FIG. 3.

FIG. 4.

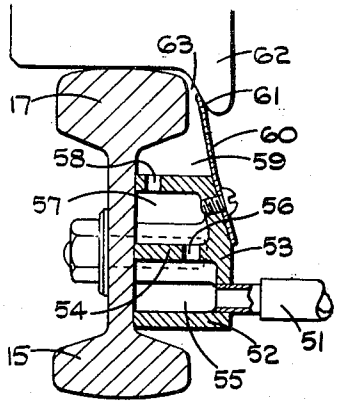
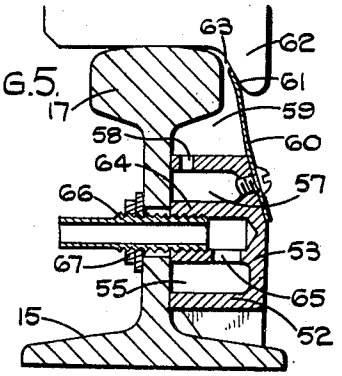


FIG. 5.



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RAIL AND WHEEL FLANGE LUBRICATOR

Filed March 24, 1953 4 Sheets-Sheet 3

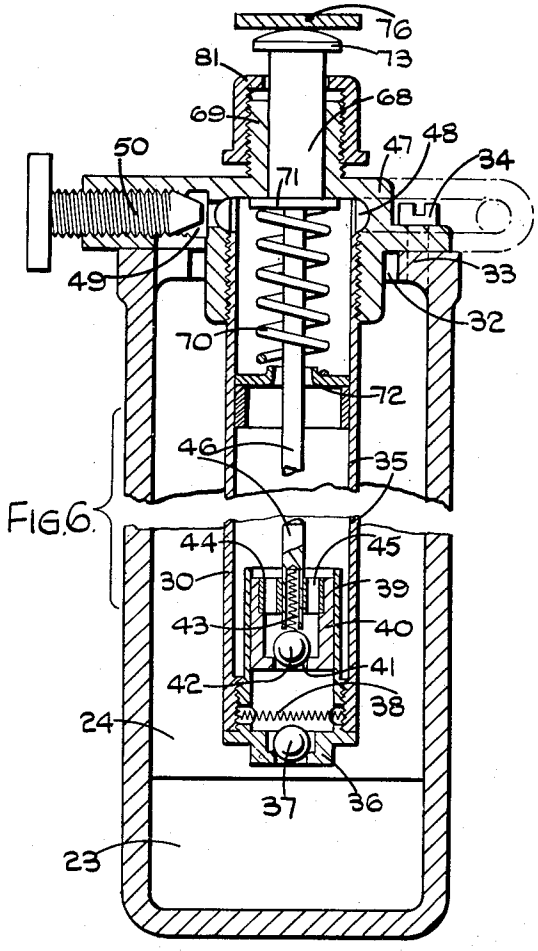
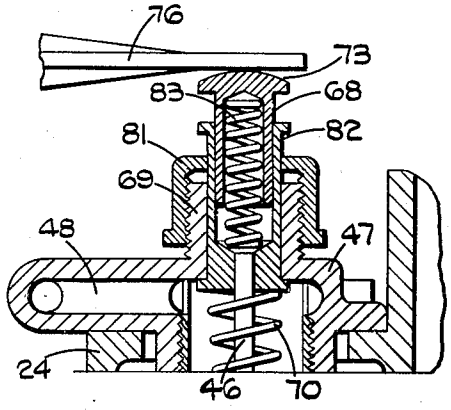


FIG. 6.

FIG. 7.



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Sept. 20, 1955 G. C. HURRELL 2,718,280

RAIL AND WHEEL FLANGE LUBRICATOR

Filed March 24, 1953 4 Sheets-Sheet 4

FIG. 8.

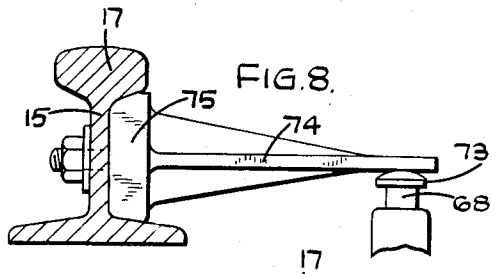


FIG. 9.

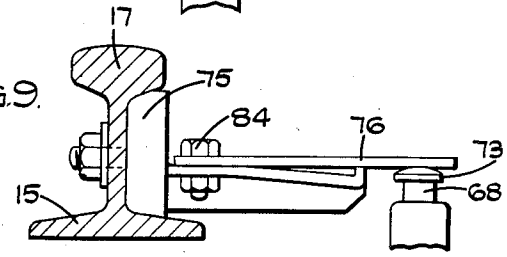


FIG. 10.

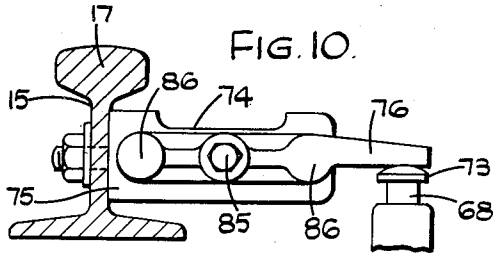


FIG. 11.

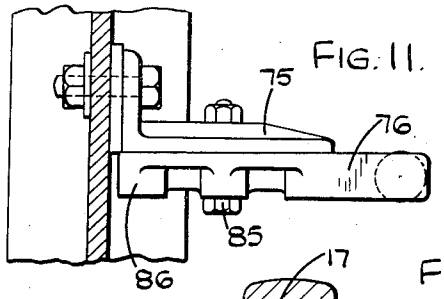
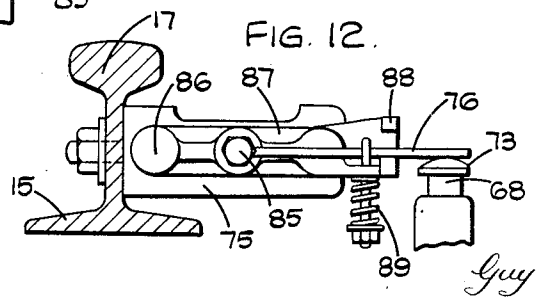


FIG. 12.



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United States Patent Office 2,718,280 Patented Sept. 20, 1955

2,718,280

RAIL AND WHEEL FLANGE LUBRICATOR

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Application March 24, 1953, Serial No. 344,350

Claims priority, application Great Britain April 2, 1952

14 Claims. (Cl. 184—3)

This invention relates to rail and wheel flange lubricators for applying lubricant to railway and tramway rails as well as to the flanges of the wheels of the passing vehicles for the purpose of reducing frictional wear between the wheel flanges and the rails, more particularly when the vehicles are passing around sharp curves.

The invention is concerned with lubricators for the above described purpose which are of the kind comprising a lubricant feeding unit adapted for mounting in a stationary manner on the rail supporting bed, such as the ballast, and means operated by the vertical deflection of the rail consequent on the passing traffic for supplying lubricant from said lubricant feeding means to the rail, such as to the side of a rail head.

One of the objects of the present invention is to provide rail lubricating means of the kind described which is of particularly simple and inexpensive but robust construction and which is not likely to get out of order after quite a prolonged period of use.

A further object of the invention is to provide a rail lubricating means of the kind described with means for automatically compensating against unduly large vertical movement of the rail which might otherwise result in damage to the device in operation.

A further object is to provide a lubricant feeding means as above described embodying a lubricant feeding pump which can particularly readily be removed and replaced for cleaning purposes.

Other objects of the invention will become apparent from the following description and the accompanying claims.

The invention in its broadest aspect comprises a lubricant feeding device for the purpose described, comprising a lubricant feeding unit adapted for mounting in a stationary manner on the rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to the rail, a pump operating element mounted or adapted to be mounted on the rail so as to project to one side thereof and adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, said pump being a reciprocating pump having a plunger mounted for substantially vertical movement and provided with an actuating element mounted on the pump casing for reciprocatory movement in alignment with the pump plunger, the actuating element projecting externally of the casing and being adapted to be engaged releasably by said operating element, the arrangement permitting of the pump being removed from the pump casing and replaced when desired.

Referring to the drawings:

Figure 1 is a plan view of one form of rail lubricating device in accordance with the present invention.

Figures 2, 3 and 4 are sectional views on the lines 2—2, 3—3 and 4—4 respectively of Figure 1, Figures 3 and 4 being drawn in each case to an enlarged scale.

Figure 5 is a view similar to Figure 4 showing a slight modification of the arrangement there depicted.

Figure 6 is a sectional view on the line 6—6 of Figure 3 drawn to an enlarged scale.

Figure 7 is a view of the upper part of the arrangement shown in Figure 6 illustrating a modification.

Figures 8, 9 and 10 are sectional views taken on part of the line 2—2 of Figure 1, showing three modifications.

Figure 11 is a plan view of the construction depicted in Figure 10.

Figure 12 is a view similar to Figure 10 showing a further modification.

Referring firstly to Figures 1 to 4 and 6 of the drawings, the invention is there illustrated as applied to the lubrication of railway rails in which each rail **15**, **16** is lubricated at a predetermined position along the rail track on the inner side in each case of the rail head **17**.

The lubricating device provided for this purpose comprises a feeding unit illustrated generally at **18** supported in a stationary manner upon the rail bed formed as shown by the ballast **19**, such feeding unit, as illustrated, being disposed between two rails **15**, **16**, although it should be understood that it may be disposed entirely to one side of the rails completely clear of the passing traffic so as to facilitate inspection and refilling of the feeding unit with lubricant.

The feeding unit comprises a vertically disposed cylindrical container **20** shown most clearly in Figure 3, the bottom of which container is open and has mounted therein a filter plate **21** spaced above the base **22** of the feeding unit so as to provide a passage **23** to a pump containing chamber **24** integral with the lubricant container **20** so as to be separated therefrom merely by a partition wall **25**.

Lubricant, which is preferably in the form of semi-solid grease, is fed gravitationally into the pump containing chamber **24** by means of a weighted piston **26** vertically slidable within the cylindrical container **20**, this piston being adapted to be withdrawn when refilling of the container **20** is necessary, and being provided with a screwed hole **27** for the attachment of a lifting handle, which lifting handle would have a threaded end for engagement within said hole **27** and would be adapted when in position to engage and open automatically an air release valve **28** which is normally displaced by a spring **29** upwardly into a closed position, the valve when open permitting of air passing freely through the centre of the piston **26** to permit of the piston being readily withdrawn without any air lock on the under side thereof.

The container **20** is provided with a hinged lid **30**.

Mounted detachably within the pump containing chamber **24** is a lubricant feeding pump illustrated generally at **31** and shown more particularly in Figure 6, such pump being removably inserted through a hole **32** formed in the upper wall **33** of the chamber **24** to which it is secured detachably by screws **34**.

As shown in Figure 6, this pump is of the reciprocating plunger type and comprises a vertically disposed barrel **35**, the lower end of which carries a removable inlet valve seating **36** provided with a non-return inlet valve member **37** of the ball type, having a control spring **38**.

The lower end of the barrel **35** including its inlet valve **37** extends substantially to the bottom of the container **20** so as normally to be completely immersed within the lubricant fed into the interior of the chamber **24** by the gravitational movement of the piston **26**.

The pump barrel **35** is provided in its lower portion with a liner **39** in which works the pump plunger **40**, which plunger is in the form of a hollow cylinder substantially closed at its upper and lower ends, its lower end

having a central opening 41 normally closed by a plunger valve 42 loaded by a spring 43. The upper end 44 of the cylindrical plunger 40 is provided with a plurality of axially extending apertures 45 and is mounted on the lower end of a plunger rod 46.

The arrangement is such that when the plunger rod with its associated hollow cylindrical plunger 40 is displaced in a downward direction, the valve member 42 is caused to open against the loading of its spring 43, thus admitting lubricant to the hollow interior of the plunger, while when the plunger moves in an upward direction, the valve member 42 closes so that the pump then acts as a reciprocating lift pump, raising the lubricant upwardly of the pump barrel 35.

The upper end of the pump barrel 35 is mounted detachably in a lubricant distributing head 47 provided internally with lubricant distributing passages 48 which are in communication with the interior of the upper end of the barrel 35. This distributing head is also connected detachably as above described by the screws 34 to the pump chamber 24, the arrangement being such that when the head is removed, there is removed with it the barrel 35 connected to the head.

Also formed in the interior of the distributing head 47 is a by-pass passage 49 which communicates with the upper end of the interior of the plunger 35, the by-pass passage being adapted to be partially closed by a by-pass valve member 50 which is threadably mounted within the interior of the distributing head, the arrangement being such that when this by-pass valve member is fully withdrawn, the by-pass passage 49 is fully open so that in these circumstances the major portion of the lubricant displaced by the pump barrel returns through the by-pass passage 49 to the interior of the top of the chamber 24, while when the valve member 50 is displaced inwardly of the head 47, the major portion of the lubricant so displaced is then fed to the distributing passages 48. Thus the amount of lubricant fed to the distributing passages 48 for a given stroke of the pump may be regulated.

The distributing passages 48 are connected through a number of distributing pipes 51 of flexible form as shown most clearly in Figure 1, to rail lubricating applicators 52 mounted on the inside of each of the two rails 15, 16 adjacent the web thereof as shown most clearly in Figure 4.

Each applicator 52 comprises a channel member 53 having its axis horizontal and with its open side directed towards the adjacent rail web, the channel being divided by a central horizontal partition 54 into two chambers, namely, a lower lubricant receiving chamber 55 connected to the associated distributing pipe 51 and communicating through an opening 56 in the partition 54 with the second of these two chambers 57 which forms a lubricant applying chamber. This chamber communicates through a series of longitudinally spaced holes 58 with a space 59 formed between the upper side of the channel member 53 and the adjacent under side of the rail head.

The side of this space which is directed away from the rail is substantially closed by a thin metal tongue 60 secured to the channel member 53 and extending for the full length thereof, the tongue being so arranged that a slight gap is left between its top edge 61 and the adjacent side of the rail head, into which gap lubricant is fed by the action of the lubricant pump as above described.

The upper edge 61 of this tongue is adapted to be engaged as shown in Figure 4 by the flange 62 of the passing wheels, thereby forcing the upper edge of the tongue towards the rail head and squeezing lubricant within the gap in so doing into the space 63 above the tongue between the side of the rail head and the wheel flange, thereby lubricating these two parts each time a wheel passes in contact with the tongue as above described.

A slightly modified form of this arrangement is shown

in Figure 5 in which the channel member 53 is unprovided with the central partition 54, but is instead formed internally with a series of horizontally spaced hollow bosses 64 which communicate at one side through an opening 65 with the hollow interior of the channel member, each boss being threadably connected by a pipe union 66 to one of the distributing pipes 51, which union passes through a hole in the rail web and by being provided with a nut 67 serves to hold the applicator 52 in this modified arrangement in position without providing separate securing means for that purpose as shown with the arrangement illustrated in Figures 1 to 4.

The pump 31 is adapted to be operated by the vertical deflection of one of the two rails consequent on the passing traffic, and for this purpose the upper end of the plunger rod 46 has rigidly secured thereto an actuating element 68 mounted for vertical reciprocating movement in a sleeve 69 integral with the distributing head 47, that is to say, the actuating element 68 is mounted for reciprocatory movement in the pump casing in alignment with the direction of reciprocation of the pump plunger, and the pump plunger is displaced in an upward direction by a spring 70 acting between a shoulder 71 on the under side of the actuating element 68 and a plate 72 fixed to the interior of the barrel 35.

The actuating element 68 projects beyond the sleeve 69 so that its upper end 73 is exposed and is adapted to be engaged by the under side of an operating element 74 mounted on the inner side of one of the two rails, namely, the rail 15, the arrangement being such that when this rail is displaced downwardly under the weight of the passing traffic, carrying with it the operating element, the actuating element 68 is also displaced so as to effect downward displacement of the pump plunger 40 to supply lubricant to the interior thereof, actual upward delivery of the lubricant occurring during the upward movement of the rail when the plunger itself moves upwardly under the action of the spring 70.

With the particular arrangement illustrated in Figures 1 to 3, provision is made for ensuring that an unduly large downward movement of the rail 15 is not transmitted to the pump plunger 40 so as either to damage the pump or to cause during its return stroke an unduly large quantity of lubricant to be fed to the rail heads with consequent possible slipping of the locomotive or other propelling vehicle.

Such undue downward displacement of the rail may occur as a result of an abnormally heavy load or as a result of a downward settlement of the rail relative to the rail bed as is liable to occur from time to time with any railway.

Accordingly the operating element 74 is made in two parts, namely, an anchorage part 75 which, as illustrated, is formed integral with the adjacent applicator channel member 53, and an arm 76 connected pivotally at 77 to the anchorage part 75.

The arm 76 is adapted on its under side to engage with the upper end 73 of the actuating element 68.

The anchorage part 75 at a position beneath the pivot 77 is threadably secured to one end of a horizontally extending adjusting bolt 78 which extends freely through a hole formed in a dependent portion 79 of the arm 76, a compression spring 80 being provided between the bolt head and this dependent portion. The arrangement is such that if the rail 15 is displaced downwardly by more than a predetermined distance, the under side of the upper end 73 of the actuating element 68 engages with the upper end of a cap 81 mounted on the sleeve 69 (see Figure 6), and on further downward movement of the rail occurring, the arm 76 pivots in relation to the anchorage part 75 compressing the spring 80 in so doing without any further movement being transmitted to the pump plunger 40, the arm 76 returning to its normal position when the rail 15 itself returns to its normal position.

In Figure 7 is shown a modified arrangement for allow-

ing for undesirable downward movement of the rail, in which the operating element **74** is constructed as a single one-piece arm **76** rigid with the rail, and a lost-motion connection is provided between the actuating element **68** and the pump rod **46**. For this purpose the upper end of the pump rod **46** is connected to a cylindrical sleeve member **82** vertically slidable within the distributing head sleeve **69**, a compression spring **83** being provided between the element **68** and this sleeve member **82** so that if an unduly large downward movement is transmitted to the element **68**, the spring is compressed without such movement being transmitted to the pump plunger.

In Figure 8 no provision is made for taking into account unduly large vertical movements of the rail, the actuating element **68** being connected directly to the pump rod **46** in the manner shown in Figure 6, and the operating element **74** being formed as a one-piece arm rigid with the rail. This arrangement is intended for situations where udue downward movement of the rail is not likely to occur.

In Figure 9 is illusrtated a modification of the arrangement shown in Figures 1 to 3, in which instead of connecting the arm **76** pivotally to the anchorage part **75**, the arm is formed as a length of resilient metal strip connected rigidly at **84** to the anchorage part **75** and adapted to flex when more than a predetermined downward movement is transmitted thereto from the rail.

In Figures 10 and 11 is depicted a further modification in which the operating element **74** is again made in two parts, namely, an anchorage part **75** and an arm **76**, the arm **76** being of rigid construction but pivoted at **85** about a horizontal axis parallel to the length of the rail to the anchorage part **75**, and being provided with friction pads **86** which engage with the anchorage part **75** and permit of the arm **76** pivoting into a new permanent angular position relative to the rail if the rail should move downwardly through more than a certain distance in relation to the rail bed. The arrangement shown in Figures 10 and 11 in fact operates in exactly the same way as that shown in Figures 1 to 3 except that the arm **76** does not return to its initial position in relation to the rail if excessive downward movement of the rail occurs.

In Figure 12 is shown a modification of the arrangement shown in Figures 10 and 11, in which the operating element is of three-part construction, namely, an anchorage part **75**, an arm **76**, and an intermediate part **87** on which the arm is mounted, this intermediate part **87** being frictionally pivoted to the anchorage part **75** in like manner to the preceding construction.

In this latter construction the arm **76** is itself of resilient form connected at one end to the pivot **85** and adapted at its other end to engage with the pump actuating element **68**, the arrangement being such that if a moderately excessive downward movement of the rail occurs, the arm **76** flexes in relation to the intermediate part **87**, while if a very substantial downward rail movement takes place, the upper side of the arm **76** then engages with an abutment **88** on the intermediate part, causing the latter then to pivot relative to the anchorage part **75** as in the case of the preceding construction.

Preferably as shown at **89**, a spring is provided between the arm **76** and the intermediate part **87** for further controlling the movement of the arm **76** in relation to the intermediate part.

The present invention provides a device for feeding lubricant to a rail such as a railway rail, as illustrated, so as to lubricate the head thereof and the flanges of the passing vehicle wheels, which device is of a particularly simple construction, and insofar as the feeding unit is mounted on the rail bed, the feeding unit itself is not displaced at all during the operation of the device so that it is not subjected to the vibration of the passing traffic.

Further, with the preferred construction as illustrated in Figures 1 to 4 and 6, provision is made for removing the pump **31** from the feeding unit for cleaning or inspection without disturbing the position of the feeding unit itself other than to the extent necessary to displace the feeding unit slightly longitudinally of the rail so as to bring its actuating element **68** clear of the arm **76**.

At the same time the lower or inlet end of the pump **31** is immersed in the lubricant so that special pipes for feeding the lubricant from the lubricant container to the pump are dispensed with.

Again with the preferred arrangement as shown in Figures 1 to 3, as well as shown in Figures 7 and 9 to 12, provision is made for avoiding the transmission of excessive rail deflection to the pump.

What I claim then is:

1. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to the rail, a pump operating element mounted on the rail so as to project to one side of the rail, said pump operating element being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, means mounting said pump removably within said casing, said pump being of reciprocating form having a plunger mounted for substantially vertical movement within said casing, said pump having an actuating element mounted thereon for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating element, said actuating element and operating element being relatively displaceable in a direction to bring said operating element clear of the pump actuating element and an associated pump so as to permit of the latter being removed from the pump casing and replaced when desired.

2. A lubricator for the purpose described, comprising a lubricant feeding unit adapted for mounting in a stationary manner on the rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element adapted to be mounted on the rail so as to project to one side thereof and adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, said pump being of reciprocating form having a plunger mounted for substantially vertical movement and provided with an actuating element mounted on the pump casing for reciprocatory movement in alignment with the pump plunger, the actuating element projecting externally of the casing and being adapted to be engaged releasably by said operating element, and means for preventing more than a certain vertical deflection of the rail being transmitted to the pump plunger.

3. A lubricator according to claim 2, wherein the operating element comprises an arm adapted to be mounted for spring-controlled pivotal movement in relation to the rail, the arrangement being such that if more than a predetermined downward displacement of the rail occurs, the arm pivots against this spring loading in relation to the rail without further movement being transmitted to the pump plunger.

4. A lubricator according to claim 2, wherein the operating element comprises an arm adapted to be mounted for friction-controlled movement in relation to the rail, the arrangement being such that for normal vertical deflections of the rail, the rail movement is transmitted to the arm without the arm being displaced in relation to the rail, while if an excessive movement of the rail occurs, the arm moves relatively to the rail against its friction control into a new position in relation to the

rail without such excessive movement of the rail being transmitted to the pump plunger.

5. A lubricator according to claim 2, wherein the operating element comprises an arm adapted to be mounted for spring-controlled movement in relation to an intermediate part having a friction-controlled pivoted connection to the rail, the arrangement being such that if moderate abnormal vertical rail deflections occur, the arm is displaced in relation to the intermediate part against its spring loading without the intermediate part being itself displaced in relation to the rail, while if excessive vertical movements of the rail take place, the intermediate part is itself displaced in relation to the rail into a new position against its friction loading, carrying with it the said arm.

6. A lubricator according to claim 2, wherein a lost-motion spring-controlled connection is provided between the pump actuating element and the pump plunger, the arrangement being such that if an excessive vertical displacement of the rail occurs, relative movement takes place between the actuating element and the pump plunger without such excessive movement being imparted to the pump plunger itself.

7. A lubricator according to claim 2, wherein the actuating member comprises an inherently resilient arm of sufficient strength to actuate the pump, the arrangement being such that when the member is displaced through the limit of movement required to actuate the pump, it will yield in response to continued deflection of the rail.

8. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating arm mounted on the rail so as to project in a substantially horizontal direction to one side of the rail, said pump operating arm being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, means mounting said pump removably within said casing, said pump being of reciprocating form having a plunger mounted for substantially vertical movement within said casing, said pump having an actuating element mounted thereon for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating arm, said pump actuating element and pump operating arm being displaceable relatively in a substantially horizontal direction longitudinally of the rail so as to bring the said arm clear of the actuating element and the associated pump so as to permit of the latter being removed from the pump casing and replaced when desired.

9. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element mounted on the rail so as to project to one side of the rail, said pump operating element being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, said pump comprising a barrel, means mounting said barrel removably within said casing with the longitudinal axis of the barrel vertical, a plunger vertically slidable within said barrel, said barrel having an inlet opening at its lower end, said casing having a lubricant receiving space within the interior thereof adjacent the lower end of said barrel so that the lower end of said barrel with its associated inlet opening is in situ permanently immersed in lubricant, said lubricant receiving space at the lower end of said barrel communicating directly without intervening pipes with said container, a pump actuating element connected to said pump plunger and projecting externally of said pump casing for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating element, said actuating element and operating element being relatively displaceable in a direction to bring said operating element clear of the pump actuating element and the associated pump so as to permit of the latter being removed from the pump casing and replaced when desired.

10. A lubricant according to claim 9 wherein the pump casing comprises a pump receiving chamber connected integrally to said container and receiving removably said pump, said pump receiving chamber being separated from said container by a partition providing an opening providing a direct communication between said lubricating container and said pump receiving chamber adjacent the lower end of said pump barrel and inlet opening therein.

11. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element mounted on the rail so as to project to one side of the rail, said pump operating element being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, said pump comprising a barrel, a plunger reciprocable in a substantially vertical direction within said barrel, inlet and outlet valves to said pump carried by said barrel and forming with said barrel and plunger a complete self contained pump unit, means mounting said pump unit detachably in said casing so that said unit complete with said two valves is withdrawable therefrom, said pump having an actuating element mounted thereon for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating element, said actuating element and operating element being relatively displaceable in a direction to bring said operating element clear of the pump actuating element and the associated pump so as to permit of the latter being removed from the pump casing and replaced when desired.

12. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element mounted on the rail so as to project to one side of the rail, said pump operating element being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, means mounting said pump removably within said casing, said pump being of reciprocating form having a plunger mounted for substantially vertical movement within said casing, said pump having an actuating element mounted thereon for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating element, said actuating element and operating element being relatively displaceable in a direction to bring said operating element clear of the pump actuating element and the associated pump

so as to permit of the latter being removed from the pump casing and replaced when desired, said pump having associated therewith a by-pass circuit provided with an adjustable control valve, the arrangement being such that when the valve is fully open, a greater proportion of the lubricant delivered by the pump passes around the by-pass circuit, and a lesser proportion is supplied to the rail, partial closure of the by-pass valve being adapted to cause a greater proportion of the pump-delivered lubricant to be fed to the rail.

13. A lubricator for the purpose described, comprising a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element mounted on the rail so as to project to one side thereof and adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, said pump being of reciprocating form having a plunger mounted for substantially vertical movement and provided with an actuating element mounted on the pump casing for reciprocatory movement in alignment with the pump plunger, the actuating element projecting externally of the casing and being adapted to be engaged releasably by said operating element, and means for preventing more than a certain vertical deflection of the rail being transmitted to the pump plunger, said pump having associated therewith a by-pass circuit provided with an adjustable control valve, the arrangement being such that when the valve is fully open, a greater proportion of the lubricant delivered by the pump passes around the by-pass circuit, and a lesser proportion is supplied to the rail, partial closure of the by-pass valve being adapted to cause a greater proportion of the pump-delivered lubricant to be fed to the rail.

14. In a rail lubricating device a lubricant feeding unit mounted in a stationary manner on a rail supporting bed, said unit embodying a container for lubricant and a lubricant feeding pump, means for supplying lubricant from the pump to a rail, a pump operating element mounted on the rail so as to project to one side of the rail, said pump operating element being adapted to be displaced in a substantially vertical direction under the vertical rail deflection consequent on the passing traffic, a casing for said pump, said pump comprising a barrel, means mounting said barrel removably within said casing with the longitudinal axis of the barrel vertical, a plunger vertically slidable within said barrel, said barrel having an inlet opening at its lower end, said casing having a lubricant receiving space within the interior thereof adjacent the lower end of said barrel so that the lower end of said barrel with its associated inlet opening is in situ permanently immersed in lubricant, said lubricant receiving space at the lower end of said barrel communicating directly without intervening pipes with said container, a pump actuating element connected to said pump plunger and projecting externally of said pump casing for reciprocatory movement in alignment with the pump plunger, means for transmitting operative movement to said pump plunger from said reciprocating actuating element, said actuating element projecting externally of the pump casing and being in detachable engagement with said pump operating element, said actuating element and operating element being relatively displaceable in a direction to bring said operating element clear of the pump actuating element and the associated pump so as to permit of the latter being removed from the pump casing and replaced when desired, said pump having associated therewith a by-pass circuit provided with an adjustable control valve, the arrangement being such that when the valve is fully open, a greater proportion of the lubricant delivered by the pump passes around the by-pass circuit, and a lesser proportion is supplied to the rail, partial closure of the by-pass valve being adapted to cause a greater proportion of the pump-delivered lubricant to be fed to the rail.

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