Jan. 2, 1940. W. C. HEIDENTHAL 2,185,810

RAIL LUBRICATOR

Filed May 29, 1936 4 Sheets-Sheet 1

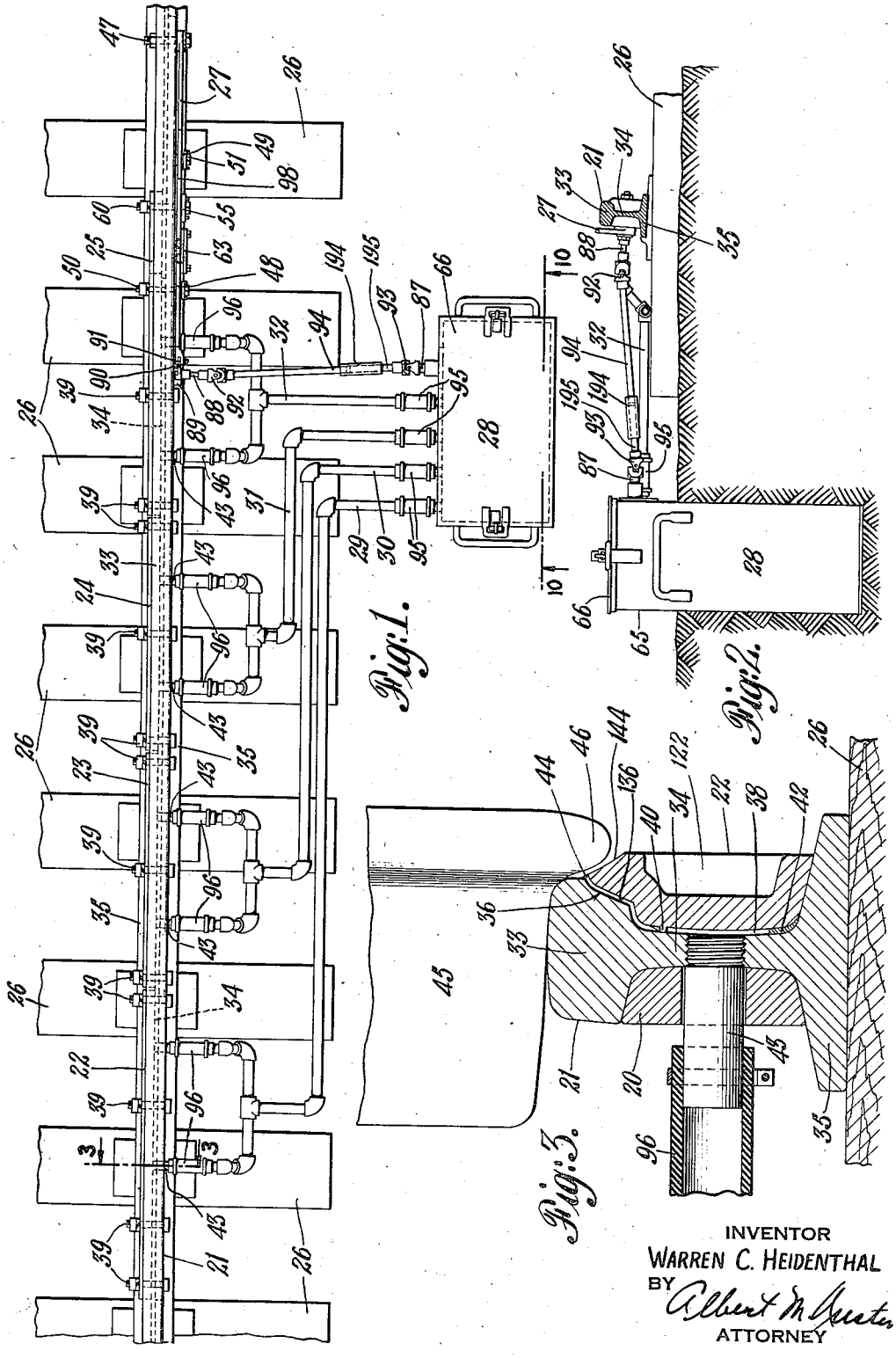


Fig. 1.

Fig. 2.

Fig. 3.

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Jan. 2, 1940. W. C. HEIDENTHAL 2,185,810

RAIL LUBRICATOR

Filed May 29, 1936 4 Sheets-Sheet 2

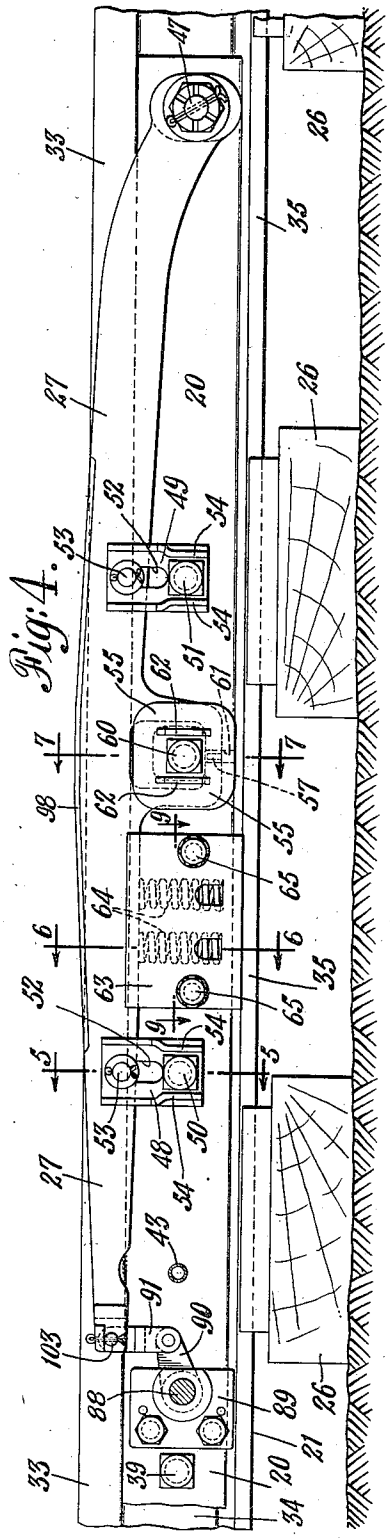


Fig. 4.

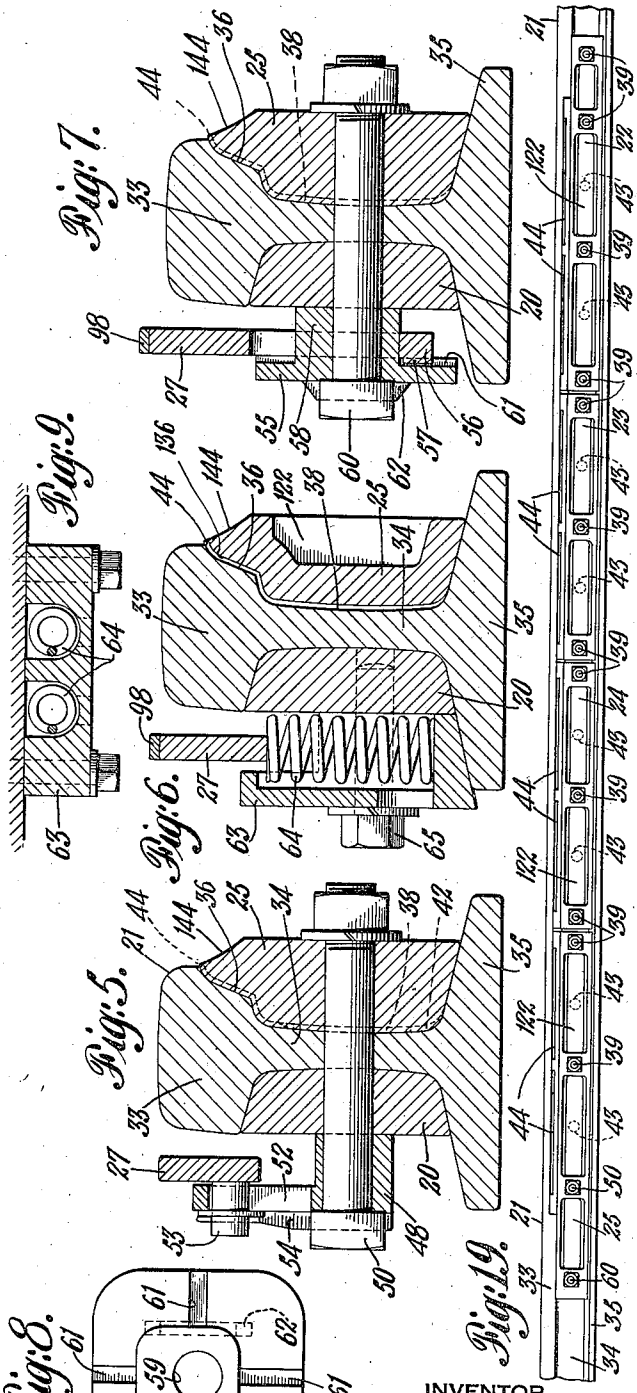


Fig. 7.

Fig. 9.

Fig. 6.

Fig. 5.

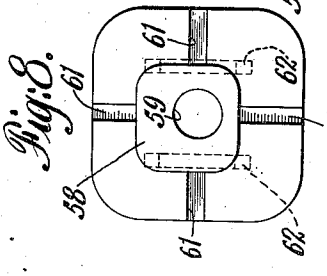


Fig. 8.

Fig. 10.

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Jan. 2, 1940. W. C. HEIDENTHAL 2,185,810

RAIL LUBRICATOR

Filed May 29, 1936 4 Sheets-Sheet 3

Fig:10.

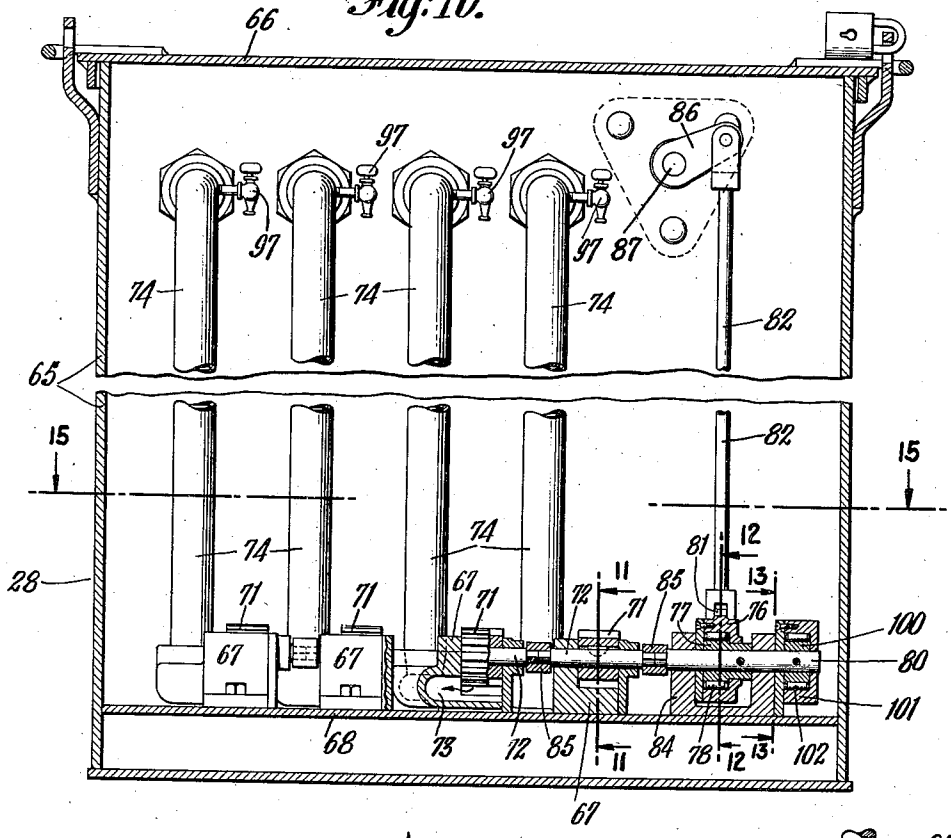
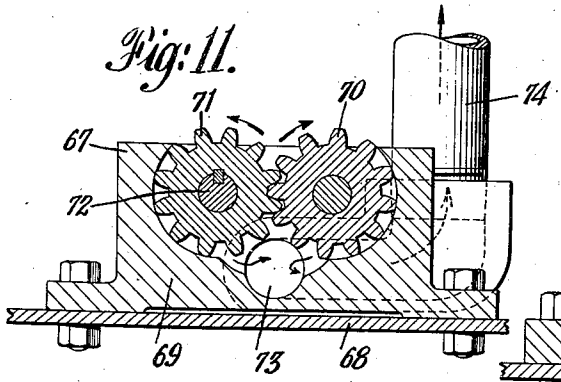


Fig:11.



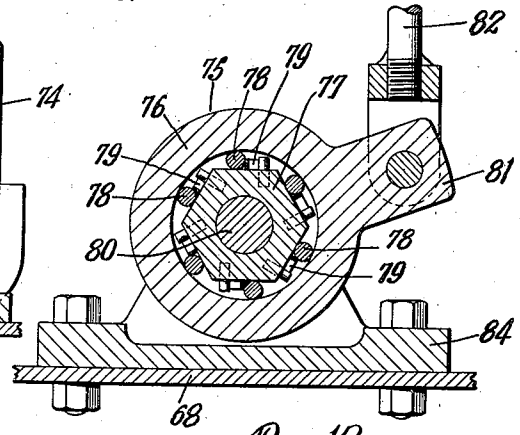
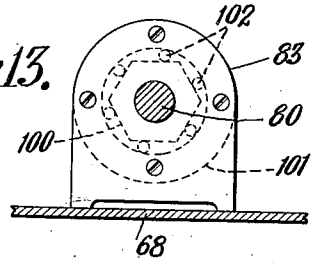


Fig:12.

Fig:13.



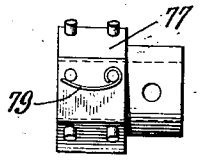


Fig:14.

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Jan. 2, 1940. W. C. HEIDENTHAL 2,185,810

RAIL LUBRICATOR

Filed May 29, 1936 4 Sheets-Sheet 4

Fig:15.

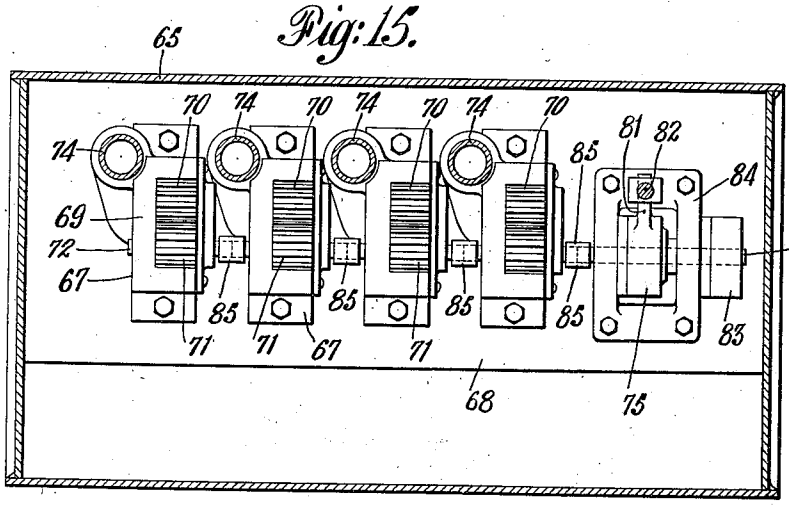


Fig:16.

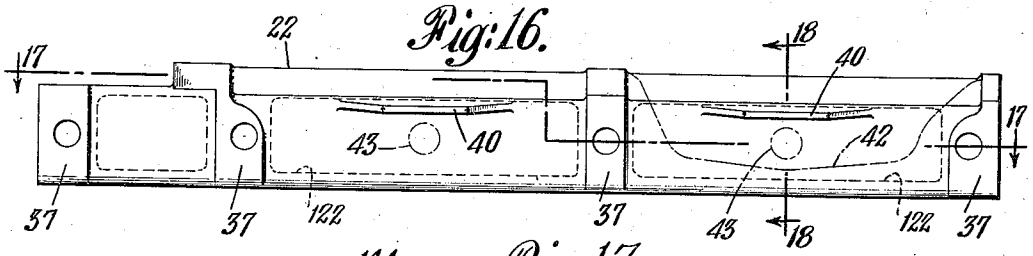


Fig:17.

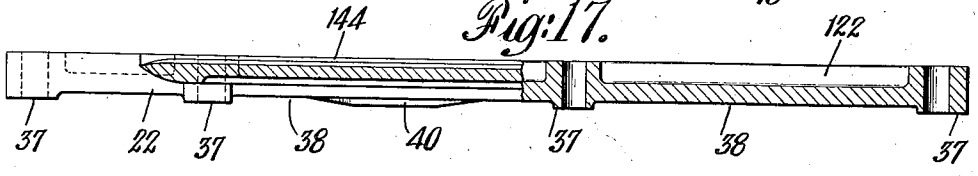
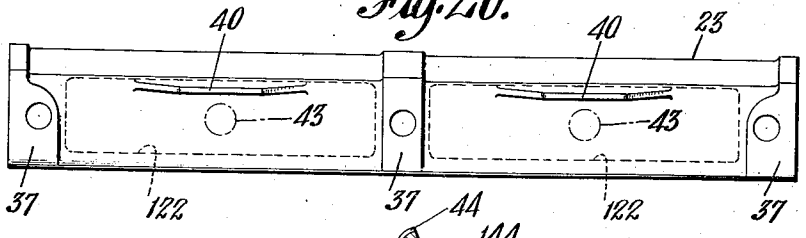


Fig:20.



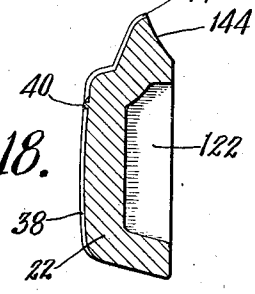


Fig:18.

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UNITED STATES PATENT OFFICE

2,185,810

RAIL LUBRICATOR

Warren C. Heidenthal, Middletown, N. Y., assignor, by mesne assignments, to The American Brake Shoe and Foundry Company, New York, N. Y., a corporation of Delaware

Application May 29, 1936, Serial No. 82,481

12 Claims. (Cl. 184—3)

The invention relates, in general, to railway tracks, and more particularly to devices for lubricating the flanges of rolling stock wheels and the flange-engaging surfaces of the rails. This application is a continuation-in-part of copending application Serial No. 681,242, filed July 20, 1933, now Patent No. 2,059,235, granted November 3, 1936.

According to a preferred form of the invention, the head of the T-rail is cut away and a lubricant delivery plate is bolted to the rail, forming a dispensing slot or crevice on the side surface of the rail which applies lubricant to the flanges of the wheels, but not to the treads. One or more stationary plates may be used, which plates may be either castings or of rolled section. If desired, an extra reenforcing plate may be used on the outer surface of the rail to further reenforce it.

If desired, suitable grease deflecting members may be provided on the delivery plates or on the rail for assisting in evenly distributing the grease along the length of the delivery crack or crevice. Furthermore, any suitable devices may be provided for delivering lubricant to the delivery plates.

For example, a ramp member may be pivoted to the side surface of the rail, to be operated by the treads of the wheels, this ramp imparting a reciprocating motion to a suitable clutch which converts the reciprocating motion into unidirectional rotary motion for driving a pump. Suitable devices may be provided for laterally guiding the ramp and for adjusting the upper position of the ramp and thereby the throw of the ramp.

A lubricant supply tank may be located adjacent the track and independently mounted, in which the pump and overriding clutch mechanism is located. A suitable flexible drive assembly may connect the ramp with the supply tank to take care of vertical deflection of the rail as the rolling stock passes over it.

The oneway clutch may be of the frictional roll type which is responsive to even small reciprocating movements. A further and similar clutch may be provided for preventing backward movement of the pump when the main clutch is executing its return movement.

The invention also consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner by which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which:

Fig. 1 represents a plan view of the track lubricating system according to the invention;

Fig. 2 is a side elevation thereof;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is an outside elevation of a rail illustrating the mounting of the ramp;

Figs. 5, 6 and 7 are transverse sections taken on the lines 5—5, 6—6 and 7—7 of Fig. 4 illustrating details of the ramp mounting;

Fig. 8 is a detail of the ramp check for adjusting the throw of the ramp;

Fig. 9 is a section on the line 9—9 of Fig. 4 illustrating the construction of the spring assembly;

Fig. 10 is a vertical section through the grease tank taken on the line 10—10 of Fig. 1;

Fig. 11 is a section on the line 11—11 of Fig. 10 illustrating the construction of one of the gear pumps;

Fig. 12 is a section on the line 12—12 of Fig. 10 illustrating the construction of the oneway clutch;

Fig. 13 is a section taken on the line 13—13 of Fig. 10 illustrating the second clutch for preventing return movement;

Fig. 14 is a detail of the oneway clutch;

Fig. 15 is a section taken on the line 15—15 of Fig. 10;

Fig. 16 represents a view of one of the end distributing plates showing the inner side thereof which normally is clamped against the rail;

Figs. 17 and 18 are sections taken on the lines 17—17 and 18—18 of Fig. 16;

Fig. 19 is an elevation of the inner side of a section of track equipped with the greaser according to the invention; and

Fig. 20 represents a view of one of the intermediate distributing plates showing the inner side thereof which normally is clamped against the rail.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of

explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now to the drawings, and more particularly to Figs. 1, 2, 3 and 19, the invention is shown as applied to on ordinary T-rail 21. This rail may be cut to a length corresponding to the length of the track greaser or it may constitute a standard length of rail, a part of which only is utilized for the greaser. In either case, the rail 21, having a head 33, web 34 and base 35, rests on the usual ties 26 and has applied thereto a series of delivery plates 22, 23, 24 and 25 (Fig. 19) and a reenforcing plate 20. Delivery plates 22–25 may be formed all in a single piece or they may be separate as illustrated. They may be rolled sections suitably machined or they may be castings. The reenforcing plate 20 may be in one piece, as indicated, and is preferably of rolled section suitably machined to fit the standard stock rail 21.

In addition to the delivery plates 22—25 and the reenforcing plate 20, just mentioned, the track greaser also comprises a ramp 27 (Fig. 4); a supply tank 28 having a series of gear pumps 67 (Fig. 15) which are driven by the reciprocating action of the ramp 27 as the wheels pass thereover. The pumps 67 force lubricant through discharge pipes 29, 30, 31 and 32 to the several delivery plates 22—25, there being two reservoirs or chambers 38 to each delivery plate. Each chamber 38 is supplied by a separate branch pipe.

The delivery plates 22—25 are similar in construction and are bolted to the rail (as shown). The left end plate 22, as illustrated in Figs. 16, 17 and 18, has a series of lands 37 which abut against the stock rail 21 and form the grease chambers 38 between the plate and the rail. This delivery plate is clamped to the stock rail 21 by a series of bolts 39. Gaskets of soft material 42 (Figs. 3 and 16) are located around the periphery of the grease chambers 38 to form greasetight joints to hold the grease. The plate 22 has recesses 122 in its outer surface to save metal.

The intermediate delivery plates 23 and 24 (Fig. 20) are alike and have grease chambers 38; lands 37; gaskets 42 and are otherwise similar to end delivery plate 22. End delivery plate 25 is likewise similar to the other delivery plates. The end delivery plates 22 and 25 are somewhat longer than intermediate delivery plates 23 and 24.

The following description relating to the relation of the delivery plate 22 to the rail obviously applies to all of the delivery plates 22—25.

At the center of each chamber 38 a supply nipple 43 is provided. These nipples pass through openings in the reenforcing plate 20 and are threaded into the web 34 of the rail. Each grease chamber 38 communicates with a dispensing slot or crevice 44. These form, in effect, a slot which is substantially continuous along the length of the rail, being interrupted only at the lands 37, which, if desired, may be made very narrow at their upper edges to provide a substantially continuous slot for the entire length of the greaser.

The head 33 of the rail is cut away, as indicated by 36 in Fig. 3, this cut extending from the side surface of the head to the lower fishing surface thereof. The cut away portion 36 extends the length of the greaser, cooperating with delivery plates 22—25. The distributing plate 22 has a similar configuration, forming connecting channels 136 which bend in an approximately horizontal direction at their upper ends where they merge into the slots or crevices 44. This approximately horizontal direction prevents the grease from being forced upwardly too close to the tread 45 of the wheel and limits the distribution to the flange 46. The delivery plate 22 is shaped as indicated in Fig. 3 to form an outwardly extending bevel portion 144 whose upper edge, if desired, may project outwardly a little beyond the adjacent face of the head, providing, in effect, a slight ledge at the slot or crevice 44.

The position of the wheel flange 46 with respect to the greaser depends upon whether the wheel is new or worn and upon how far up on the fillet between wheel tread 45 and flange 46 the wheel is riding. However, in any case, the grease oozes out of slots 44 and due to its viscosity it builds up on the surface of the beveled surface 144 where it is wiped off by the wheel flanges as they roll along the rail. In the form shown there are eight delivery slots and the entire greaser may be about ten feet long.

To assist in uniform distribution of the grease along the length of crevices 44, deflecting members 40, having tapering ends, are formed on the delivery plates 22 directly over the supply nipples 43. This insures a substantially even and uniform distribution of the grease along the length of the crevices 44 so that, as the wheel rolls along the head of the rail, the flange 46 thereof will have uniformly applied thereto a strip or line of grease, which grease is restricted to the flange and does not get on the tread 45.

For pumping grease to the nipples 43, a mechanical ramp arrangement is provided (Figs. 4–9). The ramp 27 has a sloping upper surface with its highest point midway of the length of the ramp so that traffic may pass in either direction. The ramp 27 is pivoted to the track by a pivot bolt 47 passing through the reenforcing plate 20 and the web 34 of the rail. The ramp 27 is guided by guides 48 and 49 which are clamped by bolts 50 and 51, respectively.

Since these guides are alike, it is sufficient to describe guide 48 in detail (see Fig. 5). Guide 48 has a sleeve portion through which the bolt 50 passes, this bolt also passing through reenforcing plate 20 and delivery plate 25. The guide 48 has a pair of flanges 54 for preventing the head of bolt 50 from turning. It also has a vertical slot 52 in which is slidably mounted a pin 53 secured to the ramp 27. This pin 53 has a suitable washer and cotter pin so that the guide 48 holds the ramp in proper lateral position with respect to the rail. The guides 48 and 49 also hold the ramp 27 from flying up and fouling the wheels in case pivot bolt 47 or check 55 breaks.

The ramp 27 is also provided with an adjustable check 55 (see Figs. 7 and 8). The check 55 comprises a sleeve 58 having an eccentric opening 59 through which passes the bolt 60, this bolt passing also through the reenforcing plate 20 and the delivery plate 25. The flat side surfaces of sleeve 58 are located at different distances from opening 59. The ramp check 55 has a plate-like flange having a series of keyways or slots 61 radial with respect to hole 59. The ramp 27 has an apertured lug 56 through which the sleeve 58 projects. The lug 56 has a key or projection 57 adapted to slide in one of the ways 61. The check 55 has flanges 62 engaging the head of bolt 60 to prevent turning. The engagement of the member 57 in the ways 61 prevents the check 55 from turning.

Thus, the check 55 limits the upper position of the ramp 27, it being understood that the springs

64 always urge the ramp upwardly. The throw of the ramp is the distance between its uppermost position and a position corresponding to the upper surface of the rail head 33. If it is desired to change this throw, the bolt 60 is loosened and the check 55 is turned so that one of the other flat surfaces of sleeve 58 engages the bottom of the hole in lug 56. Thus, the throw of the ramp and consequently the amount of grease discharged may be adjusted. If desired, one of the positions of adjustment of the check 55 may hold the ramp 27 so low as to have zero throw. This condition of adjustment may be desirable in some instances, when it is desired to stop the flow of grease.

Referring to Figs. 6 and 9, the springs 64 for urging the ramp 27 upwardly are housed in a two compartment box 63, bolted to the reenforcing plate 20 by bolts 65 tapped into the reenforcing plate. Openings may be provided in the bottom of the spring compartments to permit adequate drainage of water. As indicated, especially in Fig. 6, these springs directly engage the lower edge of the ramp 27.

Referring now to Figs. 1, 2 and 10–15, the supply tank 28 comprises a body 65 set well into the earth alongside of the ties 26. The box has a cover 66 removably secured thereto. This body is of sufficient size to hold the lubricant and contains the gear pumps 67 and the operating mechanism for driving the pumps.

Referring now to Fig. 11, each gear pump comprises a driving gear 71 mounted on a drive shaft 72 and meshing a driven gear 70. These gears are mounted in a housing 69 which is bolted to a supporting plate 68 spaced above the bottom of the body 65. These gears rotate in the direction of the arrows in Fig. 11, taking grease in at the top and discharging it through opening 73 which communicates with discharge pipe 74, there being one discharge pipe for each pump.

For driving gear pumps 67, a oneway clutch 75 is provided. This clutch 75 comprises a housing 84 secured to the plate 68, an outer drum 76 and an inner drum 77 secured to shaft 80. The inner drum 77 is hexagonal, forming a series of wedge-shaped cavities with the outer drum 76 for cylindrical rolls 78. These rolls 78 are wedged into their cavities by a series of springs 79 secured to the inner drum 77, as indicated in Fig. 14. The outer drum 76 has an arm 81 to which a vertical link 82 is pivoted, this link extending to an arm 86 mounted on shaft 87 passing through to the outside of the body 65 and driven by the ramp 27 by mechanism hereinafter described more in detail.

Oscillation of the ramp 27, due to wheels passing thereover, oscillates link 82 up and down, thereby rotating the shaft 80 in one direction. The rotation of shaft 80 is imparted to the several shafts 72 of the gear pumps 67 by square collars 85, all of these shafts being in line.

For preventing the shaft 80 from backing up when the oneway clutch 75 executes its return stroke, a holding clutch 83 is provided. This clutch has an inner hexagonal drum 100 secured to shaft 80 and an outer drum 101 secured to the stationary casing 84. A series of rollers 102 are interposed between these parts, the construction and operation of this clutch being similar to that of clutch 75. The wedging action of clutch 83, however, is so arranged as to permit driving of the shaft 80 by clutch 75, but to prevent backward slipping of the shaft 80 when the clutch 75 retracts.

The linkage between ramp 27 and the grease chamber 28 is best shown in Figs. 1, 2 and 4. The ramp 27 has a forked end receiving the upper end of link 91. A pin 103 pivots the ramp 27 to link 91. The lower end of link 91 is forked to pivotally receive an arm 90. Arm 90 is located in a recess behind plate 89 and is secured to shaft 88 which projects out through a hub on plate 89. Plate 89 is suitably secured to the reenforcing plate 20. A universal joint 92 is connected to shaft 88 and a universal joint 93 is connected to shaft 87. The two universal joints 92 and 93 are connected by a telescoping shaft made up of a square sleeve 194 connected to shaft 94 and a square rod 195 slidably received in sleeve 194. Thus, reciprocation of the ramp 27 oscillates shafts 88 and 87 and link 82, driving the oneway friction clutch 75.

The grease is supplied by a series of separate gear pumps, one pump being shown for each of the supply pipes 29, 30, 31 and 32. Each of these pipes is connected by a rubber coupling 95 to its respective discharge pipe 74. Each of the pipes 29—32 supply a single delivery plate, each of these pipes dividing into two branches, one branch for each grease chamber 38. The separate branches are connected by hose couplings 96 to the respective nipples 43 (Figs. 1 and 3).

The ramp 27 may be provided with a special hardened wearing surface 98 to increase the life of the ramp. The vertical discharge pipes 74 may each be provided with a pet-cock 97, if desired, to equalize the grease flow to the several delivery plates. In practice, these stop cocks will probably not be required, but if a condition should arise, such as unequal pumping action by the several gear pumps 67, whereby the delivery plates are being unequally supplied with grease, this condition could be remedied by opening up the stop cocks 97 in the particular supply systems getting too much grease, to bypass some of the grease back into the supply tank.

It will be noted that the downward movement of the ramp 27 merely compresses the spring 64 without driving pumps 67. All driving action of the pumps takes place under the return force of springs 64 returning the ramp to upper position. This permits successful operation of the greaser at all speeds of train movement since, no matter how hard the train hits the ramp, no shock to the pumping mechanism results. The grease being delivered to the several grease chambers 38 is delivered uniformly along the length of each slot or crevice 44. The wheel flanges pick up the grease on the inner side of the running rail and effectively lubricate the running rail, in some cases as far as ten miles. These greasing units may be placed at or before a curve to lubricate the running rail on the high side or in any other location where grease is needed. These units are of value at the throat of busy yards for lubricating the switches and curves throughout the yard. Where lubrication is required on both rails, one unit will be used on each rail.

Thus, a rail greaser is provided which is rugged in construction and simple in operation. It effectively applies a substantially continuous strip or line of grease to the flanges of wheels without any danger of getting the grease on the wheel treads. There are no moving parts on the grease applying members, and the delivery conduit, being in the form of a long crevice or slot, cannot easily be clogged. The use of gear pumps and the use of one-way friction roll clutches insure freedom from trouble at these points. The fric-

tion clutches are particularly advantageous since they respond to the smallest movement of the ramp.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In apparatus for lubricating railway rails, a track structure having an extended lubricant chamber, said structure having an extended delivery slot for applying lubricant to the flanges of wheels of rolling stock, means for introducing lubricant into said chamber, said chamber having lubricant deflecting members to equalize the distribution of lubricant along said delivery slot.

2. In apparatus for lubricating railway rails, a track structure comprising a T-rail having the side surface of its head cut away, a lubricant delivery plate mounted adjacent said cut away surface, said lubricant delivery plate forming a lubricant chamber, said structure having an extended delivery crevice for applying lubricant to the flanges of wheels of rolling stock, means for introducing lubricant into said chamber, said chamber having lubricant deflecting members to equalize the distribution of lubricant along said delivery crevice.

3. In apparatus for lubricating railway rails, a track structure comprising a T-rail having the side surface of its head cut away, a lubricant delivery plate mounted adjacent said cut away surface, said lubricant delivery plate forming with said T-rail a lubricant chamber, said structure having a delivery slot between said delivery plate and said head for applying lubricant to wheel flanges, means for introducing lubricant into said chamber, said delivery plate having lubricant deflecting members to equalize the distribution of lubricant along said delivery slot.

4. In apparatus for lubricating railway rails, a track structure comprising a rail, a ramp member pivoted to said rail, a spring for normally holding said ramp member above the top of the rail, an adjustable ramp check between said ramp and said rail for limiting the upper position of said ramp, said adjustable ramp check comprising a rectangular sleeve having an eccentric hole therethrough; a bolt passing through said hole and through said rail, said sleeve having a flanged plate, said ramp having a recessed ear surrounding said sleeve, said plate having radial guide channels, said ear having a member riding in one of said channels, said hole being so related to the side surfaces of said sleeve that the rotative position of said check determines the upper position of said ramp.

5. In apparatus for lubricating railway rails, a track structure comprising a rail, a ramp member pivoted to said rail, a spring for normally holding said ramp member above the top of the rail, an adjustable ramp check between said ramp and said rail for limiting the upper position of said ramp, said adjustable ramp check comprising a polygonal sleeve having an eccentric hole therethrough, a pivot passing through said hole and secured to said rail, said sleeve having a flanged plate, said ramp having a recessed ear surrounding said sleeve, said plate having radial guides, said ear having a guide portion cooperating with said guides.

6. In track lubricating apparatus, a track, a ramp mounted adjacent said track for engagement by the wheels of rolling stock, yieldable devices for normally holding said ramp above the top surface of the track, a pump for delivering lubricant to the track, an overriding friction clutch for driving said pump, and means for conveying the reciprocating action of said ramp to said clutch, said clutch retracting, when said wheels engage said ramp, and driving said pump, under the action of said yielding devices, when said wheels disengage said ramp.

7. In track lubricating apparatus, a track structure, an actuating member mounted adjacent said structure for engagement by the wheels of rolling stock, yieldable devices for normally holding said actuating member in position to be engaged by said wheels, a pump for delivering lubricant to the track structure, an overriding clutch for driving said pump, and means for conveying the reciprocating action of said actuating member to said clutch, said clutch retracting, when said wheels engage said actuating member, and driving said pump, under the action of said yielding devices, when said wheels disengage said actuating member.

8. In apparatus for lubricating railway rails, a track structure comprising a rail, a ramp member pivoted to said rail, a spring for normally holding said ramp member above the top of the rail, an adjustable ramp check between said ramp and said rail for limiting the upper position of said ramp, said adjustable ramp check comprising a projecting member secured to the track structure, said ramp having a recessed member surrounding said projecting member, and adjustable devices between said recessed member and said projecting member to vary the throw of said ramp.

9. In apparatus for lubricating railway rails, a track structure comprising a rail, a lubricant delivery plate mounted on the side of said rail, a ramp member, means pivoting said ramp member to said track structure, an adjustable ramp check for adjusting the upper position of said ramp, a spring device for normally holding the top of said ramp above the upper surface of the running rail, guide members located on opposite sides of said spring device to limit the uppermost position of the ramp in case of failure of the normal functioning of the ramp.

10. In apparatus for lubricating railway rails, a track structure comprising a T-rail, a lubricant delivery plate mounted on the inner side of said rail, a reenforcing plate on the outer side of said rail, a ramp member, means pivoting said ramp member to said reenforcing plate, an adjustable ramp check for adjusting the upper position of said ramp, a spring assembly for normally holding the top of said ramp above the upper surface of the running rail, guide members for laterally guiding said ramp, a lubricant tank independently mounted alongside of the track, pumps in said lubricant tank, means for conveying lubricant from said pumps to the rail, stud shafts mounted on said track structure and said tank, respectively, a transmission member comprising a telescoping shaft and universal joints connecting said stud shafts, an arm connected to said rail stud shaft, a link connecting said ramp and said arm, a second arm in said tank connected to said tank stud shaft, an overriding clutch arrangement for converting the reciprocating movement of said tank arm into rotary movement for said pumps.

11. In apparatus for lubricating railway rails, a track structure having an extended lubricant chamber, said structure having an extended de-

livery slot for applying lubricant to rolling stock, means for introducing lubricant into said chamber, said chamber having a lubricant deflecting member to equalize the distribution of lubricant along said delivery slot.

12. In apparatus for lubricating railway rails, a track structure comprising a running rail, a series of separate lubricant delivery plates placed end to end on the inner side of said rail, the side surface of said rail being cut away to accommodate said delivery members, a continuous reenforcing plate on the outer side of said rail extending throughout and being coextensive with a plurality of said separate lubricant delivery members, said delivery members having means for supplying lubricant to the wheels of rolling stock, and means for supplying said delivery members with lubricant.

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