May 23, 1944. H. FULLER 2,349,259

RAILROAD TRACK EQUIPMENT

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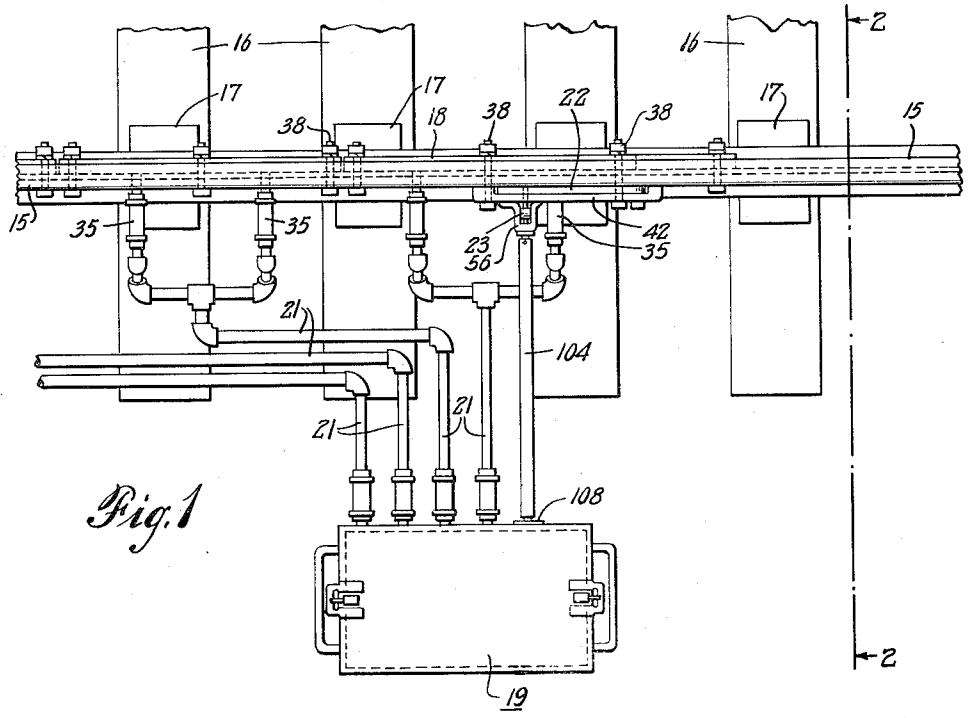


Fig. 1

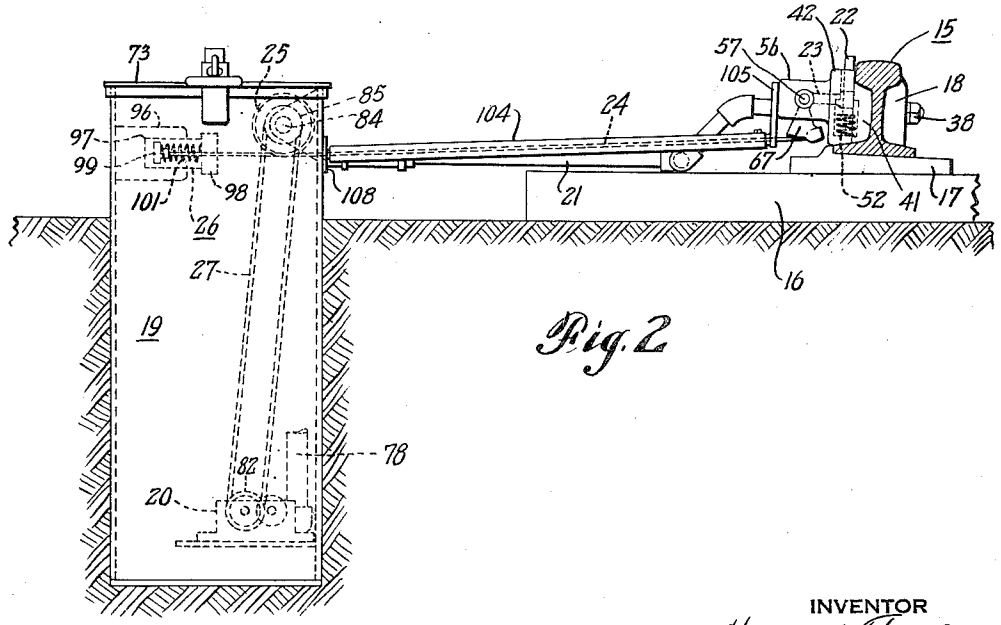


Fig. 2

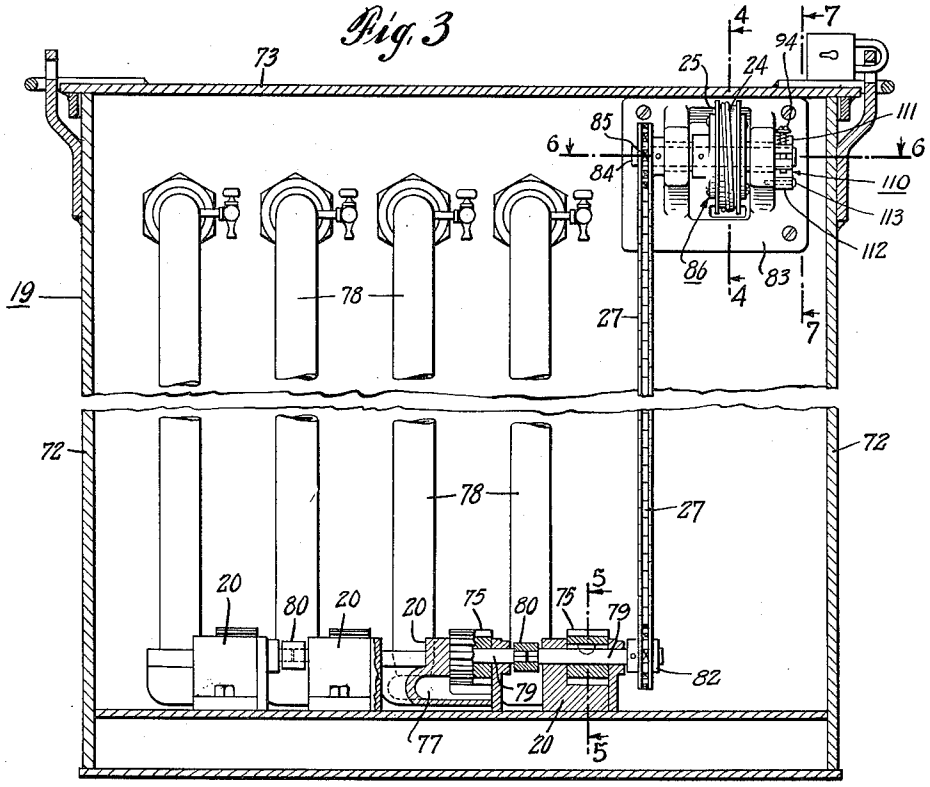
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RAILROAD TRACK EQUIPMENT

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Fig. 3



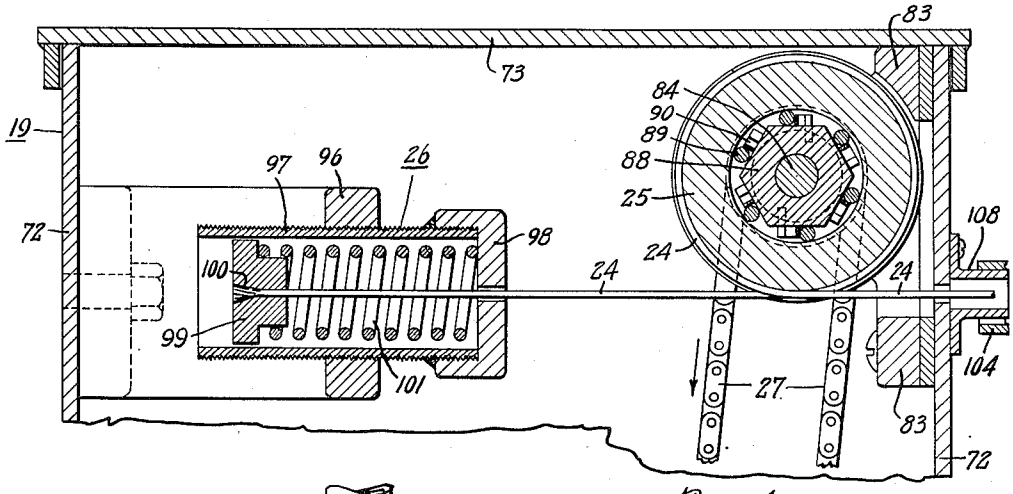


Fig. 4

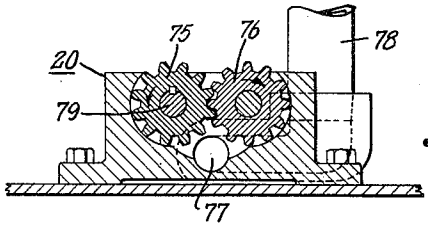


Fig. 5

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RAILROAD TRACK EQUIPMENT

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Fig. 6

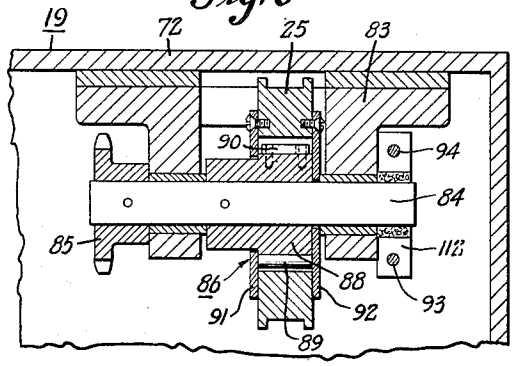


Fig. 7

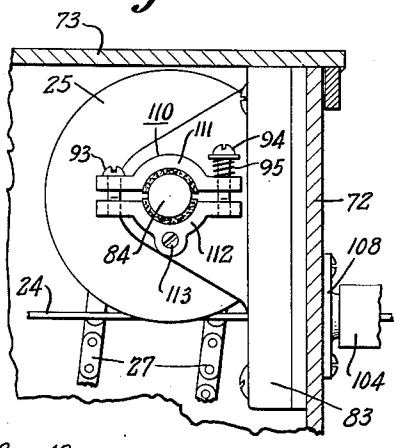
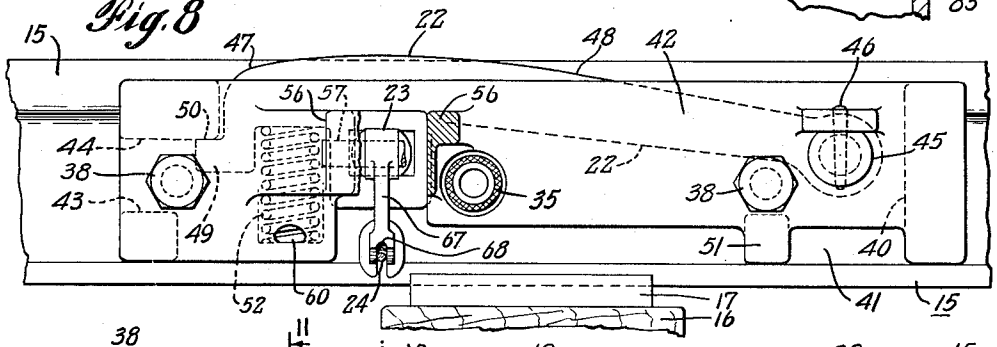


Fig. 8



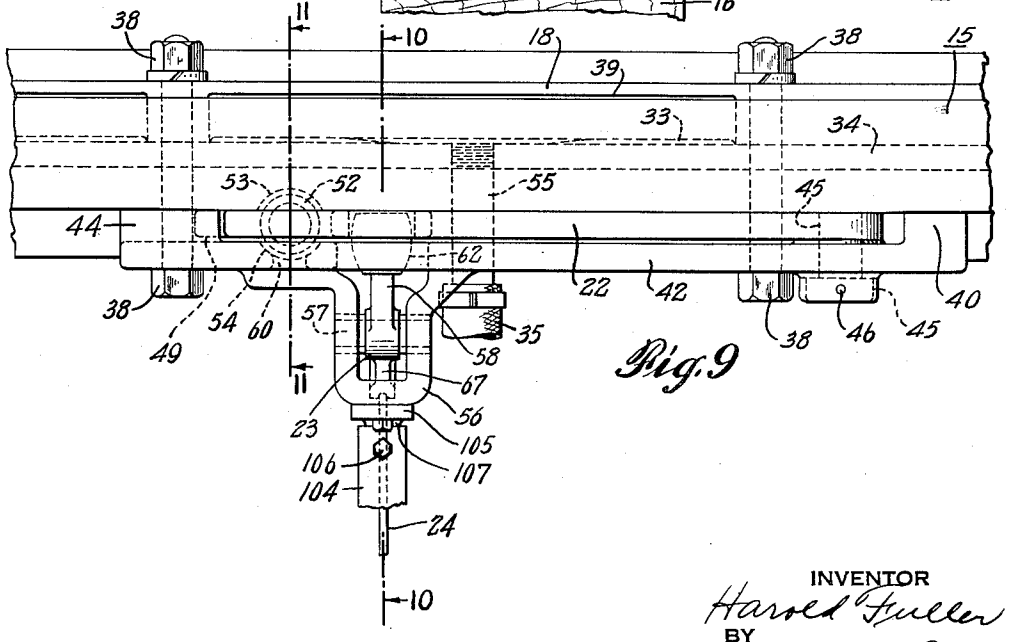


Fig. 9

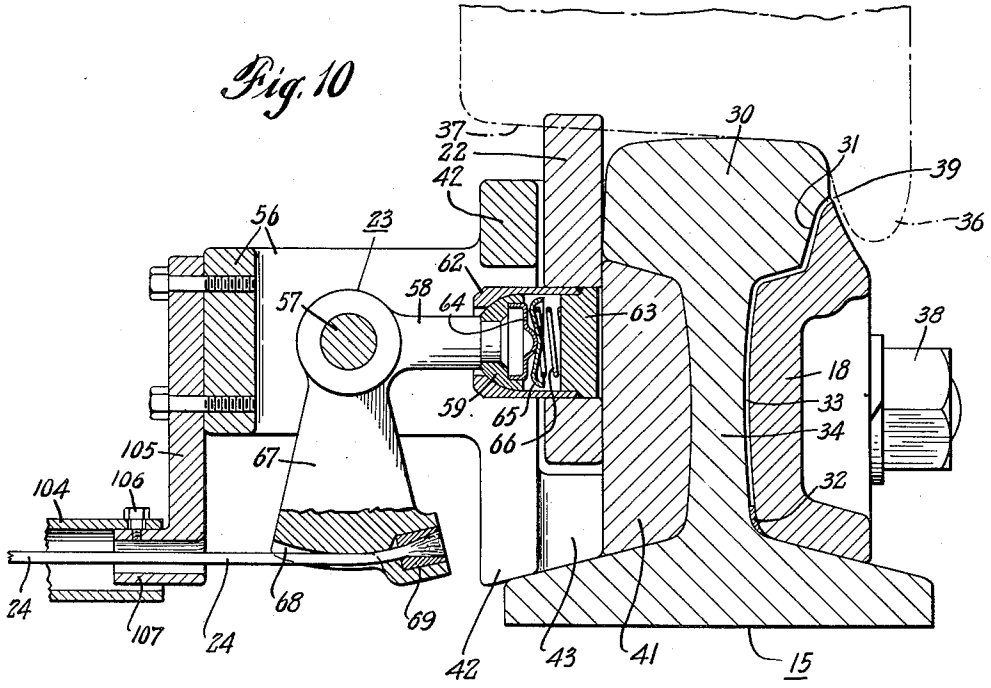
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Fig. 10



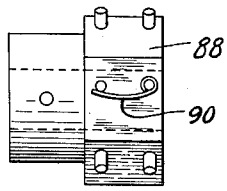
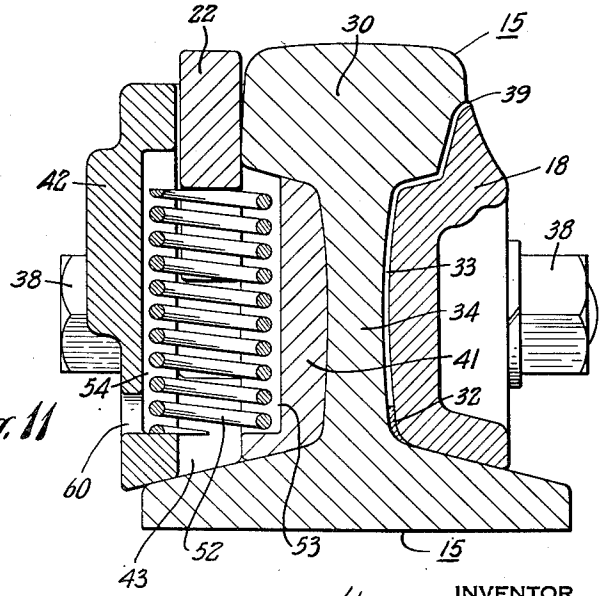


Fig. 12

Fig. 11



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UNITED STATES PATENT OFFICE

2,349,259

RAILROAD TRACK EQUIPMENT

Harold Fuller, Middletown, N. Y., assignor, by mesne assignments, to American Brake Shoe Company, a corporation of Delaware

Application January 25, 1941, Serial No. 375,898

15 Claims. (Cl. 184—3)

The invention relates in general to railroad track equipment and, more particularly, to devices for lubricating the flanges of car wheels and the flange engaging surfaces of the rails.

The invention relates further to operating mechanism which, when actuated by the passage of rolling stock, operates pumping apparatus for supplying lubricant to the rails.

According to a preferred embodiment of the invention, a flexible cable is connected to a wheel engaging ramp secured to the running rail and to a suitable spring device associated with the lubricant reservoir. Depressing the ramp operates the cable, which in turn operates the pumping system for supplying the rail with lubricant. The ramp is pivoted to a housing plate secured to the rail and supporting a ramp spring for holding the ramp in the path of the car wheels. The housing plate is provided with a bell crank lever, one arm of which is connected to the ramp and the other arm of which is connected to the operating cable. The lubricant reservoir is seated in the ground alongside the track and contains the pumps for delivering the lubricant to the track. The reservoir contains a spring, a unidirectional clutch and drum, the cable being wrapped around the drum and secured to the reservoir spring. The cable is thus held under tension by the two springs at all times.

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 in 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 is a plan view of a section of track to which a lubricating device according to the invention is applied;

Fig. 2 is a vertical transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section through the lubricant reservoir;

Figs. 4, 5 and 6 are sections taken on the lines 4—4, 5—5 and 6—6 of Fig. 3;

Fig. 7 is a section taken on the line 7—7 of Fig. 3;

Fig. 8 is a side elevation of the ramp assembly;

Fig. 9 is a plan view thereof;

Figs. 10 and 11 are sections taken on the lines 10—10 and 11—11 of Fig. 9; and

Fig. 12 is a detail of a part of the unidirectional clutch.

In the following description and in the claims, various details will be identified by specific names for convenience, but they are intended to be 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 and 2, the running rail to which the lubricator is applied is denoted by 15, resting on the usual ties 16 with the usual tie plates 17 interposed. Secured to the inner side of the rail 15 is the delivery plate 18 for delivering lubricant to the wheel flanges. The reservoir comprises a tank 19 set into the ground alongside the track so as to occupy a substantially fixed position unaffected by the movement of the rails or ties due to the passage of railway trains. The reservoir tank 19 houses a series of pumps 20 which deliver lubricant through pipes 21 to the delivery plate 18.

Secured to the running rail is a ramp assembly, including ramp 22 which operates a bell crank lever 23 (Fig. 10) to which is secured cable 24. The cable 24 extends through the wall of the tank 19 and is wrapped several times around the drum 25 of the unidirectional clutch assembly 86 and is connected to spring assembly 26. A chain 27 connects the clutch assembly and the pumps 20, it being understood that up and down movement of ramp 22 pulls cable 24 driving drum 25 and its unidirectional clutch, in turn driving the chain 27 and the pumps 20.

Referring now also to Figs. 10 and 11, the lubricant applying apparatus will first be described. The head 30 of T-rail 15 is cut away, as indicated at 31, and the delivery plate 18 is spaced from the rail by suitable gaskets or washers indicated by 32 to form a series of lubricant chambers 33 with the web 34 extending along the track. The delivery plate 18 is clamped to the running rail 15 by a series of nut and bolt

assemblies indicated by 38. The several lubricant chambers 33 are supplied by branch pipes 35 supplied by the delivery pipes 21 and grease is fed to the wheel flanges 36 through delivery slots 39.

Attention is called to Heidenthal Patent No. 2,185,810, granted January 2, 1940, for a more complete description of the lubricant applying apparatus.

Referring now also to Figs. 8 and 9, the ramp assembly will now be described. This construction comprises the inner plate 41 fitting the web 34 which extends along the rail substantially the same distance as the lubricant applying apparatus for the purpose of reenforcing the cut away rail 15. An outer housing plate 42 has an end pad 40 and spaced end pads 43, 44 bearing against the inner plate 41 and against the rail. Plates 41 and 42 are clamped to the running rail 15 by two of the nut and bolt assemblies 38 which are used to clamp the delivery plate 18 to the rail.

The housing plate 42 carries a pivot shaft 45 pinned thereto by a pin 46 passing through an adjacent flange on the housing plate, as indicated particularly in Figs. 8 and 9. A special abutment 51 and the spaced abutments 43, 44 bear against inner plate 41 to take the stress due to the clamping action of the adjacent bolts 38.

The ramp 22 is pivoted on shaft 45 and has its upper surface suitably tapered in both directions, as indicated by 47 and 48, for traffic in either direction. The upper wheel engaging surface may be suitably hardened to withstand the wear due to the engagement of the wheel treads 37. The ramp 22 has a nose 49 which is disposed under a shoulder 50 secured to the housing plate 42 to limit the upper position of the ramp.

If desired, the nose 49 may be provided with suitable shims (not shown), whereby the stroke of the ramp 22 may be adjusted. The ramp may also be provided with a recess (not shown) for the engagement of a suitable tool for operating the ramp by hand, if desired, for testing purposes. It will be understood that the housing plate 42 will have a suitable opening for access to the tool recess and for adjusting the shims.

The plates 41 and 42 are provided with matched recesses 53 and 54, forming a seat and housing for ramp spring 52 located under ramp 22. A drain 60 at the bottom of the spring housing prevents collection of water. It will be understood that the ramp is of such shape as to clear bolts 38 and nipple 55 threaded into web 34 to which branch 35 is connected for supplying lubricant to chamber 33.

Referring now also to Fig. 10, the housing plate 42 has secured thereto an integral strap or support 56 in which is secured a shaft 57. Journalled on shaft 57 is a bell crank lever 23 having an arm 58 connected to ramp 22 by a ball and socket connection. The ball 59 is connected to arm 58 and has a spherical surface engaging a spherical surface on socket 62 which is fixedly secured to a plug 63 and both members 62 and 63 are fixedly secured within an opening in ramp 22. Bearing plates 64 and 65 and a spring 66 are interposed between ball 59 and plug member 63.

It will be understood that, as the ramp 22 moves up and down, it must communicate its motion to arm 58 and the ball and socket joint must communicate this motion without any lost motion. Due to the slight arc in which the free end of ramp 22 moves, the ball and socket joint must yield slightly, the spring 66 permitting a slight yield between ball 59 and socket 62. Lever 23 has a depending arm 67 provided with a circular cable race 68 and a recess 69. The end of cable 24 is anchored in recess 69 in any suitable way and it rides in the circular groove 68 so that the cable 24 always has true tangential relationship with the arm 67 at constant radius as the latter moves under the influence of the ramp.

Referring now to Fig. 3, the tank 19 comprises a casing 72 having a removable cover 73. Secured to the bottom of the tank are a series of gear pumps 20, each of which comprises gears 75 and 76 (Fig. 5), whose upper sides are exposed to the grease in the tank. Upon movement of the gears 75 and 76 in the direction indicated by the arrows in Fig. 5, the grease is forced through duct 77 into delivery pipe 78 which connects with the delivery pipes 21. The gears 75 of the several pumps are mounted on drive shafts 79 which are aligned and connected by couplings 80, the drive shaft of the end pump supporting a sprocket 82.

Referring now to Figs. 4, 6 and 7, a clutch assembly 86 is provided above the level of the lubricant in the reservoir. This assembly includes a bracket 83 suitably bolted to the side of the tank and supporting bearings for a shaft 84, to which sprocket 85 is pinned. A chain 27 rides on sprockets 82 and 85.

The unidirectional roll clutch 86 comprises an outer ring or drum 25 having a grooved periphery around which several turns of cable 24 are wrapped. Within the ring 25 is a hexagonal core 88 fixedly secured to shaft 84 and supporting a series of rollers 89 held in position by a series of springs 90 anchored on the hexagonal surface of core 88 (Fig. 12). Discs or plates 91 and 92 are bolted to drum 25, these plates riding against core 88 and holding the unidirectional clutch in assembled relationship. It will be understood that as the outer ring 25 is rotated by movement of the cable 24 in one direction, it will impart no movement to shaft 84 and sprocket 85, but when moved in the other direction, it will drive members 84 and 85, which in turn drive the pumps 20 for pumping lubricant to the lubricant distributing apparatus.

For insuring no retrograde movement of shaft 84 when the overriding clutch executes its retracting stroke, a fibre brake 110 is provided comprising shoes 111 and 112 connected by bolts 93 and 94. A spring 95 is interposed between the head of bolt 94 and the shoe 111 to yieldably hold shoes 111 and 112 in contact with shaft 84. Shoe 112 is suitably anchored to support 83 by bolt 113. The shoes 111 and 112 have fibre linings which frictionally engage shaft 84, exercising sufficient braking action to prevent retrograde movement of the shaft 84, but not enough to prevent forward movement of the shaft 84 for pumping grease. It will be understood that other types of unidirectional clutches may be used and other devices may be provided for preventing retrograde movement.

For anchoring the end of cable 24 a spring assembly 26 is provided (Fig. 4). This comprises a strap or support 96 suitably bolted to the side of the tank and having a sleeve 97 threaded into the support. The sleeve 97 has a cap 98 fixedly secured thereto, for example, by welding, and provides a seat for a spring 101 operating against a movable plug or plunger 99. The plunger 99

has a recess 100 in which the end of cable 24 is suitably anchored, this cable passing along the axis of spring 101 and through an opening in cap 98. The tension of spring 101 may be adjusted by adjusting the sleeve 97 in its support 96, the threaded engagement being sufficiently tight to prevent accidental turning of sleeve 97 when the device is in use.

If desired, a suitable protector may be provided for the flexible cable 24 where it extends from the ramp 22 to the reservoir 19 to prevent the cable being stretched by persons accidentally stepping on it. While any type of protective plate may be suitably supported above the cable 24, there is shown for purposes of illustration a heavy iron pipe 104. This pipe may be sufficiently large to adequately clear the cable and may be anchored at the ramp end on a sleeve 107 secured to a flange 105 secured to the support 56 (Fig. 10).

The pipe 104 should preferably be somewhat larger than sleeve 107 and is loosely secured thereto by a bolt 106 so as to permit angular movement between pipe 104 and the ramp assembly due to the movement of the running rail. The other end of protecting pipe 104 may loosely fit on a collar 108 suitably secured to the tank wall 72 at the point where the cable 24 passes through. As seen particularly in Fig. 4, pipe 104 loosely telescopes fitting 108 so as to permit not only slight relative angular movement but also slight telescopic movement caused by the movement of the track. The pipe 104 may be filled with grease to further protect the cable if desired.

Operation and advantages

It will be understood that the ramp spring 52 is normally in expanded condition (Fig. 8), while the tank spring 101 is normally held by the tension of cable 24 in compressed position (Fig. 4). As the wheel tread 37 engages ramp 22, spring 52 is compressed and the bell crank lever 23 moves in such a way as to permit the flexible cable 24 to be taken up by the reservoir spring 101. This movement rotates the outer ring 25 of the unidirectional clutch 86. In the form shown, this movement is in such direction as to cause the clutch to retract and impart no movement to the gear pumps 20.

As the wheel tread 37 leaves the ramp, the ramp spring 52 moves the ramp upwardly, which pulls the cable 24 out of the reservoir against the force of spring 101, imparting rotation to the outer collar 25 of the unidirectional clutch in such direction as to drive the gear pumps 20.

It will be understood that, if desired, the action of unidirectional clutch 86 may be reversed so as to permit pumping action upon downward movement of the ramp with corresponding no pumping when the ramp moves upwardly, but it is preferred in most cases to provide pumping action only with upward movement of the ramp.

The cable 24 may be of any flexible material, such as steel or bronze, and is wrapped around the clutch drum 25 several times with sufficient tension to prevent slipping, both when the clutch 86 is engaged for driving the pumps and when the clutch is free-wheeling.

This arrangement provides a very efficient means for transferring force where it is desired to minimize lost motion. Substantially all the wearing parts are located between the main springs 52 and 101 so that all lost motion is immediately taken up by these springs. The wear in the unidirectional clutch 86 is not taken up by the springs, but such clutches are very efficient, especially when kept out of the bath of lubricant. The lost motion in the chain and sprockets may be kept very small so as to be substantially negligible.

It will thus be seen that the cable is under tension between the ramp and reservoir springs at all times. These springs may be of the same size and strength, the ramp spring being normally (with the ramp in its upper position) compressed about one-half inch more than the reservoir spring.

It has been found from actual tests that the cable connection, according to the invention, is so efficient, as compared with older connections, that a short ramp having a short throw may be used. The freedom from lost motion insures delivery of a fresh supply of lubricant to the delivery slots with very small movement of the ramp.

The invention, furthermore, has the advantage that the tank spring 101 will automatically take up any slight shifting horizontally in the track with respect to the reservoir and, when installing the apparatus, an adjustment of this spring assembly will take care of any slight variations in distance between the reservoir and the track.

If desired, the seat for ramp spring 52 may be built entirely in housing plate 42. In this case, the pivoting of the ramp to the outer housing plate and the extension of the housing plate 42 to cover both ends of the ramp permits completing the ramp assembly in the factory and applying the device to the rail as a unit.

The present cable construction also substantially lightens the oscillating or reciprocating parts, reducing inertia to a minimum and reducing the force of impact due to the reciprocating movement of the parts. This makes the mechanism responsive to faster train movements.

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. A railway lubricator comprising a track, an operating member adapted to be moved by the passage of rolling stock, a first spring holding said operating member in normal position and adapted to be compressed by the passage of said rolling stock, a lubricant reservoir, pumping apparatus associated with said reservoir, a second spring, and a flexible tensile means connected to said operating member, to said second spring and to said pumping apparatus, whereby to operate said pumping apparatus by movement of said operating member.

2. A railway track lubricator comprising a running rail, an operating member adapted to be deflected by the wheels of rolling stock, a first spring holding said operating member in the path of said wheels and adapted to be compressed by the passage of said wheels, a reservoir mounted independently of the running rail, said reservoir having associated therewith pumping apparatus, an overriding clutch having a drum, driving devices between said pumping apparatus and said drum, and a second spring; and a flexible cable connected to said operating member and to said second spring and wound around said drum, said first spring normally being in relatively expanded condition and holding said second spring in relatively compressed condition, the deflection of said

operating member compressing said first spring, permitting said second spring to expand and rotating said drum to operate said pumping apparatus.

3. A railway track lubricator comprising a running rail, a ramp pivoted thereto adapted to be contacted by the wheels of rolling stock, a ramp spring holding said ramp in the path of said wheels and adapted to be compressed by the passage of said wheels, a reservoir spaced from said track and fixedly mounted in the ground alongside said track, pumping apparatus, a unidirectional clutch having a drum, and a reservoir spring all located in said reservoir, driving devices between said clutch and said pumping apparatus, a flexible cable connected to said ramp and to said reservoir spring and wound around said drum, said ramp spring normally being in relatively expanded condition and holding said reservoir spring in relatively compressed condition, the depression of said ramp compressing said ramp spring, permitting said reservoir spring to expand and rotating said drum to operate said pumping apparatus.

4. In a railway lubricator, a running rail, an operating member adapted to be deflected by the passage of rolling stock, a lubricant reservoir spaced from said rail, and mounted independently thereof pumping apparatus associated with said reservoir, a spring assembly associated with said pumping apparatus comprising a cable-holder, a guide therefor and a spring between said guide and cable-holder, means for adjustably mounting said guide to adjust the tension of said spring, and a flexible cable connecting said operating member, pumping apparatus and cable-holder and held in tension by said spring, whereby deflection of said operating member drives said pumping apparatus.

5. In a rail lubricator, a running rail, a plate secured to said rail, a ramp associated with said plate for movement by contact with car wheels, a bell crank lever pivoted to said plate and having a first arm, a connection between said arm and said ramp, said bell crank lever having a second arm, a cable secured to said second arm and pumping apparatus operated by said cable for supplying said lubricator with lubricant.

6. In a rail lubricator, a running rail, a lubricant delivery member for applying lubricant to rolling stock, a housing plate secured to said rail and providing a space therebetween, a ramp disposed in said space and pivoted to said housing plate, a spring disposed under said ramp, said housing plate having an abutment, said ramp having a toe disposed under said abutment to limit the upper position thereof, said housing plate having a support, a bell crank lever pivoted to said support and having a first arm, a connection between said arm and said ramp, said bell crank lever having a second arm, a cable secured to said second arm and pumping apparatus operated by said cable for supplying said delivery member with lubricant.

7. In a rail lubricator, a running rail, a lubricant delivery member attached to the inner side of said running rail for delivering lubricant to rolling stock wheels, a filler bar attached to the outer side of said running rail, a housing plate secured to said filler bar and providing an elongate slot therebetween, a ramp disposed in said slot and pivoted to said housing plate, said housing plate and filler bar having matched recesses to support a spring disposed under said ramp, said housing plate having an abutment, said ramp having a toe disposed under said abutment to limit the upper position thereof, said housing plate having a support, a bell crank lever pivoted to said support and having a horizontal arm, a ball and socket joint between said arm and said ramp, said bell crank lever having a depending arm having a circular groove, a cable secured to said arm and disposed in said groove, and pumping apparatus operated by said cable for supplying said delivery member with lubricant.

8. In a rail lubricator, a running rail having an operating member operable by the passage of rolling stock, a lubricant reservoir, a pump in said reservoir, a supporting structure in said reservoir above the level of the lubricant, a unidirectional clutch mounted on said supporting structure and having a drum, driving devices between said clutch and pump, a spring assembly located in said reservoir comprising a support, a threaded sleeve member adjustably mounted in said support, a movable plunger within said sleeve member, a coil spring operating between said sleeve member and said plunger, an operating cable secured to said plunger wrapped around said drum and extending to said operating member, whereby movement of rolling stock moves said cable and rotates said clutch.

9. In a rail lubricator, a running rail having an operating member operable by the passage of rolling stock, a lubricant reservoir located alongside said track and independently of said track, a pump in the bottom of said reservoir, a supporting structure in the top of said reservoir and above the level of the lubricant, a shaft supported in said supporting structure, a transmission connecting said pump and shaft, a unidirectional clutch mounted on said shaft and having a peripheral drum, a spring assembly located in said reservoir above the level of the lubricant and comprising a support secured to said reservoir, a threaded sleeve member adjustably mounted in said support, a movable plunger within said sleeve member, a coil spring operating between said sleeve member and said plunger, an operating cable secured to said plunger and wrapped around said drum and extending to said operating member, whereby movement of rolling stock pulls said cable against said reservoir spring and rotates said clutch.

10. A railroad track lubricator comprising a track structure having a running rail, an operating member associated with and supported by the track structure and adapted to be moved by trains passing over the running rail, a lubricant supply spaced from and mounted independently of said track structure, a linear operating element extending from said operating member to said lubricant supply, one part of said linear element being mounted on said track structure and the other part being mounted on said lubricant supply, and means controlled by movement of said linear operating element lengthwise of itself for transferring lubricant from said supply to said track structure.

11. In a track lubricator, a track structure including a running rail and a lubricant applying member, a lubricant supply, conveying apparatus for conveying lubricant from said supply to said lubricant applying member, an operating ramp on said track structure adapted to be moved by passage of cars on said running rail, a bell-crank lever pivoted on said track structure and having one arm connected to said ramp, and means connecting said conveying apparatus and the other arm of said bell-crank lever whereby

movement of said ramp causes said conveying apparatus to deliver lubricant to said applying member.

12. A railroad track lubricator comprising a track structure having a running rail, an operating member associated with and supported by the track structure and adapted to be moved by trains passing over the running rail, a lubricant supply spaced from, and mounted independently of said track structure, a linear operating element extending from said operating member to said lubricant supply, one end of said linear element being mounted on said track structure and the other end being mounted on said lubricant supply, means controlled by movement of said linear operating element lengthwise of itself for transferring lubricant from said supply to said track, and a protecting tube surrounding said linear element and pivotally supported at its ends on said track structure and on said lubricant supply respectively, whereby the wave motion of said track structure has no substantial effect on said lubricant supply.

13. In a railway track lubricator, a track structure comprising a running rail, a short-stroke operating member, a support for said member permitting it to execute a plurality of complete oscillations under action of trains passing over said running rail, a lubricant applying device on said track structure for applying lubricant to wheels of said trains, a lubricant supply, pumping apparatus associated with said supply, conduit means connecting said supply and said applying device, a cable connecting said operating member and said pumping apparatus, whereby said operating member causes said cable to oscillate lengthwise of itself to cause said pumping apparatus to deliver lubricant to said applying device.

14. In a railway track lubricator, a track structure comprising a running rail, an oscillatory, wheel-contacting, operating member, means supporting said operating member in the path of wheels of trains passing over said running rail, a lubricant applying device on said track structure for applying lubricant to said wheels, a lubricant supply, pumping apparatus associated with said supply, conduit means connecting said supply and said applying device, a cable connecting said operating member and said pumping apparatus, whereby said operating member pulls said cable to cause said pumping apparatus to deliver lubricant to said applying device.

15. In a railway track lubricator, a track structure comprising a running rail, an oscillatory, wheel-contacting, operating member supported by the track structure and adapted to be oscillated by contact of successive wheels of rolling stock passing over said running rail, a lubricant applying device on said track structure for applying lubricant to said wheels, a lubricant reservoir spaced from, and mounted independently of, said track structure, pumping apparatus located in said reservoir, conduit means connecting said pumping apparatus and said lubricant applying device, a uni-directional drive located in said reservoir, driving apparatus between said uni-directional drive and said pumping apparatus, a flexible cable connecting said operating member and said uni-directional drive, and a spring for holding said cable taut, whereby movement of said operating member pulls said cable to operate said uni-directional drive.

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