Jan. 21, 1941. R. S. MENNIE 2,229,111

RAIL LUBRICATOR

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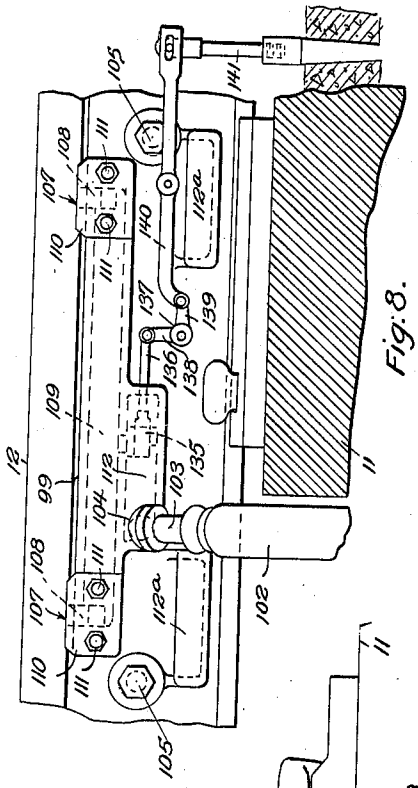


Fig. 8.

Fig. 1.

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RAIL LUBRICATOR

Filed Jan. 12, 1937 6 Sheets-Sheet 2

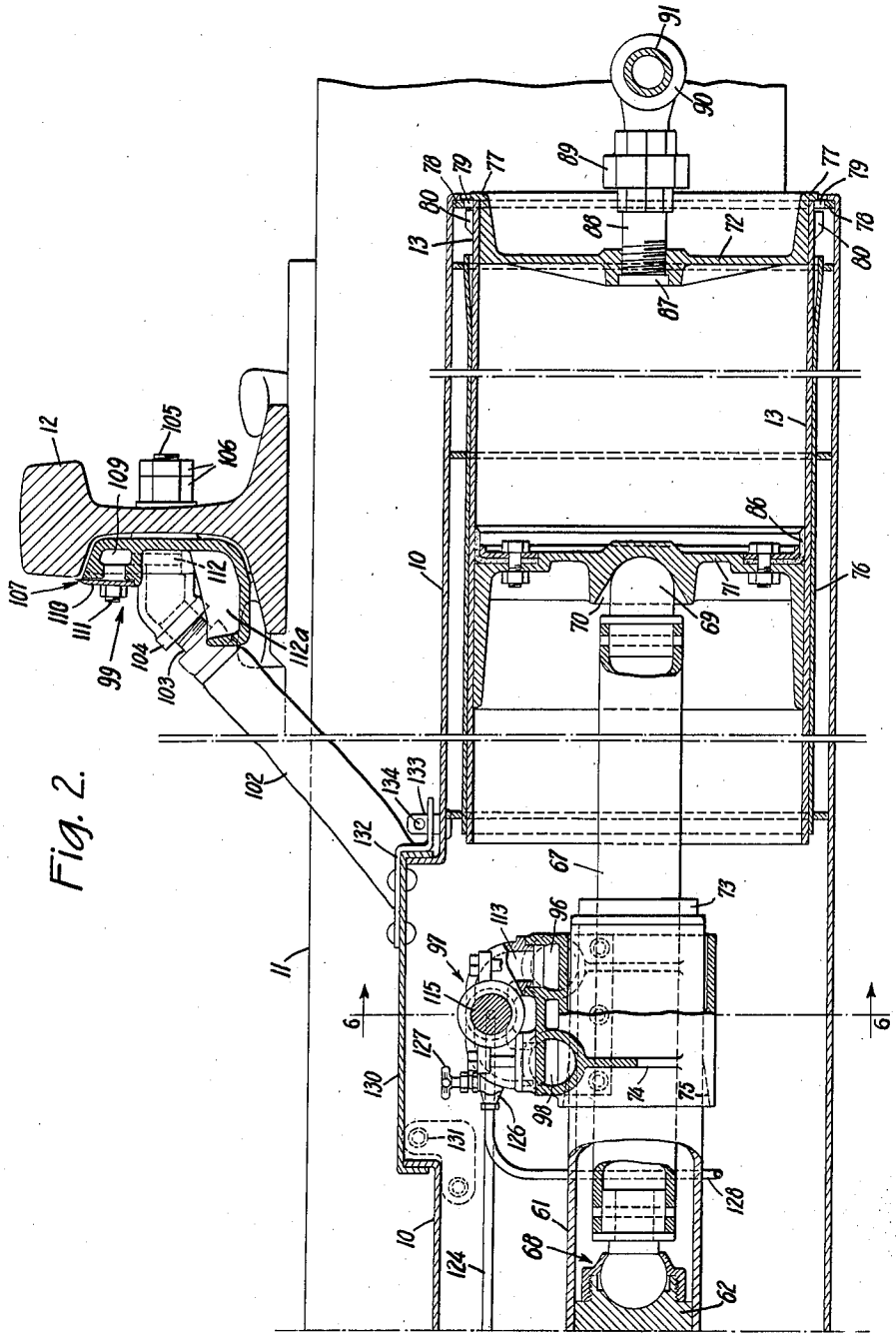


Fig. 2.

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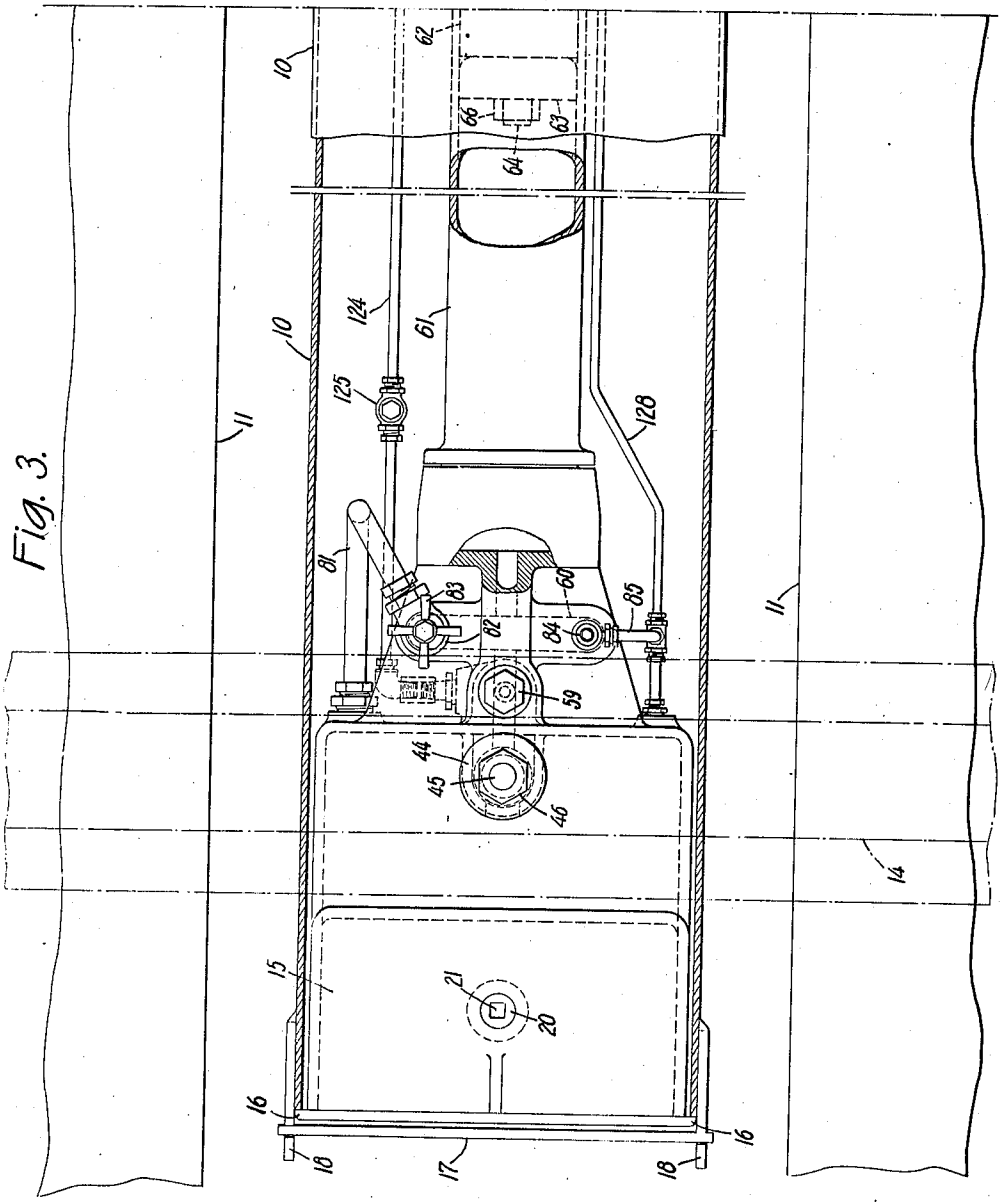
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RAIL LUBRICATOR

Filed Jan. 12, 1937 6 Sheets-Sheet 3

Fig. 3.



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Jan. 21, 1941. R. S. MENNIE 2,229,111

RAIL LUBRICATOR

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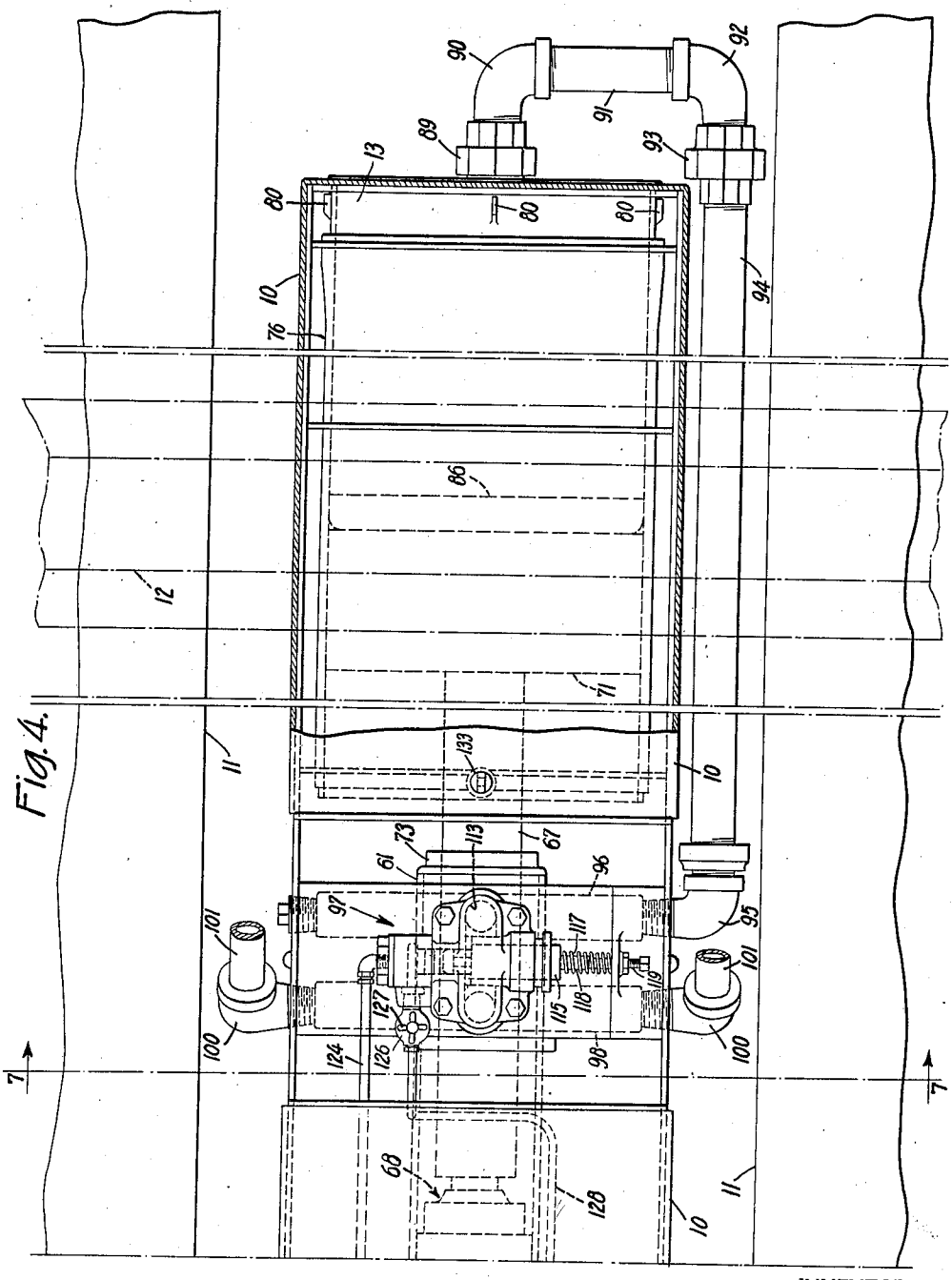


Fig. 4.

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Jan. 21, 1941. R. S. MENNIE 2,229,111

RAIL LUBRICATOR

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Fig. 6.

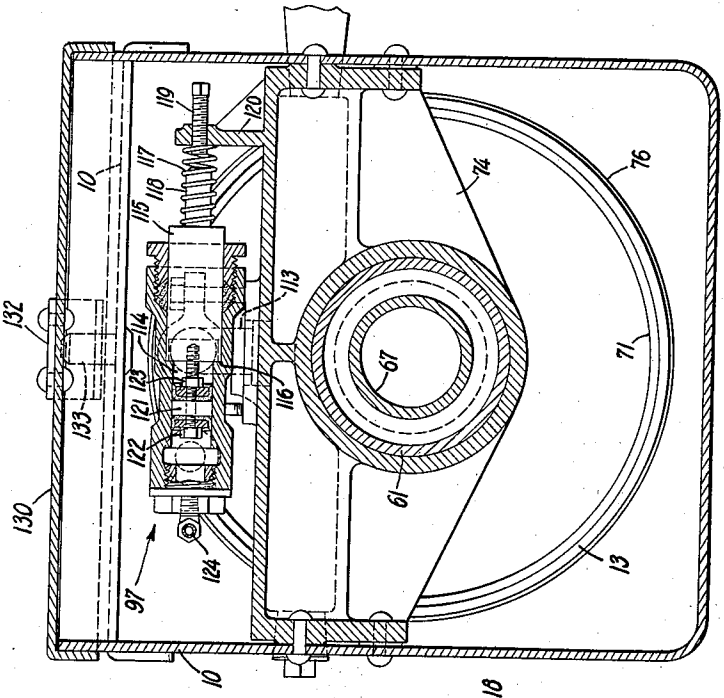
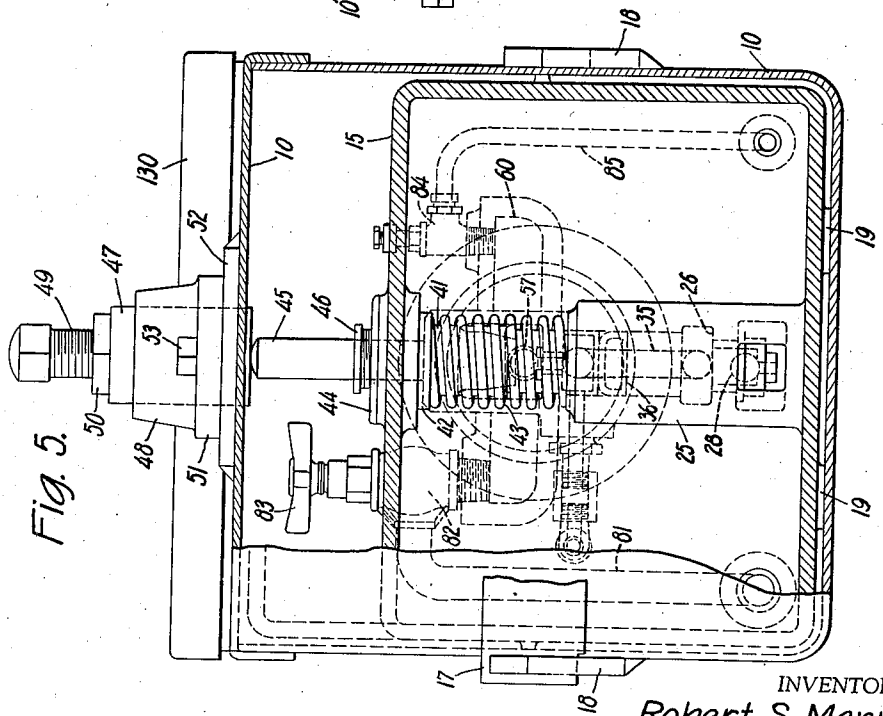


Fig. 5.



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Jan. 21, 1941. R. S. MENNIE 2,229,111

RAIL LUBRICATOR

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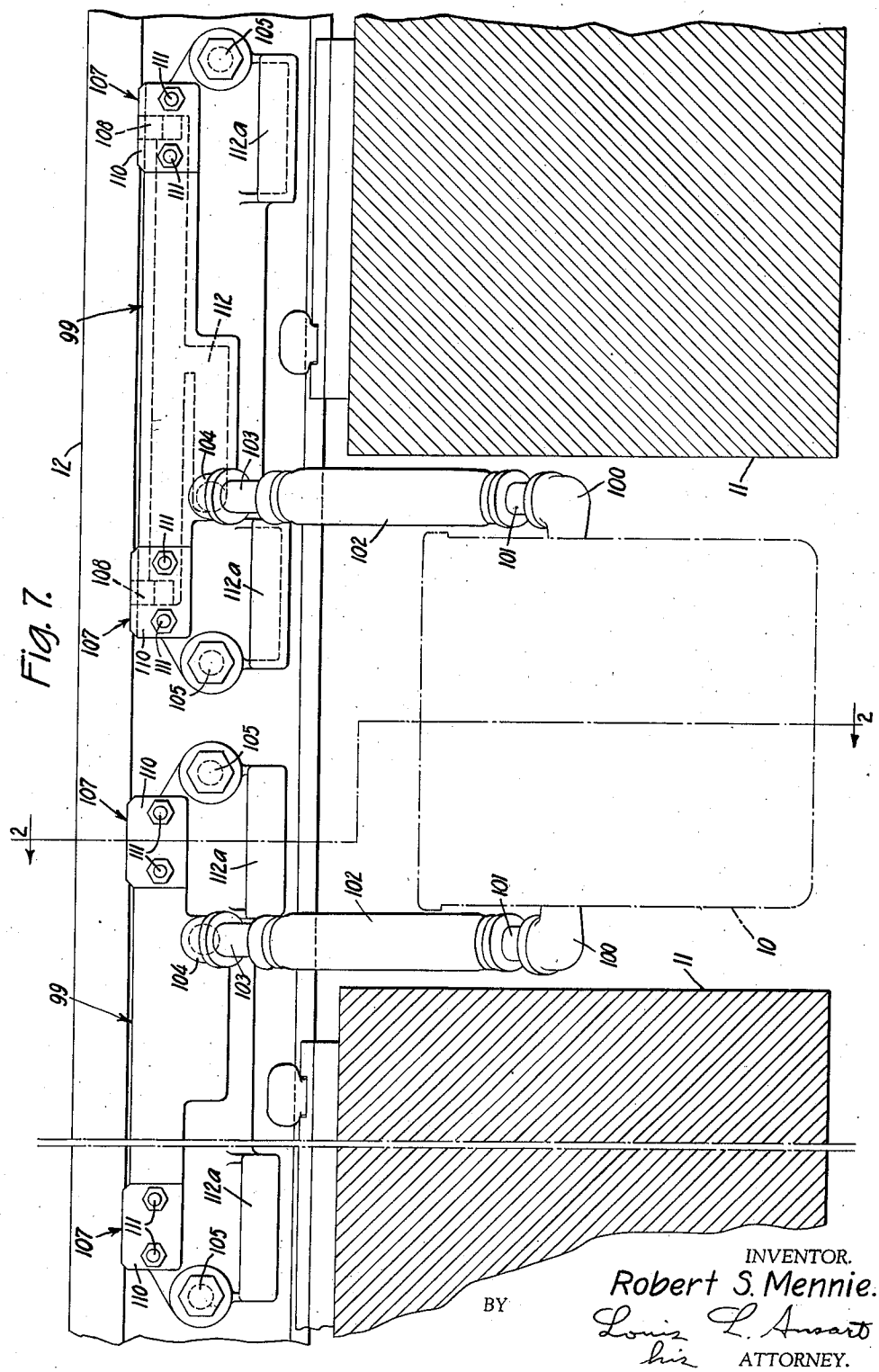


Fig. 7.

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Patented Jan. 21, 1941

2,229,111

UNITED STATES PATENT OFFICE

2,229,111

RAIL LUBRICATOR

Robert S. Mennie, Montclair, N. J.

Application January 12, 1937, Serial No. 120,170

15 Claims. (Cl. 184—3)

This invention relates to automatic rail lubricators adapted to apply relatively thick grease to rails of railroad tracks where lubrication is required, and more particularly to rail lubricators of the general class described in my Patents No. 1,941,265, December 26, 1933, and No. 2,029,828, February 4, 1936.

Important objects of the invention relate to the provision of a novel and advantageous form of rail lubricator which is efficient in action, economical to manufacture, and readily installed.

Another important object is to provide means for positively and automatically controlling afterflow of grease or other lubricants, that is a flow of grease after rolling stock has passed the position where the lubrication is effected.

A further object is to provide afterflow preventing means which may be adjusted to determine the length of a period during which afterflow may take place. A further object is to provide improved hydraulic-pressure-producing means for this type of apparatus. A further object is to provide a novel and advantageous form of grease holder or cartridge and means for positioning it in the body of the lubricator and securing it in such a position. A further object is to provide novel and advantageous nozzles for directing the lubricant to the rails.

A further object is to provide a device having a frame portion adapted to be placed between two successive rails, a grease receptacle or cylinder insertable into one end of the frame portion, a piston adapted to fit into the open inner end of the grease cylinder, a connection from the outer end of the grease cylinder to the adjacent rail, and a hydraulic device insertable into the other end of said frame portion and into a position to be operated by the other rail and to operate the grease piston.

In carrying out the invention in a preferred manner, there is provided a hollow casing between two ties of a track, usually at the beginning of a curve, and extending substantially parallel to the ties. Into the end of the casing adjacent the outer rail of the curve, there may be inserted into a suitable guide a grease cylinder which fits in the guide and may be secured against outward movement by suitable means such as a bayonet-joint connection. In the inner open end of the grease-filled cylinder is a piston having at its center on the side opposite to the grease a formation adapted to be engaged by the suitably shaped end of a piston rod projecting from one end of a hydraulic cylinder and connected to a piston in the hydraulic cylinder.

The hydraulic cylinder projects from a pump-and-reservoir assembly which is slidable into the other end of the casing and may readily be locked in its inserted position. An operating member for this pump will then be positioned immediately beneath the inside rail at the curve and may be operated by a member passing through the top of the casing and interposed between the rail and the pump-operating member. The pump may be operated by passage of rolling stock to draw oil or other suitable liquid from the reservoir through a check valve and force it through another check valve to the hydraulic cylinder to cause grease to be supplied from the grease cylinder, through one or more suitable nozzles to a surface of the outside rail.

Between the hydraulic cylinder and the check valve through which the hydraulic fluid or oil is forced thereto, the duct between these parts may be connected through a pressure relief valve to the reservoir to allow hydraulic fluid to be returned to the reservoir in the event of excessive pressure, and through a manually operated valve to drain the hydraulic cylinder into said receptacle and allow the hydraulic piston to be forced back to permit insertion of a newly-filled grease cylinder.

The hollow casing of the rail lubricator may be also provided with a fixed member having an opening to receive the free end of the hydraulic cylinder and hold it firmly in position. The free end of the hydraulic cylinder may also be provided with means for positioning the piston rod to cooperate with the center of the grease piston.

From the outer end of the grease cylinder, grease may be supplied through a conduit to the rail surface to be lubricated. To prevent afterflow to the rail surface after pumping has ceased due to passage of the rolling stock from that location, this conduit may be supplied with positively-acting flow-preventing means normally held effective by suitable means such as a spring but rendered ineffective by hydraulic-liquid pressure supplied from the discharge side of the pump through a duct with a check valve and a liquid-leak beyond the check-valve so that the after-flow preventing means will gradually become ineffective after the rolling stock has passed the pump. By adjustment of the liquid leak, the time interval between the termination of the passage of the rolling stock and the stopping of the flow of grease to the rail surface may be varied as desired. The said afterflow not only results

in waste of grease but smearing of the rails, ties and ballast with the grease.

Other objects, features and advantages will appear upon consideration of the following detailed description and of the drawings in which:

Figure 1 is a vertical longitudinal section of one end of a preferred embodiment of the invention;

Fig. 2 is a corresponding vertical longitudinal secton of the other end of the device, on line 2—2 of Fig. 7;

Fig. 3 is a top plan view of the end illustrated in Fig. 1, the top of the casing and certain other parts being broken away;

Fig. 4 is a top plan view of the end illustrated in Fig. 2, the top of the casing and certain other parts being broken away;

Fig. 5 is a section taken on the line 5—5 of Fig. 1;

Fig. 6 is a section taken on the line 6—6 of Fig. 2;

Fig. 7 is a view taken on the line 7—7 of Fig. 4; and

Fig. 8 is a view, corresponding to part of Fig. 7, illustrating a modified form of the invention.

Referring to the drawings, reference numeral 10 designates an elongated hollow metal body which serves as a casing and support for the operating parts of the rail lubricator and may conveniently be supported by the ballast between two ties 11 as indicated in Fig. 7. Preferably the metal body or casing 10 is formed of metal plates for convenience and economy in manufacture. The rail lubricator is preferably located at the begining of a curve and is utilized to apply a relatively thick or viscous lubricating fluid such as grease to the inner side of the head of the outside rail 12 (Figs. 2 and 4), of the track at the curve, the grease being forced from a container 13, removably mounted in the casing 10 beneath the outside rail by means of a hydraulic pressure system which is built up by means located principally within the casing 10 and actuated by upward and downward movement of the inside rail 14 (Figs. 1 and 3) due to the movement of rolling stock therealong. Where a railroad is double-tracked a rail lubricator is placed at the beginning of a curve as already described, but on a single track railroad where trains run in both directions, the lubricator is preferably placed at the middle of the curve.

The hydraulic liquid may be oil of which the supply is kept in a receptacle or tank 15 adapted to slide into the open end of the casing 10 until a flange 16 at the outer end of the tank engages the edges of the casing 10, the tank being held in this position by suitable means such as a latching bar 17 engaging notches in keepers 18 attached to the casing at its sides. The exterior dimensions of the oil tank 15 are somewhat less than the interior dimensions of the casing 10 so as to facilitate easy insertion and removal of the tank, the tank being held in proper position by suitable means such as spacing projections 19 on the bottom, the top and the sides of said tank 15. In the top of the tank 15 is a screw plug 20 with an air vent opening into the bottom of a wrench socket 21, and immediately above the screw plug 20 is an opening 22, in the casing 10. In alignment with this opening 22 is an externally threaded nipple 23 having at its lower end a flange secured to the casing 10 in any suitable manner, for example by welding, and screwed on the nipple 23 is a cap 24. Obviously, upon removal of the cap 24 and the screw plug 20, suitable hydraulic liquid may be supplied to the tank 15 as required.

Preferably, as indicated in Fig. 1, a pump and pump valves are provided in a structure integral with the tank 15, that is, all of these parts may be included in a single casting. The pump may include a vertical cylinder 25 at the inner side of the tank so that it will be beneath the inside rail 14. The cylinder 25 may have an open top communicating directly with the interior of the tank 15 and a bottom 26 spaced above the bottom of the tank 15 so that liquid from the tank may flow or be drawn into the bottom of the cylinder 25 through a suitable check valve 27 which may include a ball 28 and a suitable seat member 29 having a central passage 30 controlled by the ball. The valve-seat member 29 may be screwed into a suitable opening in the cylinder bottom 26 and may be inserted or removed through an opening in the tank bottom normally closed by a screw plug 31 having a wrench socket 32. Slidably mounted in the cylinder 25 is the lower part 33 of a piston or plunger 34, during the upward movement of which oil from the tank 15 passes into the cylinder 25 through the check valve 27 and during the downward movement of which the oil is forced from the cylinder through an outlet duct 35 formed in the casting.

Above the cylinder 25, the top of the tank may be much lower than at the point where screw plug 20 is inserted, and may be provided, in axial alignment with the cylinder, with an opening through which the piston or plunger 34 is introduced into the cylinder. The only times when leakage between the plunger 34 and the cylinder 25 needs to be guarded against are those during which the plunger is moving downwardly to force oil out of the cylinder. Such leakage may be avoided by placing a cup-shaped washer 36 of suitable flexible material over a screw-threaded stem 37 projecting from the lower end of the plunger 34 and securing the washer 36 in position by means of a flat washer 38 encircling the stem 37 and located in the washer 36 and a nut 39 screwed down on said stem 37.

Downward movement of the plunger into the cylinder 25 may be limited by a shoulder 40 provided by the lower end of a part 41 of the plunger somewhat larger than said lower part 33, and adapted by engagement with the top of the cylinder to stop such downward movement. At the upper end of the part 41 is an annular flange 42 between which and the upper end of the cylinder is interposed a helical spring 43 surrounding the plunger and acting to lift the plunger 34 until the flanged upper end of the part 41 engages an annular member 44 screwed into the opening in the tank top through which the plunger 34 is inserted into the cylinder 25.

Above the flange 42 the plunger is provided with an axial stem 45 which extends upwardly through the central opening of the annular member 44, leakage of oil along the stem being prevented by suitable means such as a packing gland 46. The stem 45 may be made of such length that it will not project above the highest part of the tank 15 and therefore will not interfere either with the insertion of the tank 15 and associated parts into the casing 10 or their removal therefrom.

Depression of the pump plunger or piston 34 may be effected by a suitable device interposed between the inside rail 14 and the stem 45 at the upper end of the plunger. Preferably this device includes a member 47 slidably mounted in a guide 48 so that

it may pass downwardly through a suitable opening in the upper wall of the body or casing 10 and engage the upper end of the stem 45, and a screw 49 threaded axially and downwardly into the member 47 and held in adjusted position by means of a lock nut 50. This arrangement enables adjustment whereby the upper end of the screw 49 may be at the proper height for effective engagement by the rail 14 when the member 47 rests on the stem 45 with the plunger in its upper limiting position, as shown in Fig. 1.

As illustrated, the guide 48 includes a body extending just through the top of the casing 10 and a supporting flange 51 resting on a reinforcing member or plate 52 secured to the upper wall or top of the casing 10 as by welding. The flange 51 may be secured to the member 52 by suitable means such as screws 53.

From the cylinder 25, the oil or other hydraulic liquid may be forced through the outlet duct 35 and upwardly through a check valve 54 into a chamber 55. As illustrated, in Fig. 1, there is a removable valve seat 56 with an axial passage and a ball 57 urged toward the valve seat by a helical spring 58 in the hollow lower part of a screw plug 59 screwed into an opening in the casting, said opening being available for insertion and removal of the valve seat 56 and the ball 57. The opening in the hollow lower end of the screw plug is large enough to receive the ball 57 and the hollow lower end extends close enough to the valve seat 56 to prevent excessive sidewise displacement of the ball. From the chamber 55, the oil is forced through a short passage into the middle of a chamber 60 extending transversely of the casing 10 for a purpose to be brought out hereinafter.

During the actuation of the pump by the passage of rolling stock, oil from the transverse chamber passes into a hydraulic cylinder 61, of which one end may be screwed into a suitable opening in the structure or casting containing the passage 60, and acts on a piston 62. This piston may be provided at the oil-pressure side with suitable leakage-preventing means, such as a cup-shaped washer 63 held by a spindle 64 projecting from the piston through the washer 63, a flat washer 65 in the cup-shaped washer 63 and a nut 66 screwed on the spindle. At the other side of the piston 62, there may be a piston rod 67 connected by a ball-and-socket joint 68 (Fig. 2) to the piston 62.

At its end remote from the piston 62, the piston rod 67 may have a rounded end 69 adapted to enter a central socket 70 at the adjacent side or face of a piston 71 in the grease cylinder 13 which has a strong and stiff outer end or head 72. The side wall of the socket 70 is so inclined as to assist in centering the rounded end 69 in the socket 70, the piston rod 67 being held in position for centering by a device 73 at the end of the hydraulic cylinder 61 remote from the rail-operated pump. The hydraulic cylinder 61 may be aligned with the grease cylinder 13 by use of a member 74 fixed to the casing 10 and having a cylindrical passage receiving the end of the cylinder 61 and holding it firmly against lateral movement. This cylindrical passage may be beveled at 75 to assist in positioning the cylinder in the passage. Obviously, if desired, the outer end of the cylinder 61 might be beveled and the beveling at the end of the passage or guide-way omitted.

The grease cylinder 13 may be supported in the end of the casing 10 adjacent the outside rail 12 by any suitable means such as a guide or cylinder 76 supported in the casing 10 and having an opening in which the grease cylinder fits when inserted endwise, the opening being flared at the entrance end to facilitate insertion of the grease cylinder 13. The inward movement of the grease cylinder may be limited by engagement of a peripheral flange 77 projecting outwardly from a part of the head 72 and engaging the outer side of a member 78 secured in the end of the casing 10 and having a circular opening just large enough to admit the grease cylinder 13 and having recesses 79 at the edge of the circular opening. The grease cylinder 13 may be provided at its outer end with lugs 80 arranged so that they can be passed inwardly through the recesses 79 and, upon a slight turning of the grease cylinder 13 about its axis, will be positioned so that they may prevent outward movement of the grease cylinder until the lugs 80 are again brought into alignment with recesses 79.

It will be evident that when a filled grease container or cylinder 13 is to be inserted in the holding cylinder or guide 76, the hydraulic liquid or oil in the cylinder 61 back of the piston 62 must be released so this piston can be shoved back by engagement of the grease cylinder piston 71 with the piston rod 67. To this end there may be provided a pipe or duct 81 which may be connected at one end with one end of the transverse chamber 60 from which the hydraulic liquid passes to the cylinder 61, and at the other end with the oil receptacle or tank 15. Flow of oil through pipe 81 may normally be prevented by a valve 82 having a controlling member or handle 83 accessible through a suitable opening in the top of the main casing 10. It is also desirable to prevent pressures in the hydraulic cylinder 61 from rising above a predetermined limit. This result may be attained by the use at the other end of the chamber 60 of a pressure relief valve 84 and a duct or pipe 85 connecting the relief valve with the tank 15.

Inasmuch as the piston 71 acts on the grease to force it out of the grease cylinder, the piston is provided with suitable leakage-preventing means such as a flanged packing ring 86 secured to the piston at its grease-engaging side. The grease may be forced out of the grease cylinder 13 through a central opening or outlet 87 in the grease cylinder head 72. In order to facilitate insertion and removal of the grease cylinder 13 and handling of the grease cylinder for filling, the head 72 may be formed with a concave outer face and there may be screwed into the outlet 87 a nipple 88 short enough to enable the grease cylinder to stand on its outer end without interference by the nipple. The nipple 88 may be connected by a union 89 with one end of an elbow 90 connected at its other end with a pipe 91 extending radially of the cylinder head 72. At its outer end, the pipe 91 may be connected through an elbow 92 and a union 93 with a pipe 94 extending along the side of the casing 10 toward the hydraulic cylinder 61. Obviously by loosening the unions 89 and 93, the pipe 91, together with the elbows 90 and 92 and unions 89 and 93 may be removed, thus leaving a free path for removal of the grease cylinder.

The pipe 94 might lead directly to the rail 12 to be lubricated, but preferably, for reasons which will appear hereinafter, is connected through an elbow 95 with a chamber 96 in an after-flow-preventing device 97 carried by the member 74 which serves as a support and guide for the hydraulic cylinder 61. The chamber 96 is at the entrance side of the after-flow-preventing device 97, and at the outlet side there may be a transverse chamber 98 from which grease may be dis-

charged at one or both ends and applied to nozzle devices 99 by use of elbows 100, connections 101, flexible pipes or hose 102 and connections 103 and 104.

The nozzle devices 99 may take different forms but preferably are formed as illustrated in Figs. 2 and 7. There may be two of these nozzle devices or nozzles for each lubricator in right hand and left hand forms extending over the adjacent ties 11. Each nozzle device fits between the rail head and the base flange of the rail 12 at the inner side thereof and may be secured in position as by the use of bolts 105, passing through portions of the nozzle device and also through the upright web of the rail, and nuts 106 screwed on said bolts.

Each nozzle device may, as shown, be provided with two nozzles 107 including an upright channel 108 at the surface of the body of the device 99 communicating at its lower end with an internal passage 109 in said body and extending from one nozzle to the other. Each channel 108 extends to the top of the nozzle device and may be closed at its open side by a cover or plate 110 adjustably held in position by means of screws or bolts 111. The grease may be supplied to the internal passage 109 at its middle point to assure the supply of substantially equal amounts of grease to the two nozzles 107, the supply of grease to said middle point being effected through a passage 112 connecting with the adjacent pipe or hose 102 adjacent one end of the nozzle device. Beneath each nozzle 107 is a trough 112a to catch excess grease.

The grease used for rail lubrication is found to be compressed by the grease cylinder piston 71 during the operation of the rail-operated pump, and without control as by the after-flow-preventing device 97, the grease would expand and continue to flow to and through the nozzle devices 99 thus tending to smear the rail 12 and also the adjacent ties and the roadbed, as well as to waste the grease. While rolling stock is passing along the track, part of the grease applied to the rail by the lubricator will be picked up by the wheels and spread along the side of the rail head, but as soon as the rolling stock has passed, the grease of the afterflow may continue to flow for a substantial period of time. From the transverse entrance chamber 96, the grease may pass to the transverse discharge chamber 98 through a central passage 113 intersected at an intermediate point by a transverse valve chamber 114 in which is slidably mounted a valve member 115 urged toward a stop, in the form of a shoulder 116, by suitable means such as a helical spring 117.

The spring 117 may be mounted at one end on a pin 118 projecting from the end of the valve member or slide 115, and at the other end on a pin or screw 119 threaded through a bracket 120. Obviously the screw 119 may be used as an adjustable stop for engagement by the pin 118 on the valve member 115, thus limiting the movement of the valve member 115 in its valve-opening movement. The valve end of the member 115 may be flat and, when the valve is closed, may rest against the stop shoulder 116. As shown in Fig. 6, the opening from the passage 113 into the chamber 114 at the entrance side of the latter may have a plane closing side so as to provide for rapid opening and closing.

Movement of the valve member 115 to open the valve may be effected by means of a double piston 121 comprising a central body, oppositely positioned cup washers and flat washers mounted on a screw 122 and held against the head thereof as by a nut 123. The double piston 121 may conveniently be attached to the valve member 115 by screwing the end of the screw 122 into the end of the valve member 115. Each time rolling stock moves along the track the valve member 115 is shifted to open the valve. Any suitable means may be used to produce this effect but preferably the opening is effected by hydraulic pressure produced in the chamber 114 at the side of the piston 121 remote from the valve member 115 through a duct 124 connecting the corresponding end of the valve chamber 114 with the outlet duct 35 through which the hydraulic fluid is forced from the pump on its way to the hydraulic cylinder 61, the duct 124 being provided with a suitable check valve 125.

When the rolling stock has completely passed the lubricator, the pumping action will cease and the pressure at the pump side of the check valve 125 will drop. The check valve 125 will prevent backward flow through the duct 124 and the closing of the valve of the afterflow-preventing device 97 by the spring 117 may be permitted by providing a pressure-relief device in the form of a liquid-leak at the end of the chamber 114 adjacent to the connection with the duct 124. The liquid-leak device may comprise a suitable valve 126, a needle valve for example, adjustable by means of a handle 127 and connected with the oil tank or receptacle at the other end of the lubricator by means comprising a duct 128. As illustrated, the duct or pipe 128 and the duct 85 leading from the pressure relief valve 84 in the hydraulic system are connected and discharged through a common duct into the tank or receptacle 15. Notwithstanding the leak, the hydraulic liquid is supplied rapidly enough, during the passage of rolling stock, to provide in the valve chamber the requisite pressure to open the valve, and by adjusting the opening of the valve 126 the closing of the valve may be satisfactorily timed.

When it is desired to replenish the supply of grease, the duct connections at the head of the grease cylinder may be disconnected, the grease cylinder may be turned to release the bayonet-joint connection with the guide 76, and the cylinder with the piston 71 therein may be removed from the guide 76 and the main casing. The grease cylinder may then be filled either through the central opening of its head accompanied by a forcing back of the piston 71 toward the open end of the cylinder, or by removing the piston from the cylinder inserting grease into the cylinder and replacing the piston in the cylinder. Then the cylinder 13 may be inserted endwise into the cylinder accompanied by the seating of the rounded end 69 of the piston rod 67 in the socket 70 of the piston 71.

In order to permit insertion of the cylinder 13 into the guide 76, the piston rod 67 must be moved back to starting position either by pressure exerted by the piston 70 or by moving it back in another manner before inserting the grease cylinder. However, in order to permit the piston rod 67 to move back, it would be necessary to release the hydraulic fluid back of the piston 62 in the hydraulic cylinder 61. This may be done by opening the valve 82 and permitting the liquid to flow back to the tank or container 15. Access to the handle 83 of the valve 82 may be had through a suitable opening in the casing normally closed by a plate 129. As shown in Fig. 2, access to the after-flow-preventing device may be had at the top of the casing 10 through an opening normally closed by a

door 130 connected at one edge to the casing 10 by pivoted links 131 and provided at its opposite edge with suitable holding means comprising a slotted plate 132 on the door, and a fixed member 133 on the casing and adapted to enter the slot, the fixed member having a perforation 134 to receive a locking pin or a part of a lock.

The location and form of the after-flow preventing means may be varied. For example, each of the nozzle devices 99 might be provided with an after-flow-preventing device comprising a valve seat mounted across a passage 112b, connecting the passage 112 with the passage 109, a valve member 135 cooperating therewith and having a valve stem 136 passing through an opening in the end wall of the passage 112, and a device to withdraw the valve member 135 each time a wheel passes over the corresponding part of the rail 12 and to restore the valve member to closed position after the release of the rail from downward pressure. The withdrawing and restoring device may take a form comprising a bell-crank, one generally vertical arm 138 of which is loosely pivoted to the valve stem and the other arm 139 is generally horizontal, a generally horizontal bell-crank-operating lever 140 pivoted at an intermediate point to said rail and connected at the end of one arm with the horizontal arm of the bell-crank, for example with a pin-and-slot connection, and fixed means 141 cooperating with the other arm so that downward movement of the rail will open the valve and upon return of the rail to normal position the valve will be closed.

It should be understood that various changes may be made and that certain features may be used without others without departing from the true scope and spirit of the invention.

Having thus described my invention, I claim:

1. In a track lubricator, means for effecting a flow of lubricant under pressure to a rail surface during the passage of rolling stock, and track-controlled means for positively stopping the forward flow of lubricant after the rolling stock has passed the rail surface thus lubricated and irrespective of such pressure.

2. In a track lubricator, means for effecting a flow of lubricant under pressure to a rail surface during the passage of rolling stock, and track-controlled means for positively stopping the forward flow of lubricant at the end of a predetermined time interval after the rolling stock has passed the rail surface thus lubricated and irrespective of such pressure.

3. In a track lubricator, means for effecting a flow of lubricant under pressure to a rail surface during the passage of rolling stock, and rolling-stock-controlled means for positively stopping the forward flow of lubricant at the end of a predetermined period after the rolling stock has passed the rail surface thus lubricated and before substantial fall in such pressure.

4. In a track lubricator having a nozzle device to supply grease to a rail surface of the track, and means for supplying grease under pressure to said nozzle device, a valve to control positively the forward flow of grease to the nozzle device, and valve-controlling means normally closing said valve irrespective of such pressure and operable by the passage of rolling stock to open said valve and permit the flow of grease to the nozzle device.

5. In a track lubricator having a nozzle device to supply grease under pressure to a rail surface, and means for supplying grease under pressure to said nozzle device, means for positively preventing the forward flow of grease under such pressure to the rail, rendered ineffective by the passage of rolling stock over the portion of the track to be lubricated and again effective, substantially as soon as the rolling stock has passed and before any substantial drop in such pressure.

6. In a track lubricator, the combination with means rendered effective by the passage of rolling stock over a relatively short section of the track to supply grease under pressure to a rail surface in said section, of afterflow preventing means controlled by the passage of rolling stock to effect a positive shutting off of the forward flow of grease to the rail surface substantially as soon as the rolling stock has passed said section and before any substantial drop in such pressure.

7. In a track lubricator, the combination with a nozzle device to feed lubricant to a rail surface, and a track-actuated means for exerting pressure on said lubricant to urge it toward said nozzle, of a track-controlled device for positively preventing the forward passage of lubricant under such pressure to the rail surface except during the passage of rolling stock.

8. In a track lubricator, the combination with a nozzle device to direct grease to a rail surface, a grease container connected with said nozzle device, and track actuated means to exert pressure on the grease in the container to force it through said nozzle device, of means for positively shutting off the forward flow of grease to the nozzle device controlled by the pressure-exerting means to permit the passage of grease to the nozzle device during the passage of rolling stock and to shut off the flow of grease after the rolling stock has passed and before any substantial drop in such pressure.

9. In a track lubricator, the combination with a nozzle device to direct grease to a rail surface, a grease cylinder connected with said nozzle device, a piston in said cylinder and means for actuating said piston to exert pressure on said grease to force it to said nozzle device including a hydraulic system and a track-operated pump to build up pressure therein, of controlling means normally acting positively to shut off the flow of grease to the nozzle device and a pressure connection from the hydraulic system to said controlling means to shift the same to permit passage of grease to the nozzle device.

10. In a track lubricator, the combination with a nozzle device to direct grease to a rail surface, a grease cylinder connected with said nozzle device, a piston in said cylinder and means for actuating said piston to exert pressure on said grease to force it to said nozzle device including a hydraulic system and a track-operated pump to build up pressure therein, of controlling means normally acting positively to shut off the flow of grease to the nozzle device, a pressure connection from the hydraulic system to said controlling means to shift the same to permit passage of grease to the nozzle device, and a device associated with said pressure line whereby the controlling means is made effective to shut off the grease upon stoppage of the pump.

11. In a track lubricator, the combination with a nozzle device to direct grease to a rail surface, a grease cylinder connected with said nozzle device, a piston in said cylinder and means for actuating said piston to exert pressure on said grease and force it out of said nozzle device including a hydraulic system, a track-operated pump to build up pressure in said system, and a check valve to prevent the flow of hydraulic liquid back to the pump, of after-flow preventing means in-

cluding a positive shut-off device in the connection between the grease cylinder and the nozzle, a pressure line taking oil from the pump before it passes through said check valve and opening said shut-off device to permit grease to flow to the rail, a check valve in said pressure line to prevent backward flow therein, and an adjustable hydraulic liquid-leak device to cause closing of said shut-off device.

12. In a track lubricator, a hollow member extending transversely of the track between two successive ties, a round-ended piston rod in said member reciprocable transversely of said track, a lubricant cartridge having a permanently attached outer head and being provided with a piston serving as the other end of the cartridge when the latter is filled and having at its face away from the grease a central socket to fit over the rounded end of the piston rod and a cartridge-receiving and positioning device in said hollow member comprising a cylinder with a flared end to facilitate the insertion of the cartridge, means conducting lubricant from said cartridge to a rail surface of said track, and rail-operated means for advancing said piston rod and forcing lubricant through the conducting means.

13. In a track lubricator, the combination of a hollow body portion to lie between two successive ties and transversely of the track, a nozzle to direct grease to one of the rails, a grease cylinder open at its inner end and connected with said nozzle and located in the adjacent end of said hollow body portion, and a piston to be forced into the cylinder from its inner end and to exert pressure on said grease, of actuating means for said piston slidable as a whole into the other end of said hollow body portion and comprising an oil receptacle, a vertical pump receiving oil from said receptacle and operated from the other rail of the track, a hydraulic cylinder receiving oil from said vertical pump and projecting from said pump toward the grease cylinder, a piston in said hydraulic cylinder, and a piston rod extending from the hydraulic-cylinder piston to operate the grease-cylinder piston, and a guide fixed in said hollow body portion adjacent to the inner end of the grease cylinder and having a recess to receive the end of the hydraulic cylinder and hold the hydraulic cylinder in substantial alignment with the grease cylinder.

14. In a track lubricator, the combination with a body portion for location between two successive ties and transversely of the track, a nozzle to direct grease to one of the rails, a grease cylinder connected with said nozzle and located in the adjacent end of said body portion and a piston in said cylinder having a centering recess on the side remote from the grease, of a device slidable into the other end of said body portion and comprising a pump, a hydraulic cylinder receiving hydraulic fluid from said pump and projecting from said device in substantial alignment with the grease cylinder, a piston in said hydraulic cylinder, a piston rod having a rounded outer end to cooperate with the centering recess on the grease-cylinder piston and having a universal joint connection with the hydraulic-cylinder piston, and means at the end of the hydraulic cylinder remote from the pump for assuring entrance of the rounded end of said piston rod into said centering recess.

15. In a track lubricator having a lubricant supply device mounted on a rail and comprising a nozzle and a duct through which grease under pressure passes to the rail surface to be lubricated, a valve member movable across said passage to shut off the grease or permit it to flow to the nozzle, and means for moving the valve member to open and close said passage including a stem attached to the valve and passing to the outside of the device, a bell crank having one arm pivotally attached to said stem, a lever pivotally connected with the rail and having at one end a pivotal connection with said bell crank and at the other end a pivotal connection with a stationary member, said lever being operable by the passage or rolling stock to open said valve and permit the flow of grease to the nozzle device.

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