

Sept. 14, 1965

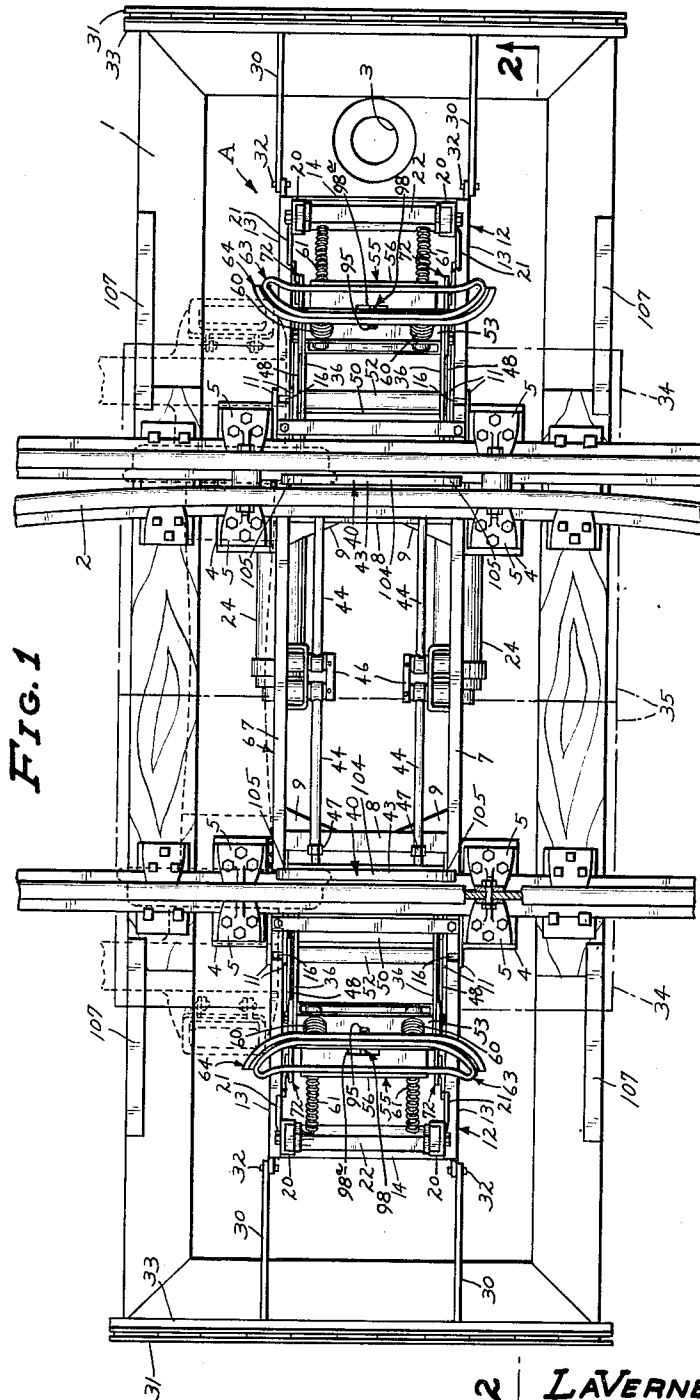
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3,205,974

AUTOMATIC JOURNAL BOX OILER

Original Filed Jan. 13, 1960

6 Sheets-Sheet 1



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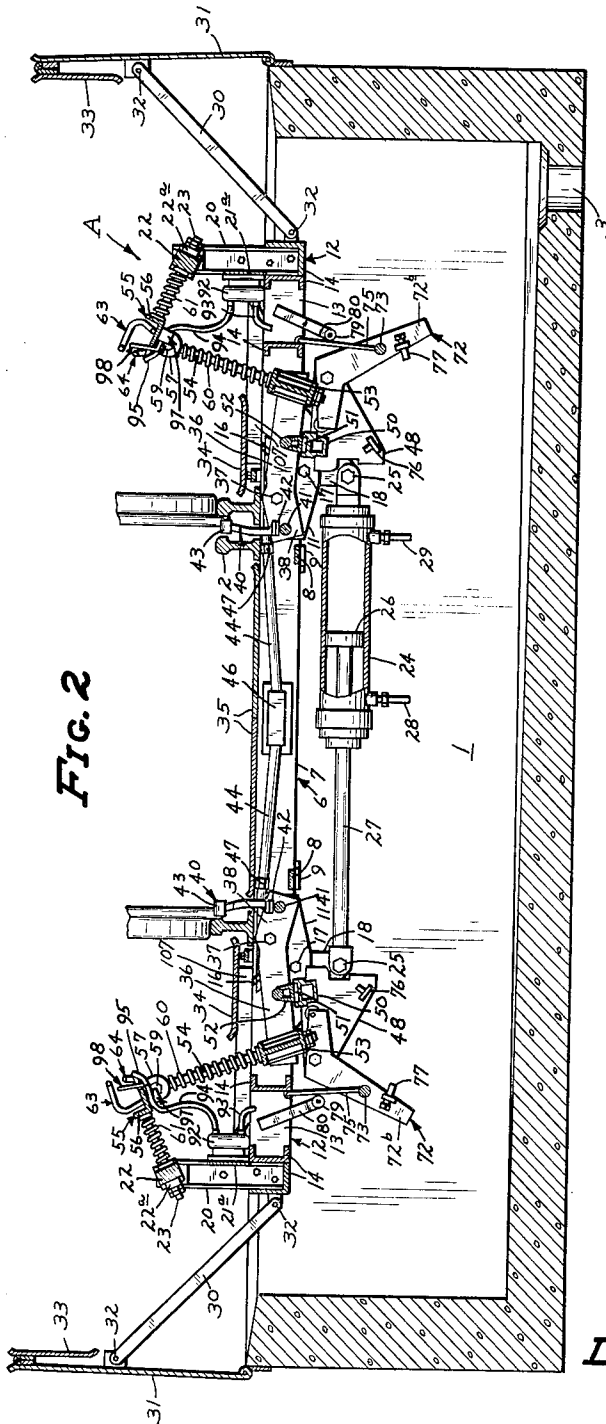


Fig. 2

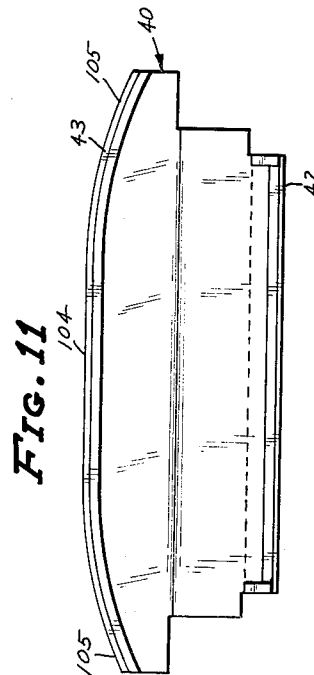


Fig. 11

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FIG. 3

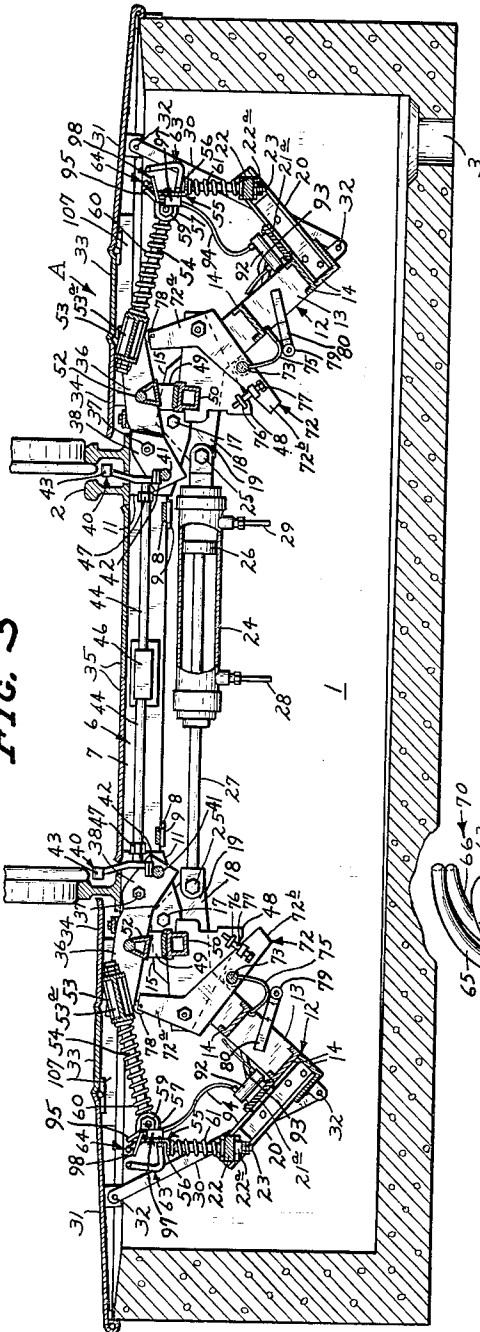


FIG. 8

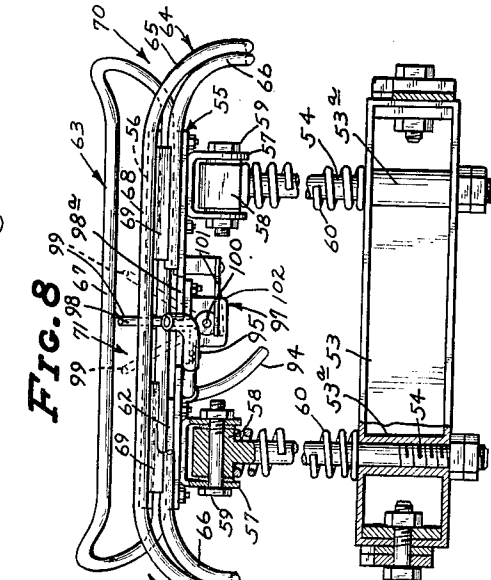
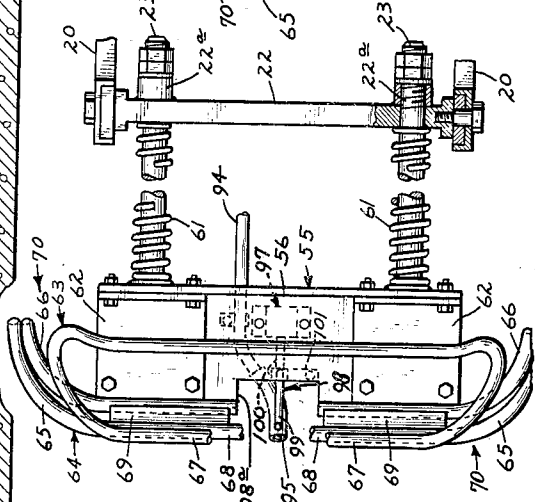


FIG. 7



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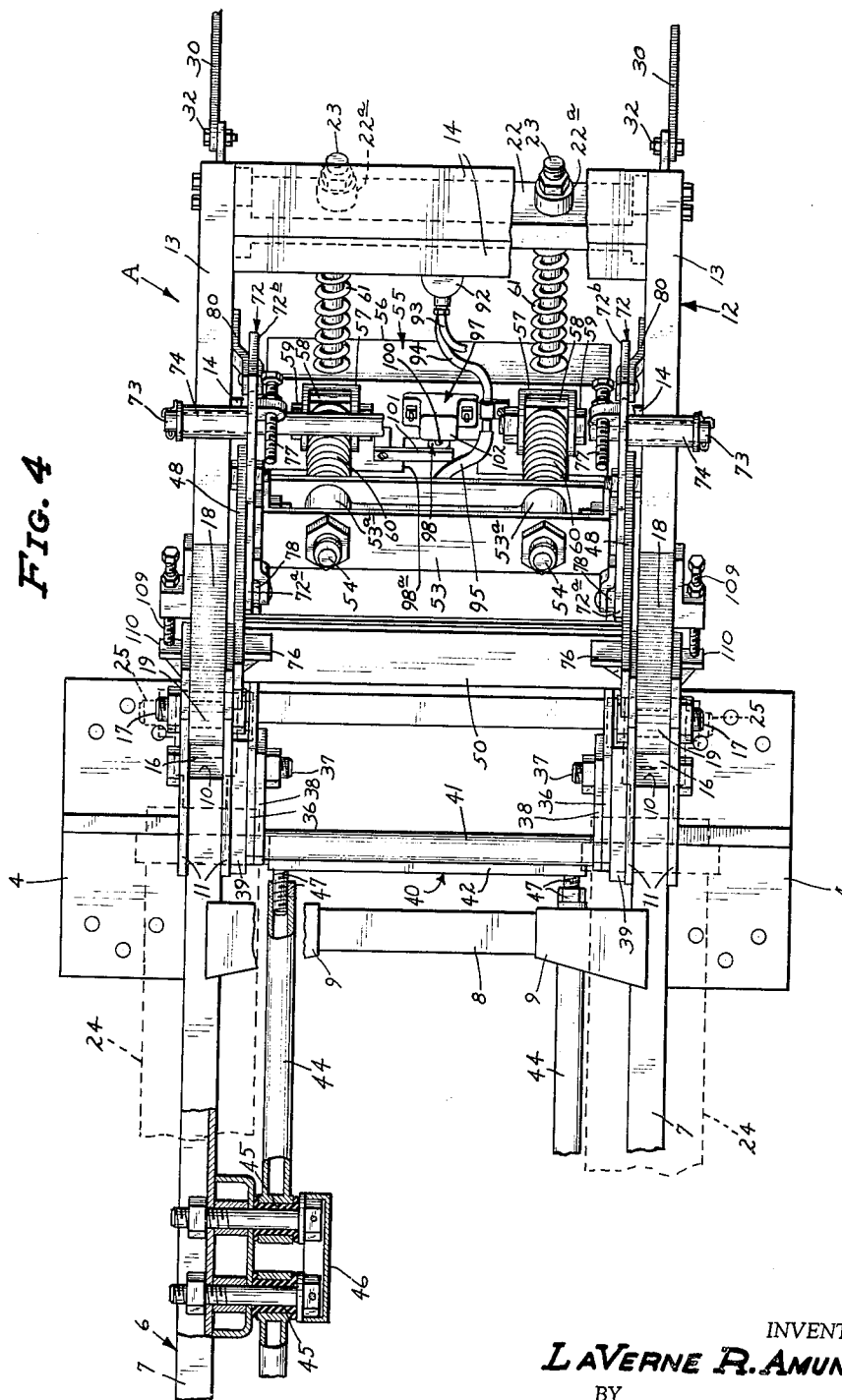
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FIG. 4



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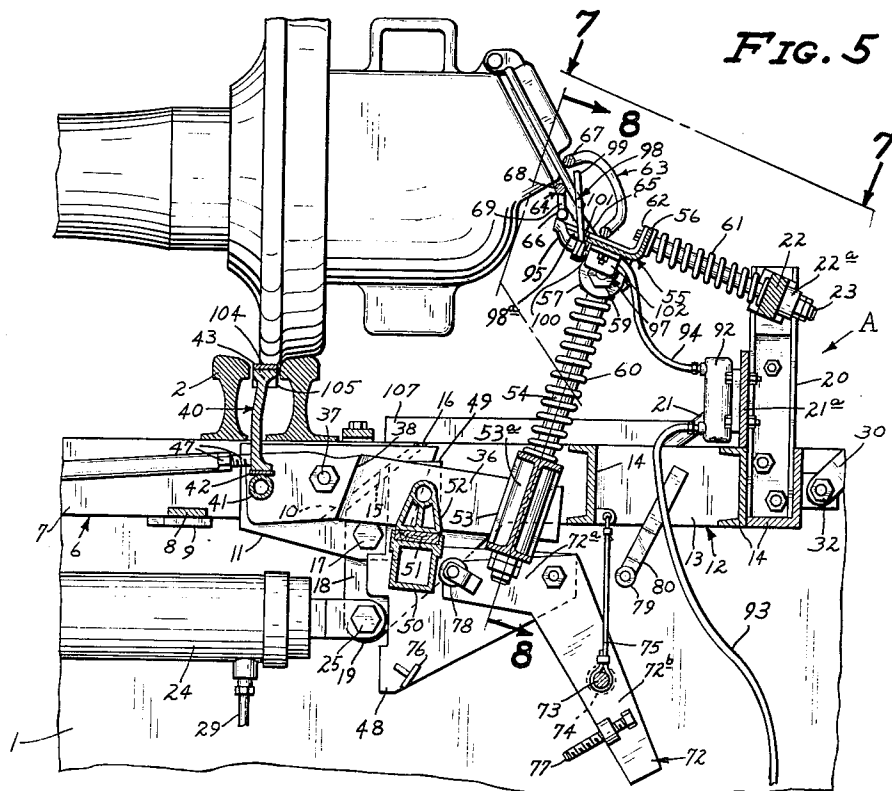
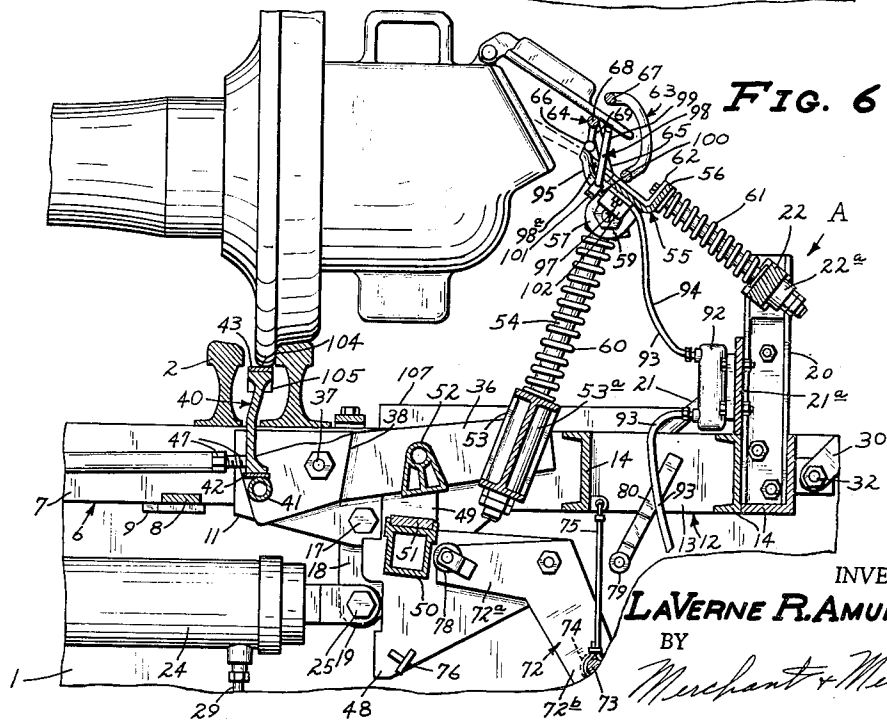
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Fig. 9

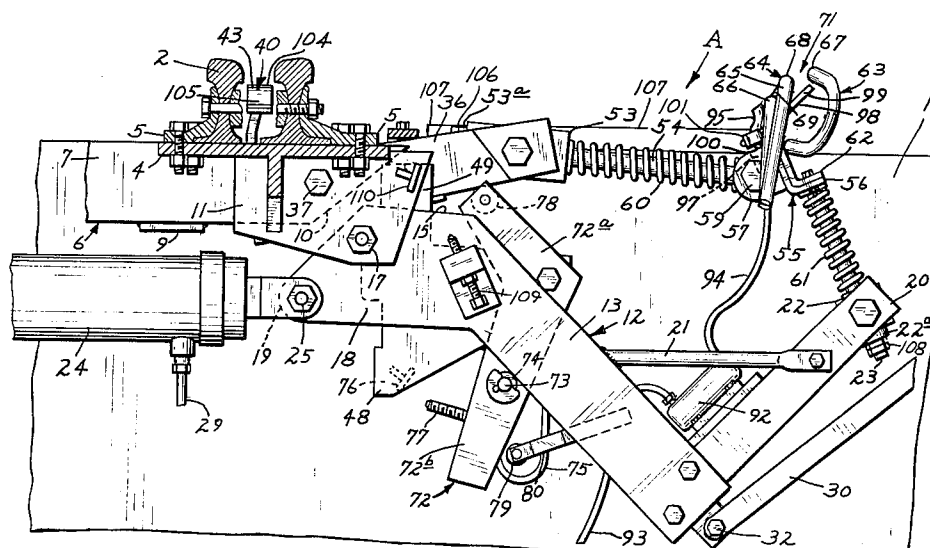
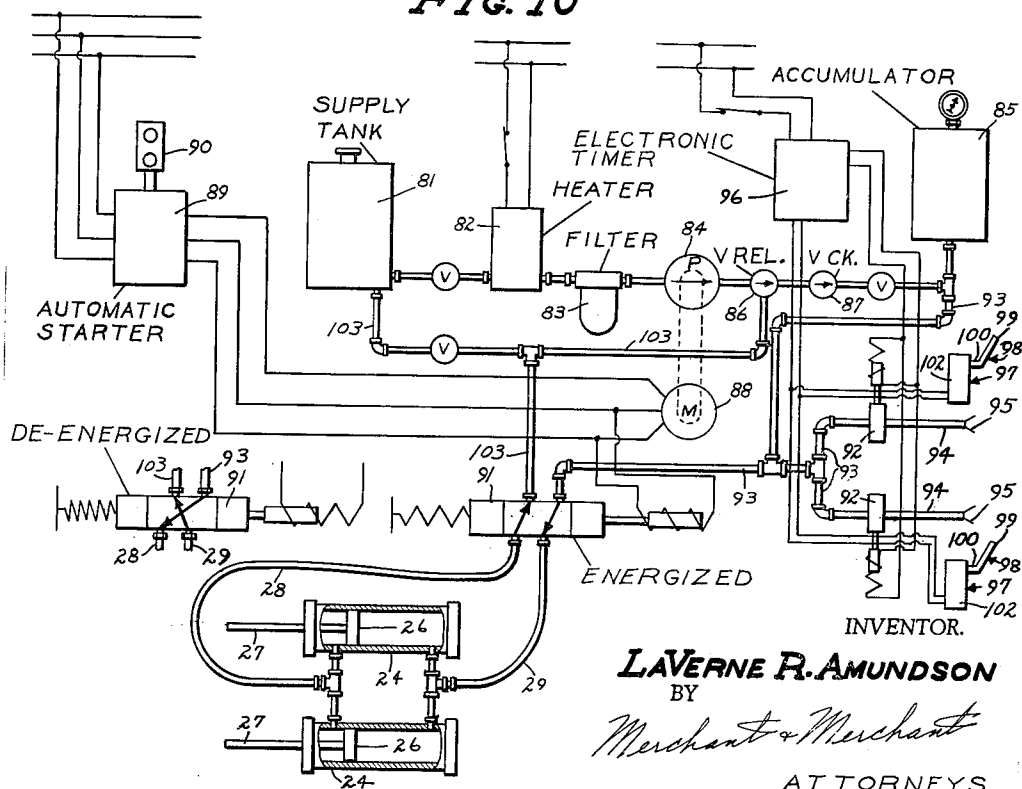


Fig. 10



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AUTOMATIC JOURNAL BOX OILER

La Verne R. Amundson, Hudson, Wis., assignor of three-fourths to Great Northern Railway Company, St. Paul, Minn., a corporation of Minnesota
Continuation of application Ser. No. 2,264, Jan. 13, 1960. This application Jan. 6, 1965, Ser. No. 424,886

28 Claims. (Cl. 184—2)

This application is a continuation of my co-pending application Serial No. 2,264 entitled "Automatic Journal Box Oiler," filed January 13, 1960.

This invention relates to improved means for lubricating the journal of railway car axles; in particular, it contemplates apparatus for automatically oiling the journal boxes of railway cars as the cars move along a track.

A great many of the railway cars in service today, particularly freight cars, have axles equipped with friction type bearings. These bearings support the car axles at each end thereof and are enclosed by a journal box, the exterior surface of which is spaced from the terminal portion of the car axles to define an oil receiving lower chamber and an upper chamber adapted to contain the bearing and shaft structure. The upper end of the journal box is provided with a rather large opening suitable for oiling and cleaning purposes which is enclosed by a spring urged hinged lid. The journal box lid is hinged at its upper end and rests in a depending normally closed position. It may be opened by engaging the lower surface thereof and moving it upwardly and outwardly in an arc about its hinge. A torsion spring mounted coaxially with the hinge member keeps the lid normally closed. Opening the lid and swinging into an arc of about 20° results in a toggle action whereby the lid remains in an open position above the aforementioned angular position facilitating hand oiling of each journal box as the cars stand still or move along a track.

During a normal oiling operation for oiling trains in motion, the practice has been to position men on each side of the moving cars in a train to open the journal box lids, inject oil into the open boxes as the cars move by and then close each lid after the oiling step. It can be seen that for proper oiling to take place, even in a train moving from one to three miles per hour, several persons are required to lubricate the cars in a train. Moreover, the amount of labor necessary to completely oil each car is somewhat proportional to the length and speed of the train. Experience has shown that for efficient oiling the train must move no more than four miles per hour to enable the men stationed on each side of the cars to adequately deliver oil to each journal box.

Hand oiling poses other problems, too. For example, it is possible for the oilers to sometimes skip journal boxes as they pass by, or they may have to reload their oil container before the train has been completely serviced. Such oversights are especially costly as they may result in hot boxes, a primary cause of freight train delays.

While some of the prior art devices teach means for injecting oil under pressure into journal boxes as they pass a given point, none of them disclose or suggest mechanism adapted to open and close each of the lids on moving railway car journal boxes together with associated means for injecting oil into each box during the time the lids are open. And, none of the prior art structures are adapted to be retracted into a below ground protected position during periods of non-use.

Accordingly it is a primary object of this invention to provide improved means for lubricating railway car journals.

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Another broad object of this invention is to provide new and improved means for automatically lubricating railway car journals as the cars move continuously along a track.

Still another object of this invention is to provide a railway car lubrication device adapted to automatically lubricate each of the journal boxes in a train moving along a track.

Another object of this invention is to provide a device for automatically lubricating each journal in a moving railway car with a minimum of hand operation and supervision.

Another object of this invention is to provide railway car journal lubricating means adapted to open and close each lid of the journal boxes that pass by and to inject oil into each box during the time that its lid is in an open position.

Yet another object of this invention is to provide in a railway journal lubricator novel means for engaging the journal box lids of a moving railway car.

Still another object of this invention is to provide a railway car journal lubricator adapted to reside in a position of repose during periods of non-use and adapted for movement into an upright working position during the time it is used for oiling railway car journals.

A further object of this invention is to provide in a railway car lubricating device novel means responsive to movement of the car along the track for opening and closing the lids of the journal boxes as they pass by.

Yet another object of this invention is to provide in a railway car lubricating device novel means for actuating the oil injection system in response to the movement of the car and adapted to deliver oil into each journal box at the precise moment the lid thereof is in an open position.

A still further object of this invention is to provide in an automatic railway car journal lubricator novel structure for mounting the device in a yieldable car engaging position on each side of the track.

Yet another object of this invention is to provide novel railway car journal lubricating means normally positioned below the track and adapted to swing upwardly and outwardly into a working position on each side of the track.

A further object of this invention is to provide in a railway car lubrication system novel means cooperable with the lid engaging and opening means for injecting oil into the passing journal boxes at the precise moment each of the journal boxes is in an open position.

Yet another object of this invention is to provide in a railway car lubrication device novel means responsive to the movement of the car for imparting vertical movement to the lid engaging members of said device to thereby open and close the journal box lids as they pass by.

Another object of this invention is to provide in an automatic railway car lubrication system adapted to reside normally in a position of repose below the tracks and adapted to swing out into a working position adjacent the track novel structure associated with the positioning members thereof for protecting the device during periods of non-use and for enclosing the external boundaries of the device during periods of use.

Another object of this invention is to provide in a railway car lubricating device having wheel operated treadle members novel means for transmitting the motion of the treadle members to the lid operating members of the device.

A still further object of this invention is to provide in a railway car lubricator having journal box lid engaging members positioned adjacent the track novel means for moving the journal box lid engaging members into posi-

tion to open and close the journal box lids of each car as they pass by the device on the track.

Yet another object of this invention is to provide a novel railway car lubrication device characterized by efficiency in operation and economy of manufacture.

These and other objects and advantages of the invention will become more fully apparent from a consideration of the following detailed specification and accompanying drawings wherein a preferred embodiment of the invention is shown for purposes of illustration only.

Referring to the drawings wherein like reference characters indicate like parts throughout the several views:

FIG. 1 is a plan view of the invention, with parts of the cover structure shown in dotted lines;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1 showing the device in an upstanding working position;

FIG. 3 is a view similar to FIG. 2 wherein the device is shown in a retracted non-operative position;

FIG. 4 is an enlarged fragmentary bottom plan view of the invention with some parts broken away for purposes of clarity;

FIG. 5 is an enlarged fragmentary elevational view, partially in section, illustrating the device in operation at the moment of initial contact with a passing railway car;

FIG. 6 is a view similar to FIG. 5 showing the movement of the journal box lid opening members in response to the passage of a car wheel over the treadle member;

FIG. 7 is an enlarged fragmentary view, partially in section, taken along the line 7—7 of FIG. 5;

FIG. 8 is an enlarged fragmentary view, partially in section, taken along the line 8—8 of FIG. 5;

FIG. 9 is an enlarged fragmentary side view, partially in section, of the device illustrating the coaction of the linkage members used in raising and lowering the device;

FIG. 10 is a combined hydraulic and electrical schematic diagram of the device with certain components shown in cross-section to facilitate a fuller understanding thereof; and

FIG. 11 is an enlarged side view of the treadle member used in the device.

Referring now to the drawings for a better understanding of the invention, and more particularly to FIGS. 1 to 3 thereof, the invention in its entirety is represented by the letter A. In practice the device is preferably located in a railway car service switching yard that has suitable maintenance facilities and means for selecting those cars that require journal box lubrication service.

As shown in FIGS. 1 through 3, a concrete pit 1 is provided beneath the rails transversely positioned with respect to the rail centerline. Pit 1 is large enough to accommodate the movable and fixed components of the device as will become apparent as the device is more fully disclosed. The removal of one cross tie from the rail bed has been found to provide the necessary space for the width of pit 1, while its length and depth is of a sufficient size to allow for the retraction and servicing of the device. A guard rail 2 is positioned adjacent the inner surface of one of the running rails to provide proper alignment of the car wheels as the cars pass through the zone of operation of the device. Drainage means including a sloping floor and a drainage outlet 3 allow water and other foreign matter to escape from pit 1.

Fastened to the undersurface of the running rails by means of hangers 4 (as shown in FIG. 4), which are clamped to track braces 5, is a rigid base frame 6 comprising spaced parallel longitudinal side members 7 and cross members 8. Standard rolled steel structural shapes are used in the construction of base frame 6 as well as in most of the other structural members that make up the device. For example, side members 7 may be fabricated from channel sections while cross members 8 are of plate stock with welded reinforcements 9 at each end thereof. Frame 6, of slightly greater length than the track gage, extends slightly beyond each side of the outer

rail surface. Side members 7 of frame 6 terminate outwardly of the rails in a re-entrant angle defining lower facing inclined surfaces 10. Connecting plates 11 are secured adjacent inclined surfaces 10 of side members 7 and extend in a parallel manner therefrom to provide spaced parallel mounting means for receiving movable carriages 12 which support the car engaging and oiling mechanism.

Movable carriages 12 each situated at opposite ends of rigid frame 6 are identical in construction and include spaced longitudinal side members 13 held together by cross members 14. Side members 13, in lateral and vertical register with side members 7 of rigid frame 6, terminate at their inner ends in upper facing inclined surfaces 15 which are complementary to and cooperate with inclined surfaces 10 of rigid frame 6 to form a scarf joint 16 between the inner rigid frame 6 and movable outer carriages 12. Connection between the inner end of side members 13 of carriage 12 and the outer end of side members 7 of frame 6 is made by means of bolts or pins 17 extending in a horizontal plane through connecting plates 11 and positioned so as to allow swinging movement of carriages 12 about spaced parallel horizontal axes on opposite sides of rigid frame 6. It can be seen that this construction results in a movable member on each side of the track adapted to swing outwardly and upwardly to a working position in closely spaced relationship with passing railway cars.

The inner ends of elongated side members 13 each have a depending triangular gusset section 18 integral therewith and adapted to receive bolts 17 for the rotational movement of carriages 12. The extreme lower edge 19 thereof is adapted for connection to hydraulic means suitable for imparting rotatable movement to carriages 12 about axes 17, as will be set forth in the following discussion. Carried at the outer end of each carriage 12 are a pair of spaced upstanding legs 20 rigidly secured perpendicular to side members 13 and supported by guy rods 21. A support plate 21a, secured to the inner surface of legs 20 provides mounting means for various electrical and hydraulic components employed in the operation of the device, as will be explained. Between the upper ends of legs 20 is mounted outer support member 22 adapted for rotatable movement about its major axis and provided with means 22a for slidably receiving spaced parallel elongated outer support rods 23.

Rotation of carriages 12 is effected by means of a pair of hydraulic cylinders 24 positioned horizontally below inner frame 6. Each cylinder 24 is pivotally mounted at one end thereof to the inner lower edge 19 of side members 13 by suitable means as shown at 25. A piston 26, mounted within each cylinder 24, is connected by means of piston rod 27 to the inner lower edge 19 of the opposing carriages 12, as shown in FIGS. 2 and 3. Fluid under pressure is delivered to cylinders 24 by virtue of hydraulic lines 28 and 29, as will be explained.

Pivotally secured at the outer extremities of carriages 12 are a pair of slender elongated links 30 which connect at their outer ends to cover plate 31 and at their inner ends to each movable carriage 12 by means of pivotal connection 32. Cover plate 31, which is hinged at its lower edge to the outer wall of pit 1, carries a foldable section 33 at its outer edge adapted to hang in a vertical depending position during the time the device is in an upright working position. This feature provides in effect a guard rail along the outer edge of pit 1 that is low enough to afford a full view of the mechanism during its operation and at the same time provide a safety barrier along the outer edges of the pit. It can be seen that when the device is in a retracted position the cover elements 31 and 33 assume an overlying position with respect to the retracted structure, while during the time the device is in an upright working position the cover elements are vertically positioned to provide a safety

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barrier on each side of the lubricating zone. In addition to the movable cover elements, fixed cover means including cover plate 34 adjacent the outer surface of each rail and inner plate 35 are provided, which with the movable cover plates results in a completely weather-proof and tamperproof enclosure for the device.

Turning now to a consideration of the car engaging components and associated structure, a wheel actuated operating lever 36 is pivotally mounted as at 37 to side members 7 of frame 6. The inner arm of lever 36 is reinforced by means of plate 38 to enable it to withstand severe loading conditions of the type normally expected when a loaded freight train passes over the structure and engages the operative components thereof. A filler plate 39 secured to side members 7 and more clearly shown in FIG. 4 separates each lever 36 from the adjacent side member 7 and provides space for other members. Pivotal movement of each lever 36 is caused by the downward movement of wheel actuated treadle members 40 that are positioned adjacent the inner edge of each rail in a manner so as to engage, under appropriate conditions, the flange of the railway car wheels as they pass along the track. Each pair of spaced levers 36 that are attached to opposite ends of frame 6 are connected by means of an elongated horizontal rod 41 engageable along the upper surface thereof with longitudinal wear member 42 of treadle members 40. The upper surface of treadle member 40 is equipped with a similar elongated wear member 43 adapted to engage the flanges of the railway wheels as they pass by.

Attached to each end of the inner lower surface of treadle members 40 are spaced parallel guide arms 44 which are rotatably mounted near the centerline of the rails on side members 7 of frame 6 and are adapted for transverse swinging movements outwardly from the center of the track, as shown in FIGS. 1 to 3. Resilient means 45 (shown in FIG. 4) within housing 46, secured to each side member 7, rotatably contain guide arms 44 about closely spaced horizontal axes and provide for the absorption of the lateral stresses transmitted by treadle members 40 in response to the train movement. The outer end of each guide arm 44 is equipped with threaded means 47 adapted to adjustably secure treadle members 40 into proper alignment adjacent each wheel. It is apparent that when treadle member 40 moves into and out of engagement with the flange of a car wheel it describes a circular path having a radius equal to the length of guide arms 44, the horizontal displacement of the arc described by treadle member 40 being very small compared to its vertical displacement.

A fixed plate 48, substantially triangular in shape and having a projecting upper leg 49, is welded at leg 49 to each inner connecting plate 11 on frame 6. An elongated lower stop 50 equipped at its upper surface with a resilient wear member 51 rigidly connects and supports the matching fixed plates 48 in a spaced parallel horizontal relation in register with each other. Elongated limit member 52 fastened between each pair of parallel operating levers 36 engages wear member 51 of stop 50 to limit the downward rotation of the outer arm of levers 36.

Carried at the outer ends of each pair of levers 36 is inner support member 53, larger in size than outer support member 22 and adapted for swinging movement about its major axis. Inner support member 53 is provided with means 53a for slidably receiving spaced parallel elongated inner support rods 54. As shown in FIGS. 5 and 6, each pair of inner support rods 54 and outer support rods 23 converge, at the ends thereof remote from support members 53 and 22 respectively, upon and are secured to an elongated substantially rectangular mounting bracket 55. Bracket 55 is L-shaped in cross-section and has an upstanding rear lip portion 56 adapted to abuttingly receive spaced rods 23. The lower surface of bracket 55 is in abutting engagement with a pair of spaced U-shaped hangers 57 adapted to rotatably support

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the upper enlarged head portion 58 of rods 54 by means of bolts 59, see particularly FIGS. 4 and 8.

Surrounding each of the inner support rods 54 is a compression spring 60 abuttingly engaging at its upper end the enlarged head portion 58 thereof and at its lower extremity the upper surface of inner support member 53. Similarly, compression spring 61 surrounds outer support rod 23 between outer support member 22 and lip 56 of bracket 55. It can be seen that the structure associated (e.g., spring 60 and rods 54) with the inner support member 53 is of heavier cross-section and sturdier than the corresponding structure (e.g. springs 61 and rods 23) associated with the outer support member 22 for reasons relating to the loading conditions on each member, as will become apparent during a discussion of the operation of the device.

Attached to the upper surface of each bracket 55 are a pair of spaced removable guide member supports 62 to which are secured, as by welding, upper and lower lid guides 63 and 64 respectively. Lower lid guide 64 includes an outer elongated curved lid engaging member 65 and an elongated curved inner supporting member 66 adapted to reinforce and stiffen outer member 65. Upper guide 63 is formed in the shape of an elongated loop having a straight middle section 67 vertically spaced from and in register with a corresponding straight middle section 68 of lower guide 64. Lower lid guide 64 includes spaced connectors 69 that are welded between members 65 and 66 to provide rigidity and strength.

The car engaging elements of guide 63 and 64, viz., members 63 and 65, are made of high strength spring steel while reinforcing member 66 may be fabricated of cold rolled stock. As shown in FIGS. 7 and 8, the ends of upper lid guide 63 are turned up and away from the lid engaging middle section 67 thereof while the ends of lower lid guide 64 are formed down and away from the lid engaging middle section thereof. The result is a relatively wide throat section 70 at both ends of the guide members which tapers into an elongated relatively narrow working area 71 thereby permitting the device to engage moving journal box lids from either direction along the track and allow for differences in the positions of the lids as they pass by.

Coaction between the movable elements of carriages 12 and the corresponding levers 36 during their rotational displacement into and out of a working position is accomplished by means of bell cranks 72. Bell cranks 72 are rotatably secured in spaced relation at each end of frame 6 to fixed plates 48. Each bell crank 72 is characterized by a relatively short inner arm 72a and a relatively long outer arm 72b. An elongated cylindrical rod 73, transversely positioned between each pair of spaced parallel bell cranks 72 extends through each bell crank 72 a distance sufficient to receive rotatable cylindrical sleeves 74. Sleeves 74 slidably contact the undersurface of side members 13 of carriage 12 during the rotation of the assembly.

Elongated flexible members 75 attached to side members 13 of carriage 12 and outer arm 72b serve to inhibit the downward rotation of bell crank 72 while the assembly is in an upright working position, as shown in FIG. 5. Lower stop means for each bell crank 72 consisting of a platform 76 secured integrally to the lower edge of the corresponding fixed plate 48 and a threadedly secured member 77 on the end of outer arm 72b provide adjustable means for fixing the lower terminal position of bell cranks 72.

Carried at the ends of inner arms 72a of each bell crank 72 is an inner thrust roller 78 adapted to slidably engage the undersurface of the outer arm of adjacent lever 36 to thereby rotate lever 36 about its axis so that treadle member 40 is in a non-wheel engaging position. Cooperative means for accomplishing this action is provided by outer thrust roller 79 carried on the end of elongated thrust arm 80 which is secured to side members 13, as shown

in FIGS. 5 and 6. And, as shown in FIG. 9, side arm 13 slidably engages rotatable sleeve 74 before outer thrust roller 79 leaves the upper surface of arm 72b of bell crank 72 to provide continuity of the thrust transmitted by carriage 12 through bell crank 72 to levers 36 during the lowering of carriage 12 into pit 1. This sequence of action results in the ultimate downward movement of treadle member 40 into a non-wheel engaging position in response to the lowering of carriages 12 to a retracted below ground position.

The hydraulic and electrical system employed in the operation of the device is shown schematically in FIG. 10. Oil from supply tank 81 is drawn through heater 82 and filter 83 by means of pump 84 which supplies oil under pressure to accumulator 85. Relief valve 86, a self-contained regulator which maintains the correct operating pressure in the line, is situated between pump 84 and check valve 87. As shown in FIG. 10, motor 88, which operates pump 84, is controlled by starter 89 having push button controls 90. Starter 89 also energizes four way valve 91 which releases fluid under pressure into the head end of cylinders 14 to thereby rotate carriages 12 upwardly into a working position.

Safety devices (not shown) for deenergizing starter 89 and causing carriages 12 to rotate into a retracted position may be provided to permit cars having unusual appendages, which may collide with the oiling structure, to pass. For example, such cars may be equipped with special feelers or contact arms adapted to actuate switches interlocked with starter 89 and positioned a sufficiently great distance from the oiling device to allow complete retraction of the device before the interfering car passes through the lubrication zone.

Also shown in the diagram of FIG. 10 are a pair of solenoid actuated output valves 92 which are connected to the pressure line 93 and secured to mounting plate 21. Each valve 92 is in communication with inlet pressure line 93 and discharge line 94. In communication with discharge line 94 is an injection nozzle 95 positioned intermediate the ends of guide members 64 on mounting bracket 55 so as to inject oil into the passing journal boxes when the lids thereof are in an open position. Thus whenever the system is energized by means of starter 89 constant pressure conditions exist in line 93 up to solenoid valves 92.

Delivery of the oil under pressure from valves 92 through discharge line 94 and nozzles 95 into opposing journal boxes in a railway car shaft during the precise moment their lids are open is effectuated by means of an electronic timer 96 cooperatively connected to identical trigger assemblies 97 which are mounted adjacent each nozzle 95 on mounting brackets 55. Trigger assembly 97 consists of a slender flexible contact arm 98 having an upstanding lid engaging portion 99 integral with a lower generally horizontal rotatable portion 100 journaled on the undersurface of each bracket 55. The upstanding lid engaging portion 99 of arm 98 extends upwardly through an elongated slot 98a in bracket 55, as shown in FIG. 7.

Upper portion 99 of contact arm 98 is adapted to rotate on either side of a generally vertical position, its return to a normally vertical attitude being accomplished by a flat leaf spring 101 bearing against lower portion 100 thereof. Cooperative with contact arm 98 is microswitch 102, of the double throw type energized by a source of 110 volt, single phase current and operatively engageable with lower cam portion 100 of contact arm 98 so as to close its contacts whenever contact arm 98 is deflected on either side of its axis of rotation. Closing of the contacts of switch 102 results in a flow of current to electronic timer 96 which in turn allows current to flow for a predetermined period of time to energize the coils of the solenoids in valves 92. This action opens valves 92 and permits the flow of oil under pressure through nozzles 95 into the passing journal boxes.

The timing sequence in electronic timer 96 is variable

and may be adjusted for changes in lubrication requirements, oil pressure conditions and train speeds. It has been found that a 3 cycle or $\frac{1}{20}$ second period of opening valves 92 under 200 p.s.i.g. conditions will deliver about five ounces of oil into each journal box. This time-interval and oil pressure combination is adequate to oil the average journal box in trains moving at moderate yard speeds (three to five miles per hour) without loss of oil due to the premature closing of the lids. Of course, greater yard speeds call for higher oil pressures and correspondingly less time for its delivery if oil waste is to be avoided.

Operation

FIG. 3 illustrates the invention in a retracted position below the tracks. Movable cover plates 31 and 33 reside in an overlying position with respect to pit 1 affording with fixed cover plates 34 and 35 a protective and tamperproof enclosure for the device.

When the device is in an inoperative position of repose, four way valve 91 is deenergized and pistons 26 are retracted within cylinders 24, as shown in FIG. 2. As explained previously, the linkage between carriages 12 and operating levers 36 keep treadle members 40 below the range of the passing car wheels when the structure is retracted.

Operation of the device is initiated by depressing push button 90 to start motor 88 which is coupled to vane pump 84. Oil from the supply tank 81, which may be located remotely from the lubricating zone, is preferably heated to about 150° F. and then filtered before it reaches the suction side of pump 84. The oil leaves the discharge side of pump 84 and passes through relief valve 86 which is set to the desired operating pressure (normally about 200 p.s.i.g.). Return line 103 provides a return passageway to supply tank 81 for the oil that has been by-passed by relief valve 86 and also provides communication for the oil exhausted from cylinders 24 into supply tank 81. Pressurized oil enters accumulator tank 85 which dampens its pulsations and provides reserve storage capacity for a continuous operation of the lubricating cycles. Check valve 87 interposed between pump 84 and tank 85 insures an unidirectional flow of oil from tank 85 to valves 91 and 92.

From accumulator 85 oil flows through line 93 into solenoid actuated valves 92 and into four way valve 91. When four way valve 91 is energized (as is the case during operation of the device) oil under full pressure flows from line 93 into the head end of cylinders 24 thereby forcing pistons 26 to move towards the rear end of cylinders 24 and extending piston rods 27 in an axial direction. The force of piston rods 27 is transmitted to each of the inner ends 19 of carriages 12 resulting in the simultaneous upward rotation about bolts 17 of carriages 12 into an upstanding working position on each side of the track.

During the initial simultaneous upward rotation of carriages 12, links 30 move in an upward and outward direction to raise cover plates 31 and 33 into a position adapted to provide an outer vertical guard rail for the device. Operating levers 36 are also caused to rotate about their axes 37 to bring treadle members 40 up into a flange engaging position, as illustrated in FIG. 5. Inner and outer support rods 54 and 23 respectively, rotate with their pivotal support members 53 and 22 to bring the journal box lid engaging assembly into a working position on each side of the track, as shown in FIG. 2. When carriages 12 are in a final upward position flexible members 75 restrain bell crank 72 from downward rotation.

FIGS. 5 and 6 illustrate the functioning of the device during the time when a car is passing through the lubricating zone. In this connection, reference to FIG. 11, which illustrates a side profile of the treadle members 40, is germane. As shown in FIG. 11, the upper wheel engaging

contour of treadle member 40 is characterized by a horizontal middle section 104 terminating on both ends thereof in identical slightly arcuate transition sections 105. It is clear that upon initial contact of a car wheel flange with treadle member 40 the large forces resulting from the weight and speed of the train are transmitted to operating levers 36 and ultimately to guide members 64 in smoothly graduated increments thereby reducing serious shock loads and providing for maximum opening of the journal box lid at the precise moment oil is injected therein.

As a car moves into the lubricating zone each journal box lid is initially slidably engaged at its depending lower surface by the downwardly sloping end of lower lid guide 62 and the upwardly sloping end of upper lid guide 63 to bring the journal box lid from the wide outer throat section 70 defined by the ends of guide members 62 and 63 into the reduced inner working area 71 defined by the middle section thereof. Such initial positioning of the journal box lid is desirable as it permits the subsequent uniform treatment of the lid after it is engaged by the guide members.

If a lid passes through the guide members slightly askew because of a broken hinge spring or some other reason, it is either forced into alignment within the working area 71 or the entire upper assembly yields, by means of springs 60 and 61, thereby preventing breakage of or damage to either the train structure or the lubricating device.

Simultaneously with the initial contact of the journal box lid with the lid guide 62 and 63 the flange of the wheel associated therewith makes contact with treadle member 40. As explained the vertical forces imparted by the moving train are transmitted gradually to operating lever 36 causing an upward rotation of its outer arm and inner support member 53. This movement causes inner support member 53 and outer support member 22 to rotate toward each other slightly to accommodate support rods 54 and 23, respectively, in their new position. Bracket 55 also rotates about a generally horizontal axis defined by the major axis of bolts 59 of hangers 57. It should be mentioned at this point that compression spring 60 and support rod 54 are rather large in comparison with compression spring 61 and support rod 23. This is so because of the heavier loading imposed upon compression spring 60 and support rod 54 during the operation of the device. Therefore, bracket 55 is rotated outwardly against spring 61 by the force of rods 54 resulting in the relatively gradual and smooth upward and outward movement of the journal box lid as it passes through lid guides 62 and 63.

Upon reaching the intermediate longitudinal portion of the lid guides 62 and 63, the lid strikes flexible contact arm 98 thereby causing switch 104 to close its contacts and energize timer 96. As mentioned previously, under ordinary conditions timer 96 allows current to flow into the coils of the solenoids of valves 92 for a period of $\frac{1}{20}$ second, thereby opening the valves and allowing oil to flow from nozzles 95 into each journal box during the exact time each lid is opened a maximum amount i.e., during the time the flange of the wheel is passing over the horizontal middle section 104 of the contour of each treadle member 40. As the closure of solenoid valves 92 is entirely controlled by the electronic timer 96 the return of contact arm 98 to a vertical position is not necessary for the completion of the oiling sequence.

Preferably each nozzle 95 is directed and arranged so as to inject oil into the open journal boxes at a slightly inclined upward angle to strike the roof of the journal housing, as shown in FIG. 6. In this regard experience has shown that injecting oil in a horizontal plane into the journal boxes often results in the passage of the high velocity oil stream around the bearings and into the space between the axles and bearings.

As the train passes through the lubrication zone the

wheel flange operating the lubricating mechanism passes from the horizontal middle section 104 of treadle members 40 to the final arcuate transition section 105 thereby resulting (by virtue of the larger moments of inertia in that direction) in a counter rotation of each operating lever 36. The counter rotation of lever 36 produces a generally downward movement of rods 54 which together with the pressure exerted by springs 61 on bracket 55 causes bracket 55 to rotate inwardly about axes 59 and simultaneously move in a linear downward direction coaxial with rods 54. The result is a vigorous and fast closing of the lid by upper lid guide 63 as the lid leaves the area of contact between lid guides 62 and 63.

This sequence is repeated for each pair of journal boxes as they pass through the lubrication zone defined broadly by the laterally spaced opposed carriages 12.

After the oiling operations are concluded the operator shuts down the system by depressing push button 90 thereby deenergizing the system. When the current is turned off, motor 88 and pump 84 cease operating and four way valve 91 assumes the deenergized position shown in FIG. 10. Pressure is maintained in line 93 for a period of time (varying with the capacity of tank 85) after the system is shut down by virtue of accumulator tank 85. The reversal of flow through valve 91 during the time it is in a deenergized position permits the oil under residual pressure to enter the rear end of cylinders 24 through lines 28 and force pistons 26 toward the head end of cylinders 24. Inasmuch as the pressure in the line is reduced because of the stoppage of pump 84, retraction of the device into a lowered position is accomplished swiftly and smoothly. The friction inherent in the return line serves to prevent an abrupt collapse of the structure into its retracted position thereby avoiding damage and costly repair. In addition, proper adjustment of the valves in the return and pressure lines augments the safety features of the retracting cycle.

As each carriage 12 moves downwardly about axes 17 thrust roller 79 contacts the top surface of outer arm 72b of bell crank 72 and pushes it in a downward direction about its axis of rotation. Just before roller 79 reaches the outer end of arm 72b of bell crank 72, the undersurface of side members 13 engages rollable sleeves 74, as shown in FIG. 9, and continues its downward movement. Thrust roller 78 situated on the end of inner arm 72a of bell crank 72 contacts the undersurface of lever 36 outwardly of the axis of rotation thereof and forces it in a generally upward rotation during the counter movement of carriages 12. This action brings treadle members 40 down from and out of contact with the flanges of passing car wheels.

The downward movement of carriages 12 also results in a simultaneous inward and downward movement of cover plates 31 and 33 in response to the corresponding movement of linkage members 30. The outer longitudinal edges of plates 33 are turned up slightly to slide upon guide blocks 107 which are positioned on the transverse sides of pit 1.

The device is adjustable in several respects to meet various conditions of use. For example, inner support rods 54 and outer support rods 23 may be adjusted axially by means of threaded connections 106 and 107, respectively, to accommodate varying conditions that may be imposed during the operation of the device. Similarly, support arms 44 may be adjusted by threaded means 47. And, the timing sequence and oiling pressures may be changed according to the requirements that may exist from time to time.

From the foregoing it can be seen that an improved mechanism has been devised for automatically oiling journal boxes of railway cars as the cars move along a track. The device completely eliminates the need for hand operation not only in the opening and closing of the moving journal box lids but also in the injection of oil into the passing journal boxes. Moreover, a uniform quan-

tity of oil is injected into each journal box as the cars pass through the device resulting in more efficient and less costly maintenance of the rolling stock in a railroad yard.

The invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects and while there has been disclosed a preferred embodiment thereof, it should be specifically understood that same is capable of considerable modification without departure from the scope and spirit of the appended claims. In many instances, features may be added; in others, features may be omitted. In the case of the trigger assemblies 97 and their contact arm 98, it is clear that other means for energizing timer 96 to open the valves 92 and permit the flow of oil through nozzles 95 into the journal boxes may be used without departure from the spirit of the invention.

It is intended that the patent shall cover, by summarization in the appended claims, all features of patentable novelty residing in the invention.

I claim:

1. Apparatus for lubricating railway car journal boxes as the car moves along a track including a pair of lid engaging members adapted to slidably contact the free end of a hinged journal box lid, yieldable mounting means for said lid engaging members, wheel engaging means adapted to cause said lid engaging members to open and close said lid after its engagement therewith, and means including a control element responsive to engagement by said lid for injecting oil into the journal box when the lid is open.

2. Railway journal box lubricating apparatus comprising, in combination, upstanding yieldable support means positioned adjacent the track upon which the cars to be lubricated move along, a first elongated member on said support means, a second elongated member on said support means, said first and second elongated members being vertically spaced and presenting upper and lower guide surfaces adapted to slidably receive the depending end of the hinged lid of a railway car journal box as the car passes by, wheel engaging means pivotally linked to said elongated members operable to alternately open and close each journal box lid as it passes, and an oil pressure system including a control element operated by the journal box lid as it passes through said elongated members for injecting oil into the journal box when the lid is in open position.

3. The device set forth in claim 2 wherein said oil pressure system is characterized by timing means adapted to inject a uniform quantity of oil into each journal box during the time the lid thereof is in an open position.

4. A railway journal box oiler adapted to supply oil to the journal boxes of a railway car as it moves along a track including a lower lid engaging member on each side of the track for opening the lids of moving railway car journal boxes, on upper lid engaging member in register with said lower lid engaging member for closing the lids of moving railway car journal boxes, mounting means on each side of the track for said lid engaging members, each of said mounting means when in operative position being spring biased in at least two directions transversely of the track, wheel engaging treadle means cooperative with said mounting means and said lid engaging members for imparting opening and closing movements to said lid engaging members when a railway car journal box lid is passing therethrough, means for injecting oil into the journal boxes of a railway car when the lids thereof are in an open position, means responsive to the movement of the journal box lid for actuating said injection means, said actuating means being adapted to supply a predetermined quantity of oil to each journal box when a lid thereof is open without regard to the speed of the train, and means for supplying oil to said oil injection means.

5. A lubricating device for railway car journal boxes of the type having hinged covers for oiling, said device comprising, in combination, a pair of spaced cooperative

parallel elongated guide members adapted to receive a journal box door therebetween and positioned adjacent to the outer surface and parallel with a rail, said guide members including a lower journal box cover engaging guide for slidably contacting and opening a moving journal box cover and an upper journal box cover engaging guide for slidably contacting and closing a moving journal box cover, lever means for actuating said guide members pivotally mounted beneath the rail, said lever means having a relatively short substantially horizontal arm extending inwardly of the rail and a relatively long substantially horizontal arm extending outwardly of the rail, a perpendicular wheel engaging foot connected to the inner end of said lever means and adapted to rotate the long arm of said lever means upon its engagement with the flange of a car wheel in a substantially upward path, first mounting means for said guide members pivotally secured to the outer end of the long arm of said lever means, second mounting means attached to said guide members coplanar with said first mounting means, spring means cooperative with said mounting means for urging said guide members into a yieldable journal box cover engaging position, the long arm of the said lever means being returnable to a normally downward position upon the release of downward pressure on said foot, oiling apparatus including a valve positioned intermediate the ends of said guide members, and an actuator for opening said valve in response to the sliding movement of the journal box cover on said guide members to thereby allow oil under pressure to be delivered into the journal box when the cover thereof is open.

6. Railway car journal box lubricating apparatus comprising, in combination, upstanding yieldable support means positioned adjacent the track carrying the cars to be lubricated, a first guide member on said support means, a second guide member on said support means, said guide members being arranged to provide longitudinal upper and lower guide surfaces slidably receiving therebetween the free end of the hinged journal box cover carried at an end of each railway car axle, wheel engaging means cooperative with said support means to impart generally vertical movements to said guide members as a journal box cover passes therebetween whereby to successively open and close the journal box cover, means for injecting oil under pressure into the journal box as it passes said guide members and a control element engageable with the moving lid of the journal box to render the oil injecting means operative to inject oil into the journal box when the cover is in an open position.

7. A railway journal box oiler adapted to discharge oil into the journal box of a moving car including journal box cover engaging means positioned alongside a track, said means comprising, an elongated substantially horizontal lower guide member adapted to slidably engage and open a journal box cover and an elongated substantially horizontal upper guide member adapted to slidably engage and close a journal box cover, spring biased mounting means for said cover engaging means adapted to urge said guide members into a cover engaging position, railway car wheel actuated lever means cooperating with said mounting means for elevating said lower guide member to open said journal box cover responsive to the movement of the car, and oil injection means including an actuator engageable with said cover as said cover slidably engages said guide members for injecting oil into the moving journal box at the precise moment the cover thereof is open.

8. A lubricating device for railway car journal boxes of the type having depending hinged access covers, said device comprising, in combination, a pair of cooperative vertically spaced substantially parallel elongated guide members adapted to receive a moving access cover therebetween, said guide members including a lower guide for slidably contacting and opening said access cover and an upper guide for slidably contacting and closing said

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access cover, lever means for imparting cover opening and closing movements to said guide members, said lever means being pivoted at a point beneath a rail and having an arm of relatively short length extending inwardly of the rail from the pivot point and an arm of greater length than and integral with the inner arm extending outwardly of the rail from the pivot point of said lever means, movable guide member support means carried at the end of the outer arm of said lever means, a treadle member operated by the flange of the wheel of a passing car for momentarily rotating the outer arm of said lever means in an upward direction to thereby lift said lower guide member and open the journal box access cover, said treadle member having a flange engaging surface comprising an elongated relatively flat intermediate surface portion and longitudinally outwardly and downwardly directed surface portions at the opposite ends of said intermediate surface portion, whereby that irrespective of the direction of travel of said wheel the outer arm of said lever means will first be raised from a normally lowered position then maintained in a raised position for a predetermined distance of travel of the wheel flange thereon and thereafter permitted to again assume said normally lowered position to thereby cause said upper guide member to initially contact the upper surface of the journal box access cover in a slidable manner and subsequently close the axis cover after the cover has been opened by said lower guide member, spring means associated with said support means for urging said guide members into a yieldable journal box access cover engaging position, and an oil pressure system for delivering oil into the journal box at the precise moment when the access cover thereof is in an open position, said oil pressure system including an actuator responsive to the movement of the access cover through said guide members adapted to provide a predetermined quantity of oil during each injection of oil into each journal box.

9. A railway journal box oiler adapted to discharge oil into the journal box of a railway car as it moves along a track including journal box lid engaging means positioned along side the track, said means including an elongated substantially horizontal lower guide member adapted to slidably engage and lift the free end of a journal box lid and an elongated substantially horizontal upper guide member adapted to slidably engage and close the free end of a journal box lid, mounting means adapted to urge said engaging means into a journal box lid engaging position, wheel engaging treadle means pivotally connected to said mounting means adapted to elevate said lid engaging means to thereby open said lid, said treadle means being adapted to allow said upper guide member to initially contact and subsequently close each journal box lid after each journal box has been lubricated, oil injection means including an actuator engageable with said lid as it slides along said guide members adapted to release oil into the journal box when the lid thereof is open, and means for supplying oil under pressure to said oil injection means.

10. In a railway car lubricating device for oiling both journals of a car axle simultaneously as the car rolls by, a fixed supporting framework positioned transversely beneath the rails, a movable carriage rotatably carried at each end of said framework adapted to reside in a normally concealed below ground level position, a journal box lid engaging member carried by each of said carriages adapted to slidably contact the journal box covers of a car axle, means for rotating said carriages from an inoperative below ground position into an upright working position, pivotal means responsive to the movement of each passing car operable to raise and lower said lid engaging members to open and close each passing journal box lid, oil pressure means for delivering oil to each passing journal box, and control elements each operable responsive to the engagement of said lids for injecting oil into each journal box when said lid is in an open position.

11. An automatic journal box oiler adapted to lubri-

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cate the journals of a moving railway car comprising, in combination, a pair of journal box lid engaging members on each side of a track adapted to slidably engage each pair of journal box lids as they pass, a rigid base frame of slightly greater length than the track gage positioned below the rails, a carriage mounted for swinging movement about horizontal axes on each end of said base frame, a flange engaging treadle member positioned adjacent each rail, pivotal rod means mounted on each side of the rail centerline on said frame for guiding said treadle members in a generally vertical direction, lever means pivotally mounted below each rail having an inner end engageable with a corresponding treadle member and an outer end of greater length than the inner end outward of each rail, first support members pivotally carried on the outer end of each of said lever means, second support members pivotally carried on the outer ends of each of said movable carriages, first elongated members slidably secured in each of said first support members, second elongated members slidably secured in each of said second support members, said first and second elongated members being normally biased in an extended outward position and providing a supporting cradle for each of said journal box lid engaging members, means below and between the rails for pivoting said movable carriages and lid engaging members from a position of repose to an upright journal box lid engaging position, said treadle members and said lever means being operable in connection with said lid engaging members to open and close the moving journal box lids on each car axle as the wheels thereof engage said treadle members, means cooperative with said movable carriages for guiding and controlling the pivotal movement of said lever means, means for injecting oil under pressure into each journal box as it passes said device, said oiling means including an actuator operated by the moving journal box lid operable to inject oil into each journal box when the lid thereof is open, and enclosure means pivotally mounted adjacent said movable carriages and cooperative with the movement thereof adapted to enclose said device when it is fully retracted and to provide a protective outer wall for said device when it is in an upright working position.

12. A device adapted to lubricate the journals of moving railway car axles including a rigid framework attached transversely to the rails and suspended therebelow, a rotatable outer carriage carried on each end of said framework, hydraulic means interposed between each of said carriages for rotating said carriages about spaced parallel horizontal axes from a below ground inoperative position to an upright working position adjacent each rail, a pair of levers pivotally secured adjacent each end of said framework, each of said levers having an arm extending inwardly of the rail and an arm extending outwardly of the rail, the outer arm being of greater length than the inner arm, railway car wheel engaging foot members inside each rail operatively connected to the inner arms of said levers, a first pivotal apertured support carried between the ends of each pair of the outer arms of said levers, a second pivotal apertured support carried at the outer ends of said carriages, first rigid elongated member slidably mounted in said first support, second rigid elongated member slidably mounted in said second support, a pair of mounting brackets each secured to the outer ends of said first and second elongated members, said mounting brackets being spring biased towards the outer ends of said elongated members, a pair of journal box lid engaging guide members secured to said brackets, each of said guide members adapted to slidably engage opposed journal box lids of a longitudinally moving railway car axle and adapted in response to the movement of the car over said foot members to raise and lower the lids of the journal boxes on each axle, oil nozzle means on each of said brackets adapted to deliver oil into a passing journal box, means actuated by the movement of the journal box lid for distributing oil from said nozzle means to the journal boxes at the precise moment the lids thereof are open and

an oil pressure system adapted to supply oil under pressure to said nozzle means and to said hydraulic means.

13. Railway lubricating apparatus including fixed support means transversely positioned below the rails, a pair of identical opposed rotatable carriages attached at each end of said support means, hydraulic means for rotating said carriages about spaced parallel horizontal axes into an upright position from a normally retracted below rail position, plural lever means each including inner and outer arms, means establishing pivotal connections between each said lever means and said support means for rocking movements of the former in planes normal to the track, railway car wheel engaging means operatively connected to the inner arm of said lever means, first movable elongated support members secured to the outer arms of said lever means, second movable elongated support members secured to the outer end of said carriages, a pair of guide members carried by said movable elongated support members, each of said guide members being adapted to slidably engage the opposed coaxial journal box lids of a moving car, said lever means and said wheel engaging means being operable to impart substantially vertical movements to said guide members to thereby open and close the lids as they move through said guide members, means surrounding said movable supports for biasing said guide members into a journal box lid engaging position, nozzle means in each guide member, valve means in communication with said nozzle means, an actuator on each guide member adapted to open said valve means in response to the movement of the journal box lid through said guide members, means for supplying oil under continuous pressure to said valve means and to said hydraulic rotating means, and means for controlling the pressure in said hydraulic rotating means and said valve means.

14. In railway journal box lubricating apparatus having means for engaging each journal box lid of a car axle as the car moves by and having wheel operated lever means for imparting vertical movement to the journal box lid engaging means to thereby open and close the journal box lids for oiling purposes, the improvement for retracting said apparatus into a normally concealed below rail position during periods of non-use, said improvement comprising a fixed undercarriage attached below the rails and normal thereto and having a longitudinal dimension slightly greater than the track gage, opposed carriages adapted for swinging movement about spaced horizontal axes generally defined by the ends of said undercarriage rotatably connected to each end of said undercarriage, each of said carriages having a relatively short portion thereof extending inwardly of and downwardly from each horizontal axis and having a relatively long portion extending downwardly therefrom so that a relatively small inward displacement of the short portion of said carriage produces a substantial downward rotation of said carriages into a retracted position, a pair of hydraulic cylinders interposed between said opposing carriages at each end thereof, said cylinders each having one end attached to said carriages, a piston in each of said cylinders, a rod carried by said piston extending through said cylinder at the end remote from the end affixed to said carriages and attached at its free end to the other of said carriages whereby movement of said piston in said cylinder causes said carriages to swing about the horizontal axes into or out of an upstanding working position on opposite sides of the track, and a pair of bell crank members attached to each end of said undercarriage cooperable with each of said movable carriages and with the said lever means of said lubricating apparatus to urge said lever means into inoperative position when said carriages are moved into positions of repose, and means for providing fluid under pressure for the operation of said hydraulic cylinder.

15. Apparatus for movably supporting a pair of railway car journal oiling devices arranged on opposite sides of the track and adapted to engage and oil journal boxes

as they pass by including a lower supporting framework suspended below and transverse to the rails, said framework being slightly greater in length than the track gage and having spaced longitudinal side members terminating in scarfed end portions outside the rails, a carriage rotatably mounted at each end of said framework having side members in register with the side members of said framework, the side members of said carriage having scarfed end portions complementary to the scarfed portions of said framework and adapted to allow the rotation of each of said carriages about a horizontal axis adjacent to and spaced outwardly from the scarfed joints defined by the intersection of said carriages and said framework, the side members of said carriages terminating in depending end portions normal to and below the horizontal axes of rotation, a pair of hydraulic cylinders interposed between said carriages, said hydraulic cylinders having oil passageways on the periphery thereof at each end and each having a piston adapted for axial slidable movement therein, a piston rod attached to each of said pistons coaxial with and extending through one end of each of said cylinders, means connecting the free end of said piston rods to each of the end portions of the side members of one of said carriages and the opposite end of said cylinders to the opposed side members of the other of said carriages, means for introducing oil under pressure to the oil passageways of said cylinders and control means for said oil pressure means for selectively retracting or raising said device.

16. A device for raising and lowering mechanism adapted to engage and oil the journal boxes on a railway car axle as the car passes including a rigid substantially rectangular inner support of greater length than width attached to and beneath the rails with the longitudinal axis thereof normal to the rails and being approximately equal in length to the track gage, the side members of said support having means defining parallel spaced horizontal bearings positioned at the ends thereof, carriage members having longitudinal side members rotatably positioned in said inner support adapted for swinging movement about the horizontal bearings thereof, said carriage members being mirror images of each other and adapted for opposed rotation into working positions on each side of the track, each of the side members of said carriage members having at their inner ends a depending leg portion extending below the horizontal bearings of said inner support, the length of said depending leg portion of the side members being substantially less than the length of a corresponding portion thereof extending outwardly of the horizontal bearing, and hydraulic means pivotally connected between the opposed depending leg portions of said carriage members adapted to rotate said carriage members into an upright working position from a normally retracted position of repose below the tracks.

17. In railway car lubricating apparatus for oiling both journals of an axle simultaneously, the combination consisting of a rigid framework secured transversely to the undersurface of the track, said framework extending slightly out from each rail and having at each end thereof horizontal bearing means, a movable carriage adapted to swing into or out of a below ground level position rotatably carried in each bearing means of said framework, each of said carriages being adapted to carry at its outer end railway car journal box oiling apparatus, a pair of hydraulic cylinders each having a piston therein and a piston rod extending therefrom attached at the ends thereof remote from the piston rod to one of said movable carriages, the piston rods of said cylinder being connected at their free ends to the opposite movable carriage, oil communication means at each end of said cylinders, means for supplying oil under pressure to said cylinders, and control means for said oil supply means for operating said cylinders to raise or lower said carriages according to the requirements of a particular time.

18. A railway car lubrication device consisting of a rigid base member hinged to the undersurface of the running rails, a pair of identical carriages each rotatably mounted on the opposite ends of said base members adapted to swing upwardly and outwardly beside each rail, journal box lid engaging and manipulating means mounted on each of said carriages, means on said carriages for biasing said journal box lid engaging and manipulating means into a lid contacting position on each side of the track, treadle means positioned on the inner side of each rail within said base member, lever means cooperative with said treadle means for imparting substantially vertical movements to said lid engaging and manipulating means, pivotal means for guiding said treadle means during the movement thereof, means adjacent said lid engaging and manipulating means for delivering oil under pressure to each journal box as it passes through said lid engaging and manipulating means, a trigger assembly on each lid engaging and manipulating means adapted to yield in response to the movement of a journal box lid through said lid engaging and manipulating means, oil pressure means including solenoid actuated valve means in communication with said oil delivery means, means interposed between and cooperative with said trigger assembly and said solenoid actuated valve means for energizing said solenoid actuated valve to allow oil to flow into each journal box during the precise moment said lid engaging and manipulating means operate to hold said lid open, and hydraulic means adapted to cause said movable carriages to rotate from a position of repose below the rails to a position of operation adjacent the rails.

19. In a railway car journal box lubricating device, the combination comprising rigid support means secured in an underlying manner with respect to the tracks, a pair of movable outer frames each attached at their inner ends to the outer end of said support means and adapted to rotate about spaced parallel horizontal axes situated adjacent the outer edge of and below the rails, hydraulic means interposed below the rails between said outer frameworks adapted to move each of said frames into and out of a working position, a pair of operating levers carried within each of said outer frames each having an inner arm extending slightly within the inner surface of the rails and having an outer arm extending at a greater distance from the outer surface of the rails, each pair of said levers being pivoted about horizontal axes spaced slightly outward of said rails, a pair of treadle members each mounted closely adjacent the inner surface of the rails and connected at their lower edges to the inner arms of said operating levers, first rotatable yieldable support means carried on the outer end of said operating levers, second rotatable yieldable support members carried on the outer end of each of said movable frames, said first and second support members converging at their ends remote from said operating levers and said outer frames, respectively, a substantially longitudinal elongated bracket connecting each pair of said support members at the line of convergence thereof, journal box lid receiving means secured to each of said brackets, said journal box lid receiving means each including an upper and a lower guide member adapted to raise and lower the lid of a journal box as it passes therethrough, said treadle members responsive to engagement thereof with the flange of a railroad car wheel passing thereover with said lid receiving means causing vertical movement of said upper and lower guide members when said lid receiving means slidably contacts the lid of a moving journal box, means for injecting oil into said journal box when the lid thereof is in an open position, said injecting means including means responsive to contact with said lid of said lid receiving means for actuating said injecting system to deliver a predetermined amount of oil into each journal box as it passes through said lid receiving member, and means cooperative with said outer frames for providing an enclosure for said device when it is in a retracted position and an outer guard

rail for said device when it is in an upstanding working position.

20. The device of claim 19 wherein said treadle members are characterized by having at each end thereof a straight control wheel contacting upper section bounded on each end by gently sloping downwardly curved section to thereby reduce the shock imparted to said treadle members upon contact thereof by the flanges of a moving railway car wheel and wherein said treadle members are moved out of a wheel engaging position when said device is in a retracted non-working position.

21. The device of claim 20 wherein each of said treadle members are guided in their movement by radially supported arms mounted within the inner support means of said device.

22. Apparatus for lubricating railway car journal boxes as the car moves along a track including a pair of lid engaging members adapted to slidably contact the free end of a hinged journal box lid, yieldable mounting means for said lid engaging members, wheel engaging means adapted to cause said lid engaging members to open and close said lid after its engagement therewith, and means for injecting oil into the journal box.

23. Railway journal box lubricating apparatus comprising, in combination, upstanding yieldable support means positioned adjacent the track upon which the cars to be lubricated move along, a first elongated member on said support means, a second elongated member on said support means, said first and second elongated members being vertically spaced and presenting upper and lower guide surfaces adapted to slidably receive the depending end of the hinged lid of a railway car journal box as the car passes by, wheel engaging means pivotally linked to said elongated members operable to alternately open and close each journal box lid as it passes, and an oil pressure system for injecting oil into the journal box.

24. Railway car journal box lubricating apparatus comprising, in combination, upstanding yieldable support means positioned adjacent the track carrying the cars to be lubricated, a first guide member on said support means, a second guide member on said support means, said guide members being arranged to provide longitudinal upper and lower guide surfaces slidably receiving therebetween the free end of the hinged journal box cover carried at an end of each railway car axle, wheel engaging means cooperative with said support means to impart generally vertical movements to said guide members as a journal box cover passes therebetween whereby to successively open and close the journal box cover, and means for injecting oil under pressure into the journal box as it passes through said guide members.

25. A railway journal box oiler adapted to discharge oil into the journal box of a railway car as it moves along a track including journal box lid engaging means positioned alongside the track, said means including an elongated substantially horizontal lower guide member adapted to slidably engage and lift the free end of a journal box lid and an elongated substantially horizontal upper guide member adapted to slidably engage and close the free end of a journal box lid, mounting means adapted to urge said engaging means into a journal box lid engaging position, wheel engaging treadle means pivotally connected to said mounting means adapted to elevate said lid engaging means to thereby open said lid, said treadle means being adapted to allow said upper guide member to initially contact and subsequently close each journal box lid after each journal box has been lubricated, oil injection means adapted to release oil into the journal box, and means for supplying oil under pressure to said oil injection means.

26. In a railway car lubricating device for oiling both journals of a car axle simultaneously as the car rolls by, a fixed supporting framework positioned transversely beneath the rails, a movable carriage rotatably carried at each end of said framework adapted to reside in a nor-

mally concealed below ground level position, a pair of spaced journal box lid engaging members carried by each of said carriages adapted to slidably contact and open and close the journal box covers of a car axle, means for rotating said carriages from an inoperative below ground position into an upright working position, pivotal means responsive to the movement of each passing car operable to raise and lower said lid engaging members to open and close each passing journal box lid, and oil pressure means for delivering oil to each passing journal box.

27. An automatic journal box oiler adapted to lubricate the journals of a moving railway car comprising, in combination, a pair of journal box lid engaging members on each side of a track adapted to slidably engage each pair of journal box lids as they pass, a rigid base frame of slightly greater length than the track gage positioned below the rails, a carriage mounted for swinging movement about horizontal axes on each end of said base frame, a flange engaging treadle member positioned adjacent each rail, pivotal rod means mounted on each side of the rail centerline on said frame for guiding said treadle members in a generally vertical direction, lever means pivotally mounted below each rail having an inner end engageable with a corresponding treadle member and an outer end of greater length than the inner end outward of each rail, first support members pivotally carried on the outer end of each of said lever means, second support members pivotally carried on the outer ends of each of said movable carriages, first elongated members slidably secured in each of said first support members, second elongated members slidably secured in each of said second support members, said first and second elongated members being normally biased in an extended outward position and providing a supporting cradle for each of said journal box lid engaging members, means below and between the rails for pivoting said movable carriages and lid engaging members from a position of repose to an upright journal box lid engaging position, said treadle members and said lever means being operable in connection with said lid engaging members to open and close the moving journal box lids on each car axle as the wheels thereof engage said treadle members, means cooperative with said movable carriages for guiding and controlling the pivotal movement of said lever means, means for injecting oil under pressure into each journal box as it passes said device, and enclosure means pivotally mounted adjacent said movable carriages and cooperative with the

movement thereof adapted to enclose said device when it is fully retracted and to provide a protective outer wall for said device when it is in an upright working position.

28. Railway lubricating apparatus including fixed support means transversely positioned below the rails, a pair of identical opposed rotatable carriages attached at each end of said support means, hydraulic means for rotating said carriages about spaced parallel horizontal axes into an upright position from a normally retracted below rail position, plural lever means each including inner and outer arms, means establishing pivotal connections between each lever means and said support means for rocking movements of the former in planes normal to the track, railway car wheel engaging means operatively connected to the inner arm of said lever means, first movable elongated support members secured to the outer arms of said lever means, second movable elongated support members secured to the outer end of said carriages, a pair of guide members carried by said movable elongated support members, each of said guide members being adapted to slidably engage the opposed coaxial journal box lids of a moving car, said lever means and said wheel engaging means being operable to impart substantially vertical movements to said guide members to thereby open and close the lids as they move through said guide members, means surrounding said movable supports for biasing said guide members into a journal box lid engaging position, nozzle means in each guide member, valve means in communication with said nozzle means, an actuator adapted to open said valve means during the movement of the journal box lid through said guide members, means for supplying oil under continuous pressure to said valve means and to said hydraulic rotating means, and means for controlling the pressure in said hydraulic rotating means and said valve means.

References Cited by the Examiner

UNITED STATES PATENTS

1,332,797	3/20	Brink.	
2,720,940	10/55	Gardner et al.	184—2
3,034,453	5/62	Tilden.	
3,155,191	11/64	Nelson	184—2

FOREIGN PATENTS

1,154,000	11/57	France.
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