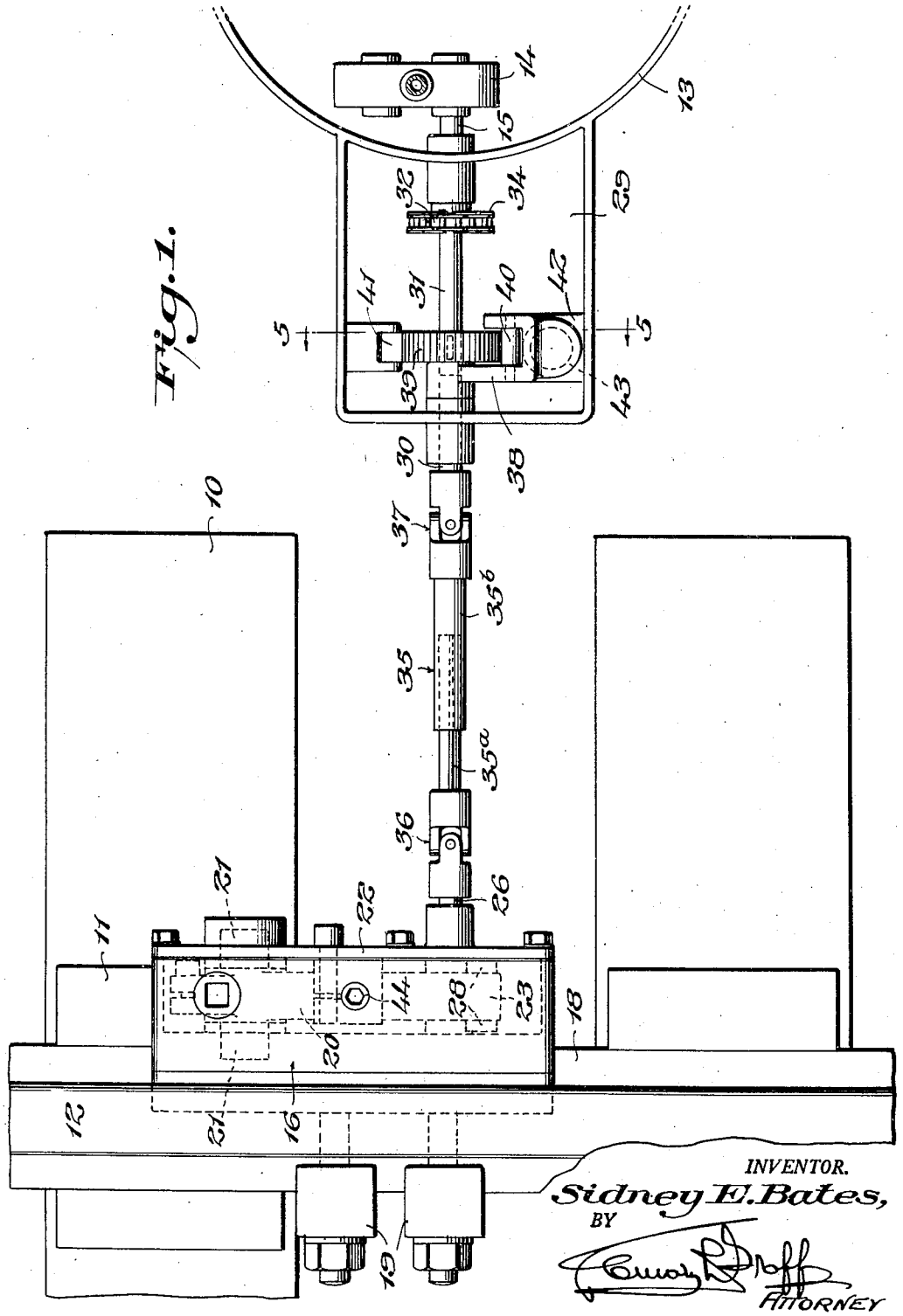
Feb. 21, 1950 S. E. BATES 2,498,519

ACTUATING MEANS FOR RAIL LUBRICATING PUMPS

Filed Jan. 30, 1948 3 Sheets-Sheet 1

Fig. 1.



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Filed Jan. 30, 1948 3 Sheets-Sheet 2

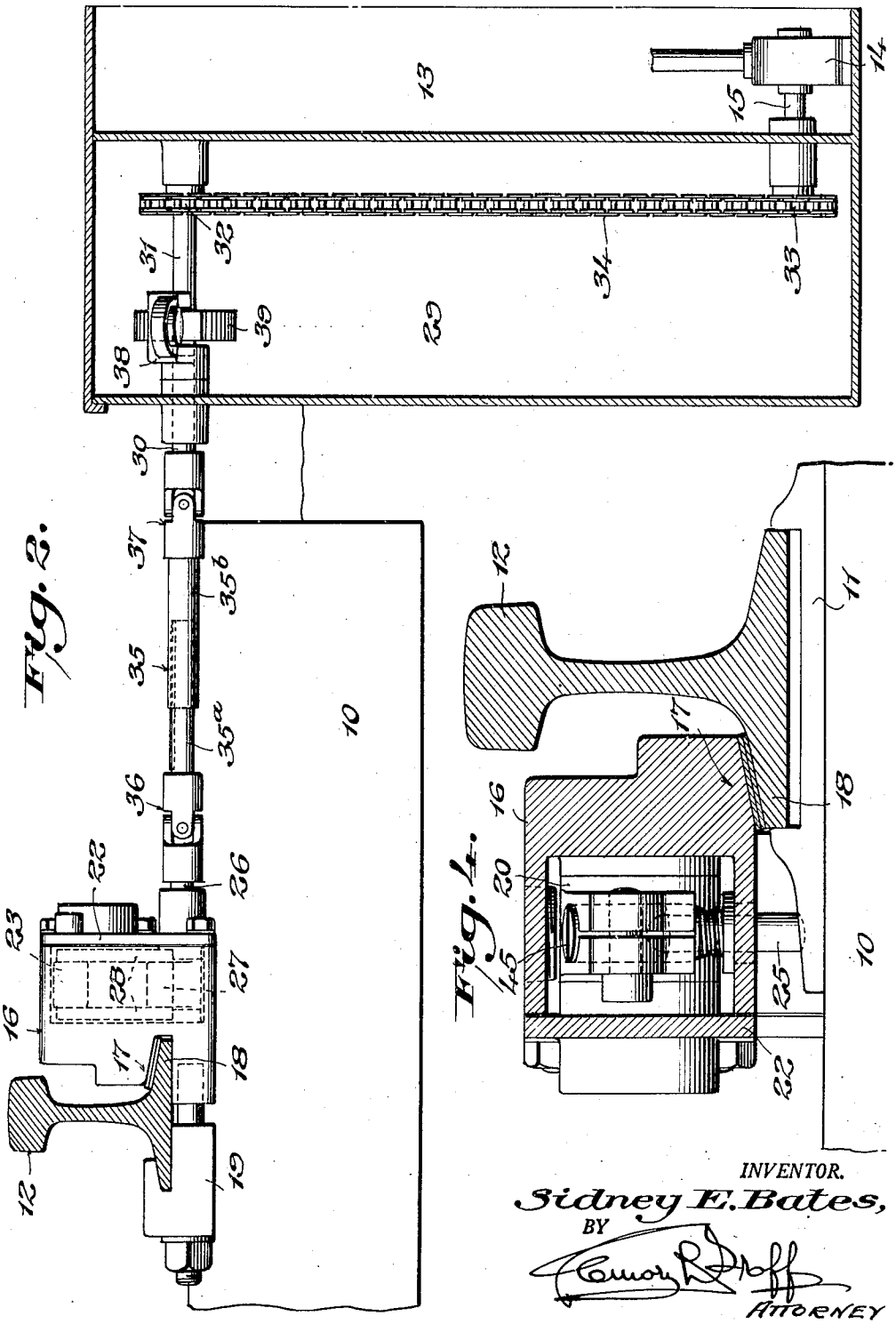


Fig. 2.

Fig. 4.

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ACTUATING MEANS FOR RAIL LUBRICATING PUMPS

Filed Jan. 30, 1948 3 Sheets-Sheet 3

Fig. 3.

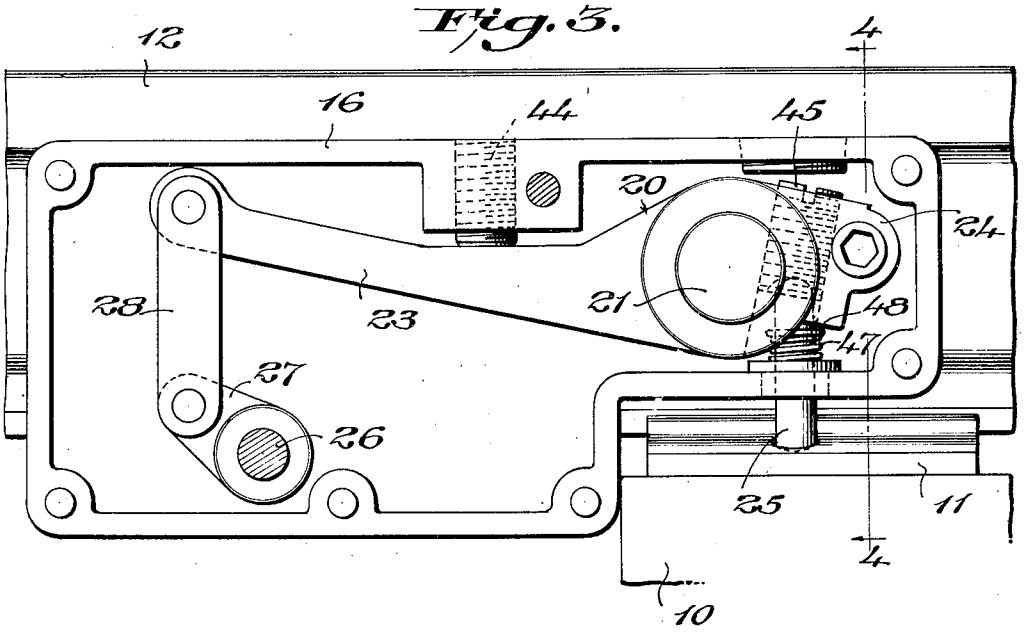


Fig. 5.

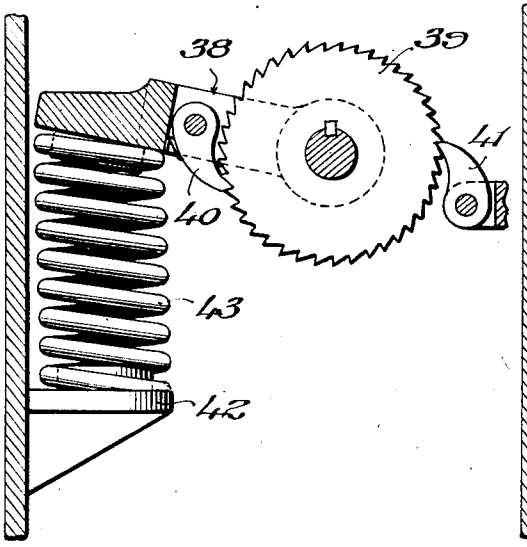
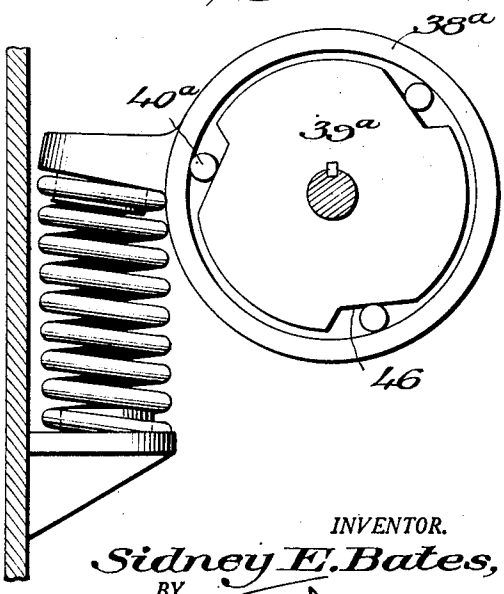


Fig. 6.



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UNITED STATES PATENT OFFICE

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ACTUATING MEANS FOR RAIL LUBRICATING PUMPS

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Application January 30, 1948, Serial No. 5,297

4 Claims. (Cl. 184—3)

1

This invention relates to track lubricators and has particular reference to improvements in actuating means for the pumps thereof.

More particularly, the present actuating means is of the type which comprises a two-arm lever mounted upon a rail to move vertically therewith, a fixed support sustaining one of the arms of the lever against downward movement whereby downward movement of the rail and the lever relative to said support results in the lever being rocked in one direction, spring means effective to rock the lever in the opposite direction upon upward movement of the rail relative to said support, and a ratchet connection between said lever and a pump shaft whereby rocking of said lever produces intermittent rotation of the pump shaft in a single direction to cause the pump to be operated intermittently to deliver lubricant from a reservoir to a rail to be lubricated.

In a pump actuating means of the type mentioned the pump usually is mounted in or upon the lubricant reservoir which usually is buried in the ground adjacent to the track. Due to settling or other causes, the lubricant reservoir may change its position relative to the track, or the track may shift or otherwise change its position relative to the lubricant reservoir. In any event, to maintain an operative connection between the pump operating lever and the pump, regardless of changes in position which may occur between the lubricant reservoir and the track, the connection between the lever and the pump includes splined, telescoped shaft sections and universal joints. In time the said telescoped shaft sections and the universal joints may wear and cause lost motion which it is essential to take up to insure a constant amount of operation of the pump for each rocking movement of the pump actuating lever.

Accordingly, one of the objects of the present invention is to combine the spring which rocks the lever in one direction with the ratchet by which rocking motion of the lever is transmitted to the pump shaft, and to locate said spring and ratchet relatively remote from the rail so that they act to take up any lost motion which may develop in the relatively long line of shafting including telescoped shaft sections and the universal joints, whereby the amount of operation of the pump for each rocking movement of the lever will remain constant despite any lost motion which may develop due to wear or other causes between the elements connecting the lever with the pump.

A further object is to locate the ratchet at a

2

point remote from the rail position so as to remove it from the zone of shocks and jars incident to traffic, and furthermore, to locate the parts which are subjected to the greatest wear in a place where they are readily accessible for repair, adjustment, and inspection.

With the foregoing and other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in a pump actuating means embodying the novel features of construction, combination and arrangement of parts as are illustrated by way of example in the accompanying drawings, and as will be hereinafter more fully described and claimed.

In the accompanying drawings, wherein like characters of reference denote corresponding parts in the different views:

Fig. 1 is a top plan view of a portion of a railway track having operatively associated therewith one practical form of the present pump operating means.

Fig. 2 is a transverse section through the structure shown in Fig. 1.

Fig. 3 is an enlarged side elevation of the rail-carried housing with its cover plate removed to show the parts contained therein.

Fig. 4 is a section on the line 4—4 of Fig. 3.

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

Fig. 6 is a view similar to Fig. 5 illustrating a ratchet or clutch mechanism of alternative form.

Referring to the drawings in detail, 10 designates a railway tie, 11 designates a tie plate superimposed thereon, 12 designates a rail superimposed upon said tie plate, and 13 designates a lubricant reservoir sunk into the ground at a suitable location and containing a pump 14 for effecting delivery of lubricant therefrom to a suitable distributor (not shown) which is understood to be mounted upon the rail 12, or upon another rail, in accordance with known practice, to deliver the lubricant at points to be picked up by the flanges of locomotive and car wheels and distributed by the latter along the gage side of the head of the rail.

The pump 14 may be of any suitable type and includes a rotary drive shaft 15 which is operated by the means constituting the present invention.

The means constituting the present invention comprises an elongated, narrow-width housing 16 which is provided at its inner side with a jaw formation 17 to receive a base flange 18 of the rail 12 and with suitable clamp means 19 for drawing it toward and into rigid assembly with the rail whereby it is constrained to move verti-

cally with the rail as the latter partakes of its vertical undulating or wave motion due to the passage of rolling stock over the same.

The housing 16 extends longitudinally relative to the rail 12 and has therein and extending longitudinally thereof, a two-arm lever 20 which is suitably pivoted for rocking movement in a vertical plane. To pivotally mount said lever the same may be provided, for example, with horizontally disposed, transversely extending trunnions 21 which may be journaled in suitable bearings in the inner and the outer side walls of the housing 16, the outer side wall of said housing being comprised, for example, by a cover plate 22 which is removable to afford access to said housing.

The pivot of the lever 20 is adjacent to one end of said lever whereby the two arms 23 and 24 of the latter are long and short, respectively. Between the short arm 24 of said lever and a fixed support, afforded in the present instance by the tie plate 11, is interposed a rod 25. Consequently, downward movement of the rail, the housing 16 and the lever 20, relative to the support 21, causes said lever to be rocked in one direction, namely, a direction in which the longer arm 23 thereof swings downwardly. Conversely, upward movement of the rail relative to said fixed support permits rocking of said lever in the opposite direction.

Extending transversely of the housing 16 below the free end portion of the longer arm 23 of the lever 20 and mounted for rotation in suitable bearings in the inner and the outer side walls of said housing, is a horizontal shaft 26 from which extends a crank arm 27 to which the said longer arm 23 of said lever 20 is connected by a link or links 28. Thus, the shaft 26 is rocked in response to rocking movements of the lever 20.

At a side of the lubricant reservoir 13 is a chamber 29 in the upper part of which are journaled two alined shafts 30 and 31 and into the lower part of which extends the pump shaft 15. On the shafts 31 and 15 are sprocket wheels 32 and 33, respectively, which are connected together by a sprocket chain 34, whereby a driving connection is provided between the shaft 31 and the pump 14, while connecting together the shafts 26 and 30 is an intermediate shaft 35.

The intermediate shaft 35 is composed of a pair of telescoped, splined sections 35^a and 35^b, respectively, which are connected with the shafts 36 and 30 by universal joints 36 and 37, respectively. Thus, even though the distance between the shafts 26 and 30 may change for any reason as, for example, because of shifting of the track or of the lubricant reservoir, or, if for any reason the shafts 26 and 30 may become more or less disalined, the operative driving connection between said shafts 26 and 30 will be maintained.

Suitably fixed to the shaft 30 is an arm 38, while suitably fixed to the shaft 31 is a ratchet wheel 39 with which cooperates a pawl 40 that is carried by the arm 38. Thus, each time the lever 20 is rocked, an increment of rotation is imparted to the shaft 31. In this connection, the arrangement of the arm 38, the pawl 40 and the teeth of the ratchet wheel 39 is such that the shaft 31 is rotated positively in response to the rocking movement imparted to the lever 20 by downward movement of the rail 12 relative to the fixed support 11 and remains idle during reverse rocking movement of said lever when the rail moves upwardly relative to said fixed support. A holding pawl 41 also cooperates with the ratchet wheel 39

to prevent any return rotation of the shaft 31 following its rotation by the arm 38 and the pawl 40.

Between the arm 38 and a suitable fixed abutment 42, which may be carried by a wall of the chamber 29, is a spring 43 which acts through said arm to tend constantly to rotate the shaft 30 in a direction counter to the direction in which it is rotated by downward movement of the rail 12. Consequently, each time the rail moves upwardly, the spring 43 acts to lift the arm 38 and to rotate the shafts 35 and 26 in directions to elevate the long arm 23 and to depress the short arm 24 of the lever 20.

Because of the ratchet arm 38 and its associated spring 43 being disposed to act through the sections 35^a and 35^b of the shaft 35, and through the universal joints 36 and 37, to rock the lever 20 in a direction counter to the direction in which it is rocked by downward movement of the rail 12, it is manifest that said shaft sections 35^a and 35^b and said universal joints will constantly be subjected to torsional stresses in directions counter to the directions in which torsional stresses are set up in the same by downward movement of the rail 12. Therefore, despite any wear which may develop between the shaft sections 35^a and 35^b and in the universal joints 36 and 37, there will always be maintained a wear-compensating relationship in the connections between the shaft 26 and the shaft 30, as well as between the lever 20 and the link 28, so that the amount of operation of the pump 14 will be the same each time the rail 12 is depressed.

An adjustable stop screw 44 may be threaded in the top wall of the housing 16 to limit rocking movement of the lever 20 by the spring 43, while in the shorter arm 24 of said lever 20 may be threaded a screw 45 to serve as an adjustable abutment for the upper end of the rod 25. The adjustments afforded by the screw 44 and 45 enable the amplitude of rocking movement of the lever 20 to be regulated regardless of the amplitude of relative vertical movement between any particular rail and the tie plate or other fixed element 11.

Summarizing, it will be apparent that as the wheels of rolling stock pass over the rail 12 and produce relative vertical movement between the tie plate 11 and that portion of the rail which carries the housing 16 and the lever 20, said lever will be rocked and for each rocking movement of the same an increment of rotation will be imparted to the pump 14 with the result that a small amount of lubricant will be delivered by the latter.

Fig. 6 of the drawings illustrates that, if desired, a one-way clutch of the ball or roller type may be employed in lieu of the pawl and ratchet mechanism shown in Fig. 5. In other words, in Fig. 6 a drum 38^a corresponds to the ratchet arm 38 of Fig. 5; a disc 39^a provided with chordal faces 46 corresponds to the ratchet wheel 39 of Fig. 5, and rolling bodies 40^a between the drum 38^a and the chordal faces 46 of the disc 39^a correspond to the pawl 40 of Fig. 5, all as is well known in the clutch art.

Preferably, but not necessarily, a suitable spring 47 is provided to urge the rod 26 constantly upwardly and thus maintain its upper end engaged with the adjusting screw 29, thus to avoid rattling of said rod in the event the distance between the lower end of said screw 29 and the top of the tie plate should at any time exceed the length of said rod. The spring 47 may be a coil spring sur-

rounding the rod 26 and reacting from the bottom of the housing 16 upwardly against a shoulder 48 on said rod.

Without further description, it is thought that the construction and operation of the present pump actuating means will be clearly understood and its advantages appreciated. It is desired to point out, however, that the structure illustrated is capable of modifications in various different respects within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. Actuating means for a device to be operated, said means comprising a lever, means mounting said lever upon a railway rail for vertical movement therewith, means whereby downward movement of the rail rocks said lever in one direction, a shaft mounted on the rail, a crank arm on said shaft, a connection between said lever and said crank arm whereby said shaft is rocked responsive to rocking of said lever by downward movement of the rail, a second shaft, a third shaft connected at one end by a universal joint to said first mentioned shaft and at its other end by a universal joint to said second shaft, a shaft to be driven, a driving ratchet element fixed to said second shaft, a driven ratchet element fixed to said shaft to be driven, and a spring acting through said driving ratchet element and said second and third and said first mentioned shafts and said universal joints to rock said lever in the opposite direction upon upward movement of the rail and to maintain torque in said second and third and said first mentioned shafts and said universal joints.

2. In a track lubricator including rotary motion transmitting shafting including universal joints and splined sections extending from the rail position to a housing portion of the lubricant reservoir located relatively remote from the rail position; a device carried by the rail and including a pivoted lever, a tie plate contacting member engaging one end of said lever, link and crank means connecting the other end of said lever with the end of said shafting near the rail whereby relative movement between the rail and the tie plate will cause said lever to rock and impart intermittent rotary movement to said shafting, a driven shaft mounted in the housing portion of the lubricant reservoir and operatively connected with the pump, and clutch means between the driven shaft and the motion transmitting shafting, said clutch means including a radial arm rigid with said motion transmitting shafting and a spring engaging said arm for constantly maintaining the motion transmitting shafting under torsional

stress to take up play in said shafting and lever.

3. Actuating means for a device to be operated, said means comprising a lever mounted upon a railway rail for vertical movement therewith and for rocking movement relative thereto, means whereby downward movement of the rail rocks said lever in one direction, a shaft mounted on the rail, a crank arm on said shaft connected to said lever so that said shaft is rocked by downward movement of the rail, a second shaft, a driving connection between said shafts, a shaft to be driven, a driving ratchet element fixed to said second shaft, a driven ratchet element fixed to said shaft to be driven, and a spring acting through said driving ratchet element and said first and second shafts and the connection between the latter to rock said lever in the opposite direction upon upward movement of the rail and to maintain torque in said first and second shafts and the connection therebetween.

4. Actuating means for a device to be operated, said means comprising a lever mounted on a railway rail for vertical movements therewith and for rocking movements relative thereto, means whereby downward movement of the rail rocks said lever in one direction, a shaft mounted on the rail, a connection between said shaft and said lever so that said shaft is rocked by downward movement of the rail, a second shaft, a driving connection between said shafts, a shaft to be driven, a driving ratchet element fixed to said second shaft, a driven ratchet element fixed to said shaft to be driven, and a spring acting through said driving ratchet element and said first and second shafts and the connection between the latter to rock said lever in the opposite direction upon upward movement of the rail and to maintain torque in said first and second shafts and the connection therebetween.

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