Nov. 3, 1936. W. C. HEIDENTHAL 2,059,235

RAIL LUBRICATOR

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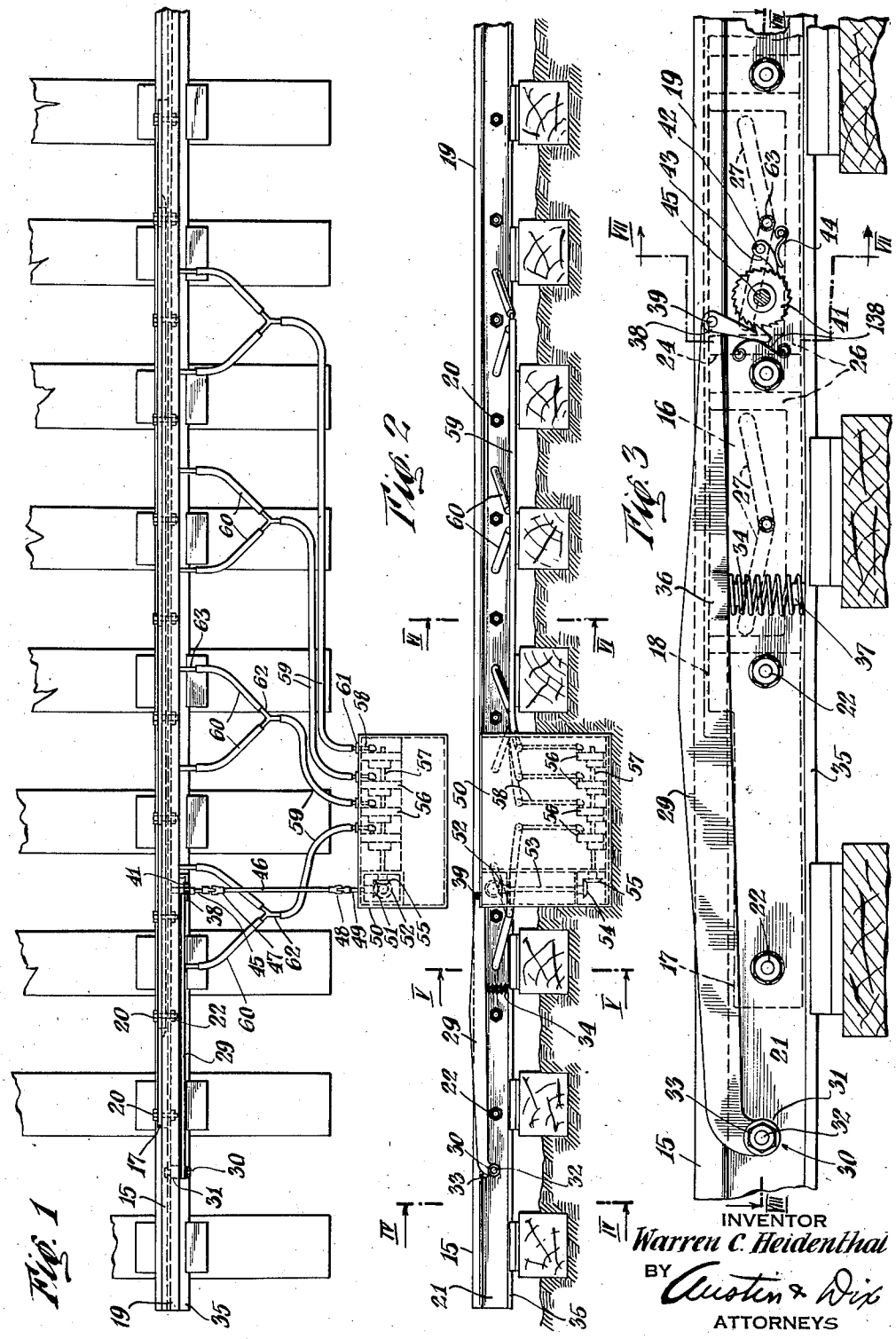


Fig. 1

Fig. 2

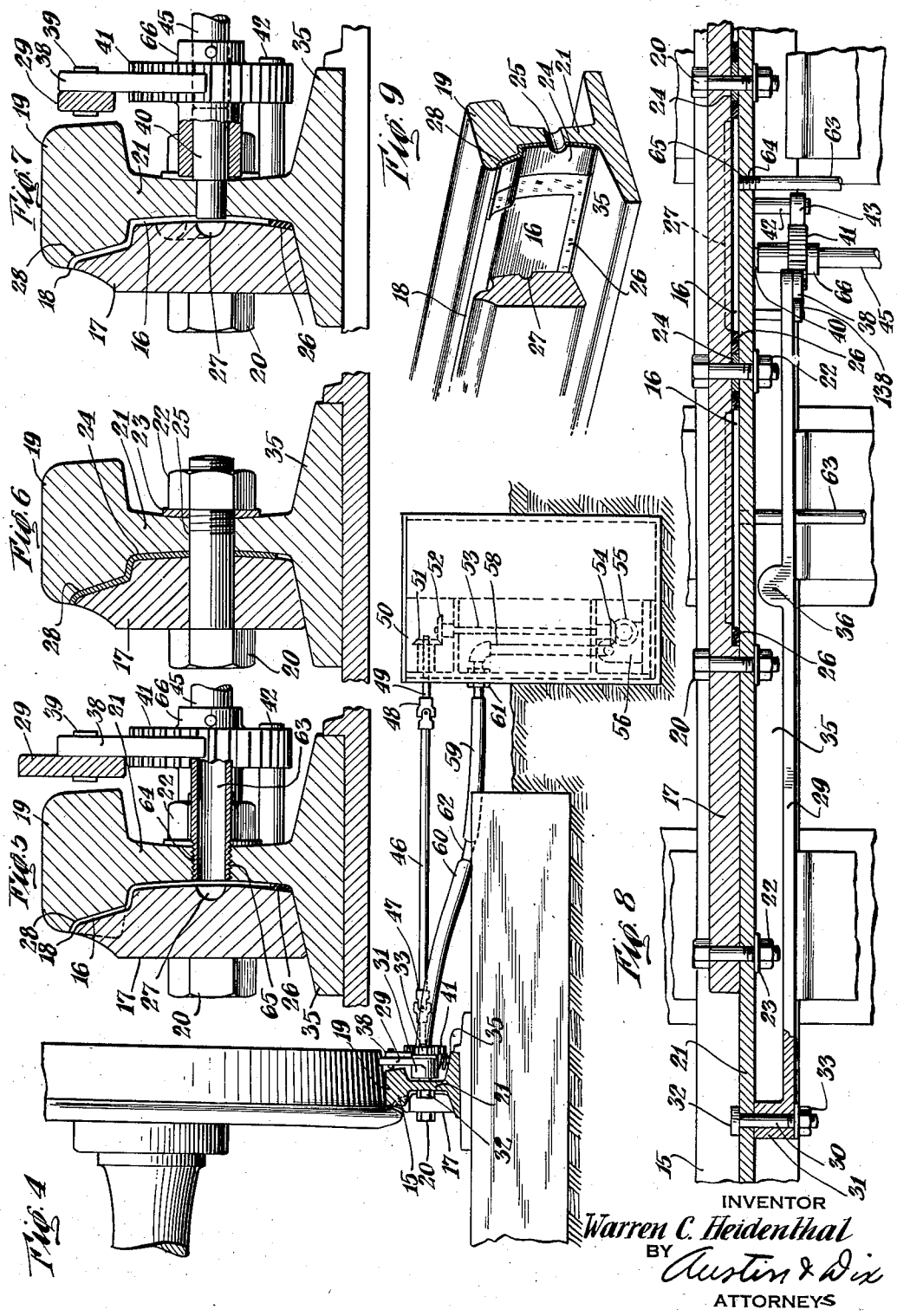
Fig. 3

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2,059,235

RAIL LUBRICATOR

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13 Claims. (Cl. 184—3)

This invention relates to lubricating means for railway tracks, and more particularly lubricating means for curved railway tracks. The invention is especially useful in connection with lubricating the inner face of the head of the outer rail in a curved section of track.

According to the invention, lubricant is carried to a slot in the gauge side of the rail which is to be lubricated and is there picked up by the flanges of passing wheels which become coated therewith, and which carry the lubricant along the gauge side of the head.

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

In accordance with the present invention, it has been found possible to construct lubricating means for the purpose described, wherein no moving parts need make contact with the wheel flanges or the inner rail face, and wherein a simple construction will provide effective lubrication of these parts.

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

Figure 1 is a plan view of a rail to which the invention is applied;

Fig. 2 is an elevation of the apparatus illustrated in Figure 1;

Fig. 3 is an elevation similar to Fig. 2, the parts being shown on an enlarged scale;

Fig. 4 is a section on the line IV—IV of Fig. 2 illustrating the operation of the lubricating means;

Fig. 5 is a section on the line V—V of Fig. 2, certain parts being omitted for simplicity;

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

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

Fig. 8 is a section on the line VIII—VIII of Fig. 3; and

Fig. 9 is a perspective view of a part of the lubricating apparatus, the elements therein having their ends shown in section.

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

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

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now more particularly to the drawings forming a part of this specification, it will be seen that they show an outer rail 15 and means adjacent the rail forming a reservoir 16 between itself and the rail. The rail is here illustrated as being straight, but obviously it may be curved. As here shown, a plurality of reservoirs are formed by a stationary delivery plate 17, which is constructed in the general form of the well known fish plate which is ordinarily employed to connect rail ends or to strengthen the web of a single rail. The rail 15 and the stationary plate 17 are so related as to form a substantially continuous slot 18 between them at the inner face of the head 19 of the rail (see Fig. 9). The slot 18 extends over a number of reservoirs, eight reservoirs being shown in Fig. 1. The slot 18, obviously, is long enough to apply a substantially continuous line of grease to a considerable length of wheel flange.

The rail and the stationary plate are conveniently attached by means of bolts 20 passing through the stationary plate and the web 21 of the rail, nuts 22 serving to tighten the bolts 20, and washers 23 being applied adjacent the nuts 22 in the usual way.

In order that the required space 18 may be maintained between the stationary plate 17 and the rail 15, spacers are provided at intervals between the rail and the stationary plate. As here shown, these spacers comprise shims 24 adjacent the holes 25 in the rail flange 21 through which the bolts 20 extend. Gaskets 26 between the rail and the stationary plate insure a tight reservoir from which the lubricant will not leak. The spacers or shims 24 and the gaskets 26 preferably terminate at their upper ends somewhat below the top of the stationary plate 17, so that the slot 18 becomes a substantially continuous slot. Obviously these upper ends may be pointed in order to facilitate further the action of the slot 18 as a continuous slot.

In order to increase the size of the reservoir and also to provide a steadier flow of lubricant through the slot 18, a groove 27 may be formed on the inner face of the stationary plate.

It is preferred to cut away the inner part of the head 19, as shown at 28, to give the stationary plate a conformation which will form the substantially continuous slot or crevice 18 at the inner face of the rail (see Figs. 5, 6 and 7). It will be noted that the inner cut-away part 28 of the head 19 and the reenforcing plate 17 is so shaped that the reservoirs 16 have a decided lateral bend at the top before opening out into slots 18 (Figs. 5, 6 and 7). This causes the lubricant forced out through the slots 18 to be directed laterally against the flanges of the wheels. Thus, the lubricant is not carried to the upper surface of the head upon which the wheel treads bear, but is applied to those surfaces with which the wheel flanges contact. In passing over the track therefor, the flanges of the wheels of both the locomotive and the rolling stock will pick up any lubricant which is at or adjacent the substantially continuous slot 18, and will carry this lubricant along the inner face of the adjacent rail head beyond the rail lubricator for an appreciable distance in a well known manner, thus interposing a film of lubricant between the moving parts and reducing the friction of contact. At the same time, the top of the rail head will remain substantially clear of lubricant so that the necessary driving friction will not be affected.

Automatic means is provided for supplying lubricant, under pressure, to the reservoir. If this were not done, the lubricant at the substantially continuous slot 18 would soon be exhausted and the apparatus would cease to function.

As here shown, a ramp 29 is provided immediately adjacent the top of the rail and normally extending a short distance above the rail top. The ramp 29 is cammed in two directions along the rail. The ramp is pivoted at 30, for instance, by means of a unitary collar 31 on the ramp end and a journal which may take the form of a bolt 32 attached by a nut 33 to the web 21 of the rail 15. A helical spring 34 is held in place between the ramp 29 and the flange 35 of the rail 15 by means of a lug 36 on the lower face of the ramp and a lug 37 to the upper face of the rail flange 35. Thus, pressure on top of the ramp 29 by the tread of a wheel passing along the rail 15 will depress the ramp against the compression of the spring 34; and as soon as the wheel has passed, the spring 34 will cause the ramp to rise to its original position. The ramp 29 is thus oscillated about the pivot 30 as the succession of wheels in a passing train rolls over its upper surface.

At the end of the ramp, which is distant from the pivot 30, a driving pawl 38 is pivoted, as at 39. As will be apparent, the driving pawl will be lowered as each wheel passes over the ramp 29. As each wheel leaves the ramp it will be immediately raised by the action of the spring 34. Accordingly, the driving pawl 38 undergoes a vertical oscillation with the passing of a train.

Attached to the web 21 of the rail 15, adjacent the driving pawl 38, is a spindle 40 upon which a ratchet wheel 41 is journalled. The position of the ratchet wheel 41 is such that the driving pawl 38 will make operating contact therewith. A leaf spring 138 secured to the rail serves to keep the pawl 38 always in contact with the ratchet wheel. Also carried by the web 21 of the rail 15 is a second spindle 42 upon which a retaining pawl 43 is journalled. The position of the second spindle 42 and the length of the retaining pawl 43 are such that contact may be made between the retaining pawl and the ratchet wheel 41. A leaf-spring 44 serves to press the retaining pawl 43 constantly against the ratchet wheel 41.

From the above description, it will be obvious that oscillation of the ramp 29 about the pivot 30 will cause the driving pawl 38 to turn the ratchet wheel 41 in clockwise direction, as viewed in Fig. 3. It will also be obvious that the retaining pawl 43 will prevent the ratchet wheel 41 from turning, except in a clockwise direction.

The ratchet wheel 41 has a hub 66 thereon which is keyed to a shaft 45 concentric with the spindle 40. The shaft 45 is coupled to a connecting shaft 46 by means of a universal joint 47. The connecting shaft 46 is in turn connected by means of a second universal joint 48 to a stub shaft 49 which is journalled in a pump housing 50. A bevel gear 51 is fixed to the end of the stub shaft 49 within the pump housing 50 and meshes with a second bevel gear 52 which is also journalled in the pump housing. A shaft 53 is fixed at one end of the second bevel gear 52 and carries at its other end a third bevel gear 54, all within the pump housing. A fourth bevel gear 55 meshes with the third bevel gear 54 and serves to drive a lubricating pump for supplying lubricant to the reservoir 16. The lubricating pump may be of any known or suitable construction, for instance, a gear pump 56 or a series of gear pumps, all on a single shaft 57.

One or more stationary pipes 58, including hose sections 59 and 60 and nipple connections 61, 62, 63, serves to carry lubricant from the pump or pumps to the reservoir 16. To this end the final nipple 63 is threaded, as at 64, and extends through a threaded hole 65 in the web 21 of the rail 15 (see Fig. 5).

The lubricating apparatus is preferably positioned in the tangent track immediately preceding the curve; since the wheel flanges will pick up the lubricant and carry it to and along the curve. On long curves, however, lubricating apparatus may be positioned on the curve itself.

From the above description, the operation of the lubricating means will be obvious. As the outer wheels of the train pass over the outer rails in the curve or in the tangent track before reaching the curve, they successively depress the ramp 29 while the latter returns to its elevated position between each pair of depressions because of the action of the helical spring 34. The operating pawl 38 at the end of the ramp rotates the ratchet wheel 41 through a fraction of a revolution following each depression of the ramp 29; and the spur gear, through the train of shafts and connections which has been described, operates the pump or pumps, which forces the lubricant into the reservoir through the pipe connections. As a result the lubricant flows through the substantially continuous slot 18 to the inner face of the head of the outer rail and to the adjacent face of the stationary plate 17. The wheel flanges passing the slot 18 come into contact with the lubricant and become coated therewith, carrying the lubricant along the inner rail face for a considerable distance.

From what has been said above, it will be seen that a simple and effective means of lubricating railway curves has been described and that this means requires a minimum of moving parts. No moving part is required for directly applying the lubricant either to the rail or to the wheel flange and the danger of destruction of such

moving parts and failure of the apparatus in this respect is thus eliminated.

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

What is claimed is:

1. Apparatus for lubricating railway curves comprising an outer rail having a portion of the inner face of its head cut away, and a stationary plate spaced from the inner side of said rail to form a reservoir between said stationary plate and said rail, said stationary plate providing a substantially continuous slot between the top of said stationary plate and the cut-away portion of the head of said rail.

2. Apparatus for lubricating railway curves comprising an outer rail having a portion of the inner face of its head cut away, and a stationary plate spaced from the inner side of said rail head to form a reservoir between said stationary plate and said rail, said stationary plate providing a substantially continuous slot between the top of said stationary plate and the cut-away portion of the head of said rail, in combination with automatic apparatus for supplying a lubricant, under pressure, to the reservoir between said rail and said stationary plate.

3. Apparatus for lubricating railway curves comprising an outer rail having a portion of the inner face of its head cut away, and a stationary plate spaced from the inner side of said rail head to form a reservoir between said stationary plate and said rail, said stationary plate providing a substantially continuous slot between the top of said stationary plate and the cut-away portion of the head of said rail, in combination with automatic apparatus operable by wheels passing over the rail for supplying a lubricant, under pressure, to the reservoir between said rail and said stationary plate.

4. Apparatus for lubricating railway rails comprising a rail, a stationary plate spaced from the inner side of said rail to form a reservoir between said stationary plate and said rail, said stationary plate providing a substantially continuous slot between the top of said stationary plate and the head of said rail, a pump, a pivoted ramp adjacent said rail, said ramp being moved by the tread of wheels passing over said rail, a driving pawl at the free end of said ramp, a gear operably associated with said driving pawl, a train of elements from said gear to said pump for operating the latter, and tubular connections from said pump to the reservoir for carrying the lubricant.

5. Apparatus for lubricating railway rails comprising a rail having a portion of the inner face of its head cut away, a stationary plate spaced from the inner side of said rail to form a reservoir between said stationary plate and said rail, said stationary plate providing a substantially continuous slot between the top of said stationary plate and the cut-away portion of the head of said rail, a pump, a pivoted ramp adjacent said rail, said ramp being moved by the tread of wheels passing over said rail, a driving pawl at the free end of said ramp, a gear operably associated with said driving pawl, a train of elements from said gear to said pump for operating the latter, and tubular connections from said pump to the reservoirs for carrying the lubricant.

6. In apparatus for lubricating railway rails, a rail having a part of its side surface cut away, a stationary plate mounted adjacent said cut away surface and forming with said rail a conduit for lubricating a railway wheel.

7. In apparatus for lubricating railway rails, a T-rail having the lower part of the inner surface of its head cut away, a stationary plate mounted adjacent said cut away surface reenforcing the rail and forming with said rail a conduit for lubricating a railway wheel.

8. In an apparatus for lubricating railway rails, a T-rail having the lower part of the side surface of its head cut away, a stationary plate mounted adjacent said cut away surface reenforcing the rail and forming with said rail a conduit for lubricating the flange of a railway wheel, said conduit intersecting said surface of said head to form a slot at a point below the top surface thereof, said conduit being directed at said slot at an angle well away from the vertical, said slot extending substantially continuously for a considerable distance along the length of the rail.

9. In apparatus for lubricating railway rails, a rail having a top tread-engaging surface and a side flange-lubricating surface, said flange-lubricating surface having a crevice both sides of which intersect said flange-lubricating surface at a point well below said tread-engaging surface but above the point corresponding to the outer periphery of normal wheel flanges, said crevice extending substantially continuously for a considerable distance along the length of the rail, and means for supplying said crevice with lubricant.

10. In apparatus for lubricating railway rails, a standard T-rail having the lower part of the side surface of its head cut away, a stationary plate secured to said rail and mounted adjacent said cut-away surface and forming with said rail a flange-lubricating surface, said rail having a crevice intersecting said flange-lubricating surface, said crevice being well below the top of said head but above a point corresponding to the bottom of said head, said crevice extending substantially continuously for a considerable distance along the length of the rail, and means for supplying said crevice with lubricant.

11. In apparatus for lubricating railway rails, a standard T-rail comprising a head, web, and flange, said head having the lower part of its side surface cut away substantially continuously for a considerable portion of the length thereof, a stationary delivery plate, spacing means between said web and said delivery plate forming a reservoir space therebetween, fastening devices passing through said delivery plate and said web, said reservoir space having sealing means between said delivery plate and rail, said delivery plate supplementing the cut-away part of said head and forming with said head at the upper edge of the delivery plate a substantially continuous crevice, and means for supplying said reservoir space with lubricant for said crevice.

12. In apparatus for lubricating railway rails, a standard T-rail having a head, web, and flange, said head having the lower part of its side surface cut away substantially continuously for a considerable portion of the length of the rail, a stationary delivery plate between said head and flange, a plurality of spacing shims between said web and said delivery plate forming a series of spaced reservoirs, fastening devices passing through said delivery plate, said web and said shims, said delivery plate supplementing the cut-

away part of said head and forming with said head at the upper edge of the delivery plate a substantially continuous crevice, said reservoirs having gaskets on the bottom thereof and on the sides thereof adjoining said shims, each of said reservoirs having an opening in the web at the center of the reservoir, supply pipes connected to said openings, and a series of individual pumps connected to said supply pipes to supply lubricant to said crevice.

13. In apparatus for lubricating rails, a track structure comprising a T-rail having the side surface of its head cut away for a substantial distance longitudinally of the rail, a stationary plate provided with a wheel flange lubricating surface mounted adjacent said cut-away surface of the rail and extending lengthwise thereof, and a conduit for supplying lubricant to the wheel flange lubricating surface.

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