

Oct. 15, 1968

W. C. DILG

3,405,654

RESILIENT RAILWAY TRUCK CENTER PLATE

Filed Oct. 7, 1966

2 Sheets-Sheet 1

FIG. 1

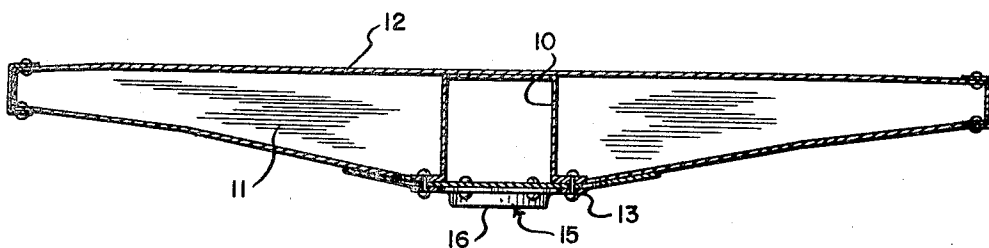


FIG. 2

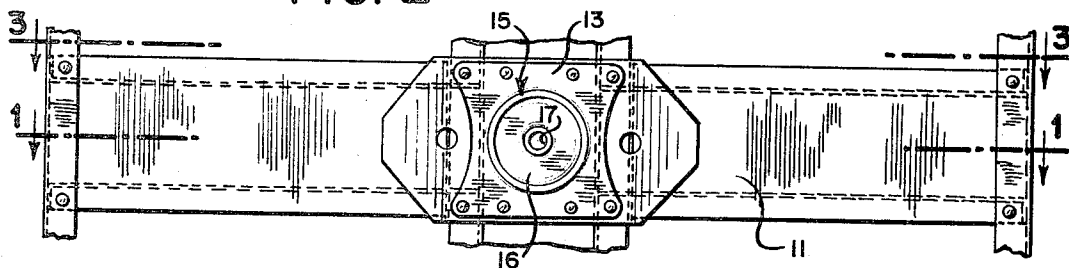


FIG. 3

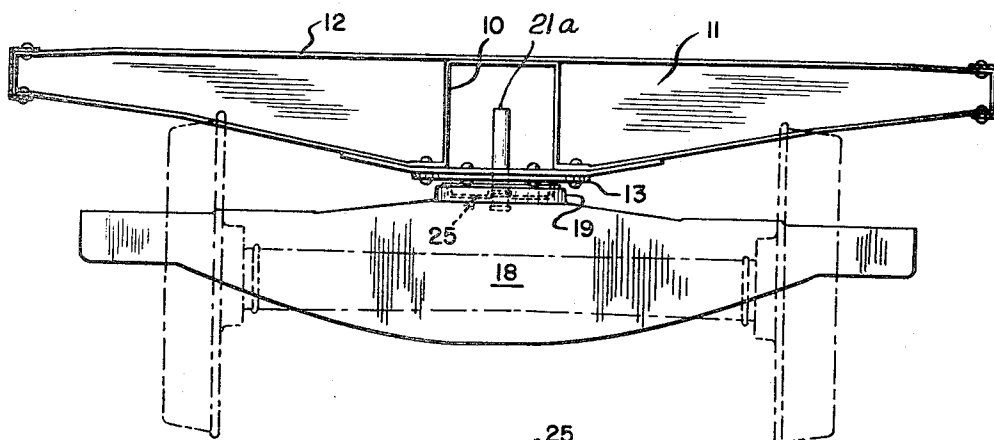
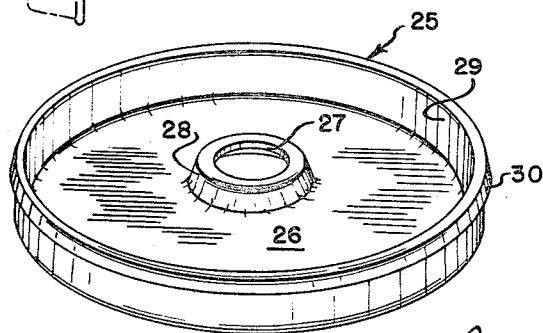


FIG. 4

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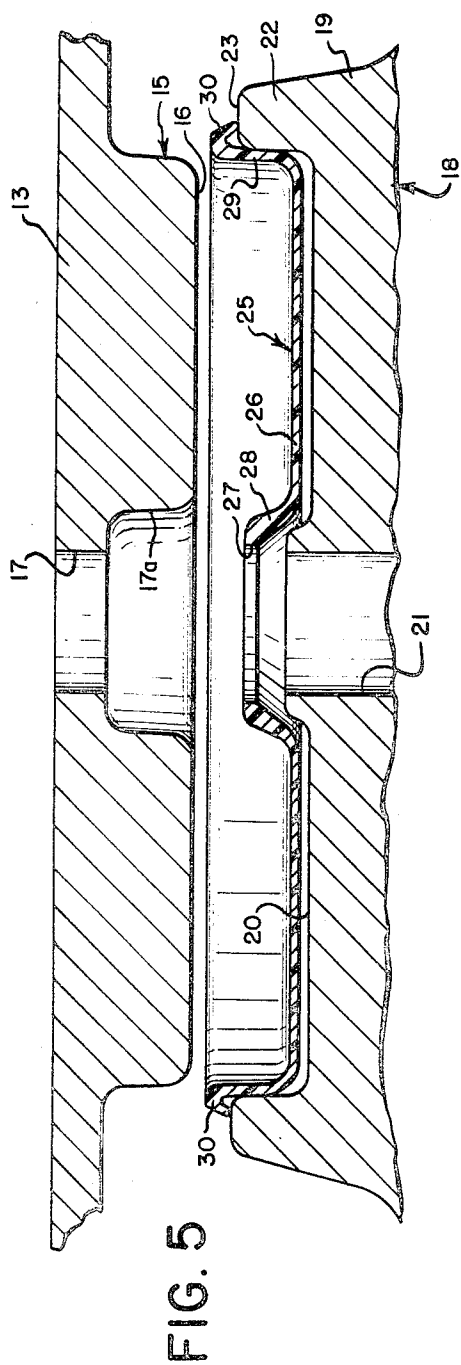
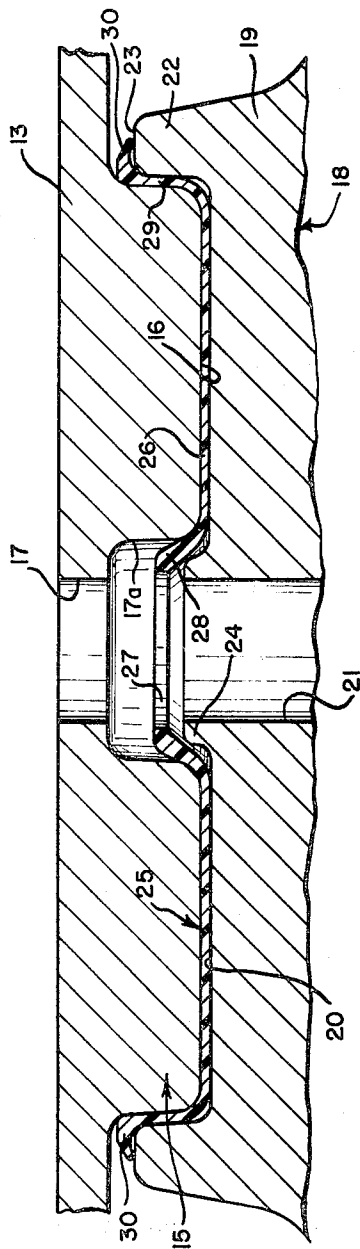


FIG. 6



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RESILIENT RAILWAY TRUCK CENTER PLATE
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7 Claims. (Cl. 105-199)

ABSTRACT OF THE DISCLOSURE

A railway car swivel connection wherein a truck bolster is rotatable with respect to a frame bolster, one bolster having a center plate and the other bolster having a bowl secured thereto, and portion of the center plate and the bowl defining opposed bearing surfaces, an improved liner of tough, flexible and stretchable material interposed between and in contact with the bearing surfaces, the liner including a disk having a central opening defined by an upstanding frusto-conical flange, and a cylindrical flange extending from the outer periphery of the disk and having at one end an outwardly extending annular sealing portion.

This invention relates to railway cars of the type having a body resting on a pair of trucks and connected thereto by a swivel connection. More particularly, the invention is concerned with improved swivel connections between the trucks and body of a railway car, which facilitate the swiveling motion of the trucks relative to the car body, resist wear, and avoid the necessity of lubrication.

In railway cars as now commonly constructed, the car body has an underframe including a longitudinal sill and bolsters connected to the sill near its opposite ends and having center plates extending across the bottom of the sill. Each bolster is supported on and connected to a truck with a swivel connection and, for this purpose, the center plate is provided with a downward cylindrical projection which enters and rests upon the bottom of a bowl at the top of the truck bolster. The lower end of the projection and the bottom of the bowl serve as bearing surfaces enabling the truck to move angularly relative to the car body as the car travels along curves.

When railway cars are operated with bare bearing surfaces between the car body and truck bolsters, as has heretofore been common practice, the high friction between the bearing surfaces causes resistance to swiveling and results in severe wear on the surfaces, the flanges of the truck wheels, and the journal bearings for the truck axles. The use of ordinary lubricants, such as grease, does not solve the problem and, although tests have been made with numerous metallic lubricants and with steel and plastic liners for the truck bolster bowl, apparently none of these expedients has proved wholly satisfactory and, so far as I am aware, none of them has gone into extensive use.

I have found that the torque required to effect the swiveling of the trucks of a railway car of the construction above described can be greatly reduced by providing the connection between each truck and the body with a liner for the truck bolster bowl, which is made of a urethane elastomer. The preferred material is one which is tough, flexible, and stretchable and has good load-bearing and wear-resistance characteristics. Materials of the type described are readily available commercially. In addition to protecting the bearing surfaces in the connections between the car body and trucks, the liner is formed in such manner that, when in position, it seals the space within the bowl and prevents the entrance of dirt, which would impair the action of the liner and cause wear.

For a better understanding of the invention, reference may be made to the accompanying drawings, in which

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FIG. 1 is a sectional view on the line 1-1 of FIG. 2 of a railway car underframe;

FIG. 2 is a bottom plan view of a bolster forming part of the underframe;

FIG. 3 is a sectional view on the line 3-3 of FIG. 2 showing the bolster of a truck in elevation;

FIG. 4 is a view in perspective of the new liner;

FIG. 5 is a vertical sectional view of the separated parts of the connection between a truck and a car body with a liner inserted in the truck bolster bowl of the connection; and

FIG. 6 is a view similar to FIG. 5 with the parts of the connection in operative relation.

The railway car underframe, of which parts are shown in the drawings, includes a longitudinal sill 10, a bolster 11 having a top plate 12 extending across the top of the sill, and a center plate 13 secured to and closing the lower end of the sill. The bolster is connected at its outer ends to side sills and the underframe includes a bolster near each end and the usual cross bearers, cross ties, end sills, etc.

The center plate is formed with a substantially cylindrical projection 15 extending downward from its lower face and the projection is provided with a flat bearing surface 16 as its lower end. A bore 17 extends vertically through the projection and plate co-axially with the projection and the section 17a of the bore within the projection is of increased diameter.

The trucks of the car each include a bolster 18 lying beneath a body bolster and each truck bolster is provided at its top with a bowl 19 having a flat bottom surface 20 serving as a bearing surface. The bowl is formed with a central vertical bore 21 of the same diameter as the upper section of the bore 17. A kingpin 21a mounted in the truck bolster 18 extends through the central vertical bore 21 and the vertical bore 17 of the body bolster. The outer peripheral wall 22 of the bowl has a substantially flat top surface 23 and the bottom of the bowl has an upstanding lip 24 surrounding the bore 21 and receivable in the section 17a of the bore in the center plate projection 15.

A liner 25 is disposed within the bowl and it is formed with a flat bottom disk 26 with a central opening 27 defined by a thickened frusto-conical flange 28. A flange 29 of generally cylindrical form rises from the outer periphery of the disk and it is formed at its upper end with a sealing section 30 extending outward and downward. The liner is of such dimensions that, when it is inserted into the bowl, the outer edge of the sealing section rests upon the top surface 23 of the wall 22 of the bowl and the bottom of the liner lies a short distance above the bottom surface of the bowl. When the projection 15 enters the liner and forces the bottom of the liner into contact with the bottom of the bowl, the surface of the projection adjacent to the sealing section of the liner causes that section to be deformed so that it extends outward over the upper end of the wall and into tight sealing contact with the upper end of the wall to prevent the entrance of dirt into the interior of the bowl. When the usual kingpin is in place in the bores 17 and 21, the interior of the bowl is further sealed. The insertion of the projection into the liner forces the bottom of the liner into tight contact with the bottom of the bowl and this causes tension to be applied to the flange 29 of the liner. Such tension together with the thickened flange 28 surrounding the lip 24 keep the liner in position.

The liner is made of an elastomer which is tough, flexible, and stretchable and has good load-bearing and wear-resistance characteristics. A urethane rubber is the preferred material and such a material having the specified characteristics is a commercial product.

I claim:

1. A railway car swivel connection comprising a frame bolster and a truck bolster, the truck bolster being rotatable with respect to the frame bolster, one bolster having a center plate secured thereto, an extreme end of a cylindrical projecting portion of the center plate defining a first bearing surface, the other bolster having a bowl secured thereto, a portion of the bowl defining a second bearing surface opposed to the first bearing surface, and a liner of tough, flexible and stretchable material interposed between and in contact with the first and second bearing surfaces, the liner including a disk portion and a cylindrical flange integral with and rising from the outer periphery of the disk portion having an outwardly extending annular sealing portion, the flange being in tension when the disk portion of the liner is in compression between the first and second bearing surfaces to maintain the liner in position, and the annular sealing portion being deformed into intimate contact with an outer peripheral portion of the bowl when the flange is in tension, the annular sealing portion being of sufficient cross-sectional thickness to remain in contact with the outer peripheral portion of the bowl to anchor the flange portion.

2. A railway car swivel connection according to claim 1 wherein the bowl has a central bore extending through and substantially perpendicular to the second bearing surface, the periphery of an end of the bowl bore adjacent the second bearing surface being defined by an upstanding central lip; the projecting portion of the center plate has a central bore co-axial with the bowl bore, the center plate bore being of increased diameter at an end adjacent the first bearing surface to receive the upstanding central lip of the bowl, the bores being adapted to receive a king-pin; and the liner has a central opening concentric with the bores, the periphery of the central opening being de-

fined by a thickened frusto-conical flange overlying and in contact with the central lip to maintain the liner in position.

3. A railway car swivel connection according to claim 1 wherein the tough, flexible and stretchable material is a urethane elastomer.

4. A liner of tough, flexible and stretchable material to be interposed between opposed bearing surfaces of a railway car swivel connection comprising a disk portion and a cylindrical flange integral with and rising from the outer periphery of the disk portion, the flange having an outwardly extending annular sealing portion.

5. A liner according to claim 4 wherein the flange is stretchable in tension when the disk portion is in compression between the opposed bearing surfaces and the annular sealing portion is deformable into intimate contact with an outer peripheral portion of at least one of the bearing surfaces, the annular sealing portion being of sufficient cross-sectional thickness to remain in place to anchor the flange portion.

6. A liner according to claim 5 wherein the disk portion has a central opening, the periphery of the central opening being defined by a thickened frusto-conical flange.

7. A liner according to claim 4 wherein the tough, flexible and stretchable material is a urethane elastomer.

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