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PEDESTAL ASSEMBLY FOR RAIL TRUCKS

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2 Sheets-Sheet 1

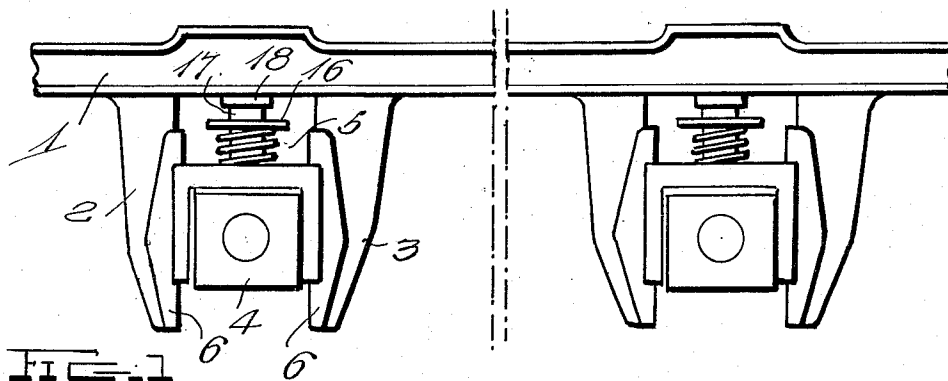


FIG. 1

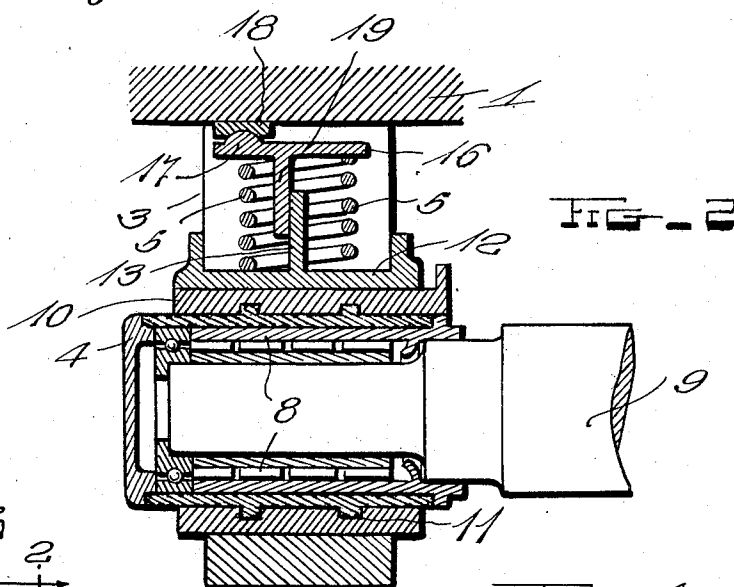


FIG. 2

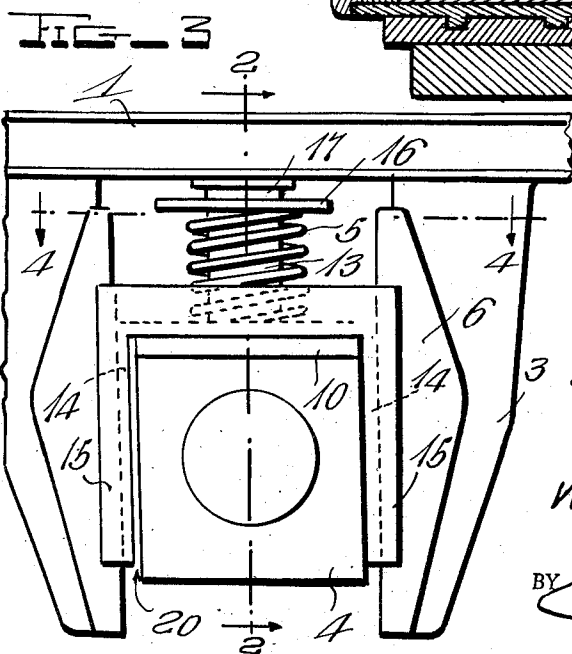


FIG. 3

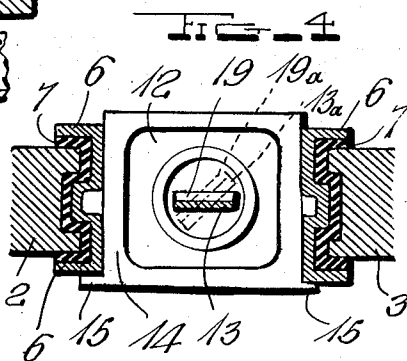


FIG. 4

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FIG. 5

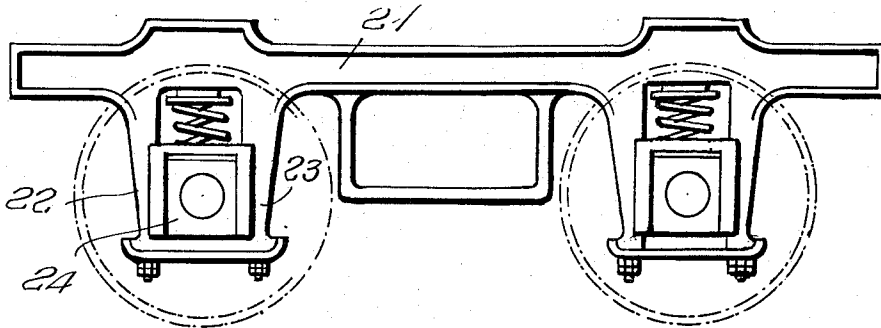


FIG. 6

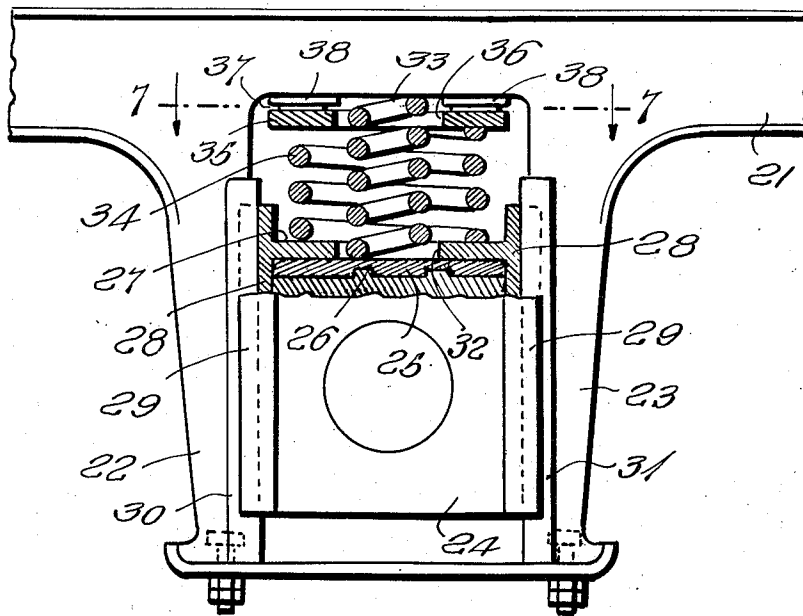
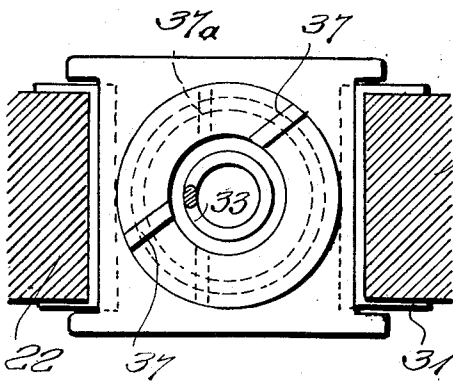


FIG. 7

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PEDESTAL ASSEMBLY FOR RAIL TRUCKS

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6 Claims. (Cl. 105—225)

This invention relates to rail trucks of the type having pedestal guides and has for its object to provide means coactive between the pedestal guides and journal bearings which will act to prevent hunting motions of the truck.

One of the principal phenomenon of conventional rail truck operation is the horizontal weaving motion known as hunting. Hunting results from the axles of the truck assuming an out of parallel relation or jointly assuming a position out of normal with the truck side frames. In either case, the flange of one leading wheel will eventually contact its rail whereupon the axle will be given a new direction which will cause the flange of the other leading wheel to contact its rail. Hunting is therefore a harmonic action and the axles generate a sine curve. Mechanically, it is caused by the freedom of the journal boxes in the pedestal guides, the freedom being a clearance which increases with wear of the journal box and pedestal wear plates.

Many ways to restrict or to restrain the journal boxes with respect to the truck frame have been proposed. Among them are rubber and steel springs of various kinds. All of them have the common feature that the restraining means act to restore the journal boxes to an initial position with respect to the frame, which feature may not be desirable. For instance, if the axles are slightly out of parallel, as initially installed, or if one wheel wears slightly faster than the wheel on the opposite end of its axle, then better riding quality would result if the axle were allowed to assume a new position without any resultant restoring force. Furthermore, restraining springs only damp hunting, they do not prevent it.

The principal object of this invention is to provide means for restraining the axles against horizontal movements with respect to the pedestal guides, the means acting frictionally to resist such relative movements and thereafter setting up no restoring force tending to force the axles to return to their initial position or to any other specific position.

More particularly, it is an object of this invention to provide a friction member between each journal box and its journal springs and to provide means active against the friction member to jam it against at least one pedestal guide. The journal box and the friction member will move together vertically with respect to the pedestal guides but the journal box can move horizontally with respect to the friction member as permitted by the spacing of the guides.

The journal box also has movement with respect to the pedestal guides transversely of the truck frames. Such movements may also contribute to hunting. Another object is to employ the friction member above mentioned, also to jam the journal boxes transversely as well as longitudinally of the truck frames. As will be more fully described in connection with the detailed description of the drawings, this may be done simply by causing the jamming means to function angularly with respect to the length of the side frames.

Another object of the invention is to provide means co-operative with the friction member and the pedestal guides

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for intercepting and damping high frequency vibrations en route from the journal boxes to the truck frame.

Other objects and advantages will become hereinafter more fully apparent as reference is had to the accompanying drawings in which:

Figure 1 is a side elevation of a rail truck equipped with my invention,

Figure 2 is an enlarged vertical section taken along the line 2—2 of Figure 3,

Figure 3 is an enlarged view of one journal bearing assembly with its pedestal guides,

Figure 4 is a horizontal section taken along the line 4—4 of Figure 3,

Figure 5 is a side elevation of a truck equipped with a modification of my invention,

Figure 6 is an enlarged side elevation, partly broken away, of a pedestal guide and journal box assembly, and Figure 7 is a horizontal section taken along the line 7—7 of Figure 6.

More specifically, the numeral 1 indicates the main frame of a rail truck which has the pedestal guides 2 and 3 depending from each of the four corners thereof. A journal box 4 resides between each pair of pedestal guides 2 and 3 and supports the frame 1 by means of journal springs 5. Between each pedestal guide and its journal box there are wear plates 6 which are, preferably, backed by rubber liners 7 as best seen in Figure 4.

To this point the construction is conventional. Since the invention is applied in the same manner to all pedestal guide assemblies only one will be referred to hereinafter.

The journal box 4 houses a bearing 8 herein shown as being of the anti-friction type. This bearing receives one end of an axle 9. Atop the journal box 4 is a wear plate 10 having a plane upper surface and a lower surface equipped with indentations to receive the positioning lugs 11 formed on the journal box 4.

Between the journal spring 5 and the wear plate 10, I insert a friction plate 12 which has a rib or pusher plate 13 arising from the center thereof and of such length as to be contained within the spring 5. This plate also has vertical projections 14 which are integral with the sides adjacent the pedestal guides for contact with the opposing faces of the wear plates 6, and two other vertical projections 15 for contact with two of the side faces of the wear plates 6. The surfaces 14 may be omitted, if desired. The friction plate 12, the vertical projections 14, if any, and the vertical projections 15 are integral and, together, constitute the friction member.

Between the top of the journal spring 5 and the frame 1, I insert a spring seat 16, which is formed with a knife edge or rocker 17 for reception by a knife edge seat 18 secured to the frame 1, the knife edge being offset from the center of the spring seat 16. The spring seat 16 has a rib or pusher plate 19 integral therewith, centrally placed thereon and of such width as to be contained within the journal spring 5. This plate 19 is of such length as to have good surface contact with the pusher plate 13 on the friction plate 12.

The operation will now be described. The weight of the frame 1 is transmitted through the knife edge 17 to the spring seat 16 and thence to the spring 5. Since the knife edge is off center with respect to the spring seat, there is a tendency or force to rock the spring seat 16 on the knife edge in a counterclockwise direction, as seen in Figure 2. This causes the pusher plate 19 to exert a force against the pusher plate 13 thus causing a pressure contact between the surfaces 15 and the adjacent faces of the wear plates 6. The pressure between the surfaces will vary with the loading imposed on the frame 1 and may be adjusted to any percentage thereof by adjusting the amount of offset of the knife edge 17 from the center of the spring 5.

The friction member 12, 14, 15 is thus jammed against the pedestal guides in a direction transversely of the truck frame 1, but there is also frictional resistance to movement of the plate 12 longitudinally of the frame 1. The axle housing 4 has a clearance indicated by the numeral 20 with the vertical walls 14 of the friction plate 12 corresponding to the clearance conventionally provided between a journal box and its pedestal guides. The journal box 4 may move longitudinally in the guides 2 and 3 against the friction of the plates 10 and 12 and after any such movement there is no restoring force tending to urge the journal box 4 to take any particular position with respect to friction plate 12. The journal box 4, and hence the axle 9, may assume any position with respect to the frame 1 longitudinally or laterally thereof as permitted by the pedestal guides 2 and 3 if the side-walls 14 are omitted. Such movements will always be against the friction of the friction plates. The amount of friction, which may be determined by the offset of the knife-edge 17 from the center of the spring 5 and the material of the friction plates 10 and 12, should be such as to be the minimum amount necessary to break up or obviate hunting.

The pusher plates 13 and 19 are illustrated as having their surfaces normal to the axles 9. In some types of operation and in certain truck or journal box designs it may be preferable to have these surfaces positioned otherwise. If these plates 13 and 19 are positioned at an angle as indicated by the dotted lines 13a and 19a of Figure 4, then the jamming action will be through both the vertical portions 14 and 15 of the plate 12. If the plates 13 and 19 are rotated through a full ninety degrees then the jamming action will occur only through the plates 14, in which case the faces 15 may be omitted. These are mere choices of the truck designer.

Figures 5, 6 and 7 show a modification of the invention in which a portion only of the loading on the journal springs is used for purposes of jamming the friction plate.

In this adaptation, the frame 21 has the pedestal guides 22 and 23 which contain the journal box 24 therebetween. The journal box has a plate 25 atop thereof and movable horizontally therewith by virtue of the dowels 26. This plate has a flat upper surface for sliding contact with a friction plate 27 having vertical wall projections 28 and 29 for sliding contact with the pedestal wear plates 30 and 31. The plate 27 has a central opening 32 therethrough. The plate 27 and the projections 28 and 29 together constitute the friction member.

Supporting the frame 21 from the journal box 24 is one spring 33 which extends directly therebetween, passing through the opening 32 in the friction plate 27. Resting on the friction plate 27 is a second spring 34 which has a spring cap 35 at its upper end. This cap has an opening 36 centrally therethrough for the passage of the spring 33. A knife edge 37, offset from the center thereof, is provided outwardly thereon, as best seen in Figure 7. This knife edge rests in a grooved receptacle 38 fixed to the frame 1.

The operation is as follows: the weight of the frame 1 is imposed jointly on the springs 33 and 34. That part of the weight carried by the spring 33 is transmitted directly to the journal box 24 but that part of the weight carried through the spring 34 is transmitted first through the spring cap 35 whose knife edge 37 causes the cap 35 to tilt in a direction normal to the axis of the knife edge. The tilting action causes the spring to set up a horizontal component of the force which it transmits to the friction plate 27 which jams the friction member by causing one vertical wall 28 and one vertical wall 29 to press against two adjacent faces of the wear plate 31. The journal box 24 can move with respect to the pedestals 22 and 23 against the friction between the plates 25 and 27 but there will be no restoring force by the spring 34.

If the knife edge 37 is given a position 37a paralleling the vertical walls 28 then there will be no jamming action

by the walls 29 and if the knife edges are given a position normal to the position 37a the jamming will occur entirely through the vertical walls 29. The position to be chosen is open to the judgment of a designer.

Various modifications may be made without departing from the spirit of my invention and I therefore desire to be extended protection as defined by the appended claims.

What I claim is:

1. A pedestal assembly for a rail truck comprising pedestal guides, a journal box, springs supporting said pedestal guides from said journal box, said journal box having a flat top surface, a friction plate interposed between said springs and said journal box, said journal box having horizontal clearance with respect to said pedestal and being capable of horizontal movements with respect to said friction plate and said pedestal guides as permitted by said clearance, said plate having vertical projections adjacent at least one of said pedestal guides and means constantly jamming said vertical projections into contact with at least one of said guides, said spring means jamming said projections against said pedestal guide or guides with a force greater than the force tending to displace it when said journal box moves horizontally with respect to said pedestal guides.

2. A pedestal assembly for a rail truck comprising pedestal guides, a journal box, journal springs supporting said pedestal guides from said journal box, a friction plate interposed between said journal box and said springs, said friction plate and said journal box being movable together vertically and being relatively movable horizontally as permitted by said pedestal guides, said journal box being in equilibrium horizontally with respect to said friction plate in any relative position thereof thereby incurring no restoring force against said journal box with respect to said pedestal guides, said friction plate having vertical projections at least one of which is in contact with at least one of said pedestal guides, and spring means jamming said projection against its pedestal guide with a force greater than the force tending to displace it horizontally when said journal box moves horizontally with respect to said pedestal guides whereby relative movements of said journal box with respect to said guides occurs against the friction between said friction plate and said journal box.

3. In a rail truck, a truck frame having a pair of pedestal guides at each corner thereof, a journal box located between the members of each of said pairs, journal springs supporting said frame from said journal boxes, said journal boxes having clearance with said pedestal guides for limited movement horizontally with respect thereto, a friction plate movable with said journal box vertically and movable with respect thereto horizontally, and spring means constantly urging said friction plate into continuous frictional engagement with said frame whereby all relative movements of said journal box and said pedestal guides are opposed by friction, the bottom of said friction plate and the friction surface of said journal box in contact therewith being flat whereby there is no restoring force resulting from said spring means after a relative movement therebetween.

4. In a rail truck, a truck frame having a pair of pedestal guides at each corner thereof, a journal box located between the members of each of said pairs, each of said journal boxes having clearance with its pedestal guides for limited movements horizontally with respect thereto, a journal spring between each of said journal boxes and said frame, a friction plate interposed between each said spring and its journal box, said friction plates each presenting a flat horizontal surface for contact with a flat horizontal surface atop each of said journal boxes said friction plates each being movable vertically with its box and being movable horizontally with respect thereto as permitted by said pedestal guides, said friction plates each having vertical projections for contact with an in-

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side wall and a lateral outside wall of at least one of said pedestal guides, and means jamming each of said projections against the said walls of said pedestal guides thereby restricting the movements of said friction plates to the vertical with respect to said guides.

5. A pedestal guide assembly of a rail truck comprising pedestal guides, a journal box, a spring supporting said pedestal guides from said journal box, a friction plate interposed between said spring and said journal box and slidable horizontally with respect to said box to the extent permitted by said guides, said friction plate having a vertical projection adjacent one of said pedestal guides for contact therewith a spring cap atop said spring, means causing said cap to tend to assume an inclination with respect to the center line of said spring, and a projection on said friction plate against which the tendency of said cap to tilt is directed thereby forcing the first named projection against at least one of said pedestal guides.

6. A pedestal guide assembly of a rail truck comprising pedestal guides, a journal box, a spring supporting said pedestal guides from said journal box, a friction plate interposed between said spring and said journal box,

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a spring cap atop said spring, a knife edge integral with the top surface of said cap offset from the center line of said spring supporting said pedestal guides, said spring cap having a projection extending downwardly toward said friction plate, said friction plate having a projection arising alongside the projection on said spring cap for contact therewith, said spring cap tending to rock on said knife edge by reason of its offset relation with respect to the center line of said spring thereby imposing a force against the projection on said friction plate, said friction plate having vertically depending side walls which are urged into contact with one of said pedestal guides thereby jamming said friction plate against one of said guides, said journal box being movable horizontally against the friction of said friction plate as permitted by the spacing of said guides without any accompanying restoring force.

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