

Feb. 28, 1939.

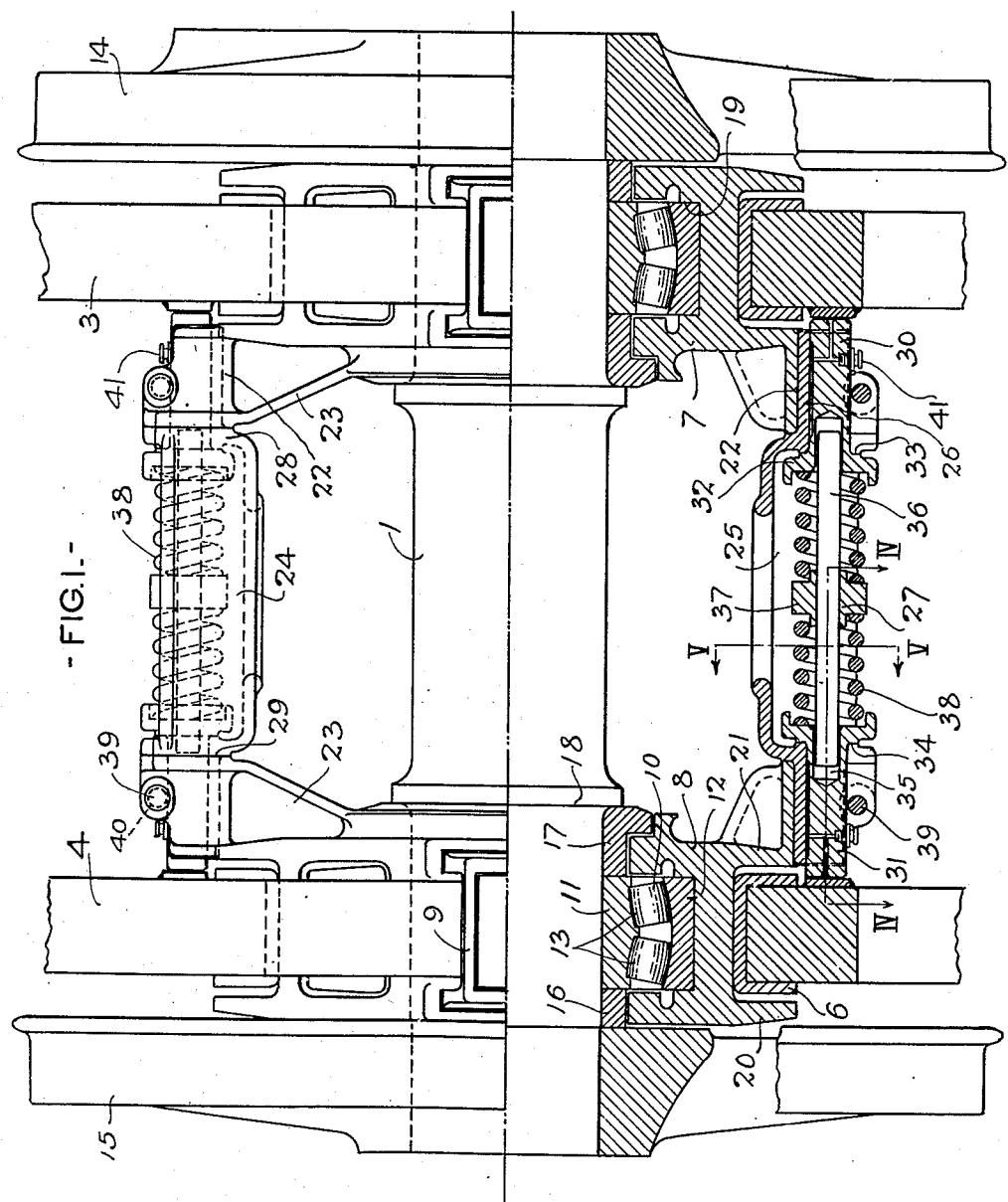
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RAILWAY VEHICLE AND LATERAL MOTION RESISTANCE AND CENTERING DEVICE THEREFOR

Filed March 16, 1938

2 Sheets-Sheet 1



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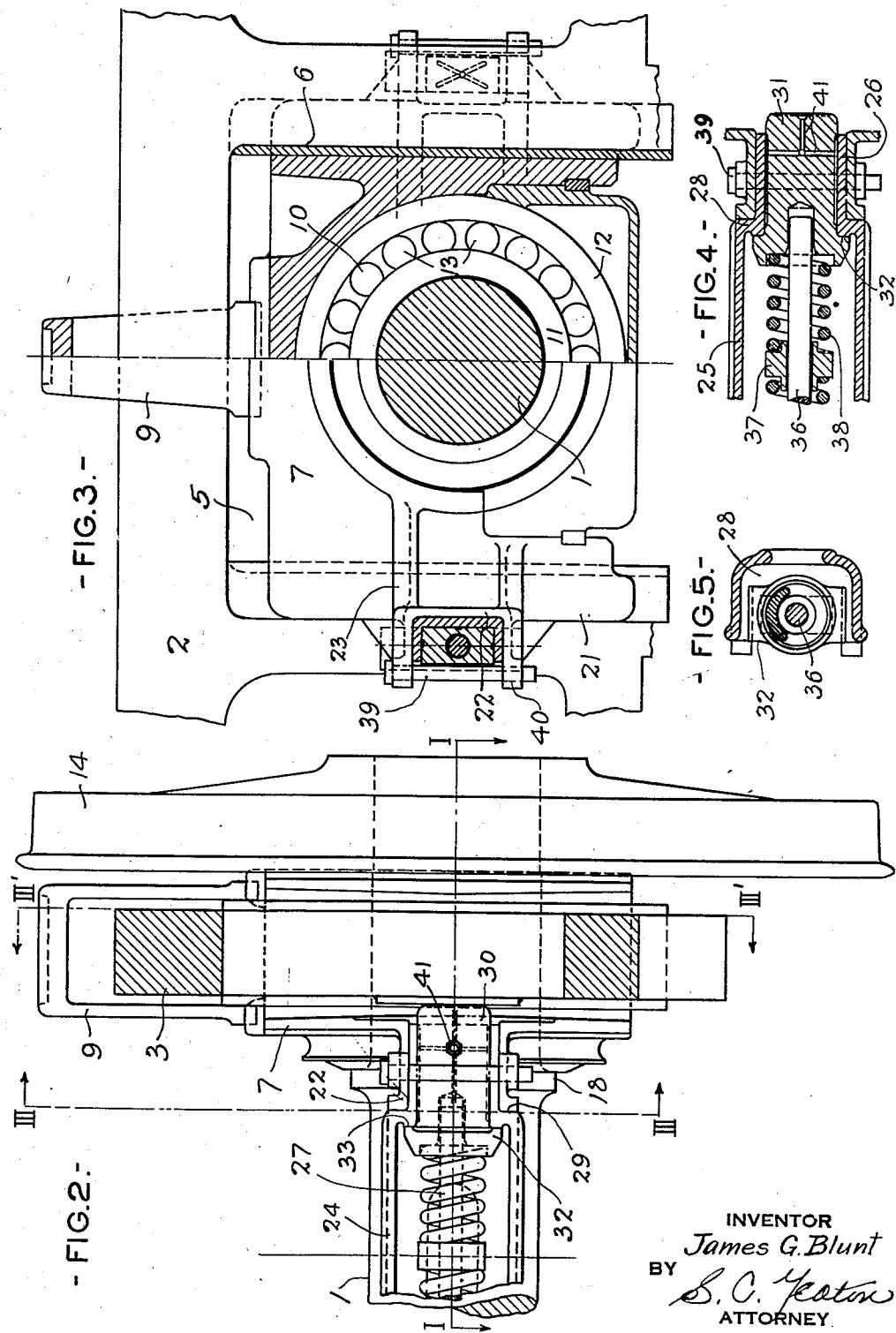
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UNITED STATES PATENT OFFICE

2,148,724

RAILWAY VEHICLE AND LATERAL MOTION
RESISTANCE AND CENTERING DEVICE
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Application March 16, 1938, Serial No. 196,126

3 Claims. (Cl. 105—80)

This invention relates to improvements in railway vehicles and lateral motion resistance and centering devices therefor, and is an improvement of the invention set forth in applicant's

5 Patent 2,047,666, granted July 14, 1936.

As in said patent, the present invention is directed to provide a resistance or cushioning and centering device in combination with an axle adapted for limited lateral movement in either 10 direction from normal position relative to the vehicle frame, the journal boxes being carried on the axle for lateral movement therewith.

More particularly the present invention is an improvement of the embodiment of said Letters 15 Patent shown in Figs. 4 to 8 thereof wherein a spreader is employed between the journal boxes for maintaining the boxes substantially parallel to each other during angular movement of the axle relative to the journal boxes. The improvement relates principally to the spreader feature.

While the invention may be employed with either a friction or anti-friction bearing for the axle journal, it is illustrated in connection with anti-friction bearings and as it has special adaptation, similar to the embodiment of said Letters 25 Patent, it is illustrated in connection with such type of roller bearings and the description will be confined thereto.

In the accompanying drawings: Figure 1 is, 30 at the upper half, a plan and at the lower half, a part section on the line I—I of Fig. 2, the side frame members being shown fragmentally and the wheels being partially broken away; Fig. 2 is a front elevation of one side of the structure of 35 Fig. 1, the side frame members being shown in section and the axle and associated parts being broken away; Fig. 3 is, at the left, a section on the line III—III and at the right a section on the line III'—III' of Fig. 2, the side frame 40 members being shown fragmentally in elevation; Fig. 4 is a fragmentary section on the line IV—IV of Fig. 1; and Fig. 5 is a section on the line V—V of Fig. 1.

Only sufficient of the vehicle, in the present 45 instance a locomotive, necessary for an understanding of the present invention, is shown, and comprises an axle 1, in the present instance shown as a driving axle of the locomotive, a frame 2, which comprises side frame members 3 and 4, disposed one at each side of the locomotive, each provided with a pedestal jaw 5 and shoes 6. Journal boxes 7 and 8 are provided, each for a portion of the axle, one at each side of the locomotive, disposed respectively in the 50 pedestal jaws provided in the side frame mem-

bers 3 and 4. Spring saddles 9 are supported on the top of the journal boxes.

A frictionless bearing 10 of the SKF type is disposed between each journal box and the adjacent axle portion. Each bearing comprises an 5 inner race 11, an outer race 12 and two series of rollers 13 connected by a cage (not shown) in the usual manner.

A spherical bearing surface for the two series 10 of rollers is provided on one of the races, in the present instance on the outer race 12. As before stated, the frictionless bearing is of the SKF type, and the spherical surface is a characteristic 15 of this type, permitting in the present instance a slight angular or tilting movement of each box independently of the other and of the axle, this provision being of advantage under certain conditions. Similar to the embodiment previously mentioned, the present invention permits this independent angular or tilting movement, and for 20 a fuller description of this type of bearing recourse may be had to the previously mentioned patent.

The vehicle is of the inside journal type and the axle 1 has mounted on the ends thereof the 25 wheels 14 and 15. Each race 11 is held from movement toward the adjacent wheel by a ring 16 disposed between the race and the adjacent wheel, and from movement inwardly by a ring 17 disposed between each race 11 and an adjacent 30 collar 18 formed on the axle. The races 12 are held against movement by the walls of an annular channel 19 formed in each of the journal boxes in which they are disposed, the boxes being made in sections as shown particularly in 35 Fig. 3 to facilitate such assemblage. It will therefore be seen that movement of the axle laterally is accompanied by movement of the bearings, wheels and boxes as a unit.

The boxes are provided with outer vertical 40 flanges 20 and inner vertical flanges 21 overlapping adjacent portions of the side frame members and spaced therefrom to provide for lateral movement in either direction from normal 45 position of the boxes, bearings, wheels and axles as a unit, and to facilitate the before-mentioned slight independent tilting movement of the boxes, there being enough working play to permit this in the connecting parts of the structure of the present invention presently to be described. Both flanges 20 and 21 are flared on their inner 50 faces from their central portions upwardly and downwardly in the usual manner to facilitate simultaneous tilting of the journal boxes rela- 55

tive to the adjacent side frame member, with the axle when tilting in a vertical plane.

Coming now more particularly to the present invention, each inner flange 21 has a channel-shaped housing 22 formed integrally therewith and extending inwardly therefrom, with the channel open at its ends providing a clearway therethrough, and open at the side remote from the axle, the bottom of the channel being a vertical wall forming the side of the channel adjacent the axle and connecting the two parallel horizontal walls of the channel. Each housing is reinforced by webs 23 connecting it to the adjacent journal box. The housings oppositely disposed are arranged in horizontal alignment and the several housings are in the horizontal axial plane of the axle. The housings are disposed beyond the flanges 21 in a direction away from the axle and in this respect differ from the housings of the aforementioned patent, the housings of the patent being in alignment with the flanges so that it is necessary to pierce the flanges to permit the lateral motion resistance and centering device to pass therethrough into engagement with the shoes of the pedestal.

The journal boxes are maintained parallel to each other by two spreaders 24 disposed one between the forward ends of the two journal boxes and one between the rear ends of the two journal boxes, the spreaders being in horizontal alignment parallel to each other in the horizontal center plane of the axle 1. As the spreaders are similar in construction and function, a description of one will suffice.

The spreader is channel-shaped throughout, consisting of an enlarged central body member 25 and reduced end members 26, the spreader being open at the side remote from the axle to receive a lateral motion resistance and centering device indicated generally by the reference numeral 27, and open at both ends. The spreader is disposed between the boxes so as to space them and is provided with walls 28 connecting the central member with the end members. The outer faces of these walls abut the inner faces 29 of the housings adjacent thereto. The boxes are thus withheld from movement toward each other. The end members 26 are disposed one in each of the channels of the housings 22 and have working clearance therein, this being sufficient to allow the aforementioned independent tilting movement of the journal boxes.

The lateral motion resistance and centering device of the present invention is in various respects similar in construction to the device shown in the before-mentioned patent, and reference may accordingly be had thereto for a more detailed description thereof. While such device is the preferred construction, it will be understood that the invention is not limited to any particular type of device except insofar as it should comprise the characteristics of the device of the present invention which differ from the devices of the prior art. For instance, where in the present instance two helical springs are employed, a single helical spring may be substituted or instead thereof any appropriate disc or leaf spring may be used.

The lateral motion resistance and centering devices are similar in all respects and therefore a description of one will suffice. The device is disposed in the spreader and comprises end portions 30 and 31 extending respectively through the adjacent channels of the end members 26, and having their respective outer ends disposed

opposite the respective side frame members 3 and 4, the respective housings being spaced from their adjacent side frame members and the end portions being extended to span these spaces. The side frame members are provided with wear plates 5 engaging the end portions for taking the wear, which plates may be welded to the side frame members, as shown. In the claims these plates are considered part of the side frame members.

The end portions 30 and 31 have enlargements 10 forming abutments 32 disposed in the member 25 providing shoulders 33 and 34, their outer faces being in abutting relation with the inner faces of the respective walls 28. Each of the end portions 30 and 31 is provided with a socket 35 at 15 its inner end, and a bar 36 is housed at its opposite ends in these sockets. A collar 37 is loosely mounted on the bar 36 and a helical spring 38 is mounted on the bar at each side of the collar, having its inner end bearing against the collar 20 and its outer end bearing against the inner face of its adjacent abutment 32.

The springs are preferably under compression, thereby normally holding the end portions 30 and 31 in their outermost positions against the walls 25 28 with a free fit between the side frame members. The end portions are held in the spreader and the spreader in the housings 22 by bolts 39 disposed in orifices 40 formed in the horizontal portions of the housings extending beyond the 30 spreader and device. Removal of these bolts permits removal of the spreader and lateral motion resistance and centering device as a unit, or only the device may be removed, if desired.

Lubricating means, indicated generally by the 35 reference numeral 41, are provided as shown for lubricating the faces of the end portions 30 and 31 and the adjacent faces of the spreader and wear plates with which they engage.

The operation of the device is similar to that 40 of the embodiment shown in Figs. 4 to 8 of the aforesaid patent, and reference may be had thereto for a full understanding thereof.

The aforesaid embodiment and the present embodiment differ in the following particulars. 45 In the former embodiment the spreader has no extending end members. It is provided with upwardly and downwardly extending parts which engage the boxes whereas the present embodiment is not provided with such parts. These 50 parts, together with the engagement of the spreader with the lateral motion resistance and centering device, function to hold the spreader in place. In the present instance the spreader is provided with reduced end members which fit 55 within the housings formed on the boxes, and by this engagement of the spreader with the housings, in cooperation with the retaining bolts 39, the spreader is retained in place. This construction provides a firmer union between the 60 spreader and the boxes, insuring unitary movement of both boxes with the axle when the latter tilts in a vertical plane without the aid of the aforementioned upwardly and downwardly extending parts of the former embodiment. Furthermore in the former embodiment the end portions of the device extend through orifices formed both in the spreader and in the lugs formed on the boxes, they therefore having a sliding fit with two members. In the present embodiment the 65 end portions of the device pass through only the reduced end members of the spreader thereby having sliding fit with only one member instead of two, which provides for better operation and facilitates lubrication.

While the housings of the present invention are shown and have been described as extending beyond the inner flanges of the boxes it will be understood that while this is preferable they may, if desired, be constructed similar to that of the former embodiment, namely disposed nearer the axle to include the inner flanges.

The invention claimed and desired to be secured by Letters Patent is:

1. In combination with a railway vehicle of the inside journal type having journal boxes associated with a wheeled axle and with the side frame members of said vehicle for lateral displacement movement with said axle in either direction from normal position relative to said side frame members and for lateral return movement thereto, housings carried by said boxes between and spaced from said side frame members; a spreader having a central member between and abutting said housings and end members within said housings, whereby said spreader moves with said boxes during their said lateral movements; and a lateral motion resistance device having separate end portions within said end members in sliding relation therewith for independent lateral movement of each end portion relative to the other end portion, said end portions having their outer ends normally extending outwardly and their inner ends extending inwardly from said end members, and yielding means disposed between said end portions yieldingly resisting inward movement of either thereof, said outer ends being oppositely disposed to their adjacent side frame members for operative engagement thereby and said inner ends having portions oppositely disposed to adjacent portions of said spreader for operative engagement thereby, whereby, during a displacement movement, said end portions will be relatively moved toward each other against the resistance of said yielding means, thereby resisting said displacement movement, and during a return movement said yielding means will effect relative movement of said end portions away from each other, thereby assisting said return movement.

2. In combination with a railway vehicle of the inside journal type having journal boxes associated with a wheeled axle and with the side frame members of said vehicle for lateral displacement movement with said axle in either direction from normal position relative to said side frame members and for lateral return movement thereto, housings carried by said boxes between and spaced from said side frame members; a spreader having a central member between and abutting said housings and end members within said housings, whereby said spreader moves with said boxes during their said lateral movements; a lateral motion resistance device having separate end portions within said end members in sliding relation therewith for independent lateral movement of each end portion relative to the other end portion, said end por-

tions having their outer ends normally extending outwardly and their inner ends extending inwardly from said end members, and yielding means disposed between said end portions yieldingly resisting inward movement of either thereof, said outer ends being oppositely disposed to their adjacent side frame members for operative engagement thereby and said inner ends having portions oppositely disposed to adjacent portions of said spreader for operative engagement thereby, whereby, during a displacement movement, said end portions will be relatively moved toward each other against the resistance of said yielding means, thereby resisting said displacement movement, and during a return movement said yielding means will effect relative movement of said end portions away from each other, thereby assisting said return movement; and means for retaining said spreader within said housings.

3. In combination with a railway vehicle of the inside journal type having journal boxes associated with a wheeled axle and with the side frame members of said vehicle for lateral displacement movement with said axle in either direction from normal position relative to said side frame members and for lateral return movement thereto, housings carried by said boxes between and spaced from said side frame members having a channel open at both ends and at one side; a spreader having a central member between and abutting said housings and end members within said channels, whereby said spreader moves with said boxes during their said lateral movements; a lateral motion resistance device having separate end portions within said end members in sliding relation therewith for independent lateral movement of each end portion relative to the other end portion, said end portions having their outer ends normally extending outwardly and their inner ends extending inwardly from said end members, and yielding means disposed between said end portions yieldingly resisting inward movement of either thereof, said outer ends being oppositely disposed to their adjacent side frame members for operative engagement thereby and said inner ends having portions oppositely disposed to adjacent portions of said spreader for operative engagement thereby, whereby, during a displacement movement, said end portions will be relatively moved toward each other against the resistance of said yielding means, thereby resisting said displacement movement, and during a return movement said yielding means will effect relative movement of said end portions away from each other, thereby assisting said return movement; and removable means for retaining said spreader within said channels whereby when said removable means are removed said spreader and device may be dismantled.

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