

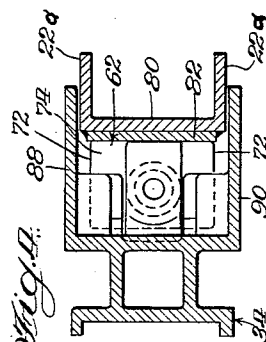
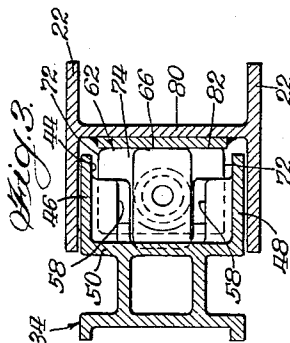
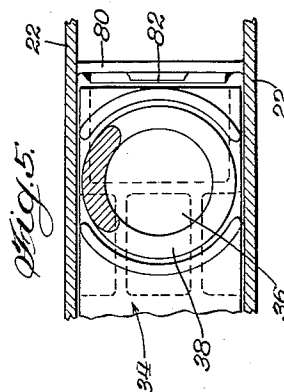
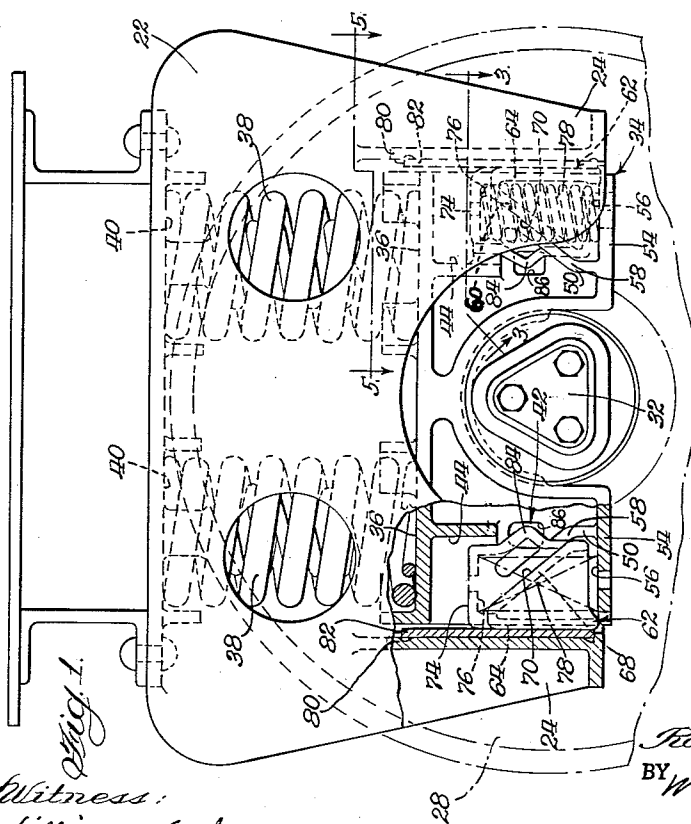
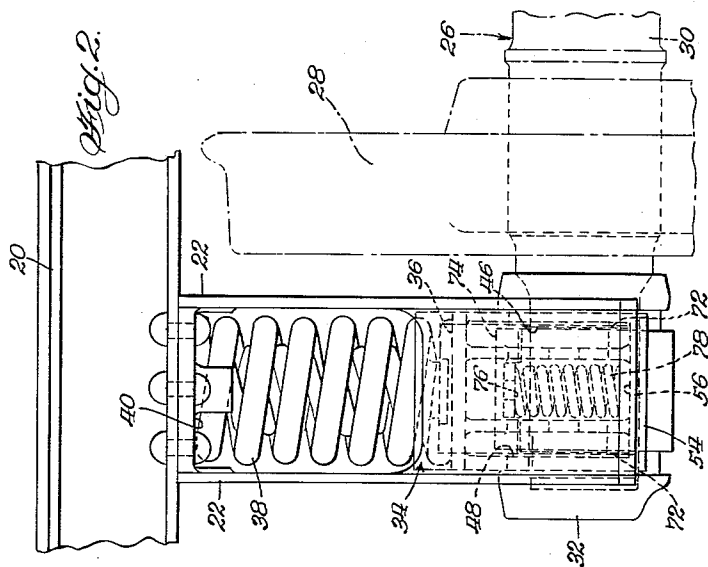
Dec. 13, 1960

R. B. COTTRELL
SNUBBED SUSPENSION MEANS FOR A RAILWAY
CAR WHEEL AND AXLE ASSEMBLY

2,963,987

Filed Feb. 7, 1958

2 Sheets-Sheet 1



INVENTOR.

Robert B. Cottrell
BY Walter L. Schlegel, Jr.

Witness:
William N. Embler

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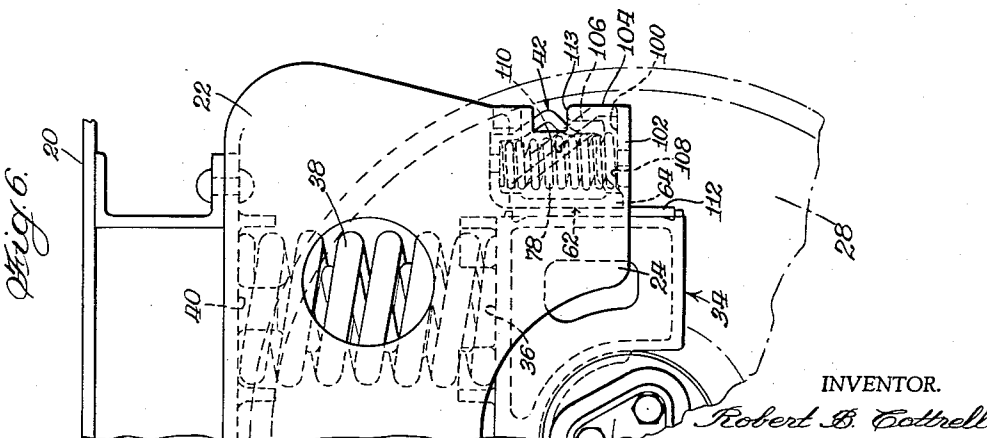
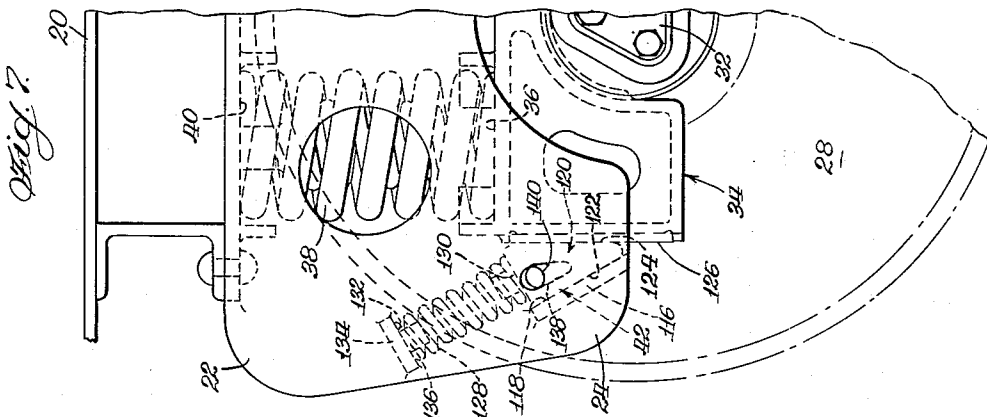
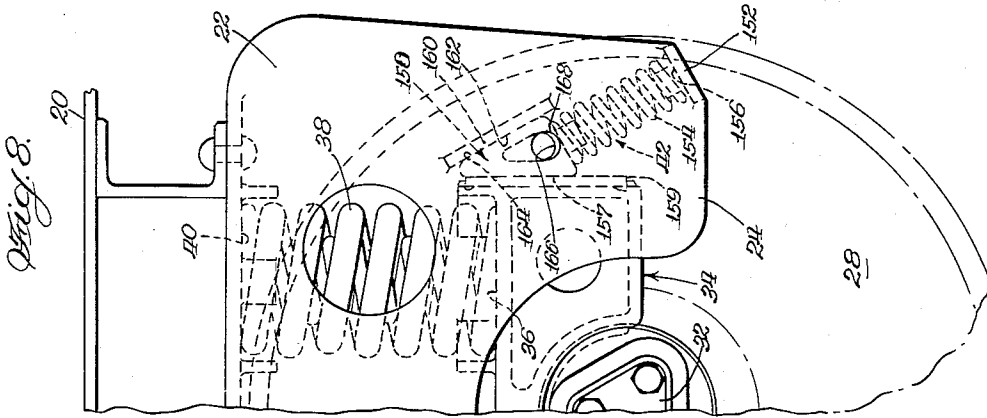
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2 Sheets-Sheet 2



Witness:
William H. Emley

INVENTOR.
Robert B. Cottrell
BY Walter S. Schlegel, Jr.

City

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SNUBBED SUSPENSION MEANS FOR A RAILWAY CAR WHEEL AND AXLE ASSEMBLY

Robert B. Cottrell, Fort Myers, Fla., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

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16 Claims. (Cl. 105-224)

This invention relates to railway cars and more particularly to a snubbing and supporting arrangement for a railway car wheel and axle assembly.

An object of my invention is to provide a railway car supported by individual wheel and axle assembly units with a built-in friction system which provides a substantially constant frictional force for controlling vertical movements of the car.

Another object of my invention is to provide a novel structure of pedestal frames for use on railway cars and particularly pedestal frames adapted for use with various friction means for controlling vertical movement of the pedestal frames relative to the supporting wheel and axle assembly.

A still further object is to provide a damping device in each pedestal frame cooperating with a friction surface and which device is resiliently urged into engagement with the friction surface to dampen vertical oscillation of the frame.

Other objects and advantages of my invention will become apparent from the following description and drawings, wherein;

Figure 1 is a fragmentary side elevational view of a snubbed wheel and axle assembly for a railway car embodying the invention with portions thereof broken away to more adequately show the cooperation of parts thereof;

Figure 2 is an end elevational view of Figure 1, as seen from the right;

Figure 3 is a sectional view taken along the line 3-3 of Figure 1;

Figure 4 is a view similar to the view of Figure 3 but illustrating a modified form of the structure of Figure 3;

Figure 5 is a sectional view taken along the line 5-5 of Figure 1;

Figure 6 is a fragmentary side elevational view of a snubbed wheel and axle assembly for a railway car embodying a modified form of the invention;

Figure 7 is a fragmentary side elevational view of a suspension system for a railway car embodying another modified form of the invention, and

Figure 8 is a fragmentary side elevational view of a suspension system for a railway car embodying still another modified form of the invention.

To achieve clarity, certain structural details have been omitted from various views where said details are believed to be adequately shown in other views.

Corresponding parts of the different embodiments are indicated with like numerals.

Referring now to the drawings, and directing attention to Figures 1 through 5 inclusive, there is preferably shown a portion of a fabricated steel car underframe 20 having rigidly secured thereto separate vertical end members or pedestal frames 22 disposed in longitudinal alignment with the underframe 20. Each pedestal frame 22 may be provided with pedestal jaws 24. Cooperating with the pedestal frame 22 may be a portion of a wheel and axle assembly 26 comprising a wheel 28 mounted on one end

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of an axle 30. The ends of the axle (only one end being shown) may be provided with anti-friction roller bearing units 32 each having disposed thereon an axle housing adapter 34 located between the related pedestal jaws 24. The axle adapter 34 may be provided with coil spring seats 36 adapted to accommodate the lower ends of the coil springs 38, the upper ends of said coil springs 38 being seated on the coil spring seats 40 shown disposed on the car underframe 20.

Disposed below the spring seats 36 and preferably on opposite sides of the roller bearing unit 32 may be snubbing devices 42 carried by the adapter 34 to damp vertical oscillation of the frame 22.

The preferred embodiment discloses the adapter carrying a pair of snubbing devices, but it is to be noted that only one snubbing device may be utilized to frictionally retard vertical movement of the frames.

In the embodiment of Figures 1, 2, 3, and 5, each of the snubbing devices 42 may comprise a friction pocket 44 having inboard and outboard side walls 46 and 48, respectively. Side walls 46 and 48 may be interconnected by rear and bottom walls 50 and 54 respectively. The upper surface of the bottom wall 54 may be provided with a spring seat 56. Each friction pocket 44 may have spaced wedge walls 58 sloping upwardly and away from bearing unit 32 the walls 58 being formed integrally with inboard, outboard and rear walls 46, 48, and 50, respectively. Each wall 58 presents a downwardly facing wedge surface 60 on the underside thereof.

Positioned in each friction pocket 44 may be a substantially box-shaped friction shoe 62 comprising a generally vertical front wall 64 presenting an outward friction surface 66, spaced walls 68 sloping upwardly towards the front wall 64 and presenting upwardly facing surfaces 70 for complementary engagement with wedge surfaces 60, and, also, spaced side walls 72 interconnected by a top wall 74 which has a spring seat 76 on the underside thereof. A spring 78, interposed between the spring seat 56 of the pocket 44 and the spring seat 76 of the friction shoe 62 resiliently supports the shoe within the pocket. The friction shoe 62 may operatively engage a web 80 interconnecting the lower ends of the pedestal jaws 24, the web 80 having a wear plate 82 which may be secured, as by welding thereto.

The sloping walls 68 of the shoe 62 may be provided with an off-set handle-like portion 84 disposed between wedge walls 58 and the side walls 46 and 48 of the pocket may be cored away at 86 in alignment with the inner surface of the handle-like portion to accommodate the reception of an associated tool (not shown) whereby the shoe 62 may be drawn into the pocket 44 against the resistance of the spring 78.

In Figure 3, there is shown the preferred arrangement of the adapter 34 with respect to the pedestal frame 22. Frames 22 are disposed inboardly and outboardly of the side walls 46 and 48, respectively, of the friction pocket 44 to maintain the cooperative relationship of the pedestal frame. However, in Figure 4 there is shown an alternative arrangement wherein the inboard and outboard pedestal frames 22a may be disposed between the inboard and outboard side walls 88 and 90, respectively, of pocket 44 disposed in a modified structure of the adapter 34 to thereby maintain the cooperative relationship of the adapter 34 and the pedestal frames 22.

In Figure 6 there is shown a modification of the embodiment of Figures 1 through 5 wherein instead of the snubbing devices 42 being resiliently supported by the adapter 34, the snubbing device is supported by the pedestal frames 22 outwardly of the related end of the adapter 34.

The web 80 has been eliminated and in its place there has been substituted a friction pocket 100 formed integral-

ly with pedestal frame jaws 24 wherein the pocket comprises a bottom and rear wall 102 and 104, respectively, and spaced outer wedge walls 106 sloping upwardly towards the adapter 34. The upper surface of the bottom wall 102 may be provided with a spring seat 108. Upwardly sloping walls 106 may be formed integrally with the upper edge of rear wall 104 and integrally interconnect the latter and pedestal jaws 24. Each wall 106 may present a wedged surface 110 on the underside thereof which engages the related surface 70 of friction shoe 62. Friction shoe 62 may be positioned in pocket 100 and spring 78 may operatively engage spring seat 108 of pocket 100 and spring seat 76 of shoe 62 to thereby resiliently support the shoe. Front wall 64 on shoe 62 may frictionally engage a wear plate 112 rigidly secured, as by welding, to the outward end of the adapter 34.

The outward ends of the jaws 24 of frame 22 may have notches 113 aligned with the inner surface of the handle-like portion of shoe 62 to accommodate the reception of an associated tool (not shown) whereby the shoe 62 may be drawn into pocket 100 against resistance of spring 78.

In Figure 7, there is shown another modification of the embodiment of Figure 1 wherein there is disposed outwardly of the end of the adapter 34 a wedge wall 116 inclined upwardly and outwardly away from the adapter 34. The wall 116 integrally interconnects the corners of frame 22 to provide a wedge surface 118 for frictional engagement with a wedge-shaped friction shoe 120. The shoe 120 may comprise a sloping wedge surface 122 in complementary engagement with wedge surface 118 and, also, a vertical wedge surface 124 in complementary engagement with a vertical wear plate 126 which may be rigidly secured, such as by welding, to the related outward end of the adapter 34.

Friction shoe 120 may be urged downwardly into engagement with plate 126 and wall 116 by means of a spring 128 which is under a predetermined amount of initial compression. The lower end of spring 128 may receive a spring guide lock 130 secured to the upper end of shoe 120 and spring 128 may bear against a seat 132 on the lower end of a web wall 134. The wall 134 may be disposed above and substantially parallel to the upper surface of shoe 120. A spring guide lock 136 may be secured to wall 134 and may be received by the upper end of spring 128.

The shoe 120 may be provided with a horizontal hole 138 and the frame 22 may be cored away, as at 140, whereby alignment of hole 138 and cores 140 accommodate reception of an associated tool (not shown) so that shoe 120 may be drawn away from wear plate 126 against the resistance of the spring 128 during assembly and disassembly of the adapter 34 and frames 22.

The modification disclosed in Figure 8 discloses an arrangement similar to the arrangement in Figure 7. In this arrangement the wedge-shaped friction shoe 150 may be disposed adjacent the end of adapter 34 and may be operative in an upward direction.

A web wall 152 may be disposed between the lower corners of each frame 22 and integrally connect the latter. A lower end of a spring 154 may engage a spring seat 156 disposed on the upper surface of wall 152, and an upper end of spring 154 may engage a lower surface of the wedge-shaped friction shoe 150 which may also have a vertical friction surface 157 in frictional engagement with a vertically disposed wear plate 159 rigidly secured, as by welding, to adapter 34. An upwardly and inwardly inclined wedge wall 160 may integrally interconnect each frame 22 and may have a friction surface 162 on the lower side thereof in complementary engagement with an inclined surface 164 of shoe 150.

The shoe 150 may be provided with a hole 166 and frames 22 may be cored away, as at 168, in alignment with the hole 166 to thereby accommodate the reception of an associated tool (not shown) whereby shoe 150 may

be drawn away from wear plate 159 against the resistance of the spring 154 during assembly and disassembly of the adapter 34 and frame 22.

The modification of Figures 6 through 8 inclusive disclose structures wherein the adapter 34 may be retained between each pedestal frame 22. However, it should be noted that the adapter 34 and frame 22 may be modified in the manner similar to that of Figure 4, wherein the inboard and outboard frame 22 may be disposed between side walls 46 and 48, respectively, of the adapter 34 to thereby maintain the operative relationship between frames 22 and adapter 34.

It is to be understood that I do not wish to be limited by the exact embodiments of the device as shown, which are merely by way of illustration and not limitation, as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or scope of the claims.

I claim:

1. In a suspension arrangement for a railway car body, the combination of: a wheel and axle assembly, said assembly comprising an axle and a pair of wheels, frames operatively secured to said body and comprising lower depending jaws, supports carried by the assembly, springs interposed between and in direct engagement with said frames and said supports, said supports being received between the frames and having friction means engaging friction means on the related depending jaws to snub vertical movement of the car, one of said means comprising a pocket and a friction shoe and resilient means disposed therein, the other of said means comprising a friction surface, wherein said resilient means directly engages the pocket and the shoe and urges said shoe into frictional engagement with said surface.

2. In a suspension arrangement for a railway car having a body, said suspension arrangement comprising an assembly having a pair of wheels and an axle affixed thereto, frames operatively mounted on said assembly and receiving the ends of the axle, said frames being rigidly secured to the body and being spaced from each other outboardly of each wheel of said assembly when viewed in a direction extending longitudinally of the car, and snubbing means operatively carried by said assembly, said means being disposed to operatively engage friction means of the frames.

3. In a suspension arrangement for a railway car, the combination of: a wheel and axle assembly, support members on said assembly, spring means interposed between said members and said car, outboardly of the wheels of said assembly and resiliently supporting the car thereon, and friction means carried by said members to snub vertical oscillations of said car, said last mentioned means comprising a plurality of spaced walls disposed on the support members and defining therebetween outwardly facing pockets, friction shoes having wedge walls and friction walls and disposed in said pockets, said wedge walls engaging said pocket walls, said friction walls engaging said car, and other spring means disposed between said shoes and said members and operable to urge said shoes into said engaging relationships.

4. In a suspension arrangement for a railway car comprising a wheel and axle assembly having a pair of wheels and an axle interconnecting said wheels, pedestal frames secured to said car and disposed outboardly of each of said wheels, said frames comprising substantially parallel spaced flat members, journal adapters mounted on each end of said axle and disposed between said members and movable relative thereto, springs interposed between the upper surfaces of the adapters and the lower surface of the car to resiliently support the latter, and snubbing devices carried by said adapters to retard vertical deflection of said springs, said devices comprising pockets in said adapters facing outwardly of said axle, said pockets being defined by a plurality of faces, friction shoes disposed in said pockets, compression springs engaging said

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shoes and portions of said faces, respectively, and webs interconnecting corresponding portions of said members outwardly of said shoes, said webs having vertical friction surfaces being frictionally engaged by said shoes.

5. In a suspension arrangement for a railway car, said arrangement comprising a wheel and axle assembly having a wheel and an axle, pedestal frames disposed outboardly of said wheel, an axle housing adapter on an end of said axle and disposed between said frames, springs engaging the adapter on the upper side thereof and resiliently supporting the car thereon, said adapter having a plurality of wedge surfaces disposed at opposite ends thereof and defining thereby outwardly facing pockets, friction shoes having complementary wedge faces, said shoes being disposed in the pockets and being engageable with the respective pocket wedge surfaces, and vertical friction web members integrally interconnecting said frames, said shoes being in frictional engagement with the adjacent related web members, and resilient members compressibly interposed between said shoes and adapter to resiliently urge the shoes into engagement with their related web members.

6. In an axle suspension arrangement for a railway car comprising a wheel and an axle, frames rigidly mounted on the car outboardly of said wheel, said frames extending longitudinally of the car, an axle housing disposed on the end of said axle, an axle housing adapter carried by said housing, the frames being disposed inboardly and outboardly of said adapter, friction wear plates secured to the ends of said adapter, and box-like friction shoes in complementary engagement with said wear plates, said shoes being carried by said frames, and resilient means interposed directly between said frames and said shoes and urging the latter into said engagements.

7. In an axle suspension arrangement for a railway car comprising a wheel and an axle, frame members rigidly secured to the car outboardly of the wheel, said members extending longitudinally of the car and having depending jaws at their lower ends, an axle housing disposed on the end of the axle, a support carried by the housing, compression springs interposed directly between said support and car and resiliently supporting the car, said support extending longitudinally of the car and being disposed between the frame members, and friction snubbing means engaging the ends of the support, said means comprising friction shoe pockets defined in part by the frame members, said depending jaws comprising the inboard and outboard walls of said pockets, webs integrally interconnecting the lower ends of the jaws and comprising the bottom walls of said pockets, rear walls integrally interconnecting said inboard, outboard, and bottom walls, spaced wedge walls integrally connected to the rear walls, friction shoes disposed within said pockets and frictionally engaging said support ends, and other compression springs interposed between the bottom walls and shoes.

8. In an axle suspension arrangement for a railway car, a wheel and an axle operatively supporting said railway car, said operative connection comprising spaced end members operatively disposed from and in longitudinal alignment with the car outboardly of the wheel, compression springs resiliently carrying the car, journal means carried by the end of the axle, adapter members carried by the journal means, said adapter members being operatively guided within said end members and effecting relative displacement therebetween, said adapter members having a top wall engaging and supporting thereon said springs, said wall being disposed above the horizontal plane extending through the axle, and the engagements of the springs with the wall being disposed longitudinally of the car on opposite sides of the axle, respectively, and coacting snubbing means operatively carried by the end members and adapter members for retarding said displacement.

9. In an axle suspension arrangement for a railway

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car according to claim 8, wherein said adapter members comprise longitudinally extending box-like structures disposed between adjacent related end members, and said snubbing means comprises inclined web members integrally interconnecting the end members, friction shoes frictionally engaging the surfaces of said web members and the ends of said structures, other compression springs bearing on the shoes and end members for urging said shoes along said inclined web members and against said ends of said structures.

10. In an axle suspension arrangement for a railway car according to claim 8, wherein each of said adapter members comprises a longitudinally extending support member disposed between the related adjacent end members and said snubbing means comprise inclined web members integrally interconnecting the lower ends of the end members, inclined wedge members connecting the medial portions of said end members, friction shoes frictionally engaging the surfaces of said inclined wedge members and the ends of the support member, and compression springs bearing against the shoes and web members for urging said shoes along said inclined wedge members and against said support member ends.

11. In an axle suspension arrangement for a railway car, comprising a wheel and an axle, a journal housing carried by one end of the axle, a support member carried by said housing, said support member having a top and a bottom wall interconnected by spaced side walls, a pair of pedestal frames integrally connected to the car outboardly of said wheel, said pair of frames being disposed inboardly and outboardly of the support member, compression springs carried by the top wall of said support member and resiliently supporting said car, an outwardly facing friction shoe pocket carried by an end of said support member, said pocket being defined by portions of the bottom and side walls of said support member and a rear wall and spaced inclined wedge walls, said wedge surfaces integrally interconnecting the bottom and side walls, said wedge walls being inclined upwardly and outwardly away from said journal housing, a friction shoe disposed in said pocket and engaging said wedge walls, a vertical wall integrally interconnecting the frames outboardly of said end of said support member, a wear plate secured to said vertical wall, a compression spring disposed directly between and engaging the shoe and the bottom wall of said pocket and resiliently urging the shoe against the wear plate to limit vertical oscillation of the car, and means engaging the other end of said support member.

12. In an axle suspension arrangement for a railway car comprising a wheel and an axle, a journal housing secured to the end of the axle, an adapter member seated on the upper surface of said journal housing and comprising a top wall and a bottom wall interconnected at opposite sides by spaced side walls, compression springs interposed between the top wall of the member and car and resiliently supporting the latter, a pair of pedestal frames extending from the car and disposed outboardly of said wheel, said frames being disposed inboardly and outboardly of said member and being engageable with said side walls respectively, a vertical wear plate operatively carried by said frames adjacent said member, a friction shoe pocket disposed in said member between said top and bottom walls and being adjacent said plate, said pocket comprising portions of said side walls, and said bottom wall and an inclined wedge wall, having a wedge surface thereon, a friction shoe disposed in said pocket, said shoe having a wedge face in complementary engagement with said wedge surface and a vertical face in frictional engagement with said plate, and a resilient spring abutting said bottom wall and shoe and urging said shoe from said pocket and into the above mentioned engagements.

13. In an axle suspension arrangement for a railway car, a wheel and an axle supporting said car, a journal

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housing disposed on the end of said axle, a pair of frames secured to the car and extending downwardly therefrom outboardly of the wheel, a journal adapter seated on said housing and disposed between the related frames, compression springs seated on the adapter and resiliently carrying said car, vertical friction wear plates operatively carried by said frames, friction snubbing devices disposed adjacent each of said wear plates, each of said devices comprising a wedge-shaped friction shoe, said shoe having a vertical friction wall in complementary engagement with the related wear plate, an upwardly inclined surface on said shoe, a web wall in complementary engagement with said inclined surface, and a compression spring disposed between and engaging said shoe and said adapter, said spring urging the shoe to engage the related wear plate and said inclined surface.

14. In an axle suspension arrangement for a railway car comprising a wheel and an axle supporting said car, a roller bearing unit disposed on one end of said axle, a roller bearing adapter carried by the upper surface of said unit, compression springs carried by the upper surface of said adapter, said springs resiliently supporting one corner of said car, pedestal frames disposed outboardly of said wheel, said frames being disposed inboardly and outboardly of said adapter, friction snubbing means engaging an end of said adapter, said means comprising a downwardly and inwardly inclined web wall having a wedge face on the upper surface thereof, said wall integrally interconnecting the related frames, a friction shoe engaging the wedge face and the said end of the adapter, an inclined wall integrally connecting the related frames, and a compression spring engaging the lower surface of the last mentioned wall and the upper surface of the shoe to urge the latter downwardly into frictional engagement with said end and inclined web wall.

15. In a suspension arrangement for a railway car body, the combination of: a wheel and an axle, frames

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fixably secured to and extending longitudinally of said body and spaced outwardly of said wheel, said frames comprising a pair of substantially parallel spaced members, each of said members forming at the lower portion thereof spaced jaws, an adapter connected to an end of the axle and comprising a bottom wall and a top wall interconnected by spaced side walls, said adapter being received between the members and in substantially longitudinal alignment with said jaws, the longitudinal ends of the adapter terminating between the corresponding jaws of the respective members, springs engaging the top wall of the adapter and resiliently supporting thereon the car body, and friction means disposed at the ends of said adapter engageable with friction means disposed on said frames, one of said means comprising the combination of a pocket and a friction shoe slidably guided therein, said pocket comprising a plurality of angularly disposed faces, said shoe being urged from said pocket by resilient means compressibly interposed between the shoe and one of the faces defining said pocket, the other of said means comprising a friction surface disposed adjacent the periphery of said pocket and engaging said shoe, said surface retaining said shoe in said pocket.

16. A suspension arrangement according to claim 15, wherein said one means is disposed on the adapter between the top and bottom walls of the adapter, said pocket faces longitudinally of the car and diverges from said axis, and said resilient means is compressibly interposed between the bottom wall of said adapter and the shoe.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,963,987

December 13, 1960

Robert B. Cottrell

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 6, line 7, after "structures," insert -- and --;
line 37, after "walls" strike out the comma; line 38, strike out "said wedge surfaces"; same column 6, line 66, after "wall", second occurrence, strike out the comma; column 8, line 28, for "axis" read -- axle --.

Signed and sealed this 21st day of November 1961.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

DAVID L. LADD

Commissioner of Patents

USCOMM-DC