Dec. 12, 1950 J. C. TRAVILLA, JR 2,533,639

RAILWAY TRUCK

Filed May 7, 1948 2 Sheets-Sheet 1

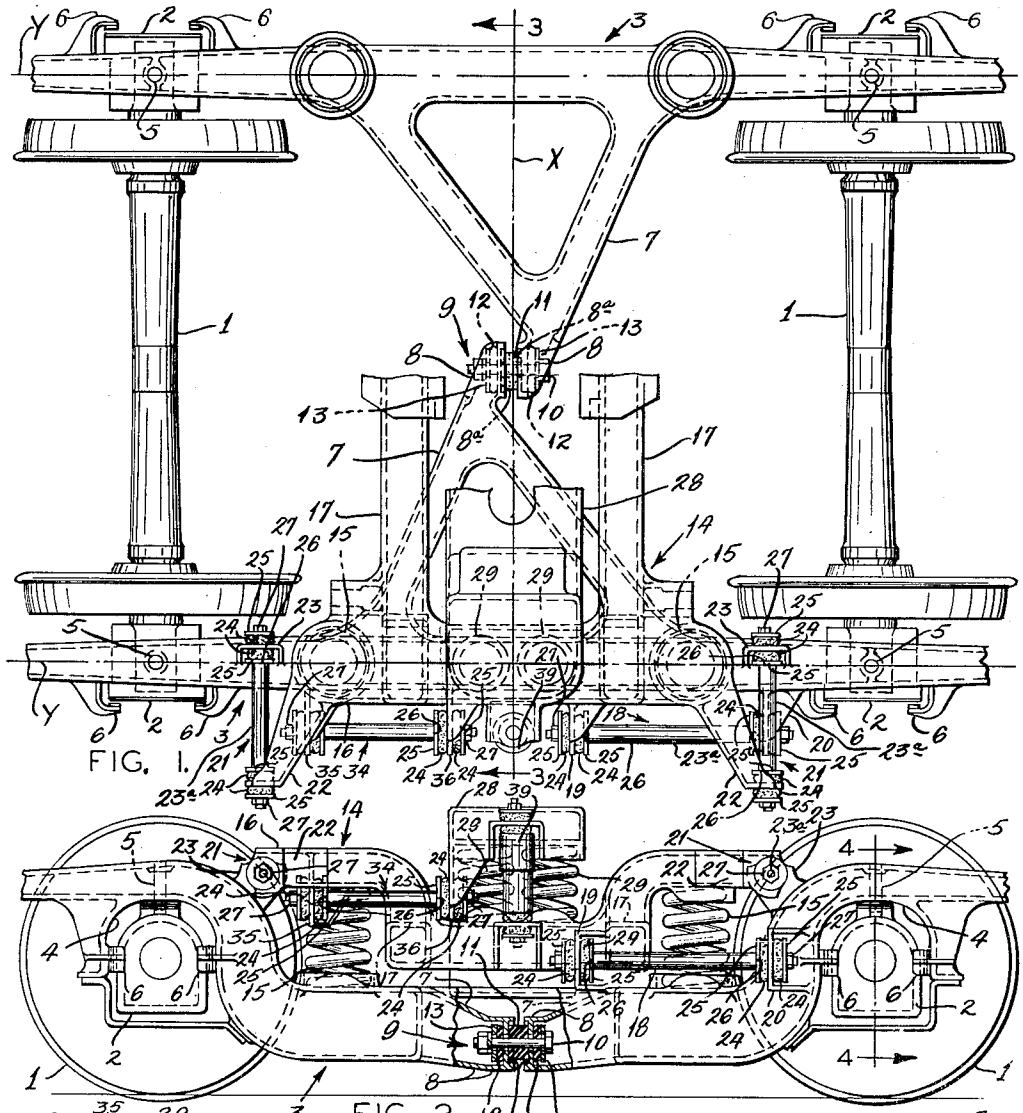


FIG. 1.

FIG. 2.

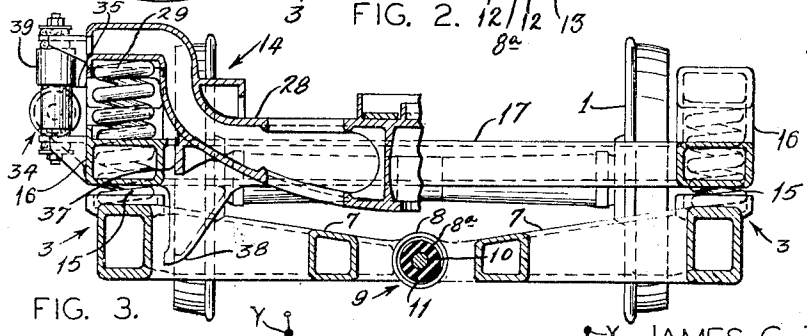


FIG. 3.

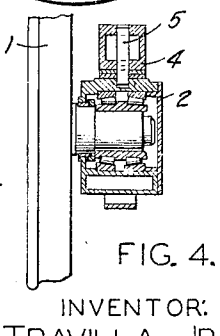


FIG. 4.

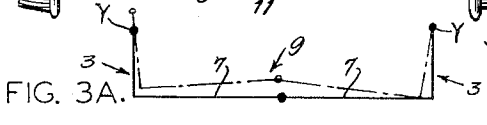


FIG. 3A.

INVENTOR:
JAMES C. TRAVILLA, JR.
BY Rodney Bedell
ATTORNEY.

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RAILWAY TRUCK

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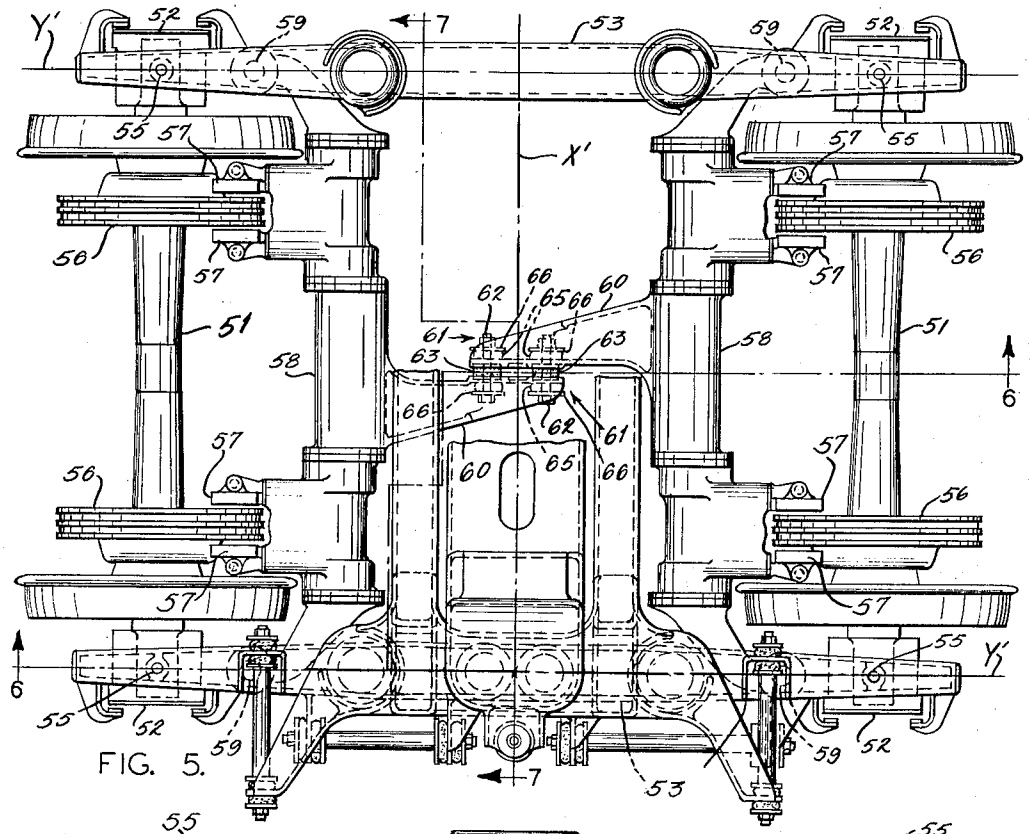


FIG. 5.

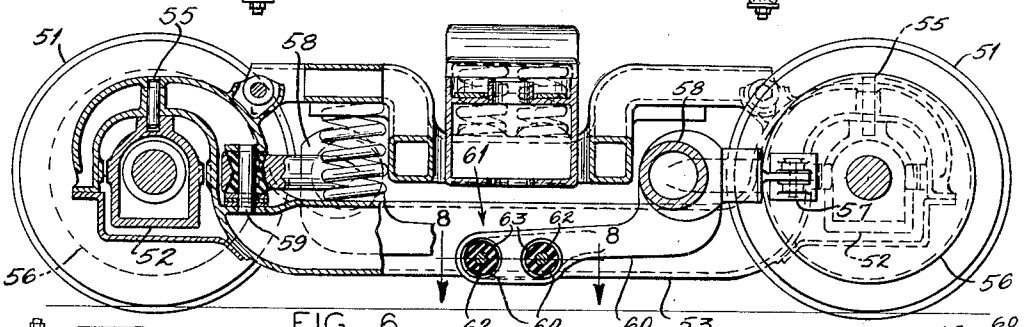


FIG. 6.

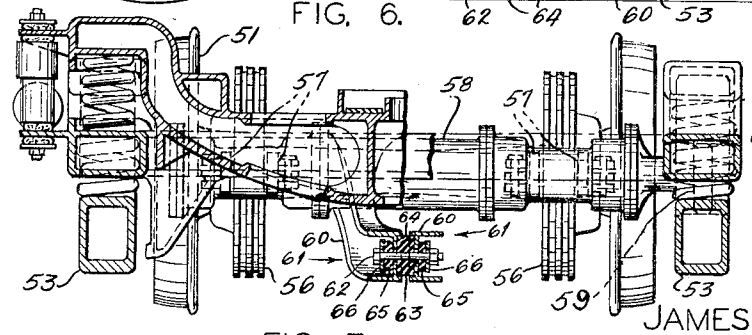


FIG. 7.

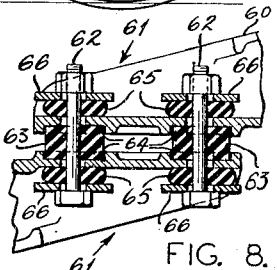


FIG. 8.

INVENTOR:
JAMES C. TRAVILLA, JR.
BY Rodney Bedell
ATTORNEY

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RAILWAY TRUCK

James C. Travilla, Jr., University City, Mo., assignor to General Steel Castings Corporation, Granite City, Ill., a corporation of Delaware

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14 Claims. (Cl. 105—182)

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The invention relates to railway rolling stock and more particularly to railway vehicle trucks.

In one type of railway truck, the journal boxes are mounted in yokes at the ends of the equalizers and the flexibility of the connections between the equalizers and journal boxes makes it difficult to prevent relative play of the axles laterally and longitudinally of the truck resulting in shimmying or nosing of the truck.

In another type of truck, each journal box is slidable vertically in a truck frame pedestal and sufficient play between the box and pedestal is desirable so the journal box and pedestal will not bind when the axle tilts in a transverse vertical plane relative to the equalizer or when the equalizer and the box tilt as a unit relative to the truck frame pedestal. The play between the boxes and pedestals sometimes permits relative play of the axles laterally and longitudinally of the truck resulting in shimmying or nosing of the truck.

The main object of the present invention is to avoid shimmying or nosing of the truck by preventing relative play of the axles laterally and longitudinally of the truck. This result is obtained by securing the axles and journal boxes to the equalizers and attaching the equalizers together to hold them against relative lengthwise movement.

Another object is to accommodate track irregularities by permitting relative rotation of the equalizers about longitudinal and transverse axes.

Another object is to connect the equalizers by a resilient device to permit such relative rotation of the equalizers.

Another object is to hold the equalizers in spaced relation by brake frame members adjacent the wheeled axles and attached to each other.

Other objects will be apparent to those skilled in the art from the following description and the accompanying drawings in which—

Figure 1 is a top view of a railway truck constructed according to the invention with portions of the truck frame and bolster cut away to more clearly show the equalizer structure.

Figure 2 is a side view of the truck with the connected equalizer structure shown in vertical section.

Figure 3 is a transverse vertical section taken approximately on the line 3—3 of Figure 1.

Figure 3a is a diagram illustrating, in exaggerated form, a relative position of the equalizers under certain conditions.

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Figure 4 is a detailed transverse vertical section through a journal box and is taken approximately on the line 4—4 of Figure 2.

Figure 5 is a view similar to Figure 1 and shows another form of the invention.

Figure 6 is a longitudinal vertical section taken approximately on the line 6—6 of Figure 5.

Figure 7 is a transverse vertical section taken approximately on the line 7—7 of Figure 5, and

Figure 8 is a horizontal section showing the connected equalizer structure and taken on the line 8—8 of Figure 6 and drawn to enlarged scale.

The four-wheel truck shown in Figures 1–4 includes wheel and axle assemblies 1 mounting journal boxes 2 of the roller bearing or other anti-friction type. The journal boxes are mounted on the axle journals without play transversely of the truck. A drop equalizer 3 extends longitudinally at each side of the truck and has a yoke 4 at each end for receiving the associated journal box to hold the journal boxes and axles against movement longitudinally of the truck. Vertical dowel pins 5 extend from equalizers 3 into recesses in journal boxes 2 and prevent relative transverse movement of the boxes and equalizers sufficient to permit the wheels to move out of tram, but the diameter of the hole in the box is slightly more than the diameter of the pin and permits limited rocking of the equalizer on the box about the longitudinal axis Y—Y, as indicated diagrammatically in Figure 3A. If desired one of the opposing surfaces between the top of the box and the underside of the equalizer may be curved transversely of the truck to better accommodate rocking of the equalizer. Safety stops 6 on equalizer yokes 4 prevent disassembly of the boxes and equalizers transversely of the truck in the event dowel pins 5 fail. Clearance is provided between the safety stops and journal boxes to permit tilting of the axles and boxes relative to the equalizers in vertical planes extending transversely of the truck.

V-shaped members 7 integral with equalizers 3 extend inwardly transversely of the truck between wheel and axle assemblies 1, and the inner end portions 8 of members 7 lie adjacent one another and have opposing surfaces extending transversely and substantially at the center of the truck.

A resilient device 9 holds end portions 8 of members 7 together and includes a bolt 10 extending longitudinally of the truck through portions 8. Bolt 10 has sufficient play in the bolt openings in portions 8 to permit relative inclination of the bolt and portions 8. Bolt 10 clamps

a rubber-like washer 11 between opposing surfaces of portions 8 and a rubber-like washer 12 and a steel washer 13 between each of its ends and the adjacent portion 8. Washer 11 is received in recesses 8a in the opposing surfaces of portions 8. Bolt 10 preferably is drawn up tight enough to initially place rubber washers 11, 12 under pressure to minimize lengthwise relative movement of equalizers 3 and thereby prevent relative play of the axles longitudinally of the truck.

A drop center truck frame 14 is supported by longitudinally spaced coil springs 15 seated on equalizers 3. Truck frame 14 includes a pair of side members 16 shorter than the distance between the journal boxes and includes a pair of transoms 17 extending from one side member to the other. An anchor rod 18 extends longitudinally at each side of the truck and is secured at one end to a bracket 19 on the truck frame and at its other end to a bracket 20 on the associated equalizer 3. A pair of anchor rods 21 extend transversely at each side of the truck and each anchor rod is secured at one end to a bracket 22 on the truck frame and at its other end to a bracket 23 on the associated equalizer 3.

Anchor rods 18, 21 each include an elongated element 23a mounting a rubber washer 24 and a steel washer 25 at each end and at each side of the associated bracket. Washers 24, 25 and the associated bracket are secured between a shoulder 26 on element 23a and a nut 27 on the adjacent end of element 23a. Stop lugs 38 on the truck frame oppose equalizers 3 and prevent excessive lateral movement of the truck frame if the transverse anchor rods 21 fail.

A bolster 28 is supported from the truck frame by a pair of coil springs 29 under each of its ends and seated on the depressed center portion of the adjacent truck frame side member. An anchor rod 34, similar to those previously described, extends longitudinally at each side of the truck and is secured at one end to a bracket 35 on truck frame 14 and at its other end to a bracket 36 on bolster 28. Stop lugs 37 on the bolster oppose the frame side members and prevent excessive lateral movement of the bolster relative to the frame. A vertical shock absorber 39 is provided between the truck frame and each end portion of the bolster to control the bolster springs. It is to be understood that the bolster may be supported on the truck frame in any other well-known manner, such as by swing hangers, roller assemblies, rubber pads, etc.

The truck is sufficiently flexible to accommodate track irregularities and permits relative tilting of the axles in vertical planes transversely of the truck which may result in relative rotation of the equalizers about a transverse axis X causing approximately half of each washer 11, 12 to be compressed and the other half of each washer 11, 12 to be relieved of compression. Relative rotation of each equalizer about a longitudinal axis Y passing over the equalizer supporting boxes (see Figures 1 and 3a) is permitted by distortion of washers 11, 12 in shear. The equalizers are held parallel by dowel pins 5 and are held against relative lengthwise movement by the resistance of washers 11 to compression. Since the wheel and axle assemblies are mounted in the equalizers without transverse or longitudinal play, the wheels are held in tram and shimmying or nosing of the truck is prevented.

The railway truck shown in Figures 5–8 includes wheel and axle assemblies 51, journal boxes 52, and drop equalizers 53 having yokes at their end portions receiving journal boxes 52. Dowel pins 55 position the journal boxes on the equalizers. Transverse brake frame members 58 are secured to equalizers 53 by rubber-cushioned pins 59 and mount brake gear including brake shoes 57 which clasp brake discs 56 rigid with the wheel and axle assemblies. Extensions 60, integral with brake frame members 58, extend longitudinally of the truck with their end portions adjacent one another and overlapping substantially at the center of the truck.

A pair of resilient devices 61 holds the adjacent end portions together. Each device 61 comprises a bolt 62 extending transversely of the truck and mounting a rubber-like washer 63 between extensions 60 and a rubber-like washer 65 and a steel washer 66 between each end of the bolt and the associated extension. Rubber-like washer 63 is seated in opposing recesses 64 in overlapping portions of extensions 60. Bolts 62 having sufficient play in the bolt openings in extensions 60 (see Figure 8) to permit tilting of the extensions relative to each other. The remainder of the truck is substantially the same as the truck shown in Figures 1–4.

The truck just described accommodates track irregularities by permitting relative tilting of the axles in vertical planes transversely of the truck by distortion of washers 63 in shear to provide for relative rotation of the equalizers about a transverse axis X'. Relative rotation of the equalizers about longitudinal axes Y' is permitted by compression of approximately half of each washer 63, 65 and relieving compression in the other half of each washer 63, 65. Equalizers 53 are held parallel to one another by brake frame members 58 and are held against relative lengthwise movement by the resistance of washers 63 or 65 to compression. If upper equalizer 53 in Figure 5 tends to move to the left relative to the lower equalizer, such movement would be prevented by the resistance of washers 63 to compression. If the lower equalizer in Figure 5 tends to move to the left relative to the upper equalizer, such movement is prevented by the resistance of washers 65 to compression. Bolt 62 preferably is drawn tight enough to place rubber washers 63, 65 under initial pressure so that further distortion of the washers by pressure during normal operation of the truck is negligible.

The tracks shown and described avoid shimmying or nosing because the axles are held against relative lateral and longitudinal play by the equalizers. The trucks are sufficiently flexible to accommodate track irregularities by providing for relative movement of the axles in vertical planes transversely of the truck and by providing for relative rotation of the equalizers about longitudinal and transverse axes.

It will be understood that all of the details described are not essential to all embodiments of the invention, but the structure may be modified substantially without departing from the spirit of the invention and the exclusive use of such modifications, as come within the scope of the claims is contemplated.

What is claimed is:

1. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies and held against movement thereon transversely of the truck, an equalizer at each side of the truck extending longitudinally of the truck with its ends mounted on the journal boxes at that side of the truck and held against move-

ment relative to the journal box transversely of the truck, a member affixed to each equalizer between said assemblies and extending from the equalizer inwardly transversely of the truck, and means attaching the inner ends of said members to one another and providing for restricted rotation of said equalizers relative to one another about their respective longitudinal axes extending over their supporting journal boxes.

2. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies and held against movement thereon transversely of the truck, a drop equalizer at each side of the truck extending longitudinally of the truck with its ends mounted on the journal boxes at that side of the truck and holding said boxes against relative movement longitudinally of the truck, a member affixed to the lower portion of each equalizer between said assemblies and extending from the equalizer inwardly transversely of the truck, and a resilient device attaching the inner ends of said members to one another and providing for restricted rotation of said equalizers relative to each other and about their respective longitudinal axes extending over the associated supporting journal boxes, and about a common transverse axis, between their ends, said means preventing relative movement of said equalizers longitudinally of the truck.

3. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies and held against movement thereon transversely of the truck, an equalizer at each side of the truck extending longitudinally of the truck with its ends mounted on the journal boxes at that side of the truck and held against movement relative to the journal box transversely of the truck, a member affixed to each equalizer between said assemblies and extending from the equalizer inwardly transversely of the truck, and a device attaching the inner ends of said members to one another and including an elongated element extending freely through said portions, there being a pad of rubber-like material between said portions and between each end of said element and an adjacent portion surface, said element clamping said pads between opposing portion and element surfaces.

4. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies substantially without play transversely of the truck, equalizers extending longitudinally of the truck and having yokes at their end portions receiving said journal boxes, a pin positioning each of said journal boxes on the associated equalizer, a member rigid with each equalizer extending from the equalizer inwardly transversely of the truck, the inner ends of said members having substantially upright faces opposing each other, a pad of rubber-like material between said faces and an elongated element extending freely through apertures in said member ends and clamping said pad between said faces.

5. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on said journal boxes, a member rigid with said equalizers and extending transversely of the truck from each equalizer towards the opposite equalizer, and a device attaching said members to one another and providing for restricted relative rotation of said equalizers about respective longitudinal axes and about a common transverse axis, said members holding said equalizers against relative movement transversely of the truck, a frame supported from said equalizers, and a bolster supported from said frame, there being anchor rods between said equalizers and said truck frame and between said bolster and said truck frame to position said truck frame relative to said equalizers and to position said bolster relative to said truck frame.

6. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on and secured to said journal boxes, members rigid with and extending inwardly from said equalizers and having opposing surfaces extending transversely of the truck, and a securing device including an elongated element extending longitudinally of the truck and through said members and clamping yieldable washers between said surfaces.

7. Structure as defined in claim 6 in which the portions of the members receiving the elongated element include opposing recesses for the washer and have openings for the elongated element larger than the diameter of the element to permit relative inclination of the element and the members.

8. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies substantially without play transversely of the truck, an equalizer extending longitudinally at each side of the truck and having yokes at its ends receiving said journal boxes and holding said journal boxes against relative movement lengthwise of the truck, pins positioning said equalizers and journal boxes against relative movement transversely of the truck, V-shaped members extending transversely of the truck and rigid with said equalizers and with the bases of the V substantially at the center of the truck with portions adjacent one another, and a securing device including an elongated element extending longitudinally of the truck through said adjacent portions and clamping yieldable washers between said portions and between each end of said element and the associated portion.

9. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on said journal boxes, brake frame members spaced apart longitudinally of the truck and extending transversely of the truck and secured to said equalizers and each associated with a respective wheel and axle assembly, extensions on said brake frame members extending longitudinally of the truck and having overlapping portions, and means yieldingly securing said overlapping portions to each other.

10. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on said journal boxes, brake frame members spaced apart longitudinally of the truck and extending transversely of the truck and secured to said equalizers and each associated with a respective wheel and axle assembly, extensions on said brake frame members extending longitudinally of the truck and having portions overlapping each other longitudinally of the truck, rubber-like pads between the overlapping portions, and means clamping said pads between said portions.

11. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on said journal boxes, brake frame members spaced apart longitudinally of the truck and extending transversely of the truck and secured to said equalizers and each associated with a respective wheel and axle assembly, extensions on said brake frame members

extending longitudinally of the truck and having overlapping portions, a plurality of securing devices spaced apart lengthwise of the truck and each including an elongated element extending transversely of the truck through said overlapping portions, and clamping a rubber-like pad between said portions.

12. Structure as described in claim 11, in which the overlapping portions include opposing recesses for receiving the pads and have openings for the elongated elements larger than the diameter of the elements to permit relative inclination of the elements and the extensions.

13. In a railway vehicle truck, wheel and axle assemblies, brake discs rigid with said wheel and axle assemblies, journal boxes mounted on said assemblies, equalizers mounted on said journal boxes, brake frame members spaced apart longitudinally of the truck and extending transversely of the truck and secured to said equalizers and each associated with a respective wheel and axle assembly, brake shoes mounted on said members and clasping said brake discs, extensions on said brake frame members extending longitudinally of the truck and having overlapping portions substantially at the center of the truck, and means yieldingly securing said overlapping portions to each other.

14. In a railway vehicle truck, wheel and axle assemblies, journal boxes mounted on said assemblies substantially without play transversely of the truck, an equalizer extending longitudinally

at each side of said truck and having yokes at its ends receiving the corresponding journal boxes and positioning said journal boxes against relative movement lengthwise of the truck, pins positioning said equalizers and journal boxes against relative movement transversely of the truck, brake frame members spaced apart longitudinally of the truck and extending transversely of the truck from one equalizer to the other and each associated with a respective wheel and axle assembly, extensions on said brake frame members extending longitudinally of the truck and having overlapping portions substantially at the center of the truck, and a plurality of securing devices spaced apart lengthwise of the truck and each including an elongated element extending transversely of the truck through said adjacent portions and clamping a rubber-like pad between said portions.

JAMES C. TRAVILLA, JR.

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