

July 29, 1941.

L. H. SHILS ET AL

2,250,609

ARTICULATED CAR

Filed Feb. 15, 1939

2 Sheets-Sheet 1

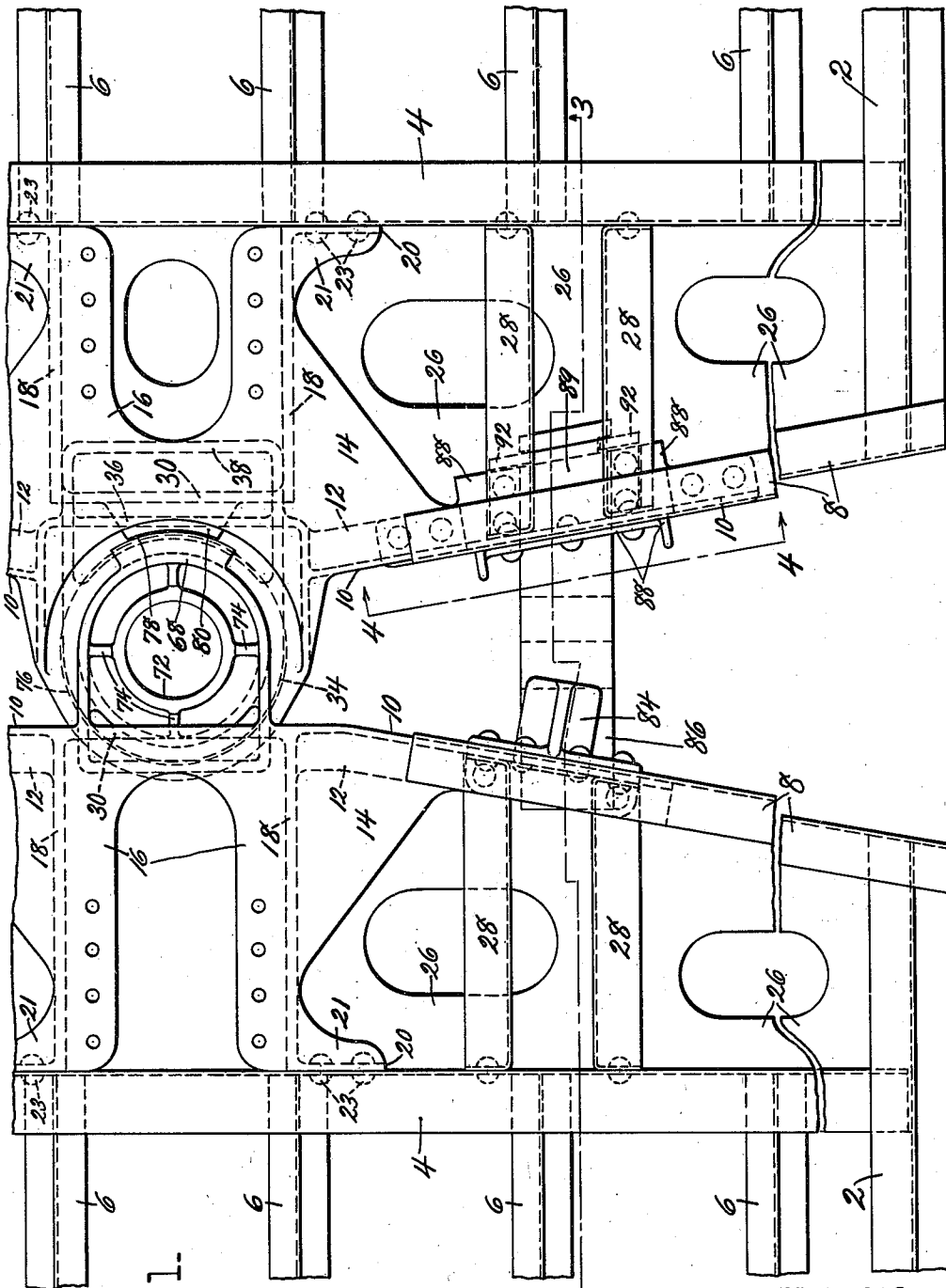


Fig. 1.

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ARTICULATED GAR

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2 Sheets-Sheet 2

Fig. 2.

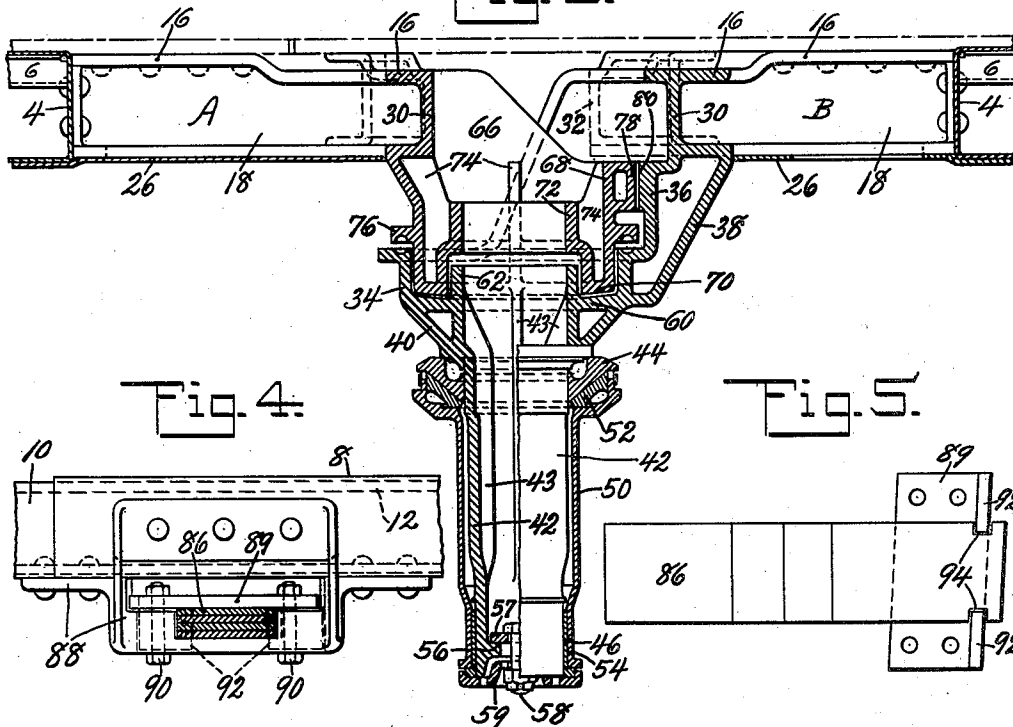


Fig. 4.

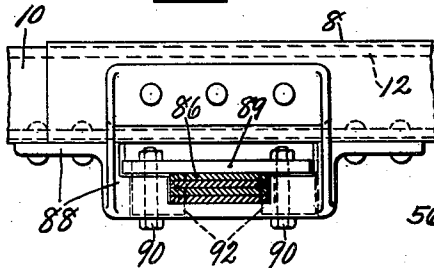


Fig. 5.

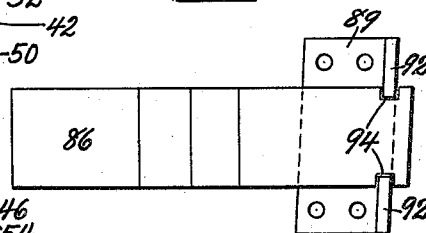


Fig. 3

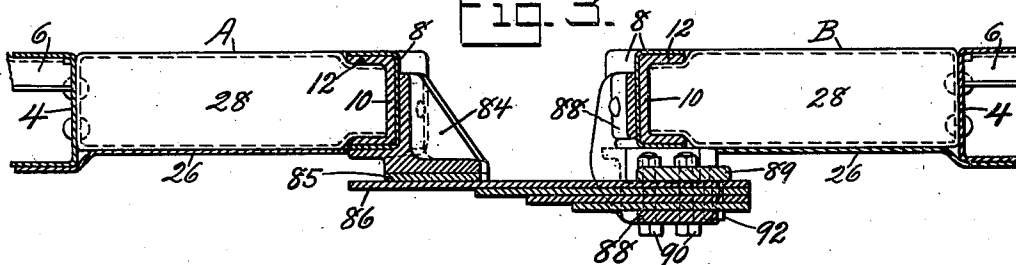
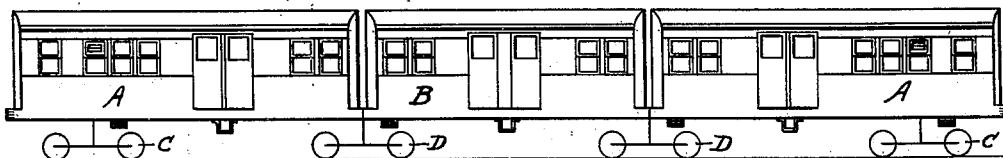


Fig. 6.



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2,250,609

ARTICULATED CAR

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Application February 15, 1939, Serial No. 256,582

15 Claims. (Cl. 105-4)

This invention relates to railway cars in general and in particular to railway cars of the articulated type wherein adjacent car bodies rest upon a common supporting truck. In the past cars of the articulated type have been built with the adjacent car bodies either supported on a common truck bolster with the side sway taken care of by side bearings, or the cars have been supported upon independent bolsters carried by a common truck with the bodies again stabilized by use of truck side bearings. It is obvious that when, for any reason due to eccentricity of load or when the cars are rounding a curve, the body contacts the side bearings, road shocks will be transmitted directly into the car body. It is also obvious that extremely limited movement between the body and truck is permissible with the old type of side bearing arrangement and such limited movement necessarily makes a hard riding car. It is an object, therefore, of the present invention to provide articulated cars in which adjacent ends of adjacent cars mutually interact to stabilize side sway of the cars without using truck side bearings.

It is another object of the invention to provide adjacent ends of adjacent cars of the articulated type with means to resiliently stabilize side sway between the cars and independently of any bearing on the truck except at the center.

Another object of the invention is the provision of articulated cars in which one car of the adjacent units is provided with a depending elongated center bearing engaging within a deep truck bolster in order that the side sway of the car may be directly controlled by the bolster.

A still further object of the invention is the provision of a new and improved end casting for use with articulated cars.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawings, in which:

Figure 1 is a plan view of the improved arrangement and disclosing substantially one-half the car and framing;

Fig. 2 is a sectional view taken substantially on the center line of the articulated connection;

Fig. 3 is a transverse sectional view taken substantially on line 3-3 of Fig. 1 and showing the stabilizing means;

Fig. 4 is a sectional view taken substantially on line 4-4 of Fig. 1;

Fig. 5 is an inverted plan view showing one manner in which the stabilizing means may be secured in the end casting, and

Fig. 6 is an elevational view disclosing one arrangement of articulated units.

Referring now to the drawings in detail and particularly Figure 6, it will be seen that the entire unit is made up of end cars A and one or more center cars B. In the instance shown the end cars A are supported upon independent trucks C, while the adjacent ends of cars A and B are supported upon common trucks D. With this arrangement it will be noted that the number of trucks required will always exceed the number of cars by one. Merely for illustrative purposes, the car B has been provided with depending elongated center bearings, later to be described, which will support this car directly upon the trucks D with the ends of cars A resting upon the upper portion of the center bearing.

Referring now to Figs. 1 to 5 inclusive, it will be seen that the cars are of the side carrying type having side sills 2 connected together at their ends by combined end structures and body bolsters. These end structures or body bolsters are built up of pressed and cast elements and, in the instance shown, an inner transverse member 4 of channel section connects the side sills and caps the ends of floor stringers 6 adapted to support the floor (not shown). The side sills project outwardly beyond this transverse member and are capped by means of a rearwardly directed channel member 8 adapted to overlap and be rigidly secured to oppositely directed wings 10 of a combined end and center bearing casting. The wings 10 are preferably of channel section and have the upper flange 12 thereof merging into a bracing gusset 14 which is continuous with a top plate 16 overlapping and formed integral with center webs 18. Each of these webs is provided with an outwardly turned foot or flange 20 braced by gussets 21 preferably located in the same plane as the beforementioned gussets 14 and plate 16. The foot or flange portion 20 and wings of the casting are adapted to be rigidly secured to the transverse member 4 and end channel 8 respectively by any suitable means, such as rivets 23. The casting, end members 8, and transverse member 4 are additionally joined together and stiffened by bottom plate 26 and by side pan-shaped bracings 28, the latter being located in pairs on either side of the center line of the end structure and in the region where the stabilizing means will be attached. The channel section wings are more or less continuous completely across the casting, thus providing a web portion 30 at the center of the casting joining the center bracing webs 18 previously referred to. As

just described, the end castings for cars A and B are substantially the same, but since the center bearing structures are different, reference will now be had to the casting adapted, in the instance shown, for use on car unit B.

The casting illustrated as connected to car unit 3 has the center bearing structure formed by extending the bracing webs 18, as at 32, outwardly beyond the connecting web 30 and deflecting such extension downwardly to merge into a bowl-like member 34 which will thus be braced by these extensions and also by a curved rib 36 formed integral with the web 30 and in turn additionally braced by means of inclined wall 38 extending between the bowl-like portion and the main body of the casting. The walls of the bowl-like member 34 are deflected inwardly and downwardly as at 40 merging into an elongated depending hollow portion 42 suitably braced internally by ribs 43 and provided adjacent its upper and lower ends with trued surfaces providing areas for reception of bearings 44 and 46 respectively. These bearings are adapted to support and guide the elongated projection in an elongated opening in the truck bolster 50, which in turn will be provided with cooperating bearing areas 52 and 54 respectively. The lower end of the elongated projection is provided with a shoulder 56 adapted to receive a plate 57 by means of which a bolt 58 and cup 59 may function to lock the projection in the truck bolster and prevent its being lifted therefrom. The walls of the elongated projection are projected upwardly through the base 60 of the bowl-like portion, thus providing a shoulder 62 which will act as a centering control for the bearing formed on the cooperating casting carried by car A.

The casting carried, in the instance shown, by car A also has a continuation of the bracing center webs extending as at 66 and merging into a curved wall 68, which wall is extended and provided at its lower edge with bearing area 70 adapted to rest upon the base of the bowl-like member previously referred to. This bearing area is reinforced by an inner annular wall 72 and bracing gussets 74, some of which are extended upwardly to engage the end bracing web 30. Flanges 76 are formed on the curved wall 68 and adapted to overlap the bowl-like member, permitting the use of any suitable type of sealing means (not shown) for retaining grease in the bearing and for excluding foreign matter. The forward edge of the curved wall 68 is formed also with a curved projection 78 adapted to come into close contact with a thickened area 80 formed on wall 36 of the casting carried by car B, thus forming a buffing area adapted to transmit buffing strains from one casting to the other independently of the bearing area. It will thus be seen that the castings carried by cars A and B are provided with center bearing structures, permitting the movement of one casting relative to the other, such movement consisting of rotational movement in a horizontal plane and a slight rocking due to the limited clearances between the bearing areas of the casting carried by car A and the bearing areas of the casting carried by car B.

In order to stabilize and control any rocking movements of the car bodies, shoe members 84 are riveted or otherwise secured to the end channels and casting wings between the bracing pans 28. Each of these shoes is provided with a bearing pad 85 adapted to slidably bear upon an upper leaf 86 of a cantilever spring, the anchored

end of which is carried by a bracket 88 bolted or otherwise secured to the end channel and wing of the casting carried by car B. As clearly shown in Figs. 3, 4 and 5 the bracket is formed with a pocket adapted to receive the spring which will be held in the pocket by means of anchor plate 89 and bolts 90. The cantilever springs are locked in position in the pocket by means of ledges 92 formed on the plate 89 and adapted to engage within notches 94 in the base end of the spring leaves. In this manner any broken springs may be readily replaced by merely loosening the bolts, removing anchor plate 89 and withdrawing the desired spring leaf.

It will be obvious that due to the elongated projection of the casting carried by car B into the opening in the truck bolster, the car B and bolster must rock and move substantially in unison in all directions except for rotational movement in a horizontal plane, thus by controlling the sway of the truck bolster in any well known manner, the sway of car B is controlled. By providing the stabilizing springs which will be contacted by the stabilizing pads of car A, any rocking movements of car A are transmitted resiliently to car B and absorbed finally by the truck bolster through the elongated depending projection. It will be obvious that slight swaying of the cars A or B will be absorbed by cars B or A respectively due to the mass of the structures without such sway being transmitted to the truck through the bolsters. In this manner an extremely easy riding arrangement has been provided which is also extremely flexible due to the articulated connections.

While the invention has been described more or less in detail, it is obvious that various modifications and arrangements of parts will be apparent to persons skilled in the art from a study of the preceding description and all such modifications and rearrangements of parts are contemplated as will fall within the scope of the following claims.

What is claimed is:

1. An articulated car arrangement comprising a pair of car bodies, a truck beneath the adjacent end portions of the bodies, a deep bolster carried by said truck and formed with an elongated cylindrical cavity, means carried by one of said bodies and formed with an elongated cylindrical projection depending therefrom and journaled in said cylindrical cavity for supporting and steadying said one body, and a bearing member carried by the other of said bodies and rotatably supported by said means with the axes of rotation of said member and means substantially coincident.
2. An articulated car arrangement comprising first and second car bodies, a truck beneath the adjacent end portions of the bodies, a deep bolster carried by said truck and formed with an elongated cylindrical cavity, means carried by the first of said bodies and formed with a cylindrical projection depending therefrom and journaled in said cylindrical cavity for supporting and stabilizing said first body, a bearing member carried by the second of said bodies and rotatably supported by said means, and stabilizing means carried by said bodies in laterally spaced relation to said first named means and bearing member, said stabilizing means mutually interacting to stabilize said bodies and limit side sway of said second body by transferring swaying movements thereof through the end of said first body to said cylindrical projection.

3. An articulated car arrangement comprising a pair of car bodies, combined end sill and body bolster structures secured to the adjacent ends of said bodies, a truck positioned beneath the adjacent end sill and body bolster structures of the bodies, a bolster carried by said truck, bearing members formed on each of said adjacent end sill and body bolster structures and rotatably supported upon said bolster for swinging movement about a common axis, one of said bearing members having vertically spaced contact with said truck bolster to stabilize one of the bodies, and stabilizing means connected to each of said adjacent structures in laterally spaced relation to said bearing members, said stabilizing means being so formed and arranged as to cause said bodies to interact therethrough to limit side sway of the bodies and transfer swaying movements through at least one of the bearing members to the truck bolster.

4. An articulated car arrangement comprising a pair of car bodies, combined end sill and body bolster structures secured to the adjacent ends of said bodies, a truck positioned beneath the adjacent end sill and body bolster structures of the bodies, a bolster carried by said truck, bearing members formed on each of said adjacent end sill and body bolster structures and rotatably supported upon said bolster substantially at the center thereof for swinging movement about a common axis, and stabilizing means connected to each of said adjacent structures in laterally spaced relation to said bearing members, said stabilizing means being resilient and being so formed and arranged as to cause said bodies to interact therethrough to limit and damp side sway of the bodies, and said bearing members being so formed and arranged as to constitute the sole means for supporting the adjacent ends of the bodies and for transferring side sway of the bodies to the common truck bolster.

5. An articulated car arrangement comprising a pair of car bodies, a truck beneath the adjacent end portions of the bodies, a bolster carried by said truck, bearing means formed on the adjacent ends of said bodies and rotatably supported upon said bolster adjacent the center thereof for swinging movements about a common axis, said bearing means including a vertically elongated cylindrical bearing member extended into the bolster, and stabilizing means connected to the lower portions of said bodies in laterally spaced relation to said bearing means, said stabilizing means being so formed and arranged as to cause said bodies to interact therethrough to limit side sway of one of the bodies and to transfer swaying movements of the car bodies to the said bearing means.

6. An articulated car arrangement comprising, a first car body, a second car body positioned with an end adjacent an end of the first car body, a truck beneath the adjacent ends of said bodies, vertically elongated cylindrical bearing means rotatably supporting said bodies adjacent their longitudinal centers upon the truck for swinging movements about a common axis, and means connected to the lower portion of said first car body and engaging means on the lower portion of said second car body to stabilize the bodies and limit individual side sway, and to transfer swaying movements of the car bodies to said bearing means.

7. An articulated car arrangement comprising, a first car body, a second car body positioned with an end adjacent an end of the first car body, a

truck beneath the adjacent ends of said bodies, vertically elongated cylindrical bearing means rotatably supporting said bodies solely at their longitudinal centers upon the truck for swinging movements relative thereto and to each other, and means connected to said first car body and acting upon said second car body to stabilize the bodies and limit individual side sway of the bodies and to transfer swaying movement of said second car body to said bearing means.

8. An articulated car arrangement comprising, a first car body, a second car body positioned with an end adjacent an end of the first car body, a truck beneath the adjacent ends of said bodies, bearing means rotatably supporting said bodies at their longitudinal centers upon the truck for swinging movements relative thereto and to each other, and said bearing means directly limiting side sway of said first car body, resilient means connected to said first car body and acting upon said second car body to limit and damp individual side sway of the bodies and to transfer swaying movement of said second car body through the end of said first car body to said bearing means.

9. In an articulated car the combination of side sills, longitudinally extending floor stringers located between said side sills, first transverse means secured to said side sills inwardly of the ends thereof and extending across said stringers and secured thereto, second transverse means secured to the ends of said side sills in outwardly spaced relation to said first transverse means, and a cast means joining said first and second transverse means together, said cast means being formed with a depending bearing portion for supporting the car and forming with said transverse means a combined body bolster and end structure for the car.

10. In an articulated car the combination of side sills, longitudinally extending floor stringers located between said side sills, first transverse means secured to said side sills inwardly of the end thereof and extending across said stringers and secured thereto, second transverse means secured to the ends of said side sills in outwardly spaced relation to said first transverse means, and a cast means joining said first and second transverse means together, said cast means being formed with a cylindrical projection extending a substantial distance below said transverse means and provided with a plurality of vertically spaced bearing portions.

11. In an articulated car the combination of side sills, longitudinally extending floor stringers located between said side sills, first transverse means secured to said side sills inwardly of the ends thereof and extending across said stringers and secured thereto, second transverse means secured to the ends of said side sills in outwardly spaced relation to said first transverse means, and a cast means joining said first and second transverse means together, said cast means being formed with a cylindrical projection extending a substantial distance below said transverse means and being provided with a plurality of vertically spaced bearing portions adapted to support one end of said car.

12. In an articulated car, a body support casting comprising a central body portion for attachment to the car structure, a cylindrical projection extending downwardly from the central body portion, and vertically spaced vertically extending bearing areas formed on said projection

and adapted to support and prevent tilting of the casting and car.

13. In an articulated car, a body support casting comprising a central body portion for attachment to the car structure, a cylindrical projection extending downwardly from the central body portion, vertically spaced bearing areas formed on said projection and adapted to support the car, and an additional bearing area forming a part of said projection and adapted to support an end of an adjacent car.

14. In an articulated car, a body support casting comprising a central body portion for attachment to the car structure, a cylindrical projection extending downwardly from the central body portion, and a plurality of vertically spaced bearing areas formed on said projection, certain of said bearing areas being widely spaced vertically and adapted to guide and support the casting and attached car, and at least one of said bearing

areas being positioned adjacent the top of said projection and being adapted to support an end of an adjacent car for rotational movement substantially about the vertical axis of said cylindrical projection.

15. In an articulated car, a body support casting comprising a central bracing body portion formed with means permitting attachment thereof to the car structure inwardly of the car end, laterally directed wings formed on said casting for attachment to the car end, and an integral elongated projection extending downwardly substantially at right angles to the body portion of the casting, said projection being formed with at least three vertically spaced bearing areas, two of which are vertically extending, said bearing areas being so arranged as to support and resist tilting of the casting and car.

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