

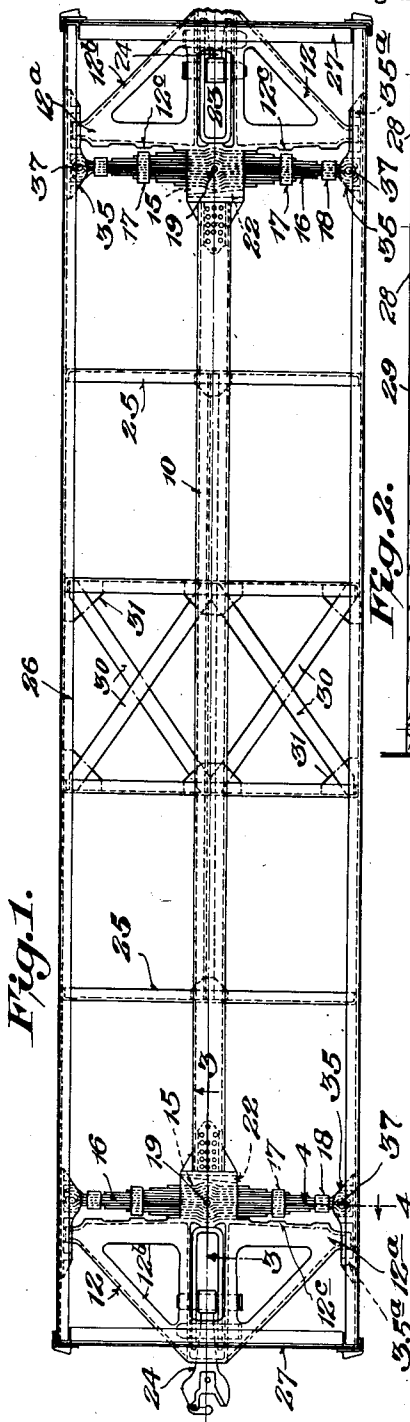
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CAR CONSTRUCTION

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CAR CONSTRUCTION.

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This invention relates to railway rolling stock, and more particularly to a railway car of the type described in my co-pending application Serial No. 23,111, filed April 14, 1925, which is so constructed that the body has limited longitudinal movement relative to the running gear.

Damage frequently results to railway cars and lading in the course of ordinary operation due to the large amount of energy which must be absorbed or dissipated when "buffing" a car, when a stationary car is placed in motion, or when sudden changes in speed are imparted to the same.

Efforts have been made to overcome the damage to the car structure by increasing the stiffness and rigidity of the structural elements such, for example, as the center sill, bolsters, cross bearers, etc. As the stiffness of the structural elements is increased, the capacity of said elements to elastically absorb blows is decreased, and consequently the inertia of the car, and its lading, play a proportionally greater part in tending to disrupt the structure under the influence of such blows which act on the car more as a pure impact and less as a yieldingly transmitted force.

In order to lower the high peak pressures resulting from the use of very rigid structures railway draft gears are designed to yieldingly resist destructive forces imparted to the car structure. The standard draft gear, however, is limited to a motion of approximately three inches and, as is well understood in the art, it is practically impossible to dissipate or absorb the large forces involved with mechanism which is so limited in its travel. This difficulty cannot be overcome by increasing the travel of the draft gears since such an arrangement increases the slack between cars and this is highly objectionable for reasons well known in the art.

In order to overcome the above objections it has heretofore been proposed to construct railway cars in such a manner that the car body has limited longitudinal movement relative to the running gear, said longitudinal movement being controlled by resilient

means. For example, it has been proposed to construct a railway car comprising a heavy underframe on which is slidably mounted a car body, said underframe and car body being provided with buffer blocks between the underframe and car body at the opposite ends thereof and at the center thereof. Between each pair of buffer blocks were introduced a plurality of groups of spring plates to absorb shocks imparted to the car body and to normally maintain said body centered on said underframe. This arrangement requires the length of the car body to be materially shortened, thereby decreasing its carrying capacity or, if the car body is maintained at standard length, the over-all length of the car structure must be increased which is highly objectionable for reasons well known in the art.

Moreover, the structures of the above type heretofore employed, have differed so greatly from standard car construction, have been so expensive to manufacture, or have required the addition of so many structural elements, thereby greatly increasing the weight of the car, as to render the same unsatisfactory for general use.

An object of the present invention is to provide a railway car of the longitudinally movable body type conforming closely to the construction at present employed in standard railway rolling stock, which embodies novel means for overcoming the above objections.

Another object of the invention is to provide novel, resilient means for yieldingly resisting relative movement between the running gear and the car body.

A further object is to provide novel means which constitute draft sills and which perform other functions to be set forth more fully hereinafter.

A further object of the invention is to provide novel means for associating certain of the transverse body members with the running gear. These and other objects will appear more fully hereinafter.

One form which the inventive idea may assume is shown in the accompanying drawings, which drawings, however, are for the

purpose of illustration only and are not to be taken as defining the limits of the invention, reference being had to the appended claims for this purpose.

5 In the drawings,

Fig. 1 is a top plan view illustrating one form of the present invention;

Fig. 2 is a detail transverse sectional view, somewhat enlarged, illustrating one manner
10 in which certain of the transverse body members may be associated with the running gear;

Fig. 3 is an enlarged longitudinal sectional view, taken on line 3—3 of Fig. 1; and

Fig. 4 is an enlarged detail sectional view taken on the line 4—4 of Fig. 1.

Referring to the drawings, wherein like reference characters refer to like parts throughout the several views, the running
20 gear constituting a portion of the subject matter of the present invention, preferably comprises a center member, constituting a draft member 10 which, in the form shown, includes a center sill composed of two longi-
25 tudinally disposed U-shaped channel members 11 that are mounted with the flanges of the same extending downwardly. Rigidly secured in any desired manner, as by means of rivets, to the opposite ends of
30 the channel members 11, are irregular shaped castings 12 which constitute draft sills and which perform certain other functions to be pointed out more fully hereinafter. As shown more clearly in Fig. 3, the draft sills
35 12 are provided on the lower surface thereof with an integrally formed portion constituting a center plate 13 for engagement with a truck bolster 14 in a manner which is well understood in the art. The draft sill
40 members 12 are provided closely adjacent the ends of the channel members 11 with transverse openings 15 and through these openings extend body bolsters 16. As shown, the body bolsters 16 are formed of a
45 plurality of vertically disposed plates or leaves constituting a leaf spring, the leaves of the spring being provided with spring clips 17 and 18. Suitable means, such for example as the pin 19 (Fig. 3), extends
50 downwardly through an opening 20 formed in the upper surface of that portion of the draft sill member 12 immediately above the opening 15, through an opening 21 in register with the opening 20 and formed in the
55 lower surface of the draft sill member 12, and thence downwardly through an opening in the truck bolster 14, which pin constitutes a king-pin. In order to rigidly secure the resilient body bolsters against lateral move-
60 ment relative to the draft sill members 12, suitable means, such as the wedge-shaped plate 22, may be positioned between the truck bolster 16 and the adjacent side wall of the opening 15, and may be welded in
65 place at one of the ends thereof. Mounted

in the usual manner in the draft sills 12 are draft gears 23 of any suitable type, which have operative engagement with coupler shanks 24. If desired, the running gear may also include additional transverse members
70 or cross bearers 25 of the type disclosed in my co-pending application Serial No. 23,111, filed April 14, 1925, but preferably the cross bearers 25 constitute a portion of the body structure, as will be pointed out more
75 fully hereinafter.

A body of any suitable type is mounted for relative longitudinal movement on the running gear. In the form shown, the body structure is represented by side sills 26, end
80 sills 27, cross bearers 25, and a suitable flooring 29. As shown more clearly in Fig. 2, the cross bearers are rigidly secured at their opposite ends, as by means of rivets, to the side sills 26 and the central portion
85 of said cross bearers preferably extends between the upper and lower channel members 11 constituting the center sill. Diagonal bracing members 30 and gusset plates 31 may be employed for bracing and strength-
90 ening the body structure, as is clearly shown in Fig. 1.

Secured to the upper surface of the cross bearers 25 are one or more wedge-shaped
95 friction shoes 32 which have frictional engagement with a block 33 that is rigidly attached in any desired manner to the lower surface of the upper channel member 11, said block being provided with grooves
100 into which said friction members 32 extend. It will be understood that by varying the angularity of the friction elements 32 and the grooves 34 the amount of friction between these elements may be changed as de-
105 sired. Preferably, longitudinally extending members 28 are secured to the flooring 29 beneath the same and in frictional engagement with the upper surface of the upper channel member 11.

The resilient members 16 constituting the
110 body bolsters are secured at their opposite ends in any desired manner to the side sills 26. In the form shown, members 35, which are preferably castings are rigidly attached to the inner surface of the side sills 26 ad-
115 jacent the ends of the bolsters 16. Extending through the ends of the bolsters 16 and through registering openings in the members 35 and retained in position by means of members 36 which may be rigidly secured
120 to the lower surface of side sills 26, are pins 37 constituting a pivotal connection between the side sills and the bolsters. The members 35 are also preferably provided with in-
125 wardly projecting portions 35^a.

The draft sill members may be provided with laterally extending arms 12^a braced by diagonally disposed portions 12^b, said arms extending outwardly into the plane of the
130 side sills 26 and the portions 35^a of the

castings 35. The portions 35^a constitute stops for positively limiting relative movement between the car body structure and the running gear. Preferably the laterally extending arms 12^a of the draft sills 12 are provided with bosses 12^c intermediate the length of the same for engagement with the spring clips 17.

Operation.—If a force is imparted to the center member 10, for example a force tending to move said center member to the left as viewed in Fig. 1, this force is yieldingly transferred through the resilient bolsters 16 and the pins 37 to the car body structure. The elements constituting the running gear tend to move to the left but the inertia of the body structure opposes this tendency. Due to the resilient members 16, the inertia of the body structure is yieldingly overcome but there results relative longitudinal movement between the body structure and the running gear. If this relative movement is sufficiently great the spring clips 17 contact with the projecting portions or bosses 12^c formed on the draft members 12, whereupon the resiliency of the bolsters is decreased, due to the shortening of the moment arm, i. e., the moment arm originally extended from the pin 19 to the pins 36 and the resiliency of the bolsters was accordingly great, but when the clips 17 contact with the portions 12^c the length of this arm is decreased. This shortening of the moment arm prevents a sudden and violent engagement between the outer ends of the arms 12^c of the draft sill members 12 and the stops 35^a, since the resisting force of the springs increases as the moment arm is shortened. Relative movement between the running gear and the body structure is resisted in either direction by each of the resilient bolsters 16. Since the spring plates forming the bolsters are vertically disposed, said plates constitute rigid transverse supporting members for the body structure in vertical planes, but said plates are capable of yielding in a horizontal plane. The relative movement between the body and the running gear is also yieldingly resisted by the friction between the cross bearers 25 and the members 33 secured to the upper channel member 11, which friction may be increased or decreased as desired, in a manner pointed out above. Moreover the friction between members 28 and channel member 11 cooperates with the flexible bolsters to yieldingly resist relative movement of the body.

It will be seen that there is provided a railway car of the longitudinally movable body type which is extremely simple in construction and which is rugged and inexpensive to manufacture. The structure is particularly adapted to prevent damage to the car body or lading during the usual operation. Various changes may be made in the details of con-

struction. For example, the draft sills are shown as integrally formed castings but it will be understood that this is not essential. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:—

1. A railway car comprising running gear including flexible bolsters formed of a plurality of vertically disposed leaves, and a body secured to said bolsters and supported thereby.
2. A railway car comprising a center member, bolsters formed of a plurality of vertically disposed leaves secured to said member, and a body secured to said bolsters and adapted for longitudinal movement relative to said member.
3. A railway car comprising running gear including resilient body bolsters, and a body supported by said bolsters and pivotally secured thereto.
4. A railway car comprising a center member, bolsters flexible in a horizontal plane secured to the center member, and a body secured to said bolsters and adapted for longitudinal movement relative to said member.
5. A railway car comprising a center sill, draft sills secured thereto, resilient bolsters secured to said draft sills, and a body secured to said bolsters and adapted for limited longitudinal movement relative to said draft sills.
6. A device of the class described comprising running gear including draft sills and bolsters secured thereto, a body secured to said bolsters and adapted for longitudinal movement relative to said draft sills, said bolsters being adapted to yieldingly resist relative longitudinal movement of said body and constituting rigid supporting members for said body in a vertical plane.
7. A device of the class described comprising a center sill, draft sills, flexible bolsters extending through said draft sills, and a body mounted on said bolsters and secured thereto, said body being adapted for longitudinal movement relative to said center sill.
8. A railway car comprising running gear including a center sill, draft sills, and bolsters, a body including cross bearers mounted for longitudinal movement relative to said draft sills, said relative movement of the body being yieldingly resisted by said bolsters and by the frictional engagement of the cross bearers with said center sill.
9. A railway car comprising running gear including a center member and bolsters, a body including cross bearers, and coacting friction elements secured to said cross bearers and center member, said body being secured to said bolsters and adapted for longitudinal movement relative to said center member, the relative movement of said

body being yieldingly resisted by the friction of said elements.

10. A railway car comprising a center member, flexible body bolsters, and a body including cross bearers mounted for longitudinal movement relative to said member, said cross bearers having frictional engagement with said center member, relative movement of said body being yieldingly resisted by said bolsters and the friction between the cross bearers and center member.

11. A railway car comprising running gear including bolsters, and a body supported by said bolsters, the latter being flexible in the horizontal plane of the same and rigid in vertical planes thereof.

12. A railway car comprising a center sill, draft sills having laterally extending arms, flexible bolsters secured to said draft sills, a body including side sills secured to said bolsters, said body being mounted for longitudinal movement relative to said center sill, and means secured to said side sills for engagement with said arms for positively limiting relative movement of said body.

13. A railway car comprising running gear including draft sills having laterally extending arms and transverse members constituting body bolsters secured to said draft sills, and a body mounted on said running gear and adapted for longitudinal movement relative to said draft sills, said transverse members being adapted to yieldingly resist relative longitudinal movement of said body and to engage said arms intermediate the length of the same.

14. A railway car comprising running gear including a center member and transverse flexible members constituting body

bolsters, a body mounted on said running gear for longitudinal movement relative to said center member, said transverse members being adapted to yieldingly resist relative movement of said body.

15. A railway car comprising running gear including a center member and bolsters a body mounted on said running gear for limited longitudinal movement relative to said member, cross bearers rigidly secured to said body, and coacting friction elements carried by the center member and cross bearers for yieldingly resisting relative longitudinal movement of the body.

16. A device of the class described comprising running gear including a center member and bolsters formed of a plurality of vertically disposed leaf springs, a car body having cross bearers mounted for relative longitudinal movement on said running gear, said cross bearers having sliding engagement with said center member, and means for connecting said body to said leaf springs.

17. A device of the class described comprising running gear including a center sill, transverse supporting members secured thereto and draft sill members secured to said center sill, a car body including end sills and side sills mounted for longitudinal movement relative to said center sill, and means securing said side sills to said bolsters, said bolsters constituting yielding means for resisting relative longitudinal movement between the body and running gear in either direction.

In testimony whereof I have signed this specification.

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