My invention relates to railway vehicle equipment and it has particular relation to the draft means employed in connecting together adjacent railway cars or other vehicles such as trucks, trailers, and the like.

My invention is particularly directed to the type of vehicle interconnecting means disclosed in application Serial No. 883,864, filed January 2, 1937, by Carl Breer, in which an interconnecting means located at the ends of the vehicle causes the forces transmitted thereby to have an effective center of application at any predetermined point within the vehicle, even though that point be materially removed from the point of attachment of the interconnecting means to the vehicle.

The object of my invention consists in providing a novel type of vehicle interconnecting means of the character indicated in which the interconnecting means adapts itself to the relative positions of the two connected vehicles and changes its position automatically with changes in the relative positions of the two cars so as to remain in alignment with any two predetermined points within those cars while under tension but which remains in substantially fixed positions with respect to those cars while under compression.

For a better understanding of my invention, reference may now be had to the accompanying drawings, in which:

Fig. 1 is a plan view, partially in section, of a railway interconnecting device constructed in accordance with my invention.

Fig. 2 is a cross sectional view of the structure illustrated in Fig. 1, the view being taken along the line $II$—$II$ thereof.

Fig. 3 is a diagrammatic plan view of a series of railway cars coupled together by means of interconnecting devices constructed in accordance with my invention.

Fig. 4 is a plan view partially in section, and generally similar to Fig. 1, representing a modified form of my invention.

As illustrated in the drawing, particularly in Figs. 1 and 2, each railway car is provided with an interconnecting means secured thereto adjacent the end of the car body. The interconnecting means comprises generally a support 10, a guiding device 11 coupled thereto, a carriage 12 mounted on the guiding device 11, and a drawbar 13 having a coupling mechanism 14. As here illustrated, the under surface of the end of the car body or coach, or the end portion of the railway truck, preferably the former, is provided with a base or mounting 15 to which the support 10 is secured by means of bolts 16, or other suitable fastening means and may also be keyed as shown at 16.

The support 10 is provided at its other end with a yoke member 17 having two laterally extending arms 18 and 19, connected together by an intermediate portion 20. Secured to the ends of the arms 18 and 19 by means of bolts 22 or other suitable fastening means is a guide member 21, the inner surface 23 of the guide member 21 being arcuate in contour, the arc being drawn about a center 24 disposed within the body of the vehicle in spaced relation to the base 18 and support 10. In like manner, the exterior surface of the intermediate member 20 is provided with an arcuate face 25 likewise drawn about the point 24 as a center.

Slidably mounted on the guide member 21 is the carriage member 12 which consists of upper and lower members 26 and 27 connected together on the exterior side of the guide member 21 by a main body portion 28, and connected together at their interior ends by a substantially upright portion 29 having an arcuate interior face 30. Rotatably mounted between the upper and lower portions 26 and 27 are two lower roller members 31, rotatably mounted on pins 32, which are adapted to engage the arcuate face 25 of the guide member 21 when a tension is exerted on the drawbar 13. These rollers being free to move, permit the carriage member 12 to move freely on the guide member 21 in accordance with the direction of the force exerted by means of the next adjacent car through the drawbar 13.

The drawbar 13 is connected to the main body portion 28 of the carriage member 12 by means of a pivotal connection 33, the pivotal axis of which is disposed vertically, or may be connected by a universal, especially where coupling 14 makes a rigid connection with the cooperating coupling member of the next adjacent car. The drawbar 13 is provided at its opposite end with the usual coupling member 14 which should be of the rigid type so that when coupled to an adjoining car the two drawbars and the attached couplings constitute a single rigid unit.

The arcuate surface 25 of the central member 20 is provided with a layer of friction inducing material 34 secured thereto which is adapted to be engaged by the exterior arcuate surface of the portion 29 of the carriage 12 which may, if desired, be provided with a layer of friction inducing material 35 when any forces from adjoining cars serve to place the drawbar 13 under compression. It will be noted that when the
drawbar is in tension, as illustrated in Fig. 1, the rollers 31 are in engagement with the arcuate face 23 of the guide 21 and the arcuate face of the end portion 29 of the car 43 is therefore free to move laterally in response to the forces imposed thereon. When the drawbar 13 is subjected to compressive forces the carriage 12 moves bodily toward the car body a short distance as to bring the arcuate surface of the end portion 29 into engagement with the friction inducing material 34 secured to the arcuate face 23 of the member 28 which, at the same time, moves the rollers 31 out of engagement with the arcuate face 23. It will be noted that the inner face of the main body member 28 of the carriage 12 is spaced a sufficient distance from the exterior surface of the guide 21 that no contact is made therebetween under any circumstances.

In the structure illustrated in Fig. 2, railroad cars 40 and 41 are disposed on a straight portion of a track 42 being drawn by a third car 43 disposed on a curved portion of the same track. The drawbars, as shown, are under tension and those between cars 40 and 41 are disposed in alignment with the centerline of a track 42 and likewise in alignment with a center pin 44, which constitutes the center of suspension of the front truck of the car 40 and the center about which the arc 23 of its associated guide member is drawn, and a center pin 45, which constitutes the center of suspension of the rear truck of car 41 and also the center about which the arc 33 of its associated guide member is drawn. The draft means interconnecting cars 41 and 43 on the other hand is disposed within the centerline of the track 42 and in alignment with a center pin 47, which constitutes the center of suspension of the rear truck of the car 43, the center pins 46 and 47 again constituting the center about which the arcs 23 of the associated guide members are drawn. It will thus be apparent that the carriages 12, 13 are disposed on the arcuate faces of the members 21 so that the drawbars 13, which together constitute a rigid unit, are disposed in alignment between the centers of the arcs 23 of the two adjacent vehicles. By making the centers of the arcs coincident with the centers of suspension of the trucks, as illustrated in Fig. 3, all tension forces being transferred from one car to another through the coupling and drawbar means are in effect transferred from the center of suspension of the rear truck of one car to the center of suspension of the front truck of the next adjacent car.

The advantage of interconnecting the centers of suspension of the two cars instead of the points adjoins the ends of the cars, as is now the common practice, resides in the fact that any lateral disturbance of one end of one car will cause the body of that car to move about the center of suspension of the truck at the opposite end of the car but will transmit no bodily movement to that center of suspension. As a result, a lateral disturbance of one end of the car cannot be transmitted through the other end of that same car to any adjoining cars through the draft means. Likewise, a lateral movement of one end of the car will cause a lateral shifting of the carriage 12 on the guide member 21 of that same end of the car and on the car to which it is coupled, thus preventing the transmission of any lateral disturbing forces from that car to the next adjoining car through the interconnecting means.

When any compressive forces are exerted on the drawbars 13 the end member 28 moves immediately into engagement with the friction inducing material 34 and remains in contact therewith as long as any pressure is exerted on the car body through the drawbars 13. This prevents the possibility of the carriage moving to an extreme left or right end position on the guide member 21 when the drawbars are under compression, as might occur if the carriage was free to move laterally while transmitting compressive forces as well as tension forces, and under which circumstances the drawbars might move into an angular position with respect to the car bodies of such degree that the stresses exerted thereon might be sufficiently great to cause damage thereto, and might, in addition, have a tendency to move the ends of the car bodies to which the drawbars are connected laterally to degrees sufficient to disturb the comfort of the passengers. While the drawbars are under compression, the carriages will not move, unless the lateral forces become excessive to align themselves between the centers of suspension of the adjacent car trucks but will instead remain in substantially the position which they occupied when tension was last exerted. However, substantially no inconvenience to the passengers will be caused thereby as the distance over which the cars are pushed as compared to that from which they are 'pulled' is of negligible proportions.

From this description, it will be apparent that relatively light construction may be employed as highly stressed members such as 21 and 31, 32 are never subjected to any forces greater than those necessary to pull the cars because when under compression, the highly stressed members are relieved of load.

In Fig. 4 I have illustrated a slight modification of my invention in which the end surface 50 of the end portion 29 of the carriage 12 is provided with a serrated face which is adapted to engage a similarly serrated face 51, either mounted on or cut into the arcuate face 23 of the central member 20 of the yoke 17. When the device illustrated in Fig. 4 is subjected to tension forces, the rollers 31 permit it to move laterally on the arcuate face of the guide member in a manner. When it is subjected to compressive force the generally arcuate surface 50 moves into engagement with the generally arcuate surface 51 to prevent lateral displacement of the carriage 12 under those conditions.

Although I have illustrated two forms which my invention may assume and have described in detail a single application thereof, it will be apparent to those skilled in the art that it is not so limited but that various modifications and changes may be effected therein without departing from the spirit of my invention or from the scope of the appended claims.

What I claim is:

1. In combination, a vehicle, a coupling member draft means pivotally secured to said vehicle, said last named means causing said draft means to be movable laterally of said vehicle with a relatively small amount of friction while exerting a generally longitudinal force on said vehicle in one direction and to be laterally movable thereof with a relatively greater amount of friction while exerting a generally longitudinal force on said vehicle in the opposite direction.
2,170,924

2. In combination, a vehicle, a coupling member and draft means pivotally secured to said coupling member and secured to said vehicle, said draft means being movable laterally of said vehicle, means adapted to engage said draft means with a relatively small amount of friction against lateral movement while the latter is under tension and with a relatively greater amount of friction against lateral movement while under compression.

3. In combination, a vehicle, a coupling member and draft means pivotally secured to said coupling member and secured to said vehicle and adapted to move laterally of said vehicle about a point within said vehicle spaced from the point of attachment thereto, said means being adapted to a relatively small amount of friction to lateral movement of said draft means when the latter is exerting a force on said vehicle in one generally longitudinal direction and to present a relatively greater amount of friction to restrain lateral movement when said draft means is exerting a force on said vehicle in the opposite generally longitudinal direction.

4. In combination, a vehicle, a coupling member and draft means pivotally secured to said coupling member and secured to said vehicle and adapted to move laterally of said vehicle about a point within said vehicle spaced from the point of attachment thereto, means engaging said draft means and presenting a relatively small amount of friction to lateral movement thereof when said draft means is in tension and to present a relatively greater amount of friction to restrain lateral movement when said draft means is under compression.

5. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

6. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

7. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

8. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

9. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

10. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

11. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

12. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

13. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

14. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

15. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

16. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.

17. Vehicle draft means comprising a member adapted to be secured to a vehicle and having two oppositely disposed substantially arcuate faces, a drawbar, and means for securing said drawbar to said member comprising a portion pivotally secured to said drawbar and portions disposed adjacent each of said arcuate faces, one of said last mentioned portions being provided with anti-frictional engaging means adapted to engage one of said faces when said drawbar is in tension and another of said last mentioned portions being provided with friction inducing engaging means adapted to engage the other face when said drawbar is under compression.
14. Vehicle draft means comprising a member adapted to be secured to a vehicle adjacent one end thereof and provided with a longitudinally outwardly extending guide member provided with a substantially laterally extending slot having two oppositely disposed substantially arcuate faces, a drawbar, and a carriage angularly movably secured to said drawbar and slidably mounted on said guide member and having a portion disposed within said slot, said portion having anti-friction rollers adapted to engage one of the arcuate faces when said drawbar is under tension and having a friction inducing member adapted to engage the other arcuate face when said drawbar is under compression, the arcs of said arcuate faces being drawn about a center disposed within the vehicle in spaced relationship with the point of attachment of the guide member to the vehicle.

15. In combination, a vehicle comprising a body pivotally mounted on two spaced trucks, a member adapted to be secured to said vehicle body adjacent one end thereof in spaced relation to said trucks and having a laterally extending slot therein provided with two oppositely disposed substantially arcuate faces, a drawbar, and a carriage angularly movably secured to said drawbar and mounted on said member and having a portion disposed within said slot, said portion having anti-friction rollers adapted to engage one of the arcuate faces when said drawbar is in tension and having a friction inducing member adapted to engage the other arcuate face when said drawbar is under compression, the arcs of said arcuate faces being drawn about the center of suspension of the adjacent truck as a center.

16. Vehicle draft means comprising members adapted to be secured to vehicles adjacent the ends thereof, interconnected drawbars, and means for pivotally securing said drawbars to said members, said means being adapted to cause said drawbars to slide on said members to positions aligned with the centers of force when the interconnected drawbars are under tension and to prevent the drawbars sliding on the members when the drawbars are under compression.

ROBERT N. JANEWAY.