

July 4, 1967

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3,329,285

RAILWAY CAR CUSHIONING ARRANGEMENT

Filed Sept. 9, 1965

4 Sheets-Sheet 1

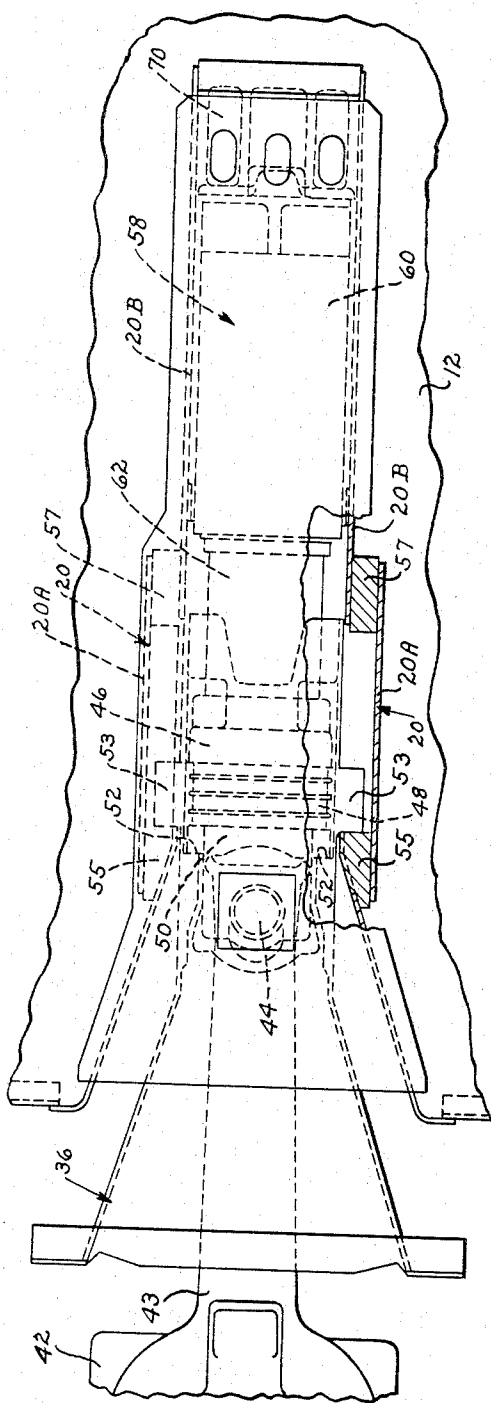


FIG. 2.

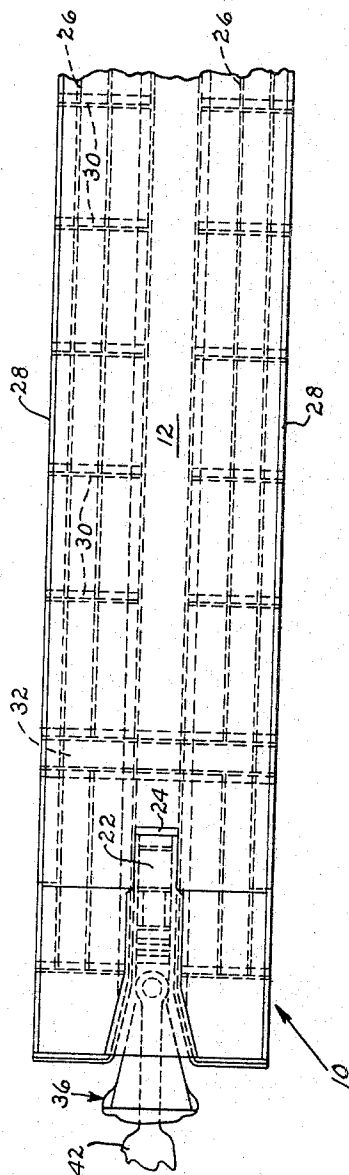


FIG. 1.

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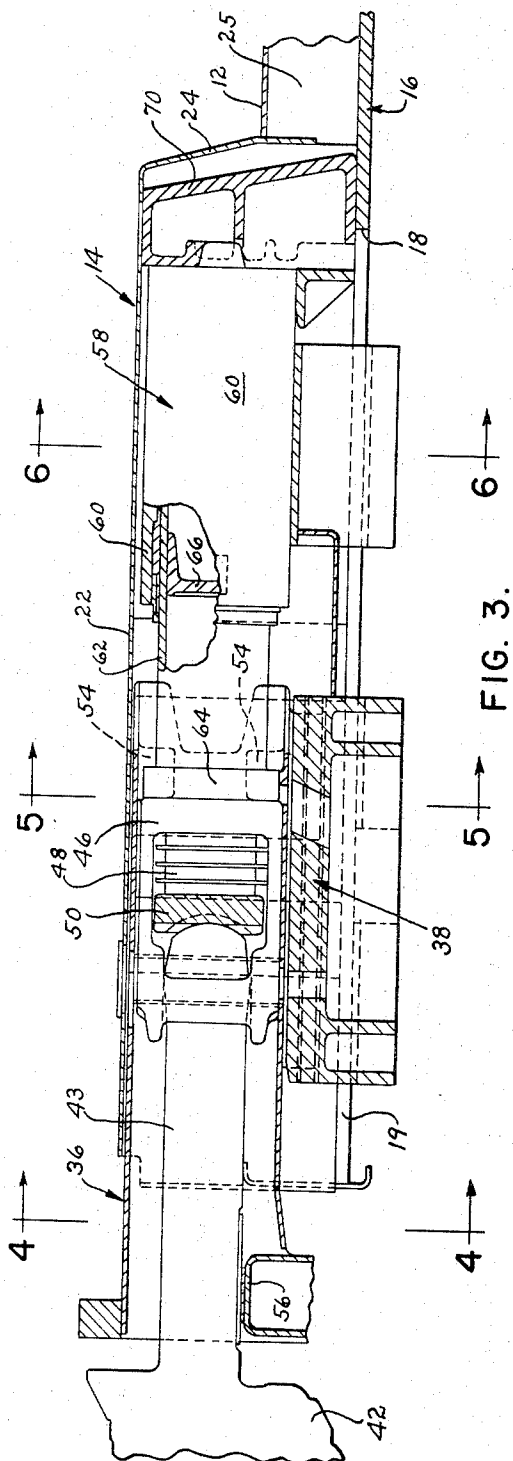


FIG. 3.

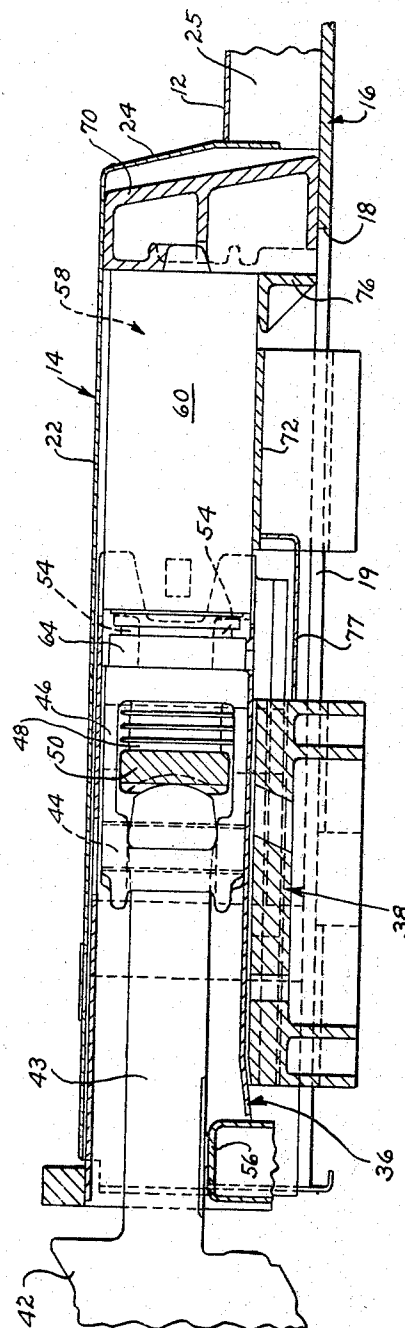


FIG. 8.

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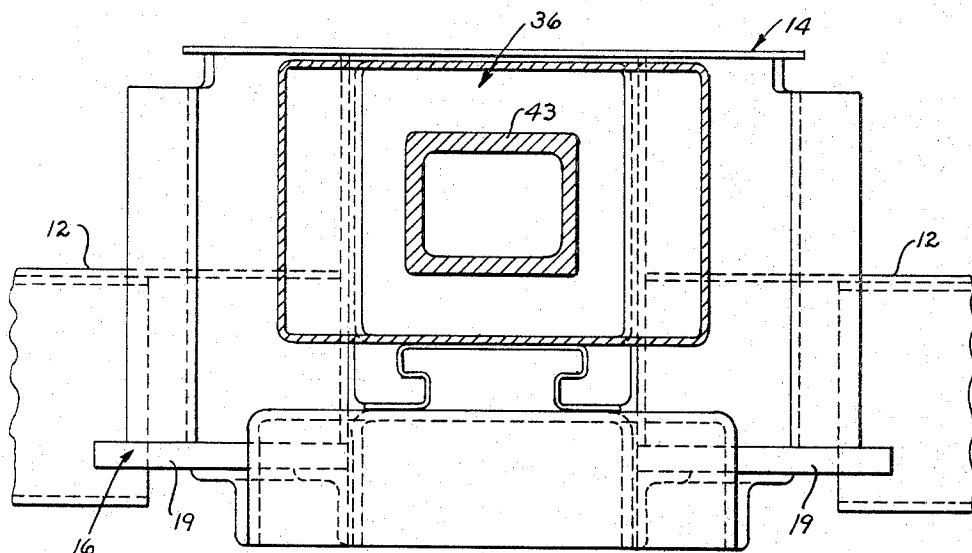


FIG. 4.

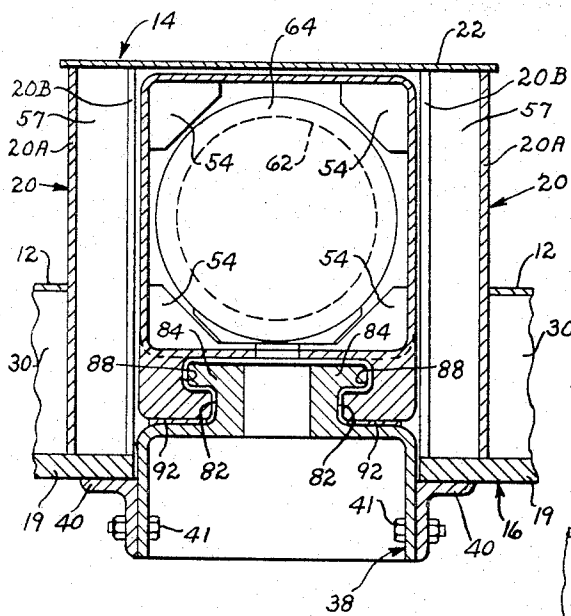


FIG. 5.

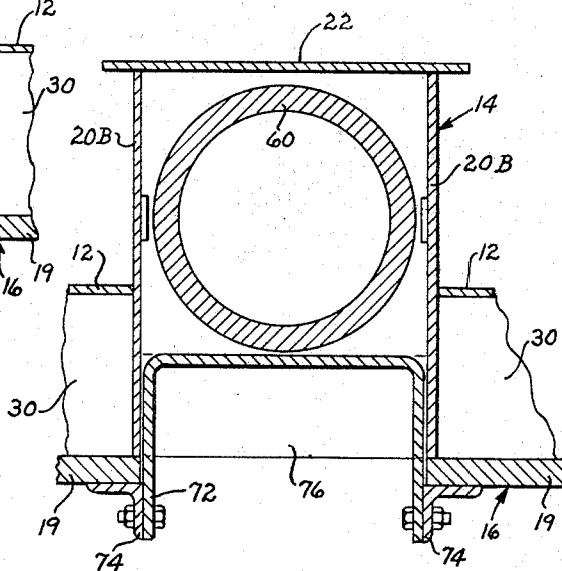


FIG. 6.

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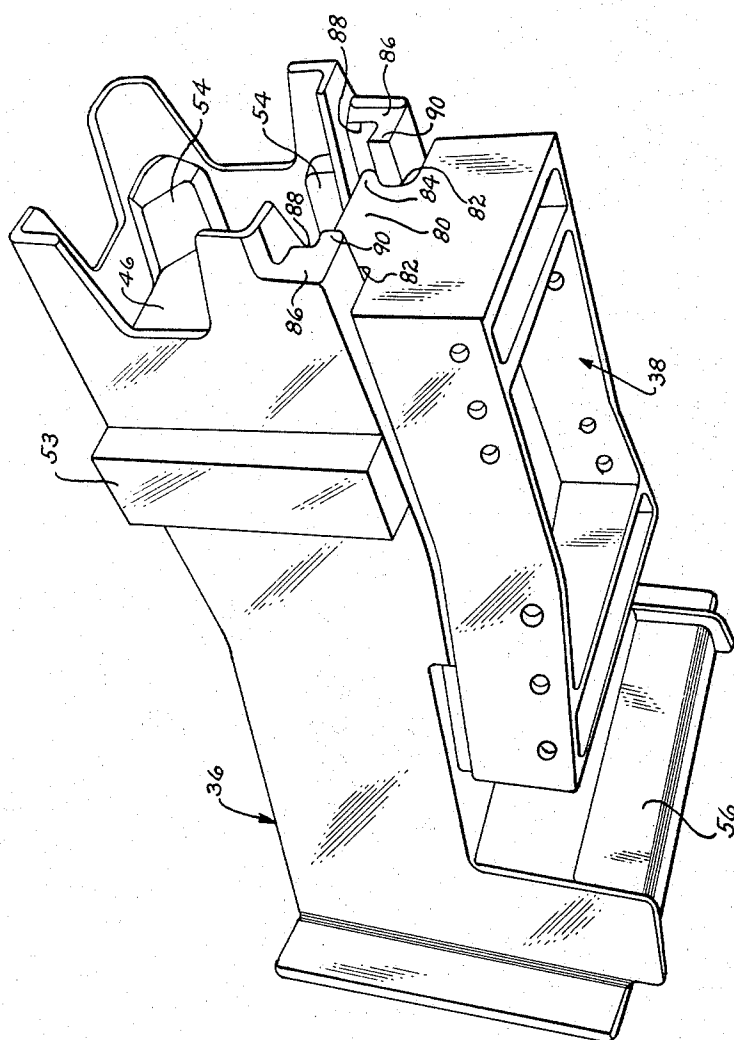


FIG. 7.

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RAILWAY CAR CUSHIONING ARRANGEMENT
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ABSTRACT OF THE DISCLOSURE

A support for mounting a stub sliding sill adjacent the end of a railway car. The support is secured to the fixed center sill and supports the sliding sill for a major portion of the length of the sliding sill. Coacting guides on facing surfaces of the sliding sill and support therefor extend along a major portion of the facing surfaces to limit lateral and vertical movements of the sliding sill upon a cushioned movement thereof relative to the fixed sill structure.

Description of the invention

The present invention is particularly directed to means for mounting a stub sliding sill adjacent the end of a railway car, the stub sill receiving a coupler and a resilient draft gear for cushioning impact and draft forces exerted against the coupler. The coupler is swingable about a vertical axis, such as designated by the Association of American Railroads as a type "F" coupler, and is mounted within the stub sliding sill. When the coupler is subjected to impact forces of a relatively large magnitude, a portion of the forces may act in an eccentric manner against the stub sliding sill tending to cant the sliding sill laterally or upwardly in a direction toward the fixed sill in which the sliding sill is housed.

Briefly described, the present invention comprises a sliding sill carrier to support a stub sliding sill within a fixed sill and to guide the sliding sill in its relative movement to the fixed sill in a direction longitudinally of the railway car. The upper portion of the sliding sill carrier and the facing lower portion of the sliding sill have coacting guides which permit the sliding sill to travel in an axial direction but restrict upward and lateral movements of the sliding sill thereby minimizing binding of the sliding sill and damage to the sills.

Since railway cars are now requiring increased cushioning due to higher impact speeds, the present end of car cushioning comprising the combination of a resilient draft gear and a hydraulic fluid cushioning device provides increased cushioning which may be desirable on existing cars, such as low level autorack or piggyback cars having conventional draft gear cushioning at each end of the car. Thus, the present cushioning arrangement may be easily installed on an existing car having a conventional draft gear mounted within a sill.

It is an object of the present invention to provide a support for a stub sliding sill in an end of car cushioning arrangement.

A further object is the provision of such a support for a stub sliding sill which guides the sliding sill when impact forces are exerted against the coupler and restrains upward and lateral canting of the sliding sill as the sliding sill moves relative to the fixed sill of the underframe.

An additional object of this invention is the provision of a hydraulic cushioning device in combination with a resilient draft gear which combination may be easily attached to an existing railway car and be easily removed for inspection or repair of the cushioning.

The invention accordingly comprises the construction hereinafter described, the scope of the invention being indicated in the following claims.

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In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated;

FIGURE 1 is a partial top plan of an underframe embodying the end of car cushioning comprising the present invention;

FIGURE 2 is an enlarged top plan of the end of car cushioning arrangement shown in FIGURE 1 with certain parts broken away;

FIGURE 3 is a longitudinal sectional view of the end of car cushioning arrangement shown in FIGURE 2 and illustrating the hydraulic fluid cushioning unit and the resilient draft gear employed in combination therewith;

FIGURE 4 is a section taken generally along line 4-4 of FIGURE 3;

FIGURE 5 is a sectional view taken generally along line 5-5 of FIGURE 3;

FIGURE 6 is a sectional view taken generally along line 6-6 of FIGURE 3;

FIGURE 7 is a perspective of the stub sliding sill and the sliding sill carrier supporting the sliding sill shown removed from the fixed sill structure shown in FIGURES 1-6; and

FIGURE 8 is a longitudinal sectional view similar to FIGURE 3 but showing the hydraulic cushioning unit and resilient draft gear under an impact force with the cushioning being compressed.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawing.

Referring to the drawings and more particularly to FIGURE 1, an underframe 10 for a low level railway flat car is shown having a deck plate 12 thereon at a relatively low elevation. A fixed center sill structure indicated generally at 14 includes a bottom cover plate 16 having a portion cut out at 18 to form flanges 19 for receiving the cushioning arrangement as shown in FIGURES 3, 5 and 8. Extending from bottom cover plate 16 are spaced vertical webs 20 connected by an upper cover plate 22 and a rear end plate 24 to form a draft gear housing projecting above the level of deck 12 at each end of underframe 10. As shown in FIGURE 2, vertical webs 20 of the draft gear housing comprises front web portions 20A and rear web portions 20B. Fixed sill structure 14 is continuous and extends the length of the car with vertical webs 25 of a reduced height between the draft gear housings secured to deck 12 and lower cover plate 16.

Stringers 26 and side sills 28 extend in parallel relation to center sill structure 14. Extending between stringers 26, side sills 28 and center sill structure 14 are cross ties 30. A bolster top cover plate 32 extends across underframe 10 at each end thereof.

Mounted within fixed sill structure 14 is a stub sliding sill generally indicated 36 and adapted for sliding movement relative to fixed sill structure 14 upon the exertion of impact forces against the car. To support sliding sill 36, a sill carrier generally designated 38 is secured to angles 40 by suitable nut and bolt combination 41. Angles 40 are welded to the lower surfaces of flanges 19 as shown in FIGURE 5. Mounted within sliding sill 36 is a coupler 42 having its shank 43 pivotally connected about a vertical pin 44. A yoke 46 carries pin 44 and a resilient draft gear 48. Draft gear 48 comprises a plurality of rubber and metal discs. A front follower block 50 fits against front draft stops 52 on the interior face of sliding sill 36 as shown in FIGURE 2. Yoke 46 fits against rear draft stops 54. Upon a draft force being exerted by coupler 42 yoke 46 is pulled forwardly to compress the rubber discs against follower block 50 which is retained by draft stops 52. A stop 53 on each side of sliding sill 36 is mounted for movement between fixed stops 57 and fixed stops 55 on sliding sill structure

14 for a travel of around eleven (11) inches. Stops 57 form a connection between web portions 20A and 20B. Supporting coupler 42 adjacent the forward end of sliding sill 36 is a coupler carrier 56 biased upwardly by a suitable spring.

To aid in cushioning impact forces, a hydraulic cushioning unit generally designated 58 is mounted rearwardly of sliding sill 36 and includes an outer cylinder 60 and an inner cylinder 62 having an end cap 64. Cap 64 fits between rear draft stops 54 as shown in FIGURE 5 against the rear face of yoke 46 and moves with yoke 46. If desired, yoke 46 may be secured to cap 64 so as to prevent any spacing between yoke 46 and cap 64 upon the application of draft forces and the forward movement of yoke 46. Hydraulic cushioning unit 58 includes a floating piston 66 within inner cylinder 62. Outer cylinder 60 contains a liquid on one side of piston 66 and inner cylinder 62 contains a compressible fluid, such as air or dry nitrogen gas, on the opposite side of piston 66. The compressed gas effects the return movement of cushioning unit 58. For further details of cushioning unit 58, reference is made to U.S. Patent No. 2,994,442 issued Aug. 1, 1961 and entitled Kinetic Energy Absorbing Device, the entire disclosure of which is incorporated by this reference.

To secure cushioning unit 58, the rear end of outer cylinder 60 fits against abutment 70 secured to the fixed sill structure. A channel-shaped support 72 as shown in FIGURE 6 is secured beneath cylinder 60 on angles 74 welded to the underside of flanges 19. A cross member 76 is secured to webs 20B to support cylinder 60 adjacent abutment 70. A cover or shield 77 extends between support 72 and carrier 38 to prevent the entry of foreign matter and the like.

Referring specifically to FIGURES 5 and 7 and forming an important feature of this invention, coating guides are provided between sliding sill 36 and sill carrier 38. Upon the exertion of high impact forces against coupler 42, yoke 46 moves rearwardly against cap 64 of inner cylinder 62 to contract cushioning unit 58 for absorbing shock. Resilient draft gear 48 acts in series with cushioning unit 58 and is compressed to aid in the absorption of impact forces. As a portion of the impact forces sometimes acts against sliding sill 36 in an eccentric manner exerting a torque, there is a tendency for sill 36 to cant laterally or upwardly upon sliding movement rearwardly. Thus, in order to protect the fixed sill structure and to prevent binding of sliding sill 36, coating guides have been provided which restrain lateral and upward movements of sliding sill 36. Extending from the upper surface of sill carrier 38 is a T-shaped projection 80 positioned centrally of the width of carrier 38 and forming a guideway 82 on each side thereof with overhanging flanges 84. Extending from the lower surface of sliding sill 36 on each side thereof is a projection 86 each having a guideway 88 receiving an adjacent flange 84 of carrier 38. An inwardly extending flange 90 on each projection 86 is received within an adjacent guideway 82 of carrier 38. A wear strip 92 is secured to the upper surface of carrier 38 in contact with each projection 86.

The interlocking arrangement between sill carrier 38 and sliding sill 36 allows sliding movement of sill 36 along carrier 38 while permitting only minimum lateral and upward movements of sliding sill 36. Thus, contact of sliding sill 36 with the adjacent surfaces of fixed sill structure 14 is prevented.

In view of the above, it will be seen that the several

objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a railway car having a fixed center sill structure including spaced parallel sides and lower flanges on the sides, a slidable stub center sill and support therefor mounted within the fixed center sill structure adjacent an end of the railway car, a coupler mounted within the slidable center sill and operatively connected to said slidable center sill to move the slidable sill upon the exertion of impact forces against the coupler, a cushioning unit mounted within the fixed sill structure adjacent the inner end of said stub center sill and being contracted upon the exertion of impact forces against the coupler and inward movement of the slidable center sill, and means on said fixed sill structure to engage the slidable sill and limit the movement thereof, said slidable center sill having a coupler carrier adjacent its outer end and extending inwardly from the coupler carrier to said cushioning unit, said support for the slidable center sill being secured to the flanges of said fixed center sill and extending longitudinally of the car between the sides of the fixed center sill structure from a position adjacent the coupler carrier to a position adjacent the cushioning unit and supporting the slidable center sill along a major portion of the length of the slidable center sill, the adjacent upper surface of said slidable sill support and the adjacent facing lower surface of said slidable center sill having coacting guides along a major portion of the facing surfaces of the respective members to permit relative sliding movement of said stub sill longitudinally of the railway car and to limit lateral and vertical movements of said stub sill upon cushioned movement thereof relative to the fixed sill structure.

2. In a railway car as set forth in claim 1, said coacting guides comprising a generally T-shaped projection on one of said facing surfaces arranged centrally of the width of said one surface, and guideways on the other of said facing surfaces receiving said T-shaped projection, thereby to guide and restrain the movement of said slidable sill.

3. In a railway car as set forth in claim 1, said cushioning unit comprising a hydraulic fluid cushioning unit, and a resilient draft gear between the coupler and the hydraulic cushioning unit and operatively connected to the coupler for receiving impact and draft forces exerted against the coupler.

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