March 7, 1967 T. J. SWEGER 3,307,496

RAILWAY CAR CONSTRUCTION

Filed April 12, 1965 2 Sheets-Sheet 1

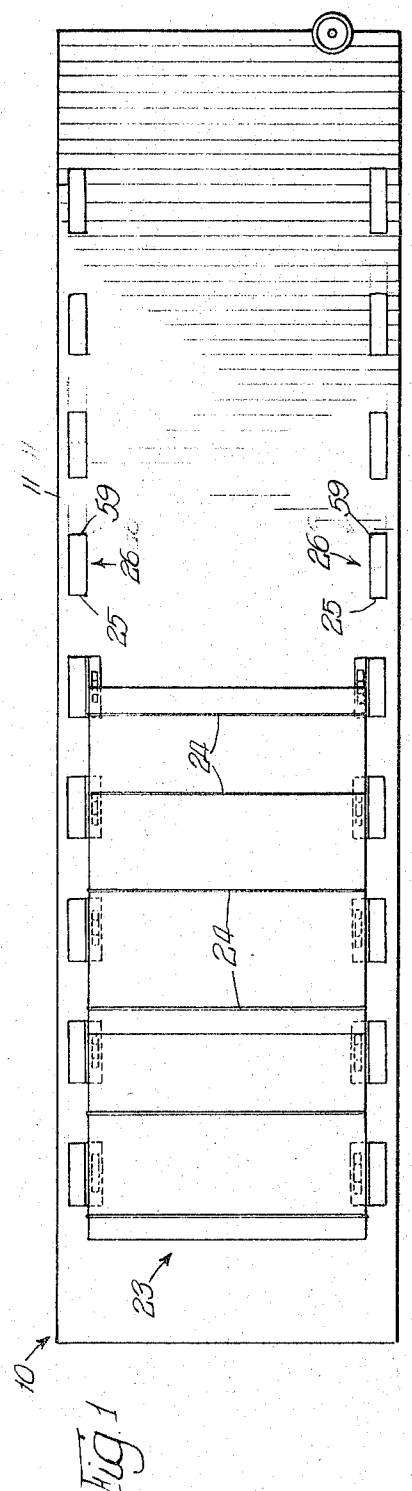


Fig. 1

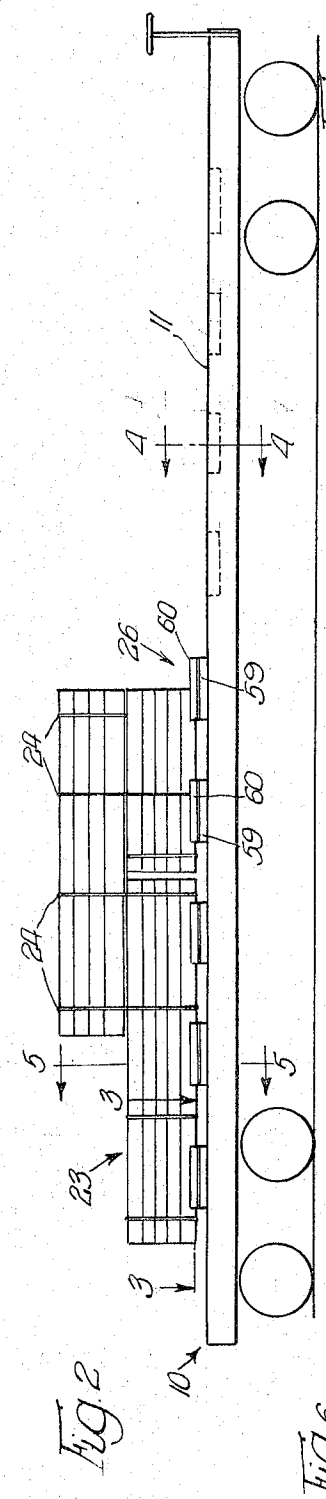


Fig. 2

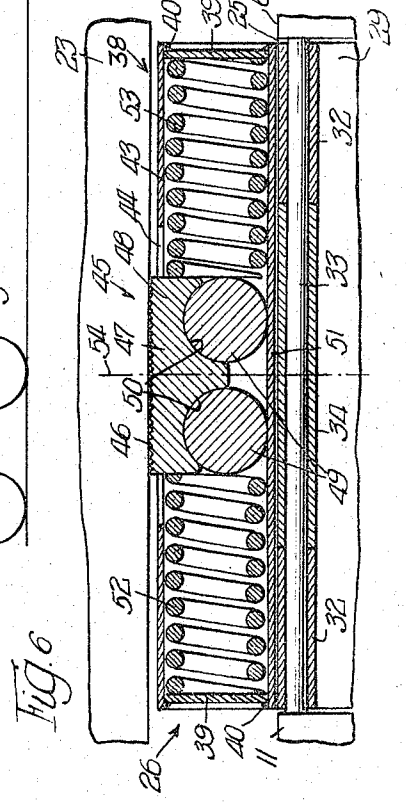


Fig. 6

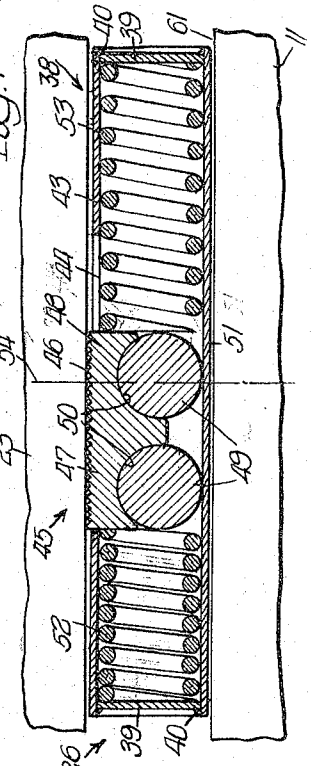


Fig. 7

March 7, 1967 T. J. SWEGER 3,307,496

RAILWAY CAR CONSTRUCTION

Filed April 12, 1965 2 Sheets-Sheet 2

Fig. 3

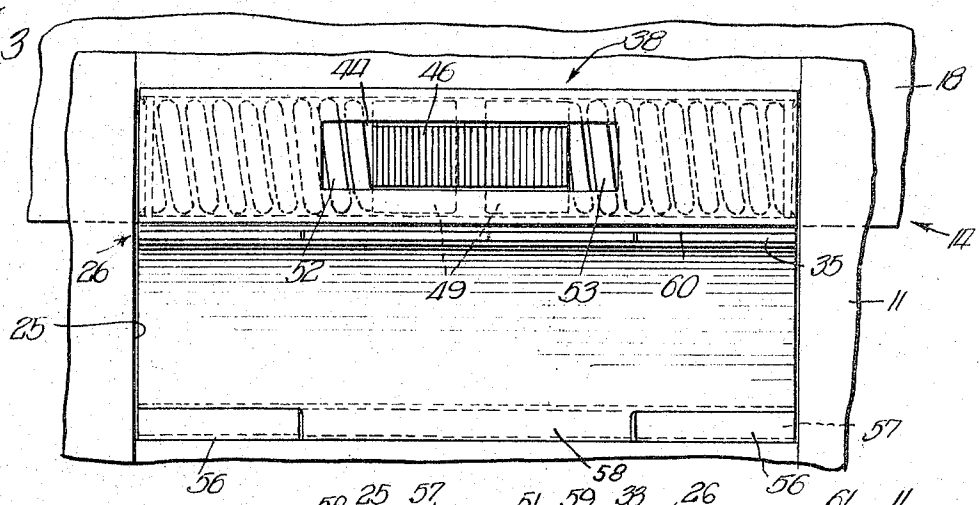


Fig. 4

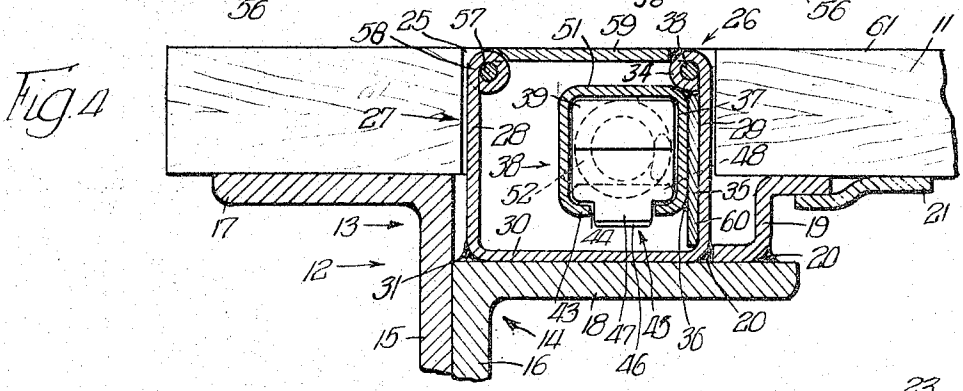
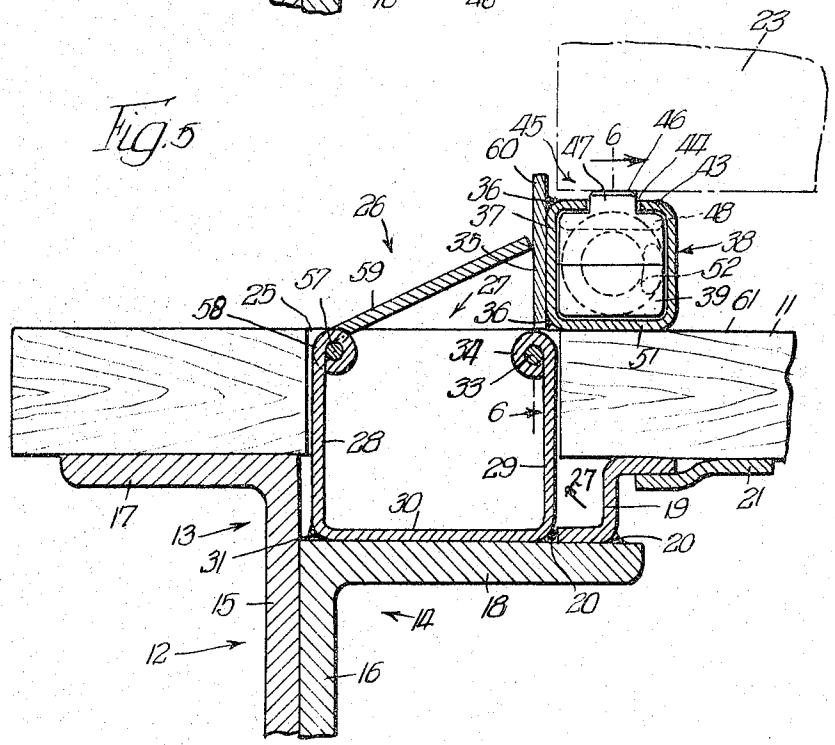


Fig. 5



United States Patent Office

3,307,496

Patented Mar. 7, 1967

3,307,496

RAILWAY CAR CONSTRUCTION

Theodore J. Sweger, Naperville, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Filed Apr. 12, 1965, Ser. No. 447,122

4 Claims. (Cl. 105—366)

This invention relates, generally, to the construction of multipurpose railway flat cars and it has particular relation to adapting them for efficient and safe transport of packaged lading, such as lumber and the like.

Heretofore provision has been made for transporting vehicles, such as tractor trailers, on railway cars specially constructed for this service. Examples of such constructions are shown in U.S. Patent No. 2,973,174, issued February 28, 1961, to T. Stanwick et al. and U.S. Patent No. 3,161,151, issued December 15, 1964, to C. E. Johansson. However, such railway cars are not readily adaptable for transport of packaged lading, such as lumber and the like. Lading of this character is loaded on flat or gondola railway cars in accordance with AAR regulations which prescribe that the lumber be tied with high tension bands and placed lengthwise on transverse wood bearing pieces secured by nails to the wood floor or deck of the railway car. Wood guide rails are nailed to ends of the transverse bearing pieces to prevent side shift of the lading. No provision is required by the AAR regulations to limit movement of the packaged lading endwise of the railway car as caused by its acceleration and deceleration. Tests on typical packaged lumber on a railway car loaded according to AAR regulations show that there is an endwise shift of about 24" when the loaded car is abruptly stopped from a speed of 5 miles per hour. There is an endwise shift in the opposite direction relative to the floor of the car on rapid acceleration thereof.

Among the objects of this invention are: To provide for absorbing in a new and improved manner the shock on packaged lading, such as lumber and the like, incident to acceleration and deceleration of a railway flat car on which it is loaded; to maintain the lading substantially in the position in which it is originally loaded on the railway car regardless of the acceleration and deceleration forces to which it may be subjected; for this purpose to provide shock absorbing units along each side of the floor of a railway flat car or gondola car, each having a carrier for receiving the lading flatwise with the carrier being movable endwise of the car from a central position for a limited distance in either direction and biased to such central position with sufficient forces to counteract the acceleration or deceleration to which the car and lading are likely to be subjected; to secure the shock absorbing units to the respective side sill of the car; to arrange and construct the shock absorbing units in such manner that they extend above the surface of the car floor to receive the lading flatwise and are capable of being swung to a position below this surface to permit use of the railway car for other purposes; to provide means on each shock absorbing unit for limiting sidewise shifting of the lading; and to provide a cover for the shock absorbing unit in retracted position and to utilize this cover to brace the side shift limiting means in operative position.

Other objects of this invention will, in part, be obvious and in part be set forth hereinafter.

In the drawings:

FIG. 1 is a top plan view of a conventional railway flat car modified to embody this invention, packaged lumber being shown as the lading loaded on a portion of the car.

FIG. 2 is a view, in side elevation, of the construction shown in FIG. 1.

FIG. 3 is a horizontal sectional view at an enlarged scale and taken generally along the line 3—3 of FIG. 2.

FIG. 4 is a vertical sectional view taken generally along the line 4—4 of FIG. 2 and showing at an enlarged scale certain details of construction of the shock absorbing unit in retracted position.

FIG. 5 is a view taken generally along the line 5—5 of FIG. 2 and showing at an enlarged scale the shock absorbing unit in extended position for receiving flatwise packaged lading thereon.

FIG. 6 is a vertical sectional view taken generally along the line 6—6 of FIG. 5 and shows the carrier in the central position.

FIG. 7 is a view, similar to FIG. 6, but shows the carrier offset from the central position as a result of change in speed of the railway car.

Referring now particularly to FIGS. 1 and 2 of the drawings, the reference character **10** designates, generally, a railway flat car of conventional construction. It is provided with a wood floor or deck **11** that is arranged to be carried by side sills one of which is shown, generally, at **12** in FIGS. 4 and 5. Here it will be observed that the side sill **12** is constructed by placing channels **13** and **14** back to back with the webs **15** and **16** in engagement with each other. It will be understood that a unitary construction can be provided by suitably securing the channels **13** and **14** together. They are provided with top flanges **17** and **18**, the latter being slightly lower than the former. The floor **11** is carried directly by the flange **17** of the channel **13** and indirectly by the flange **18** of the channel **14** through the provision of a Z-shaped floor support bracket **19** which is welded at **20** to the upper side of the top flange **18** and extends into engagement with clip means **21** suitably secured to the under side of the floor **11**.

As shown in FIGS. 1 and 2 packaged lading, such as lumber, indicated at **23**, is arranged to be loaded onto the wood floor or deck **11** of the railway flat car **10**. As is conventional, metallic bands or lading ties **24** surround the several packages for securing them together to enable handling thereof by suitable loading and unloading equipment such as fork lift trucks and the like. In the past, as pointed out above, it has been customary to load such lading **23** on the floor **11** of a railway flat car such that its sidewise movement is limited but no provision is made for limiting endwise movement which may be caused by rapid acceleration or deceleration of the car, this movement being relative to the floor or deck **11**.

In accordance with this invention rectangular openings **25** are provided in the wood floor or deck **11** along opposite sides and in overlying relation to the top flanges **18** of the side sills **12**. A shock absorbing unit, indicated generally at **26**, is positioned in each of the rectangular openings **25** so that a plurality of them are provided along the opposite sides of the wood floor or deck **11** as illustrated in FIG. 1.

Referring to FIGS. 4 and 5, each shock absorbing unit **26** includes U-shaped frame means, indicated generally at **27**. The U-shaped frame means **27** preferably is formed of suitable gauge sheet metal with side walls **28** and **29** and a bottom wall **30** which is mounted on the upper side of the top flange **18** and is secured thereto by welding as indicated at **31** and also by the welding **20**, previously referred to. Thus each U-shaped frame means **27** is secured to the respective side sill **12**.

Along the upper edge of the side wall **29** integral hinge loops **32** are provided as shown more clearly in FIG. 6. A hinge pin **33** extends through the hinge end loops **32** and through a hinge center loop **34** that is integral with a lading side shift limiting hinge plate **35**. Again, referring to FIGS. 4 and 5, the hinge plate **35** is secured by welding at **36** to a side wall **37** of an elongated metallic housing, shown generally at **38**, that is generally rectangular in cross section. End closure plates **39**, FIGS. 6 and 7, are secured by welding **40** to the ends of the hous-

ing 38. The elongated housing 38 has a top wall 43, FIG. 5, in which there is provided a rectangular slot 44 through which a generally inverted T-shaped carrier 45 projects. The carrier 45 has a serrated surface 46 on the projecting end of stem portion 47 to provide good frictional engagement flatwise with the under side of the lading 23. The serrated surface 46 tends to maintain non-slipping engagement with the lading 23. The carrier 45 has a head portion 48 which is guided under the top wall 43 for longitudinal movement with respect to the elongated housing 38. The head portion 48 is held in spaced relation by antifriction means in the form of rollers 49 in cavities 50 to a bottom wall 51 of the housing 38.

With a view to biasing the carrier 45 to the central position shown in FIG. 6 coil compression springs 52 and 53 are interposed between the end closure plates 39 and the respective ends of the head portion 48 of the carrier 45. If desired, hydraulic mechanism can be employed in lieu of the coil compression springs 52 and 53 to provide the biasing action normally tending to urge the carrier 45 to the central position shown in FIG. 6 and indicated by broken line 54.

FIG. 7 shows how the carrier 45 is displaced from the central position indicated by broken line 54 to the left with respect to the housing 38 when the railway flat car 10 rapidly decelerates when it is moving in this direction. Alternatively FIG. 7 shows the displacement of the carrier 45 when the railway flat car 10 is accelerated in the opposite direction. As shown in FIG. 7, when the carrier 45 is displaced as the result of the inertia of the carrier 45 itself and the rollers 49 together with the lading 23 thereon, the coil compression spring 52 is compressed and the coil compression 53 is allowed to expand. When the acceleration or deceleration terminates, the coil compression springs 52 and 53 act to return the carrier 45 to the central position indicated by broken line 54 together with the lading 23 mounted flatwise thereon. The relative movement of the carrier 45 with respect to the elongated housing 38 is limited by engagement of the carrier 48 with one or the other of the ends of the slot 44. The length of the slot 44 and the size and tension of the springs 52 and 53 are so chosen as to be capable of restoring the lading 23 to the position in which it is placed on the railway flat car 10 when it is stationary under those conditions likely to be encountered in the normal operation of the car 10.

As shown in FIG. 5, when the shock absorbing unit 26 is to be employed, the elongated metallic housing 38 and parts directly associated therewith are swung about the hinge pin 33 from the position shown in FIG. 4. In the extended position, the packaged lading 23 can be placed flatwise against the serrated surface 46 with the number of the shock absorbing units 26 used depending upon the extent to which the packaged lading 23 covers the floor 11.

It is desirable that the upper side of the opening 26 in the floor 11 be closed when the elongated metallic housing 38 is swung to the retracted position as shown in FIG. 4. This provides an uninterrupted surface for the floor 11. For this purpose the side wall 28 is provided with integral hinge end loops 56, FIG. 3, through which a hinge pin 57 extends. The hinge pin 57 also extends through a hinge center loop 58 that is integral with a metallic cover plate 59. In the retracted position the cover plate 59 substantially completely closes the upper side of the opening 25. In the extended position, as shown in FIG. 5, the cover plate 59 acts as a brace and bears against the adjacent side of the hinge plate 35. In order to limit side shift of the lading 23 the distatl end 60 of the hinge plate 35 extends well above the upper side of the top wall 43 and above the serrated surface 46 on the carrier 45. It extends into the path of sidewise movement of the lading 23 which thus is limited in such movement to a position where it engages the inner side of the distal end portion 60 of the hinge plate 35.

In operation, as the lading 23 is loaded onto the floor 11 of the car 10 cover plates 59 are lifted and the elongated metallic housings 38 are swung from the respective frame means 27 to the position shown in FIG. 5 where the bottom wall 51 bears against top surface 61 of the floor 11. Then the respective cover plate 59 is allowed to drop and engage the adjacent side of the hinge plate 35. Prior to the application of the lading 23, the carriers 45 are centrally located. They function in the manner described under the control of the biasing actions of the springs 52 and 53 to return the respective carriers 45 and the lading 23 thereon to the central positions on cessation of the application of accelerating or decelerating forces. Since a plurality of the shock absorbing units 26 are provided, they can be retained in the inoperative positions as the loading of the lading 23 continues. Thus they do not interfere with the movement of fork lift truck and the like in placing the lading 23 in position. As additional lading 23 is loaded onto the floor 11, additional shock absorbing units 26 are moved to the operative positions for receiving the lading.

If desired, the elongated metallic housing 38 can be hinged to the outer side wall 28 of the U-shaped frame means 27 instead of to the inner side wall 29 as shown in FIGS. 4 and 5. When this alternate construction is employed, the hinge plate 35 functions not only to provide at its distal end for limiting the side shift of the lading 23 but also it functions as the cover to close off the upper side of the opening 25. Then it is unnecessary to provide the separate cover plate 59. Preferably the location of the elongated metallic housing 38 and the carrier 45 associated therewith is so chosen with respect to the side sill 12 that maximum load carrying ability of the side sill 12 is developed.

What is claimed as new is:

1. In a railway car for transporting packaged lading such as lumber and the like subject to endwise displacement in one direction or the other due to acceleration or deceleration of the car, in combination, side sills extending along opposite sides of said car, a lengthwise extending floor carried by said side sills and having a plurality of openings therein registering with said side sills, and a shock absorbing unit for each of said openings, each shock absorber unit including frame means in each opening supported by the respective side sill, an elongated housing hinged to said frame to swing from an inoperative position below the surface of said floor to an operative position above said surface, a carrier mounted for movement endwise of and normally occupying a central position with respect to said housing and projecting thereabove in said operative position to receive flatwise the packaged lading, means in said housing for applying biasing forces to said carrier tending to restore it and the packaged lading thereon to said central position on cessation of the acceleration or deceleration causing such displacement, and antifriction roller means interposed between said elongated housing and said carrier.

2. In a railway car for transporting packaged lading such as lumber and the like subject to endwise displacement in one direction or the other due to acceleration or deceleration of the car, in combination, a side sill extending along said car, an elongated housing secured against endwise movement to and extending lengthwise of said side sill, a carrier mounted for movement endwise of and normally occupying a central position with respect to said housing and projecting thereabove to receive flatwise the packaged lading, spring means reacting between each end of said elongated housing and the respective side of said carrier for applying biasing forces to said carrier tending to restore it and the packaged lading thereon to said central position on cessation of the acceleration or deceleration causing such displace-

ment, and antifriction roller means interposed between said elongated housing and said carrier.

3. In a railway car for transporting packaged lading such as lumber and the like subject to endwise displacement in one direction or the other due to acceleration or deceleration of the car, in combination, side sills extending along opposite sides of said car, a lengthwise extending floor carried by said side sills, and a plurality of shock absorbing units mounted in spaced relation along each side sill, each shock absorber unit including an elongated housing secured against endwise movement to and extending lengthwise of the respective side sill, a carrier mounted for movement endwise of and normally occupying a central position with respect to said housing and projecting above said floor to receive flatwise the packaged lading, spring means in said housing for applying biasing forces to said carrier tending to restore it and the packaged lading thereon to said central position on

cessation of the acceleration or deceleration causing such displacement, and antifriction roller means interposed between said elongated housing and said carrier.

4. The railway car according to claim 1 wherein said means for applying biasing forces includes a coil compression spring reacting between each end of said elongated housing and the respective side of said carrier.

References Cited by the Examiner

UNITED STATES PATENTS

2,047,954	7/1936	Fitch	105—366
3,085,518	4/1963	Szczepanik et al.	105—366
3,125,035	3/1964	Loomis	105—366

ARTHUR L. LA POINT, *Primary Examiner.*

DRAYTON E. HOFFMAN, *Examiner.*