

United States Patent

[11] 3,592,142

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[54] RAILWAY BOXCAR WITH REINFORCED END
4 Claims, 4 Drawing Figs.

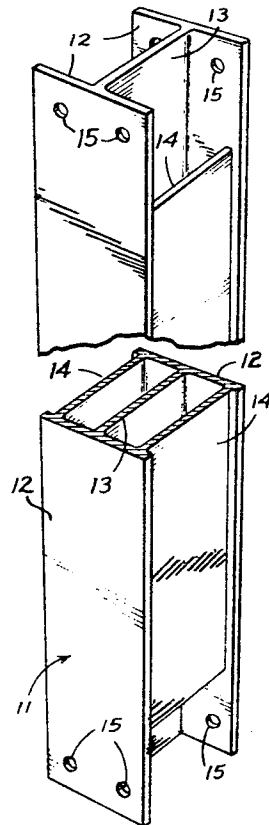
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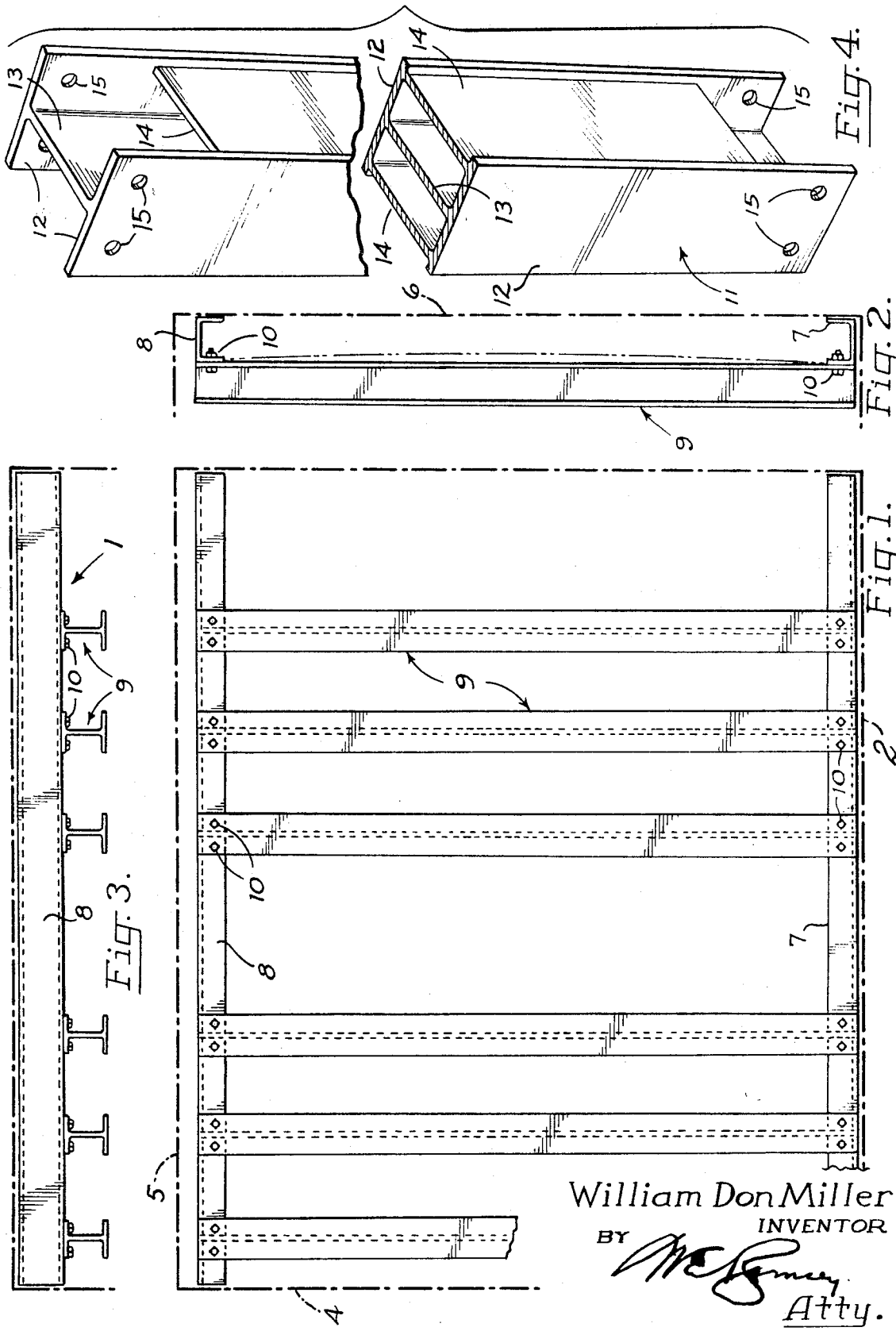
[51] Int. Cl......**B61d 17/06,**

[50] **Field of Search**..... B61d 45/00
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376, 392.5, 423, 410, 377, 369 R

[56]		References Cited
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ABSTRACT: This is an improvement in railway boxcars that include a floor, a top, two sidewalls and two end walls defining the cargo space in said boxcars. The hammering induced on the end walls of a boxcar cannot be strongly braced to resist blows imposed by heavy cargo. This invention comprises the inclusion of a detachable bulkhead laterally spanning the distance between sidewalls and located inwardly of at least one end wall of a boxcar. Thus, said bulkhead element may easily be removed, straightened, and after being repaired, reinstalled in a boxcar, to eliminate need for repair of distorted members while the bulkhead constitutes a part of the framework of said boxcar.





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RAILWAY BOXCAR WITH REINFORCED END

My invention relates to the improvement of railway boxcars that are specifically designed for carrying loads composed of flat sheets, such for example as wallboard, plywood and similar products, that may be banded or otherwise made up into rectangular packages. To this end, this application concerns the problems stated and resolved in my U.S. Pat. No. 3,342,142, that issued Sept. 19, 1967, and is entitled Bracing For Railroad Boxcar.

The vertical braces provided in said boxcar, as disclosed in said U.S. Patent, tend to wedge-lock the bundles against longitudinal movement in a boxcar. If cargo is placed carefully in a car and the vertical braces are arranged in correct spacial relationship to the bundles, destructive shifting of the rectangular bundles due to shifting in transit is substantially inhibited.

I have found that frequently when heavy bundles are initially placed in a boxcar, that they are jammed tightly against one end of the car end and damage the end of the boxcar in transit due to improper placement. The bundles hammer the ends of the cars and deform them, no matter how strongly the ends are constructed, to bow them or cup them. The ends are usually structurally reinforced to resist said hammering and also efforts have been made to place bulkheads inwardly of the car and forwardly of the end so that the hammering is taken by the bulkhead rather than the end of the car. It must be remembered that loads such as described, will weigh from 19,000- to 144,000-pounds dead weight. Also, when one or two bundles are placed in a car by the use of fork trucks, the fork trucks themselves weight 12,000 pounds and when carrying two units of plywood, the loaded weight increases from 12,000 pounds to 17,000 pounds, or 18,000 pounds. Said masses cannot be handles delicately or precisely.

A bulkhead comprising two or three upright timbers, spanned by several 1-inch boards, are of sufficient strength to absorb most of the shock of loading, and the shifting of the dead weight of the load, either in transit or while supported by a lift truck. The hammering blows laterally displace such bulkhead, made up of vertical timbers and heavy boards, and no appreciable protection is afforded the structural end of a boxcar under the physical dislodgment of the bulkhead. As an example of the destruction of, or damage to, freightcars carrying such loads, experience dictates that boxcars be reinforced or rebuilt in less than 4 years, while the expected life of the average boxcar is 30 years.

I have determined that a bulkhead, to be effective, must be secured to the floor of a boxcar, inwardly of the end thereof, being spaced a substantial distance from said end. Thus, if the vertical members of the bulkhead are bowed, or otherwise deformed, they can be distorted substantially without bearing directly against the end of the boxcar. If the vertical members of the bulkhead are separable and removable from the points of connection with the body of the car, and if they are symmetrical back-to-front and end-for-end, they may be easily removed and reversed so that the bowed portion may be turned to face the load and sustain the hammering effect which first tends to straighten them and then to bow them in the opposite direction. Thus, bulkheads formed in accordance with my invention may be repositioned without straightening, if they are not structurally distorted to such an extent that they have to be reformed in a machine shop hydraulic press. If they are bolted to the point of joinder with the floor of the boxcar and to the end thereof, the bolts may easily be removed and the vertical members may be rotated 180° so that the part that faced the end of the boxcar may be turned to face the lading. This can be done by the railroad crew without removing the bulkhead or its supporting parts from the car to take it to a rebuilding facility.

This invention is hereinafter described in greater detail, with reference to the accompanying drawings, in which:

FIG. 1 is an elevation of a bulkhead embodying my invention, shown within the dashed outline of a transverse section

of a boxcar, indicating the relationship of the bulkhead to the floor, top and the two side elements of said car;

FIG. 2 is a side view of said bulkhead similarly located with the portions of the car shown in dashed outline to illustrate the degree of spacing of the parts of the bulkhead from the end of the boxcar and the degree of bowing that may be accommodated without causing the end of the boxcar to become cupped or bowed;

FIG. 3 is a plan view, similarly treated with respect to the outline of a boxcar, showing the spacial distance of the bulkhead from the sides and the end of the car except at points adjacent the top and adjacent the floor where vertically stacked horizontally arranged members join the ends of the vertical members in defining a bulkhead; and

FIG. 4 is a foreshortened sectional view of a modified type of vertical member that may be used in lieu of an I-beam, which is sometimes called box construction, with two short sections of plate joining the marginal edges of the flanges of an I-beam and lying at opposite sides of the web of said beam, and in parallelism therewith.

A boxcar adapted for accommodating a bulkhead 1 comprises a floor unit 2, two sidewall units 4, a top or roof unit 5, and an end wall unit 6. Extending across the end wall are a pair of horizontally disposed channel members 7 and 8, channel 8 being the upper member and channel 7 being the lower one. The channel member 7 is secured to the floor unit and the upper member 8 is secured to the end wall unit, spaced somewhat from the sidewall units 4 respectively, and the top or roof unit 5, as is shown in FIG. 1. Attention is directed to the dashed outline showing of the position of the top or roof unit 5 and floor unit 2, of a railroad car to define the diagonal corner members at the top and bottom of an enclosed boxcar. These are shown and illustrate how a bulkhead would appear looking at an elevation of a bulkhead from the midpoint of a boxcar.

A bulkhead 1 embodying my invention preferably has plural vertical I-beam members 9 lying parallel with each other and spaced at predetermined modules to span the end wall unit 6 against potential damage produced by bundles of flat boards, such as plywood, for which my invention is specifically designed. The channel members 7 and 8 are arranged in stacked alignment with each other, with the flanges thereof facing each other, as is illustrated in FIG. 2. The vertical I-beam members 9 are joined to the channel members by nut-and-bolt elements 10.

In FIG. 4 is illustrated a box-type vertical member 11. An I-beam portion includes a mated pair of flange portions 12, a central beam web 13 and two plane reinforcing members 14 which are welded or otherwise made integral with the I-beam member by joining the mated flanges 12 adjacent their margins and lying parallel with the central beam web 13, as is illustrated in the lower end portion of the vertical member 11 in FIG. 4. The two reinforcing members 14 terminate short of the ends of the vertical member 11 so that holes 15 formed at the ends of both flange portions 12 of said vertical member may have bolts passed therethrough and into a mounting channel without involving inconvenience.

Although I provide in some of the claims made herein that at least one end of a boxcar be provided with a bulkhead, it is usually desirable that both ends of the boxcar be thus protected. Cars are made up in a train without respect to which end is forward. It may be that the rear end of a car receives more hammering because accelerating forces in a train are usually more severe than deceleration forces. Also, when a car is being loaded by the use of fork trucks, that end against which bundles are originally piled receives more damage-producing deflection than the end which is loaded thereafter. In loading a car, it is essential that the end against which the loads are initially placed have a plane vertical wall or abutment to square up the load, while this is not too essential at the other end. It is desirable, however.

The holes for the bolts are preferably two in number, as is shown in FIGS. 1 and 3, and they are spaced from both ends a

modular distance. The vertical I-beam members are symmetrical about their longitudinal centerlines and at their end portions so that they may be interchangeably positioned, one for the other, in a bulkhead or may be repositioned in said bulkhead with their back portions arranged forward, or with a lowermost portion arranged uppermost, merely by backing off the nuts from their respective bolts and manually rearranging the vertical members and then securing them to their new position. In traffic, as well as in loading, the vertical members are always bowed toward the end that they protect. Without the bulkhead, it is the end members that are bowed horizontally, as well as vertically, and thus it probably would be better to describe the ends as being cupped, rather than bowed, because it is two dimensional distortion. If the vertical members become bowed to a degree, equal to or greater than the width of channel mounts, top and bottom, they will strike the end unit of the car. Also, they will be foreshortened to such a degree that the holes for the securing bolts would not fair with those in the channel members. Limited distortion of a vertical I-beam member will permit replacement thereof and its reversal, as is indicated by the bowed distorting line in FIG. 2. If the channels are of 6-inch span or width, this would be a bowing of approximately 1 inch. If further bowing is developed, it is necessary to fair the holes by the use of drift pins or reamers to permit bolts to pass through the holes that originally mated. Bowing to this degree frequently elongates the holes vertically and shortening of the overall length of a vertical member may be accomplished by merely reversing the vertical member. This eliminates the necessity of taking it out of the car, to be straightened in a hydraulic press.

I have noted that when the vertical members are reversed back to front, and are later subjected to blows tending to straighten the vertical members, it will tend to push the channel members 7 and 8 apart, that is, elongate the effective height of these members, as they are bowed and thereafter producing vertical straightness. This eliminates the lifting of the channels from the floor line if the I-beams were not reversed, for example and the tearing away of the connections with the floor sections. The impacts that produce bowing of the bulkhead have the greatest destructive effect at the floor line.

It is desirable, if not necessary, to have a boxcar end that originally lies on a vertical plane and thereafter is cupped or bowed, fitted with a curved back filler extending across the bowed end to define an exposed face with a vertical plane aspect. This is expensive and time consuming, and involves a great deal of skill. Repositioning and replacing the vertical aspect after they have been bowed, requires little time loss or little skill because the vertical members are usually produced in a shop within close tolerance. The replacing and resetting of

the vertical members, if routinely done, presents a vertical plane surface without requiring fillers to correct the end bowing.

It is easy to take the vertical members that are merely bolted in position out of bulkheads and to put them into a press to straighten them if they become overbowed. Because they are merely bolted into position, rather than welded, there is no damage done end taking the individual vertical members from the bulkhead and after they have been flattened to a plane, the securing holes in the vertical members fair with those in the channel members to which they are secured in a bulkhead and the bolts do not have to be forced into position which would tend to mutilate the threads. Also, if the vertical members have to be straightened in a press, this can be done cold, even though they might be deflected as much as 6 inches from a plane touching their upper and lower ends.

A bulkhead embodying my invention effects savings not only in labor and material, but also efficiently uses operating time of the train crew, rather than a repair crew.

I claim:

1. An elongated railway boxcar having a body comprising a floor, top, two sidewalls and two end wall units joined together to define an enclosure for lading carried by said car,

at least one of said end wall elements having a bulkhead element extending laterally across the enclosure, spaced inwardly of said end wall and joined to the floor element and to said end wall element by structural sections, arranged in vertical alignment with each other, said bulkhead element including plural vertical members, removably bolted to said structural sections, said vertical elements being symmetrical about a longitudinal centerline, both face-to-face as well as end-to-end, thus to accommodate replacement in said bulkhead element if they become deflected,

said vertical members being I-beams having reinforcing members joining the edges of their top and bottom flanges, said reinforcing members lying parallel with the central beam web of said I-beam,

and terminating short of said web at both ends of the latter.

2. The organization defined in claim 1 in which the structural sections are channel elements.

3. The organization defined in claim 1 in which the vertical members are I-beam top and bottom flanges at their edges and the reinforcing members lying generally parallel with the central beam web of said I-beam.

4. The organization defined in claim 3 in which the reinforcing members terminate short of the central beam web at both ends of the latter, to aid their attachment and detachment, with and from said bulkhead.

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