May 4, 1948. A. F. O'CONNOR 2,440,830

RAILWAY CAR END WALL

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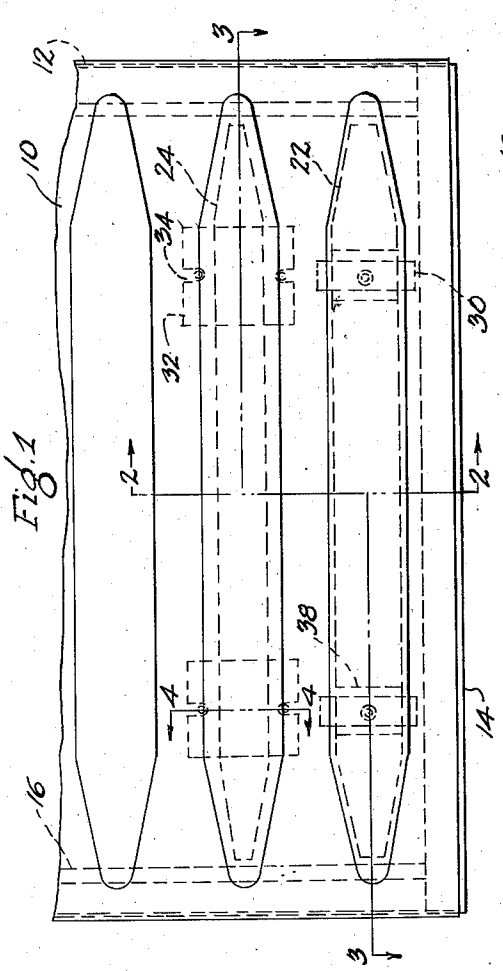


Fig. 1

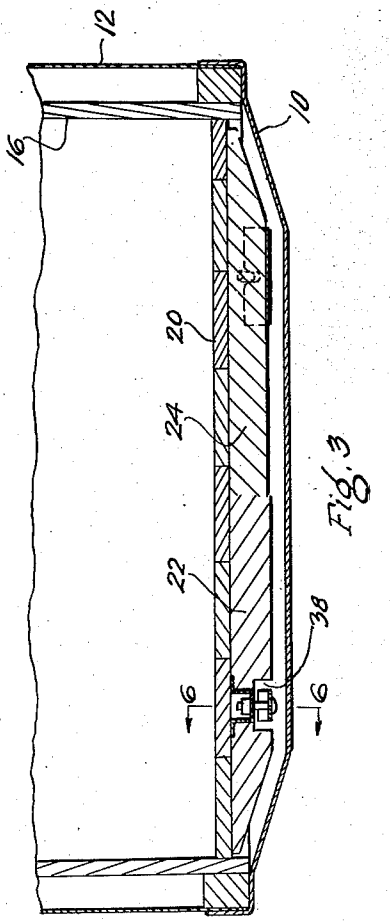


Fig. 3

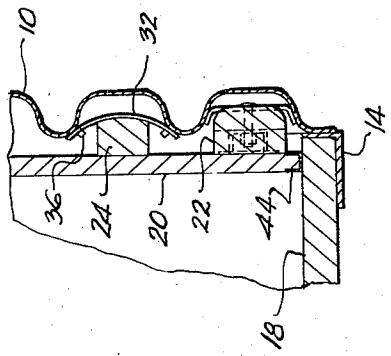


Fig. 2

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Fig. 4

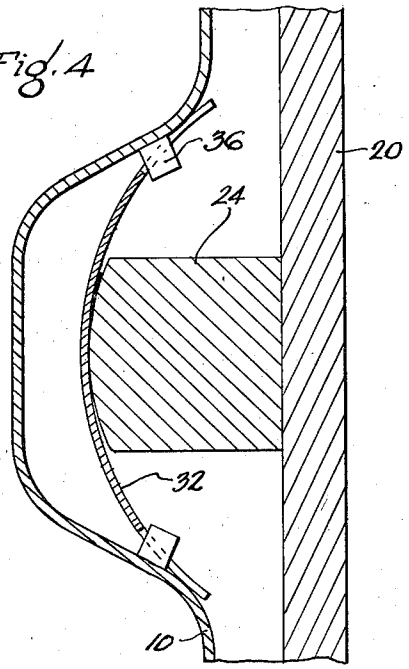


Fig. 5

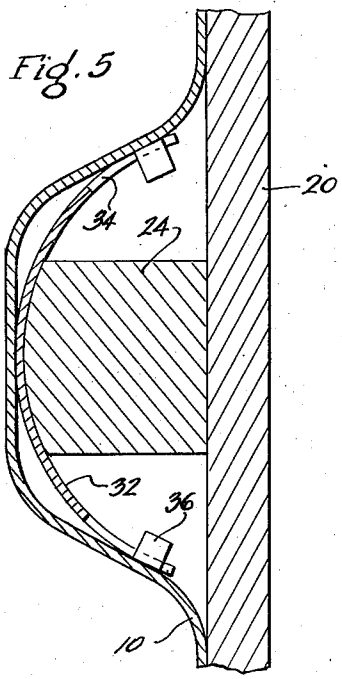


Fig. 6

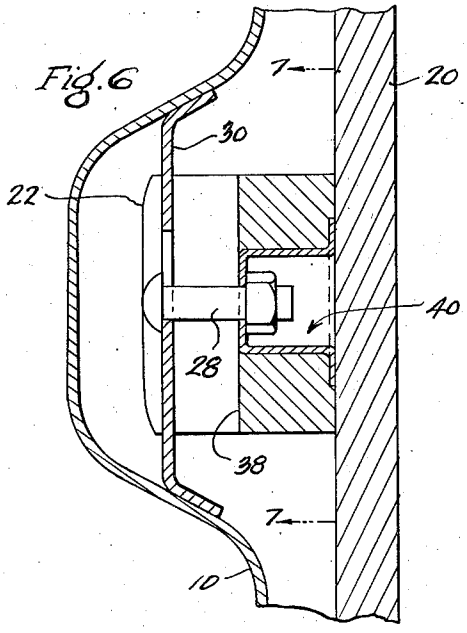
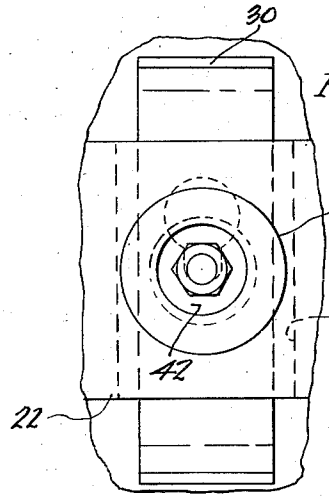


Fig. 7



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RAILWAY CAR END WALL

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9 Claims. (Cl. 105—374)

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The invention relates to railway cars and more particularly to the metal end walls of railway freight cars.

The conventional metal end wall of a freight car comprises a metal plate formed with corrugations adapted to function as girder beams between the side walls or corner posts of the car. These metal end walls are subject to terrific shocks caused by the shifting of the car lading longitudinally of the car, during switching operations, air brake applications and coupling of cars. These shocks cause breakage of and damage to lading and cause the metal end walls to bulge outwardly.

Damaged car lading results in considerable losses to the carrier in payment of damage claims. Outwardly bulged end walls require that the car be taken out of revenue service and placed in the repair shop for straightening, the work involved being an expense to the car owner.

While much attention has been given in the prior art to strengthening the metal end walls, to prevent the bulging thereof, I am aware of no instance in the prior art where the end wall structure was designed to prevent or minimize the damage to lading due to the shifting of same against a relatively rigid end wall. The prior art includes metal car ends having corrugations of varying configurations intended to let the end wall "give" or "spring" with the shock force applied thereto during the shifting of the lading, for the principal purpose of protecting the end wall. The metal sheets used in some of the prior art end walls have been made of heavier and thicker metal in order to add the required strength.

The before-mentioned varying configurations of the corrugations of the conventional car end walls have not prevented bulging of these walls and the added weight of the metal sheets used are highly objectionable in that it adds to the dead-weight or non-revenue producing load of the car. For several years every car owner has attempted to eliminate every ounce of unnecessary dead-weight and have shown a very decided preference for car parts and appliances having less weight than other parts or appliances of the kind.

An important object of my invention is to provide improved means for preventing the bulging out of metal end walls by cushioning or absorbing the shock transmitted to the end walls, intermediate the lading and the metal end walls.

Another important object is to provide improved means for preventing damage to lading

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caused by the shifting of the lading against a relatively solid or unyielding wall.

A further object is to provide a metal end wall which will retain its shape under severe shocks without the use of materials which will add to the weight and cost of the conventional metal end wall.

Another object is to provide improved means for cushioning or absorbing the shocks received by metal end walls intermediate the lading and the outer metal end walls, said means being readily usable with present designs of metal end walls and being readily applicable to metal end walls now on railway freight cars.

A further object is the provision of improved means for obviating the two greatest disadvantages or objections to the conventional type of metal car end wall with a device of great simplicity which may be produced and applied to the cars at low cost.

Other objects, advantages and capabilities of the invention will be apparent from the following description and the accompanying drawings, in which—

Figure 1 is a fragmentary end elevation of the lower portion of the corrugated end wall of a box car, embodying the invention.

Figure 2 is a vertical sectional view through the two lower corrugations of the structure of Fig. 1; the section being taken along line 2—2 of Fig. 1.

Figure 3 is a horizontal sectional view taken along line 3—3 of Fig. 1.

Figure 4 is an enlarged sectional view taken along 4—4 of Fig. 1.

Figure 5 is a sectional view of the structure of Fig. 4, with the parts thereof in contracted position.

Figure 6 is an enlarged sectional view taken along line 6—6 of Figure 3.

Figure 7 is a fragmentary view taken along line 7—7 of Figure 6.

In the drawings, I show the metal end wall as applied to a box or house-car, including an end wall 10 intermediate and secured to the side walls 12 and secured adjacent its lower edge to an end-sill 14. An inner lining 16 may be disposed in spaced parallel relation with each side wall 12 and a conventional floor 18 may be provided. An inner lining 20 may be disposed inwardly of and in spaced parallel relation with the metal end wall 10. The lining 20 may be provided with horizontally disposed beams 22 and 24 coincident certain of the corrugations of the end wall. The lining 20 may be adapted for movement toward

and away from the end wall 10 and, when moved to its extreme outward position, may abut the inner apices of the corrugations, with the beams 22 and 24 in nested abutting relation with the adjacent inner valleys of the corrugations. The beam 22 is adapted to also serve as a mounting means for maintaining the lining 20 in predetermined vertical position adjacent the end wall 10 and may be movably secured to the end wall 10 by means of bolts 28 extending horizontally through the beam 22 at one end of the bolt and through a clip 30 at the opposed end of the bolt. The clip 30 may comprise a metal strap bridging the inner valley of and being secured at its opposed end portions to the adjacent corrugation; the major portion of the strap being in a vertical plane and being formed with a key-hole shaped aperture adapted to receive the headed end of the bolt 28. The longitudinal edges of the beams 22 and 24 nearest the end wall 10 may be normally spaced from the inner valley portions of adjacent corrugations a distance equal to the desired permissable movement of the lining 20 toward the end wall, under shock from the shifting of the lading against the lining 20.

A resilient member 32 may be disposed intermediate the beam 24 and the end wall 10 and may comprise a metallic plate having an arcuate configuration formed with its arcuate axis parallel with the length of the corrugations in the end wall, with its convex surface facing the end wall 10. In its normal position (as shown in Fig. 4) the member 32 may be unflexed or slightly flexed, as desired, with the opposed straight edge portions of the member 32 abutting the inner apice portions of adjoining corrugations and the concave surface of the member 32 abutting the beam 24. The arcuate member 32 may be normally disposed in nested relation with but spaced from the adjacent valley portion of the corrugation. The opposed straight edge portions of the member 32 may be formed with inwardly disposed slots 34 preferably in vertical alignment. A stud 36 may be affixed to the end wall 10 coincident each slot 34 adapted for registering interlocking relation with the adjacent slot as a means of mounting the member 32 upon the end wall 10. The distance between the closed ends of the opposed slots 34 may be greater than the minimum distance between the studs 36 whereby the member 32 may require flexing in order to mount it upon or between the studs. While I have shown the member 32 mounted upon the end wall 10, it will be readily apparent that it might be mounted upon the beam 24 as, for instance, providing a dowel or other projecting member on the concave surface of the member 32 which may extend into the beam 24. If it is desired that the outer edge portion of the beam 24 abut the end wall throughout its greater length, when the beam 24 is at its maximum outward position, the beam 24 may be formed with a slot coincident the member 32 to permit the outer surface of the member 32 to be flush with the outer edge of the beam 24.

The outer edge of the beam 22 may be formed with an inwardly offset portion 38 coincident the clip 30 adapted to permit the major portion of said outer edge to abut the end wall 10 without interfering with the clip 30. A generally circular cup-like member 40 provided with an annular flange portion may be disposed within the vertical bounding lines of the beam 22, coincident the bolt 28, adapted to anchor the inner end of the bolt whereby to limit the inward movement of

the beam 22 to a predetermined position. The cavity 42 of the member 40 is adapted to permit the bolt 28 to telescope said cavity as the beam 22 moves toward the end wall 10 and it will also be noted that the head of the bolt 28 is normally spaced from the end wall 10 a sufficient distance to permit longitudinal movement of the bolt as the beam 22 moves toward the end wall 10.

The number of resilient members 32 provided in any corrugation is optional, as is the number of clips 30 and cooperating bolts 28.

The purpose of the invention is to provide resiliency between the car lading and metal car end wall to protect both the lading and the end wall. An important object of the invention is to absorb by friction a part of the shock force applied to the lining 20 by the shifting lading, whereby the shock force applied to the end wall will be less than the initial force applied to the lining 20. Much prior art has been directed toward cushioning vertical shocks received by the car and lading, as by snubbers which frictionally absorb part of the initial applied force before this force is transmitted to the parts of the car and the lading which are subject to damage by such shocks. Draft gears of the friction type are commonly used to reduce car shocks during coupling of adjacent cars.

While I have shown the resilient member 32 as being of arcuate configuration, in the interest of economy of space required, it will be apparent that a flat resilient plate may be used if desired. While I have shown the resilient member 32 in frictional engagement with the metallic outer wall, it will be apparent that many types of friction devices, similar in principle to snubbers and draft gears may be interposed between the lining 20 and the metallic outer wall, without frictionally engaging the outer wall proper, and I contemplate the use of such alternates in carrying out my invention.

The lower margin of the lining 20 may be provided with a metallic member 44 and similar members may be provided along the opposed vertical edges of the lining 20, to facilitate the movement of the lining 20 toward and away from the outer wall 10. Flexible strips, such as the many types of weather-stripping, may be applied also to the lower edge and the vertical edges of the lining 20 in order to accommodate such lading as grain or other granular commodities and prevent such commodities from passing between the lining 20 and the floor and side walls of the car.

While the resilient wall structure of my invention is particularly well adapted for use in the end wall structures of railway cars, it will be apparent that it may be used in any wall structure requiring resiliency between inner and outer walls and I contemplate such use.

I claim:

1. A wall structure for a railway car comprising a sheet metal outer wall formed with an elongated rigidifying corrugation, an adjacent inner wall spaced from and movable toward said outer wall provided with an elongated beam adapted for nesting relation with the valley of said corrugation, a resilient plate-like member intermediate said valley and said beam in bridged sliding relation with the wall portions of said valley, said resilient member being adapted for flexed nesting relation with said valley and fixed abutting relation with said beam as said beam and associated inner wall are moved toward said outer wall.

2. An end wall structure for a railway car comprising spaced walls including an outer wall, an

adjacent inner wall adapted for movement toward said outer wall, and a resilient spring plate member intermediate said walls adapted to be flexed during and yieldably resist said movement, said member being adapted to be flexed by one of said walls into sliding frictional engagement with the other of said walls.

3. An end wall structure for a railway car comprising spaced walls including an outer wall, an adjacent inner wall adapted for movement toward said outer wall, and a resilient member intermediate said walls adapted to be flexed during and yieldably resist said movement, said member being adapted to frictionally engage a part of one of said walls and frictionally absorb part of the driving force causing said movement.

4. An end wall structure for a railway car comprising spaced walls including a sheet metal outer wall formed with an embossment, an adjacent inner wall adapted for movement toward said outer wall, a resilient member intermediate said walls coincident said embossment adapted for flexing nested relation with the valley portion of said embossment during said movement, said member being adapted to frictionally engage a part of one of said walls during and yieldably resist said movement.

5. An end wall structure for a railway car comprising a sheet metal outer wall formed with a stiffening corrugation, an adjacent inner wall spaced from and adapted for movement toward said outer wall, a resilient member intermediate said inner wall and said outer wall in bridged relation with the valley portion of said corrugation adapted to be flexed into slidable nested relation with said valley portion and yieldably and frictionally resist said movement.

6. An end wall structure for a railway car comprising spaced walls including a sheet metal outer wall formed with an elongated stiffening corrugation, an adjacent inner lining spaced from and

adapted for movement toward said outer wall, a resilient plate-like member intermediate said walls in bridged relation with the valley portion of said corrugation, means on said inner lining adapted to flex said member into sliding nested relation with said valley portion whereby said member will yieldably and frictionally resist said movement.

7. The structure of claim 6, wherein the resilient member is arcuately formed about an axis in a substantially common plane with the longitudinal axis of said corrugation.

8. The structure of claim 6, wherein a central axis of said resilient member is in a substantially common plane with the longitudinal axis of said corrugation and wherein the edge portions of said member on opposed sides of said first named axis are adapted to frictionally engage the adjacent wall portions of said corrugation during said movement adapted to frictionally absorb a part of the driving force causing said movement.

9. The structure of claim 6, wherein a central axis of the resilient member is in a substantially common plane with the longitudinal axis of said corrugation, the edge portions of said member on opposed sides of said first named axis being formed with inwardly disposed slots adapted for interlocking mounting relation with adjacent mounting members carried by one of said walls

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