United States Patent

Ogle et al.

[15] **3,690,272**

[45] **Sept. 12, 1972**

[54] **RAILROAD CAR**

[72] Inventors: **Paul E. Ogle,** Elmwood Park; **Kenneth L. Coleman,** Chicago; **Ross W. Wagner,** Homewood, all of Ill.; **Lynn J. Harter,** Buford, Ga.

[73] Assignee: **O-T-D Corporations,** ; by said Ogle and said Coleman

[22] Filed: **May 17, 1971**

[21] Appl. No.: **144,129**

[52] **U.S. Cl.**.....**105/366 R,** 105/366 D, 105/377, 105/404

[51] **Int. Cl.**.....**B60p 7/10,** B65j 1/22, B61d 45/00

[58] **Field of Search**.....105/366 R, 366 D, 393, 370, 105/371, 377, 404; 280/179 R; 296/100; 214/10.5

[56] **References Cited**

UNITED STATES PATENTS

2,656,216	10/1953	Bobroff	105/393
2,699,735	1/1955	Williams	105/366 R
3,071,084	1/1963	Morrison	105/366 R
3,410,227	11/1968	Gutridge	105/366 R
3,478,701	11/1968	Woodman et al.	105/404
3,496,885	2/1970	Woodman et al.	105/404
3,504,638	4/1970	Yelin et al.	105/404

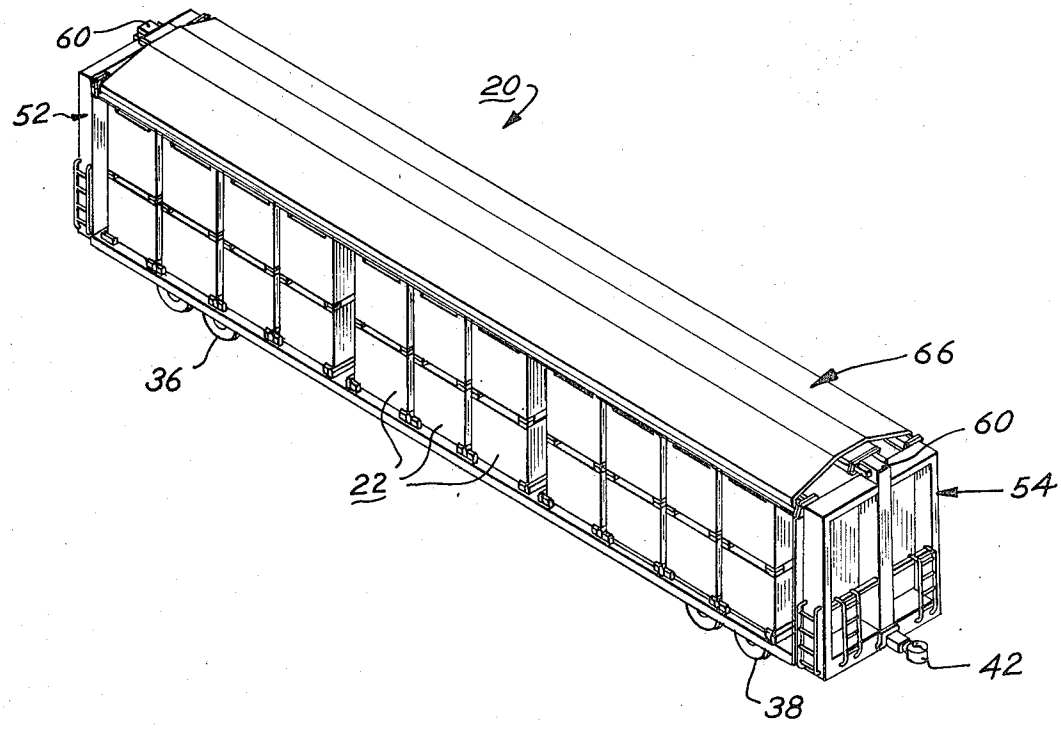
Primary Examiner—Drayton E. Hoffman
Attorney—Molinare, Allegretti, Newitt & Witcoff

[57] **ABSTRACT**

An improved railroad car for transporting a plurality of sets of containers, stacked one on top of the other, which are utilized for shipping relatively heavy materials, such as bales of synthetic rubber.

The railroad car includes a floor on which the lower ends of the sets of stacked containers rest during transport, upstanding bulkheads located at each end of the floor, and a vertically movable, upper assembly which overlies the upper ends of the sets of stacked containers and which in its lower or transport position, secures the upper ends of the sets of stacked containers against relative movement with respect to the railroad car. The floor includes a means for restraining relative movement between the lower ends of the sets of stacked containers and the floor during transport. When the upper assembly is in its upper position, containers can be loaded onto or unloaded from the car through the open sides of the car by, for example, fork lift trucks. The upper ends of the bulkheads are connected together by structural members during transport so that forces imposed on upper assembly by the containers, and particularly those occurring when the railroad car is bumped, are transmitted and distributed between both of the bulkheads. In some embodiments described herein, the upper assembly includes and carries these structural members; whereas, in other embodiments, the upper assembly carries a portion of the structural members while others of these structural members are stationary.

46 Claims, 16 Drawing Figures



PATENTED SEP 12 1972

3,690,272

SHEET 1 OF 7

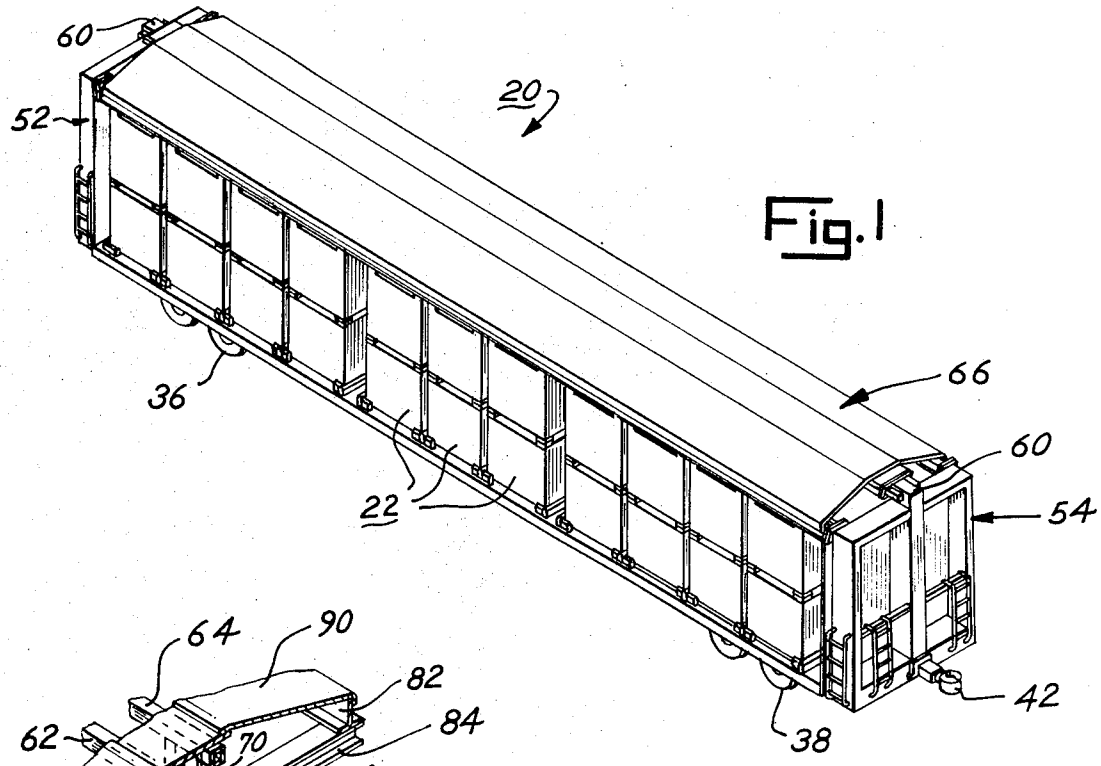


Fig. 1

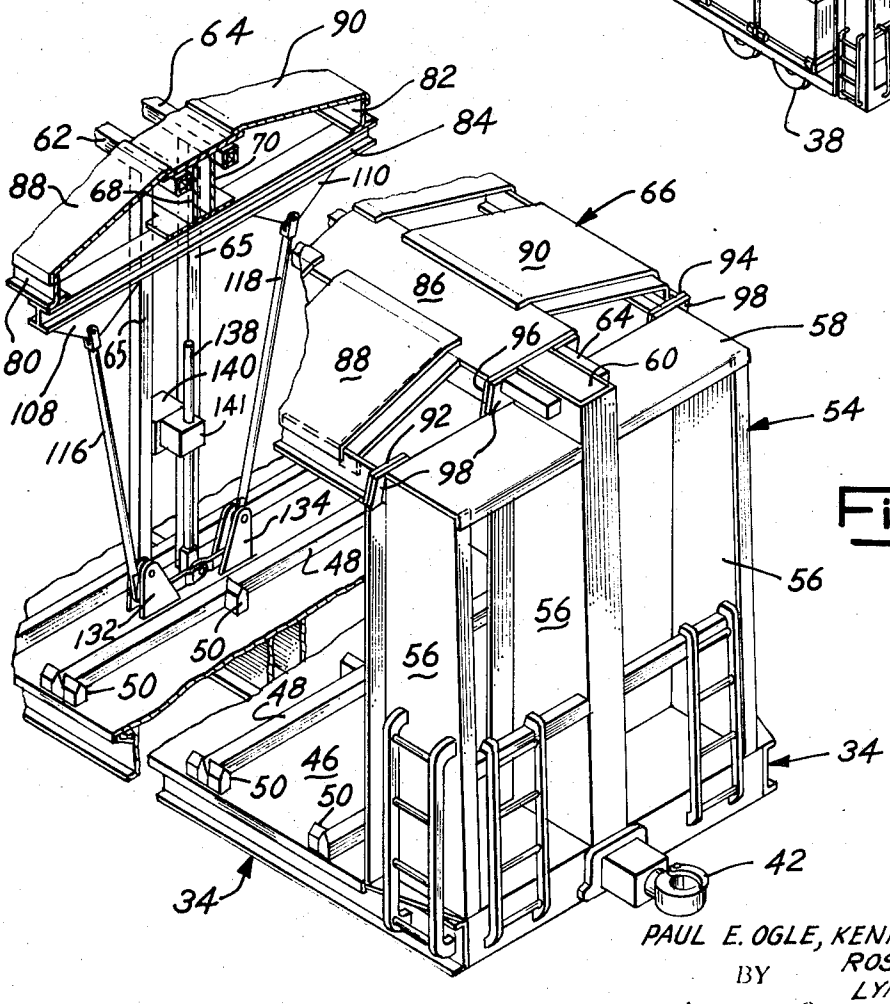


Fig. 2

INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN,
ROSS W. WAGNER &
LYNN J. HARTER
BY
Molinare, Allegretti, Newitt & Witcoff
ATTORNEYS

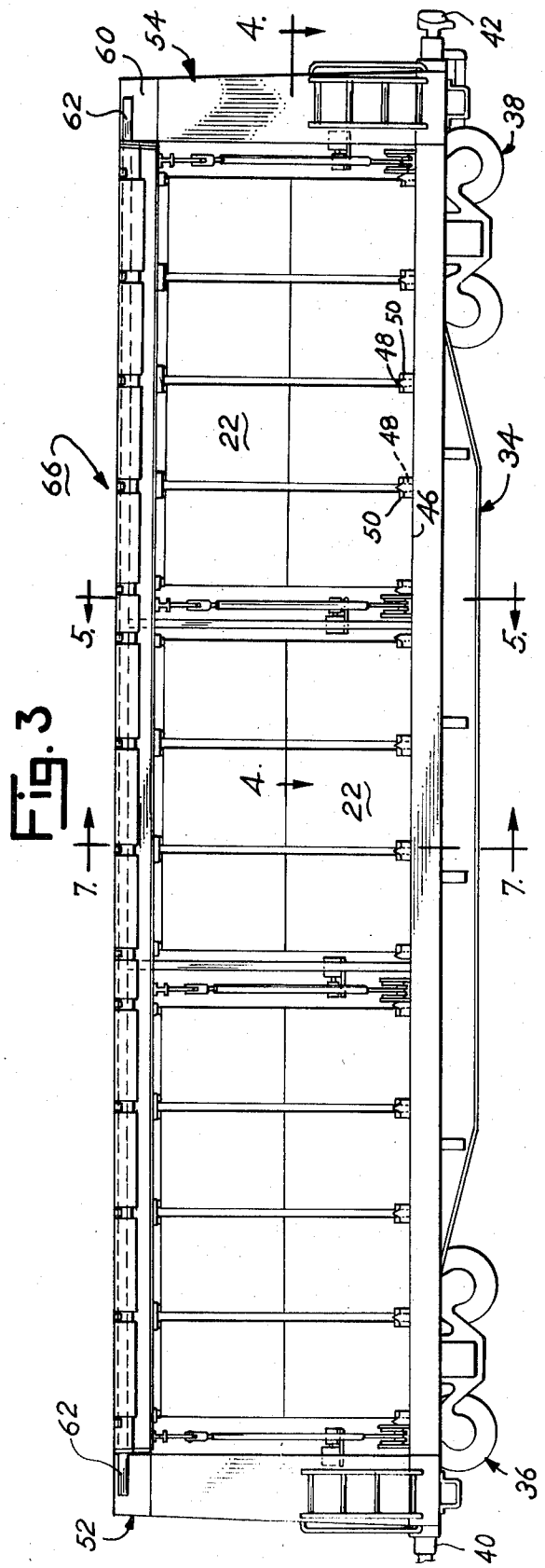


Fig. 3

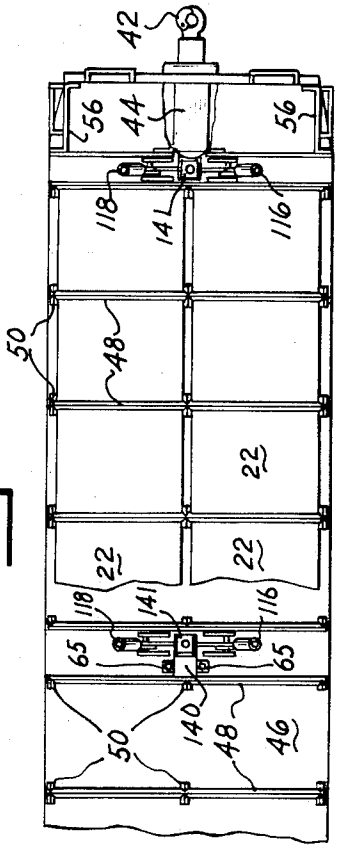


Fig. 4

INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN
ROSS W. WAGNER &
LYNN J. HARTER
BY
ATTORNEYS

Fig. 6

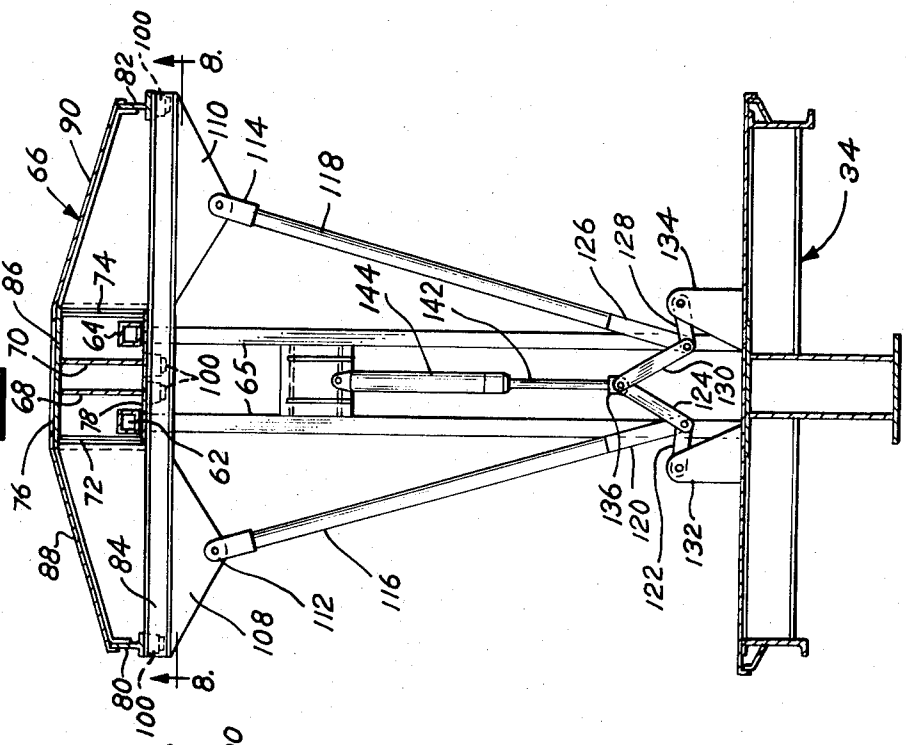
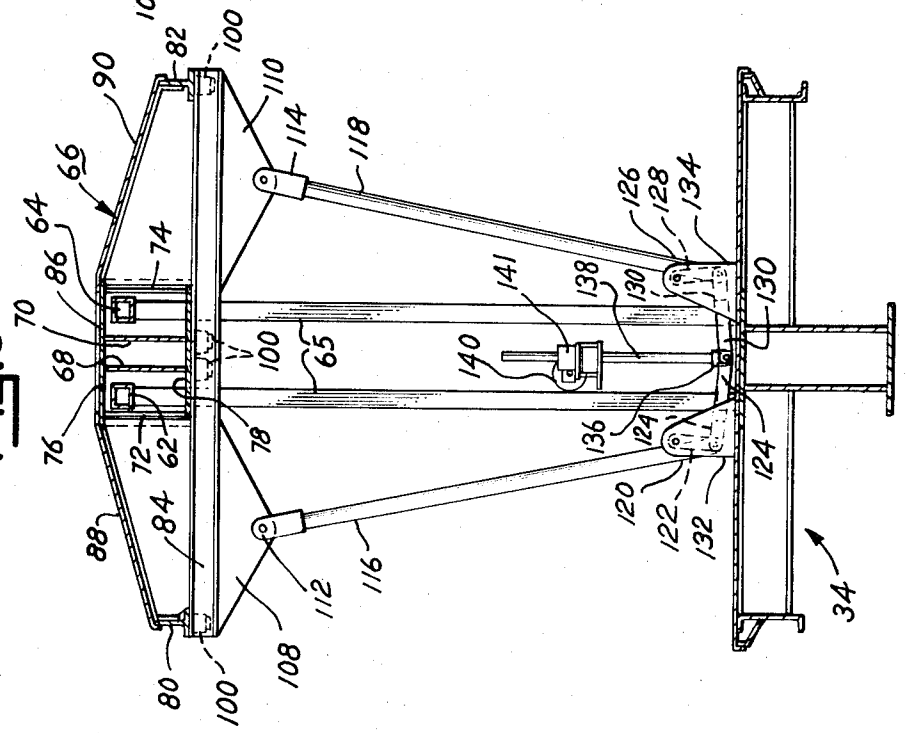
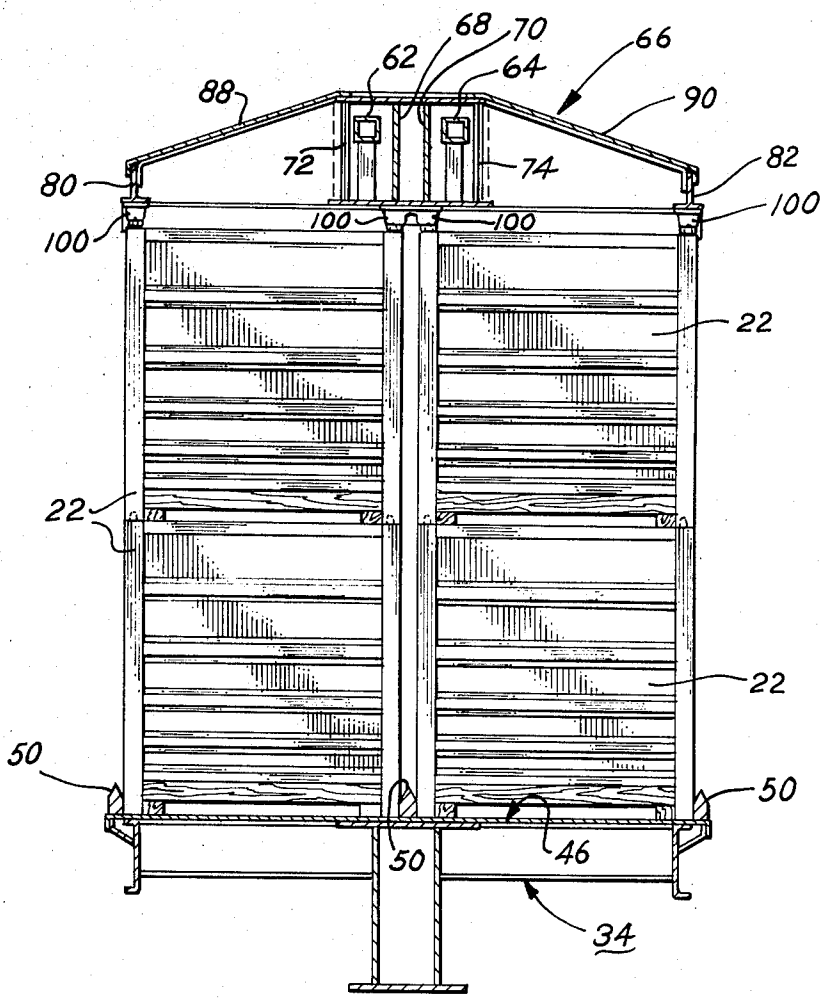


Fig. 5



INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN,
ROSS W. WAGNER &
LYNN J. HARTER
BY
Pollard, Allegretti,
Hewitt & Wiltsie
ATTORNEYS

Fig. 7



INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN,
ROSS W. WAGNER &
BY LYNN J. HARTER

ATTORNEYS

Fig. 8

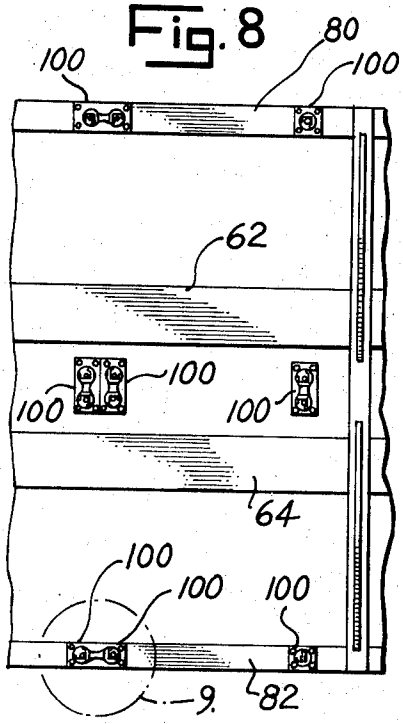
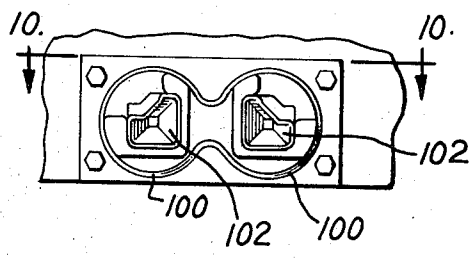


Fig. 9



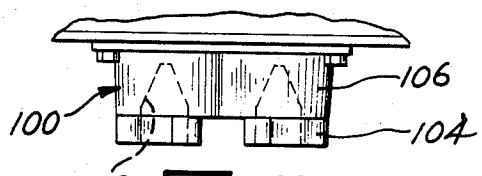


Fig. 10

Fig. 12

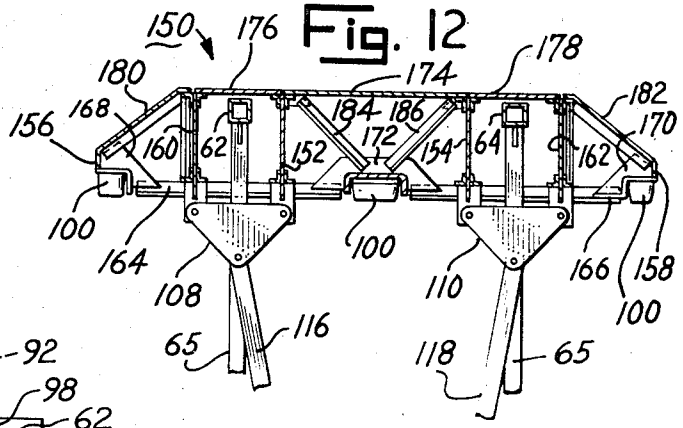
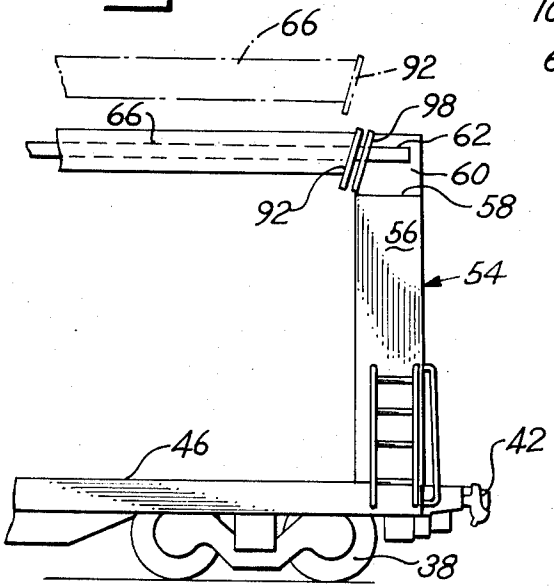


Fig. 11



INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN,
ROSS W. WAGNER &
LYNN J. HARTER
BY
Marmaro, Allegretti,
Newitt & Witcoff
ATTORNEYS

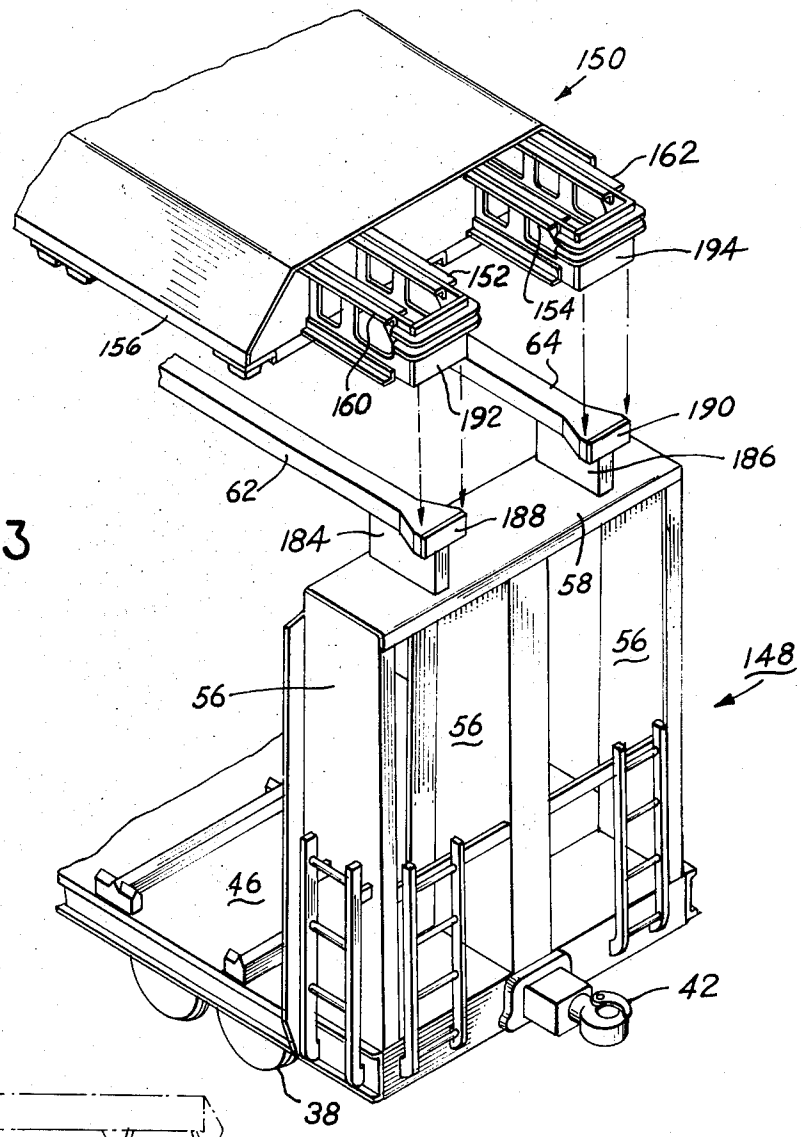


Fig. 13

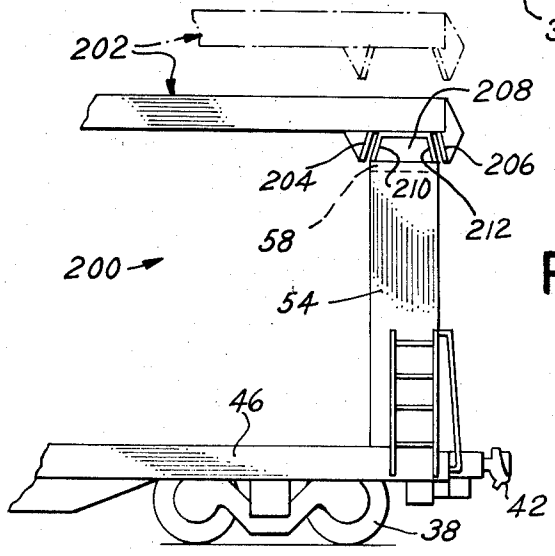
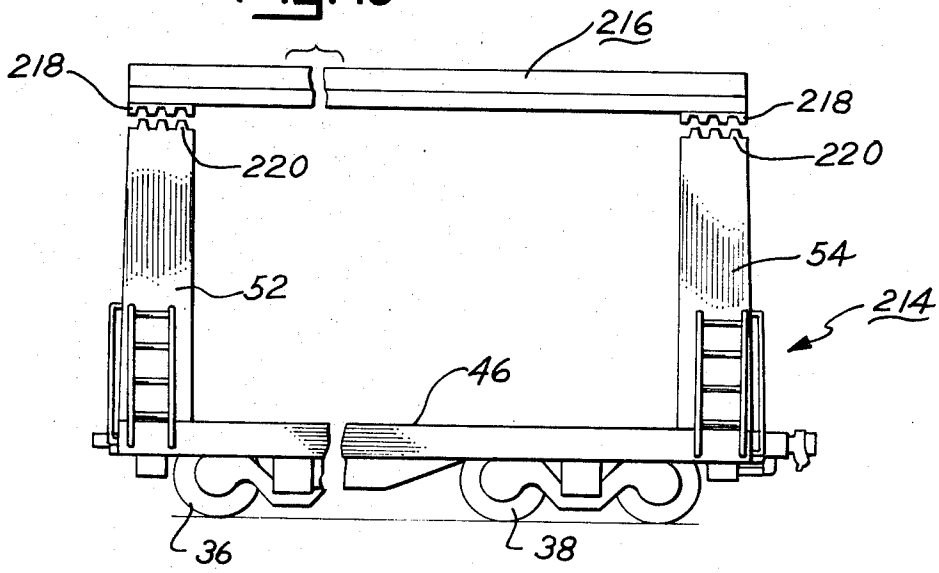


Fig. 14

INVENTORS
PAUL E. OGLE, KENNETH L. COLEMAN,
ROSS W. WAGNER &
LYNN J. HARTER
BY
Pennie, Edmonds, Morton, Barrett & Bernstein
ATTORNEYS

Fig. 15



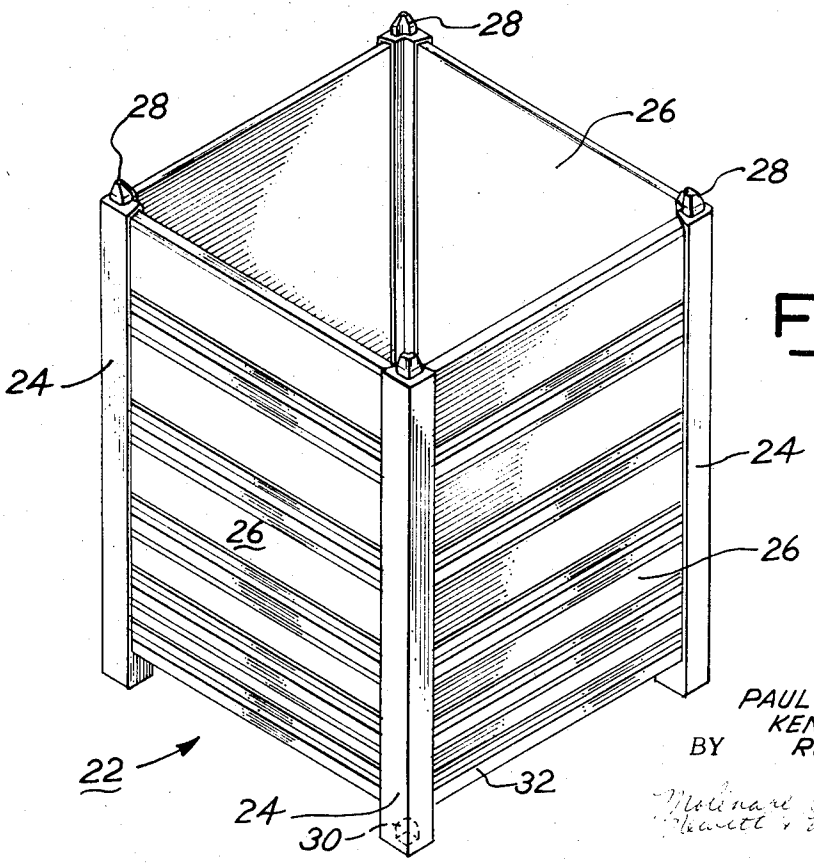


Fig. 16

INVENTORS
PAUL E. OGLE,
KENNETH L. COLEMAN,
ROSS W. WAGNER &
LYNN J. HARTER
BY Molinare, Allegretti, Newitt & Witcoff
ATTORNEYS

RAILROAD CAR

BACKGROUND OF THE INVENTION

The present invention relates to a new and improved railroad car for transporting a plurality of containers utilized for shipping relatively heavy materials and more particularly, to a new and improved railroad care for transporting a plurality of sets of at least two containers, stacked one on top of the other, for shipping relatively heavy materials such as bales or slabs of synthetic rubber.

In rubber manufacturing plants, synthetic rubber is formed into bales or slabs which are approximately 7 inches thick by 14 inches wide by 28 inches long and which weigh approximately 82 pounds a piece. For years, the bales of synthetic rubber have been shipped from the manufacturing plants in conventional railroad cars, such as boxcars. The bales have heretofore been shipped in cardboard and wooden containers which were designed to hold 24 to 27 bales, which were only semireusable in that the cardboard had to be replaced after each usage, and which have a relatively short overall life. Recently, it has been proposed to use lightweight metallic containers which are designed to hold 48 bales (although the new containers are approximately the same height as the cardboard and wooden containers), which can be reused without the use of single service components and which have a relatively long life, as compared to the prior cardboard and wooden containers, provided, of course, that the new containers are properly handled during shipment.

One of the problems, however, with the usage of these new containers is that conventional railroad cars cannot be utilized to transport these containers as economically as they might be. Because of the increased number of bales which can be placed in the containers, many conventional railroad cars cannot be fully loaded with containers because of the danger of damage to the car as a result of overweight. Moreover, in conventional cars, the containers, whether metallic or made of cardboard and wood, are subject to damage as a result of being bumped by adjacent containers and of bumping into the sides or ends of the cars during transport. If conventional dunnage is utilized to attempt to avoid such contact and bumping, this, of course, adds to the cost of shipping. Furthermore, when a conventional railroad car is fully loaded with stacked containers, there is always a risk that the ends of the car will not be able to withstand the force moments imposed thereon by the stacked containers, particularly if the car is bumped during transport, since usually the containers are not restrained against horizontal movement on the floor of the car.

Accordingly, it is a primary object of the present invention to provide a new and improved railroad car for economically transporting a plurality of sets of containers, stacked one on top of the other, used for shipping relatively heavy materials, such as bales of synthetic rubber.

The new and improved car of the present invention has a floor on which the lower ends of the stacked sets of containers rest during transport and which includes means for restraining relative movement between the lower ends of the sets of stacked containers and the floor. Bulkheads are located adjacent to each end of the floor and extend vertically upwardly from the floor.

A vertically movable upper assembly is positioned above the floor and overlies the upper ends of the stacked containers. In the embodiments of the present invention described herein, the upper assembly also serves as a roof or cover for the upper ends of the sets of stacked containers. In its lower or transport position, restraining means carried by the upper assembly contacts the upper ends of the sets of stacked containers and restrains them from relative movement with respect to the upper assembly. The restraining means carried by the upper assembly, together with the restraining means on the floor, serve to prevent any contact between adjacent sets of stacked containers and contact between the containers and the bulkheads of the car. When the upper assembly is in its upper position, containers can be relatively easily and quickly loaded onto or unloaded from the car through the open sides of the car.

In its lower or transport position, the upper assembly is utilized to hold or securely clamp the containers down, i.e., restrain them against vertical movement with respect to the floor, and also connects the bulkheads together so that the force moments which the containers impose on the upper assembly during transport, are transmitted and distributed to, and thus, resisted by, both of the bulkheads. In some of the embodiments of the improved railroad car of the present invention described herein, the upper assembly is the sole means interconnecting the upper ends of the bulkheads; whereas in other embodiments, stationary structural members extend between the bulkheads and assist in transmitting and distributing the forces acting on the upper assembly to the bulkheads.

It should be noted, however, that the concept of utilizing stationary structural members which extend between bulkheads and which provide support for the bulkheads is not new, per se, since the prestressed cords used in the railroad car disclosed in U. S. Letters Patent Nos. 3,496,885 and 3,478,701 to H. C. Woodman et al., would appear, at least inherently, to perform this function. Likewise, the concept utilizing a vertically movable roof structure in railroad cars or other freight carrying vehicles is not new, per se, as shown by U. S. Letters Patent Nos. 559,964 and 2,656,216 to A. Bierstadt and L. Bobroff, respectively. However, the improved railroad car of the present invention is the first car, insofar as is known, provided for transporting a plurality of containers for shipping relatively heavy materials, wherein the movable, upper assembly or roof serves as at least a part of the structure to connect the bulkheads together so as to transmit and distribute forces imposed on the upper assembly by the upper ends of the containers between the bulkheads and serves to secure the containers being shipped in the car against movement in the car during transport.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings, wherein like reference numerals indicate like parts throughout the figures:

FIG. 1 is a perspective view of a railroad car embodying the present invention;

FIG. 2 is an enlarged, partial perspective view, with parts shown broken away, of the railroad car shown in FIG. 1;

FIG. 3 is a side view of the railroad car shown in FIG. 1;

FIG. 4 is a partial cross-sectional view, taken along the line 4—4 in FIG. 3, with parts being shown broken away;

FIG. 5 is a partial cross-sectional view taken along line 5—5 of FIG. 3;

FIG. 6 is a partial cross-sectional view similar to that in FIG. 5 except that the upper assembly is shown in its upper position and that different means for raising and lowering the upper assembly are shown;

FIG. 7 is a partial cross-sectional view taken along line 7—7 in FIG. 3;

FIG. 8 is a partial cross-sectional view taken along line 8—8 in FIG. 6;

FIG. 9 is an enlarged detained view of the pin receiving pod indicated by line 9 in FIG. 8;

FIG. 10 is a partial cross-sectional view taken along line 10—10 in FIG. 9;

FIG. 11 is a partial perspective view of the end of the railroad car shown in FIG. 1 showing the means for connecting the upper assembly to the upper end of the bulkhead;

FIG. 12 is a partial cross-sectional view, similar to that in FIGS. 5 and 6, showing a different upper assembly construction;

FIG. 13 is a partial perspective view of another railroad car embodying the present invention which includes a modified means for connecting the upper assembly to the upper end of the bulkhead;

FIG. 14 is a side view of another railroad car embodying the present invention showing another means for connecting the upper assembly to the upper end of the bulkhead;

FIG. 15 is a side view of still another railroad car embodying the present invention showing still another means for connecting the upper assembly to the upper end of the bulkhead; and

FIG. 16 is a perspective view of a container which is adapted for use with railroad cars embodying the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIGS. 1–11, a railroad car embodying the present invention is indicated generally at 20. In FIG. 1, the car 20 is shown loaded with a plurality of sets of containers 22, stacked one on the other, and as noted above, these containers are adapted for shipping heavy materials, such as bales of synthetic rubber.

The containers 22, one of which is shown in FIG. 16, each include four corner posts 24 and four side walls 26 made of interlocking extrusions which extend between and are secured to the corner posts 24. Preferably the posts 24 and extrusions utilized for the containers 22 are aluminum. The posts 24 each have a guide or pin 28 which projects upwardly from the upper ends of the post. Each of the posts have a pin receiving recess 30 formed in their lower ends, and these recesses 30 are designed to receive the pins 28 of another container. When one container is stacked on another, the pins 28 of the lower container are received within the recesses 30 and serve to prevent relative, lateral movement between the upper end of the lower container and the lower end of the upper container. Each of the containers includes a floor portion 32 which is spaced upwardly from the plane of the lower ends of the corner posts 24 so that, for example, the forks of a fork lift truck can be placed beneath the floor of a container.

The car 20 has an underframe, shown generally at 34, which includes conventional trucks 38 and conventional couplers 40 and 42 for permitting the car to be coupled to other railroad cars and the like. To provide additional shock absorption, the couplers 40 and 42 are connected with conventional cushion units, one of which is shown at 44. The underframe 34 may be of standard design and construction so long as it is able to support the weight of the containers 22 without undue sagging.

A generally horizontal floor 46, made of a plurality of metal sheets or plates, is supported by the underframe 34 and has a generally smooth, continuous upper surface. The floor 46 extends from one end of the car 20 to the other and from one side of the car to the other. The lower ends of the sets of stacked containers 22 rest on and are supported by the floor 46 when loaded in the car 20.

As best shown in FIGS. 3, 4 and 7, a plurality of transversely disposed floor risers 48 and a plurality of shorter, longitudinally disposed floor risers 50 are secured to the floor 46. The risers 48 extend from one side of the car to the other at preselected intervals along the length of the car, while the risers 50 extend longitudinally of the car (and perpendicularly to the risers 48) a short distance from one riser 48 toward an adjacent riser 48. The risers 48 and 50 project above the plane of the floor 46, and as arranged, define four sides of a plurality of compartments which are adapted to snugly receive the lower ends of the containers 22. The risers 48 and 50 prevent lateral relative movement between the lower ends of the containers 22 resting on the floor 46 and the floor. To facilitate placement of the containers in the compartments defined by the risers 48 and 50, the upper ends of the risers are formed in a peak.

A bulkhead 52 is located at one end of the car 20, and a bulkhead 54 is located at the other end of the car 20. The bulkheads 52 and 54 extend vertically, upwardly from the plane of the floor 46, a distance greater than the height of the upper ends of the sets of stacked containers 22 above the floor 46. The bulkheads 52 and 54 are structurally identical and each is made of a plurality of large metal, vertically disposed channels 56 which are secured at their lower ends to the under frame 34. A large metal, horizontally disposed channel 58 extends transversely across the car and is secured to the upper ends of the channels 56. Other bracing members may be utilized to reinforce the bulkheads, but no such bracing members have been shown for the purpose of clarity.

On each of the bulkheads 52 and 54, a vertical bulkhead extension 60 is secured to the upper surface of the channels 58 so that the longitudinal axis of each extension is aligned with the longitudinal axis of the car. A pair of structural members 62 and 64 extend between the upper ends of the bulkheads 52 and 54. The longitudinal axes of the members 62 and 64 are parallel to the longitudinal axis of the car. The ends of these members 62 and 64 are secured to the sides of the extensions 60 so that the members can transmit and distribute forces between the bulkheads and so that when the car is bumped at one end, the members are subjected to tension. As shown, the members 62 and 64 are tubular in cross-section although, of course, the members could have any other cross-sectional configuration.

A plurality of vertically disposed beams **65** are utilized to support the members **62** and **64** at regular intervals along the length of the members. The lower ends of the beams **65** are secured to the floor **46** and the upper ends thereof are secured to the lower surface of the members.

An upper assembly, indicated generally at **66**, overlies in floor **46** of the car, and thus the upper ends of the sets of stacked containers **22** resting on the floor **46** and extends between the inner, transverse faces of the bulkheads **52** and **54**. In car **20**, the upper assembly **66** forms a roof or covering for the upper ends of the containers. The upper assembly **66** is adapted to be vertically moved, between an upper position and a lower position, as hereinafter more fully described.

As best seen in FIGS. **2** and **5–7**, the upper assembly **66** includes two center beams **68** and **70**, a plurality of supporting, vertically disposed angles **72** and **74**, upper and lower plates **76** and **78**, and side beams **80** and **82**. All of the beams **68**, **70**, **80** and **82** extend longitudinally from one end of upper assembly **66** to the other and are parallel to the longitudinal axis of the car. The center beams **68** and **70** are positioned on opposite sides of and equi-spaced from the longitudinal axis of the assembly **66**. The upper and lower plates **76** and **78** are horizontally disposed and extend from one end of the upper assembly **66** to the other. The upper plate **76** is secured to the upper surfaces or edges of the center beams **68** and **70** while the lower plate **78** is secured to the lower surfaces or edges of the center beams **68** and **70** so that the beams and the plates form a boxlike structure. The lower plate **78** has portions cut away through which the beams **65** extend.

As shown, the side edges of the plates extend beyond the vertical planes which include the beams **68** and **70**. At regularly spaced intervals along the length of the upper assembly **66**, the angles **72** and **75** are secured between the extended side edges of the plates **76** and **78** so as to reinforce and support these side edges. The side beams **80** and **82** are positioned adjacent to the sides of the assembly **66**, with the beam **80** being spaced transversely from the beam **68** and with the beam **82** being spaced transversely from the beam **70**.

A plurality of transverse beams **84** extend from one side of the upper assembly to the other at regular intervals along the length of the assembly **66**. The lower surfaces of the plate **78**, and thus indirectly, the lower surfaces of the beams **68** and **70**, are secured to the upper surfaces or edges of the beams **84**. Side plates or sheets **88** are secured, along their one side edges, to the side edges of the plate **76** and along their other side edges, to the upper surface or edge of the side beam **80**. In a like manner, side plates or sheets **90** are secured, along their one side edges to the other side edge of the plate **76** and along their other side edges to the upper surface or edge of the side beam **82**.

As seen in FIGS. **5** and **6**, the structural member **62** is disposed adjacent to the beam **68** and between the extended side edges of the plates **76** and **78** nearest to the side beam **80**, while the structural member **64** is disposed adjacent to the beam **70** and between the extended side edges of the plates **76** and **78** nearest to the side beam **82**. The space between the plates **76** and **78** is sufficient so as to permit the desired vertical movement of the assembly **66** without any contact occurring between the members and the plates **76** and **78**. In this respect, the assembly **66** is shown in its lower or transport position in FIG. **5** while the assembly **66** is shown in its upper position in FIG. **6**.

As best shown in FIG. **2**, a flat, transversely disposed, compression plate **92** is secured to each end of the side beam **80**, and a flat, transversely disposed compression plate **94** is secured to each end of the side beam **82**. In a like manner, a flat, transversely disposed compression plate **96** is secured to and between the one ends of the beams **68** and **70** while another plate **96** is secured to and between the other ends of the beams **68** and **70**. These plates **92**, **94** and **96** are all disposed in a common plane which is perpendicular to the vertical plane, including the longitudinal axis of the car **22**, and which is inclined at an angle with respect to the vertical. The inner faces of the bulkheads **52** and **54** each have three compression plates **98** mounted thereon, with a plate **98** being aligned with each of the plates **92**, **94** and **96**. Like the plates **92**, **94** and **96**, the plates **98** are disposed in a common plane which is perpendicular to vertical plane including the longitudinal axis of the car **20** and which is parallel to the plane of the plates **92**, **94** and **96**. As shown in FIG. **12**, the plates **92**, **94** and **96** are arranged so that when the upper assembly **66** is moved to its lower position, the plates **92**, **94** and **96** come into surface-to-surface contact with the plates **98** that are adjacent to and aligned therewith. Thus, when the upper assembly **66** is in its lower position and when one end of the car **20** is bumped, the beams **68**, **70**, **80** and **82** are in compression, and together with the members **62** and **64**, provide a means for transmitting and distributing forces to and between the bulkheads **52** and **54**.

As best shown in FIGS. **7–10**, a plurality of pin receiving pods **100** are mounted on the underside of the upper assembly **66**, with a pod being positioned over and aligned with each corner of each of the compartments defined on the floor **46** by the risers **48** and **50**. Each of the pods **100** are formed from a resilient material or an elastomer, such as, for example, rubber or urethane, so that the lower portion **104** thereof is more resilient than the upper portion **106**. Each pod **100** has a recess **102** formed therein. These recesses **102** are designed to receive the pins **28** on the corner posts **24** of the upper containers of the sets of stacked containers when the upper assembly **66** is in its lower position. The pods **100** restrain the upper ends of the sets of stacked containers against relative movement with respect to the upper assembly **66**, and tend to absorb or dampen forces imposed thereon by the containers. The lower portion **104** of the pod **100** is sufficiently resilient so as to allow for some misalignment between the pin **28** and the recess **102** as the upper assembly moves to its lower position and so as to permit some compression as the upper assembly moves to its lower position so that the upper assembly can securely clamp the containers. The upper portion **106** of the pods is sufficiently strong to withstand the force moments imposed thereon by the pins **28** when the car **20** is bumped. The pods **100**, of course, transmit such force moments to the upper assembly **66** as well as absorbing or dampening such force moments.

The means utilized to move the upper assembly **66** vertically is best seen in FIGS. **2**, **5** and **6**. These means are located at each end of the floor **46**, i.e., adjacent to

the inner faces of the bulkhead **52** and **54** and at two other positions equi-spaced between the ends of the floor. The means are structurally and functionally identical and for this reason, only one such means will be described in detail.

A pair of generally triangular brackets or plates **108** and **110** are secured, along their bases, to and depend from the under surface of a transverse beam **84**, with brackets and the beam lying in a common plane. The upper ends **112** and **114** of a pair of identical levers **116** and **118** are pivotally connected to the brackets **108** and **110**, respectively, adjacent to their apexes, so that the levers pivot about axes parallel to the longitudinal axis of the car **20**. The lower end **120** of the lever **116** is pivotally connected to one ends of the shorter levers **122** and **124** while the lower end **126** of the lever **118** is pivotally connected to the one ends of the shorter levers **128** and **130**. The length of the levers **116** and **118** may be adjusted so as to insure that the upper assembly **66** is level and so as to assure that the upper assembly will tightly and securely clamp the containers when the upper assembly will tightly and securely clamp the containers when the upper assembly is in its lower position. The levers **122** and **128** are identical as are the levers **124** and **130**.

Two pairs of identical, generally triangular brackets **132** and **134** are mounted on the floor **46** below the brackets **108** and **110**, respectively. The two brackets forming each of the pairs of brackets **132** and **134** are spaced from each other, in a direction parallel to the longitudinal axis of the car **20**, a distance slightly greater than the width of the levers **120**, **122** and **124** and the levers **126**, **128** and **130**. The other ends of the levers **122** and **128** are pivotally connected to the pairs of brackets **132** and **134** by means of pins, not shown, so that the levers **122** and **128** can pivot about axes parallel to the longitudinal axis of the car **20**. As shown in FIG. **5**, the other ends of the levers **124** and **130** are pivotally connected to a head **136** secured on the lower end of a vertically mounted machine screw **138**. The machine screw **138** may be rotated by a conventional electric motor **140** and coupling unit **141** which are supported above the floor by supports, not shown. Rotation of the machine screw **138** by the motor and unit **140** causes the screw to move vertically, and such vertical movement of the screw **138** results in vertical movement of the head **136** which, in turn, causes the levers **116** are **118** to be moved vertically. More specifically, when the upper assembly **66** is in its lower position, such as shown in FIG. **5**, rotation of the machine **138** causes the head **136** to move upwardly. This movement of the head **136**, in turn, causes the levers **116** and **118** to move upwardly thereby raising the upper assembly **66**. Conversely, when the assembly **66** is in its upper position rotation of the machine screw **138** results in downward movement of the head **136** and this, in turn, causes the levers **116** and **118** and, thus, the upper assembly **66**, to move downwardly. As the assembly **66** moves downwardly, the assembly contacts the upper ends of upper containers and applied an increasing clamping or downwardly directed holding force on the containers so that when the upper assembly **66** is in its lower position, the sets of stacked containers **22** are securely restrained or clamped against vertical movement with respect to the floor **46**. The levers **116**, **118**, **122**, **124**, **128** and **130** are arranged so that the levers **116** and **122** and the levers **118** and **128** "pass over center" (with respect to the pins interconnecting the other ends of the levers **122** and **128** to the brackets **132** and **134**) as the upper assembly **66** is moved to its lower position. This, together with the face that the motor **140** and unit **141** prevent any rotation of the screw **138** when the motor is not actuated, serves to retain or hold the assembly **66** in its lower position and thus, assure that the containers are and remain clamped down during transport.

Alternatively, and as shown in FIG. **6**, the head **136** can be connected to the end of a piston rod **142** of a conventional double acting, hydraulic cylinder **144** which is mounted on the beams **65** so its longitudinal axis is vertical. Actuation of the cylinder **144** causes vertical movement of the head **136** in the same manner as when the head is connected to the machine screw **138**. The hydraulic system for the cylinder **144** is conventional and for that reason is not described. The hydraulic system must, however, be designed so as to insure that the head **136** will remain in the position it was in when actuation of the cylinder **144** ceased. The hydraulic system (except, of course, for the cylinder **144**) may be mounted on the car **20** or, alternatively, be located on the loading dock used to load and unload the car **20**.

In use and assuming that the car **20** is loaded with containers, like the containers **22**, and that the car is parked next to, for example, a loading dock of a plant manufacturing synthetic rubber, the upper assembly **66** is raised from its lower or transport position, to its upper position by actuation of the motors **140** or the cylinders **144**, as the case may be. The means for raising the assembly **66** are synchronized so that the assembly **66** is raised and lowered in a level position.

When the assembly **66** is in its upper position, the operation of the motors **140** or cylinders **144** is discontinued. When the assembly **66** is in its upper position, the pins **28** projecting on the upper containers in the sets of stacked containers in the car **20** are no longer disposed within the recesses **102** in the pods **100**. In fact, the pods **100** are positioned above the upper ends of the pins **28** a distance greater than the height of the risers **48** and **50** above the floor **46**. After the assembly has been moved to its upper position, the containers **22** may be unloaded from the car, either manually or by some mechanical means, such as a fork lift truck, through the open sides of the car.

In a like manner, containers filled with bales of synthetic rubber can thereafter be loaded onto the car. As noted above, the lower ends of the bottom containers of the sets of stacked containers are placed within the compartments defined on the floor **46** by the risers **48** and **50**. The upper container of each set is placed on top of the bottom container **22** so that pins **28** of the bottom container fit within the recesses **30** in the lower ends of the posts **24** of the upper container.

When the car **20** is again completely loaded, the motors **140** or cylinders **144** can again be actuated so that the upper assembly is lowered to its lower or transport position. The assembly **66** is held in its lower position, by the motors **140** and unit **141** or the cylinders **144**, as the case may be.

When the assembly **66** is in its lower position, the pins **28** on the upper containers are disposed within the recesses **102** in the pods **100**. Thus, the pods **100** prevent any relative movement between the upper containers and the upper assembly **66**. Moreover, the pods **100**, together with the risers **48** and **50**, prevent relative movement between the sets of stacked containers and the car.

If the car is bumped during transport or otherwise, the sets of stacked containers will impose force moments on the pods **100** and thus the upper assembly **66**. The beams **68**, **70**, **80** and **82** and the members **62** and **64** transmit and distribute the resultant forces to both bulkheads **52** and **54**, which, together, are strong enough to resist without damage to the car.

Referring now to FIGS. **12** and **13**, another railroad car embodying the present invention is shown generally at **148**. The car **148** is structurally identical to the car **20** except that the construction of its upper assembly **150** is different than that of assembly **66** and the means for transmitting and distributing forces between the bulkheads is different from that utilized in car **20**. Also, it should be noted that, unlike in car **20**, the members **62** and **64** are subjected to compression loading in car **148** when the car **148** is bumped.

As seen in FIG. **12**, the assembly **150** includes two longitudinally disposed beams **152** and **154** which extend from one end of the assembly **150** to the other and which are equi-spaced from the longitudinal axis of the assembly. Two longitudinally disposed, side beams **156** and **158** also extend from one end of the assembly **150** to the other and are equi-spaced from the longitudinal axis of the assembly and from the beams **152** and **154**, respectively. The side beams **156** and **158** define the sides of the assembly **150**. Two other longitudinally disposed beams **160** and **162** extend from one end of the assembly **150** to the other, are positioned between the beams **152** and **156** and the beams **154** and **158**, respectively, and are equi-spaced from the longitudinal axis of the assembly **150**. The longitudinal axes of the beams **152**, **154**, **156**, **158**, **160** are **162** are parallel to the longitudinal axis of the assembly **150**. The beams **152**, **154**, **160** and **162** are of sufficient length so that their ends overlie or extend over the channels **58** of the bulkheads **52** and **54**.

In place of each of the transverse beams **84**, the assembly **150** utilizes a pair of aligned, transverse beams **164** and **166**. The beams **164** and **166** are connected at their outer ends, by gussets **168** and **170**, to the side beams **156** and **158**, respectively, and are interconnected at their inner ends, by gussets **172**. The lower ends of the beams **152** and **160** are secured to the beams **164** and **166**, respectively. Center plates **174** extend between and interconnect the upper ends of the beams **152** and **154**. Plates **176** extend between and interconnect the upper ends of the beams **152** and **160** while plates **178** extend between and interconnect the upper ends of the beams **154** and **162**. Side plates **180** extend between and interconnect the upper ends of the beams **156** and **160**, and side plates **182** extend between and interconnect the beams **158** and **162**. The plates **174**, **176**, **178**, **180** and **182**, in addition, form a roof or protective cover for the assembly **150**. The assembly **150** also includes a number of braces, such as braces **184** and **186**, which extend between the gusset **172** and the upper ends of the beams **152** and **154**, respectively, to reinforce the assembly.

The members **62** and **64** are positioned between the beams **152** and **160** and the beams **154** and **162**, respectively, and the beams are of sufficient height, and are spaced transversely from each other a sufficient distance so that there is no contact between members **62** and **64** and the beams **152**, **154**, **160**, **162**, **164** and **166** and the sheets **176** and **178** when the upper assembly **150** is moved with respect to the members **62** and **64**.

As best shown in FIG. **13**, the bulkheads used on the car **148** are structurally identical to the bulkheads on the car **20** except that on each bulkhead, there are two identical, transversely spaced apart, vertical extensions **184** and **186**, instead of just the one vertical extension **60**, secured to the upper surface of the channels **58**. The ends of the structural members **62** are secured to the upper ends of the extensions **184** while the ends of the structural members **64** are secured to the upper ends of the extensions **186**. Transverse plates **188** and **190** are mounted on each end of the members **62** and **64**, respectively.

Transverse, reinforced plates **192** extend between and interconnected the ends of the beams **152** and **160**. Similarly, transverse reinforced plates **194** extend between and interconnect the ends of the beams **154** and **162**. The distance between the plates **192**, i.e., the length of the beams **152** and **160**, and the distance between the plates **194**, i.e., the length of the beams **154** and **162**, is slightly greater than the distance between the plates **188** and between the plates **190**, respectively. Moreover, the beams **152** and **160** and the beams **154** and **164**, are positioned with respect to the members **62** and **64**, respectively, so that when the assembly **150** is moved to its lower position, the plates **192** are moved into surface-to-surface contact with the plates **188** and the plates **194** are moved into surface-to-surface contact with the plates **190**, whereby when the car **148** is bumped, the plates **194** will bear on the plates **190** and the plates **192** will bear on the plates **188**. In other words, when the car **148** is bumped, the beams **152**, **154**, **160** and **162** will be subjected to tension loading, and as noted above, the members **62** and **64** will be subject to compression loading.

Referring now to FIG. **14**, another railroad car embodying the present invention is shown generally at **200**. The car **200** is structurally identical to the car **20** except for the means for transmitting and distributing forces to the bulkheads **52** and **54**. Unlike cars **20** and **148**, car **200** does not utilize stationary structural members, like members **62** and **64**, but, rather, the means for transmitting and distributing forces is entirely carried by the upper assembly **202**. As shown, the upper assembly **202** overlies the upper ends of the bulkheads and includes, at each end, at least one pair of longitudinally spaced plates **204** and **206** which are secured to and depend from the lower surface of the assembly **202**. The plates **204** and **206** on each end of the assembly **202** are interconnected by longitudinally extending beams which, like beams **72**, **74**, **76** and **78**, are carried by the assembly **202**.

The plates **204** and **206** are each inclined at the same angle with respect to the vertical and are disposed so that the two transverse planes which include the plates

204 and 206 intersect each other along a line above the upper end of the bulkheads. Vertical extensions 208 are secured to the upper surface of the channels 58 on each of the bulkheads. The extensions 208 each include an inner facing plate 210 and an outer facing plate 212 which are positioned in back-to-back fashion. The plates 210 are aligned with and disposed at the same angle, with respect to the vertical, as the plates 204. Similarly, the plates 212 are aligned with and disposed at the same angle, with respect to the vertical, as the plates 206. The distance between the plates 204 and 206 and between the plates 210 and 212 is selected so that when the upper assembly 202 is moved to its lower or transport position, there is surface-to-surface contact between the plates 204 and 210 and between the plates 206 and 212. When the car 200 is bumped, contact between the plates 204 and 210 and between the plates 206 and 212 serves to transmit and distribute forces imposed upon the assembly 202 to both of the bulkheads. Lastly, it should be noted that while only one set of plates 204, 206, 210 and 212 has been shown, additional sets of such plates, of course, can be utilized on each end of the assembly 202.

Referring now to FIG. 15, still another railroad car embodying the present invention is shown generally at 214. The car 214 is structurally identical to car 20 except, like car 200, the means for transmitting and distributing forces to the bulkheads 52 and 54 is carried entirely by the upper assembly 216.

In car 214, the ends of the assembly 216 overlie the upper ends of the bulkheads 52 and 54. Racks 218, including a plurality of teeth, are secured to the under surface adjacent to each end of the assembly 216. Complimentary racks 220, also including a plurality of teeth, are mounted on the upper ends of the bulkheads 52 and 54 and are disposed beneath and in alignment with the adjacent racks 218. When the assembly 216 is moved to its lower or transport position, the racks 218 and 220 are engaged so that the sides of the teeth of the racks 218 bear against the sides of the teeth of the racks 220 and vice versa. Thus, the engagement between the teeth of the racks 218 and 220 serves to interconnect the upper assembly 216 with the upper ends of the bulkheads 52 and 54, thereby permitting the forces imposed upon the assembly to be transmitted and distributed to both bulkheads.

In view of the foregoing, it is apparent that the new and improved railroad car of the present invention provides an economical way to transport containers for shipping heavy materials. Cars embodying the present invention may be ruggedly constructed yet have relatively simple design. Such cars have an additional advantage of being capable of being loaded and unloaded with a minimum of time and effort because of the completely open sides.

In conclusion, it should be noted that while the foregoing descriptions were directed to railroad cars, the principles of the present invention could also be utilized in other types of container carrying vehicles. Also, for example, lever systems other than the specific lever system described herein could be utilized to raise and lower the upper assembly of the car, and means other than the risers 48 and 50 and the pods 100 could be used to restrain relative movement between the sets of stacked containers and the car during transport. Likewise, the design and construction of the bulkheads 52 and 54 could be modified from that described herein. Thus, it should be understood that the embodiments of the present invention which have been described hereinabove are merely illustrative of one application of the principles of the present invention, and numerous modifications may be made to the disclosed embodiments without departing from the spirit and scope of the present invention.

What is claimed is:

1. An improved railroad car for transporting a plurality of containers useful for shipping relatively heavy materials, such as bales of synthetic rubber, the improved railroad car having front and rear ends and comprising:

a substantially horizontal floor means, including supporting frame means therefor, for receiving the containers to be transported on the railroad car, the floor means having first and second ends which are adjacent to the front and rear ends, respectively, of the railroad car;

first and second vertically disposed bulkheads located adjacent to the first and second ends, respectively, of the floor means, with the bulkheads being secured, at their lower end, to the floor means and with the upper ends of the bulkheads being disposed above the plane of the floor means;

means positioned adjacent to the front and rear ends of the railroad car for coupling the railroad car to other railroad cars or the like, the coupling means including shock absorbing means;

means for restraining relative movement between the lower ends of the containers and the floor means during transport;

substantially horizontally disposed upper assembly means positioned above and overlying the lower restraining means;

means for selectively moving the upper assembly means between a first position wherein the upper assembly means is positioned above the floor means a distance substantially equal to the height of the upper ends of the containers above the floor means and a second position wherein the upper assembly means is spaced from the upper ends of the containers so as to permit facile loading and unloading of containers onto and from the floor means of the railroad car;

means for preventing relative movement between the upper ends of the containers and the upper assembly means when the upper assembly means is in its first position;

means for holding the upper assembly means in its first position during transport of the railroad car; and

means connecting the upper ends of the first and second bulkheads for transmitting and distributing forces acting in the first and second bulkheads between the first and second bulkheads, particularly when the railroad car is bumped.

2. The improved railroad car described in claim 1 wherein the railroad car is designed to transport a plurality of sets of at least two containers stacked one on top of the other; wherein the floor means includes an upper surface on which the lower ends of the lower-

most containers in the sets of stacked containers are supported; wherein the upper assembly means holds the containers against vertical movement with respect to the floor means when the upper assembly means is in its first position; and wherein at least a portion of the means for preventing relative movement between the upper ends of the uppermost containers in the sets of stacked containers and the upper assembly means is carried by the upper assembly means.

3. The improved railroad car described in claim 2 wherein the upper assembly means includes a plurality of movable structural members which extend longitudinally between the first and second bulkheads when the upper assembly means is in its first position.

4. The improved railroad car described in claim 3 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads; and wherein the movable structural members of the upper assembly means act as tension members when the railroad car is bumped; wherein the structural member of the connecting means acts as a compression member when the railroad car is bumped.

5. The improved railroad car described in claim 3 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads; and wherein the movable structural members of the upper assembly means act as compression members when the railroad car is bumped; wherein the structural member of the connecting means acts as a tension member when the railroad car is bumped.

6. The improved railroad car described in claim 2 wherein the upper assembly means functions as a roof for the railroad car and overlies the floor means between the first and second bulkheads when the upper assembly means is in its first position.

7. The improved railroad car described in claim 6 wherein the upper assembly means is moved substantially vertically between its first and second positions.

8. The improved railroad car described in claim 2 wherein the upper assembly means is positioned above the floor means a distance greater than the height of the upper ends of the stacked containers when the upper assembly means is in its second position.

9. The improved railroad car described in claim 2 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads.

10. The improved railroad car described in claim 9 wherein the structural member is tubular in cross-section.

11. The improved railroad car described in claim 3 wherein means are positioned between the upper ends of the first and second bulkheads and the adjacent end portions of the structural members of the upper assembly means for causing engagement between the upper ends of the firs and second bulkheads and the adjacent end portions of the structural members of the upper assembly means when the upper assembly means is in its first position so as to prevent relative horizontal movement between the first and second bulkheads and the end portions of the structural members of the upper assembly means so that the structural members of the upper assembly means acts as at least a portion of the means for connecting the upper ends of the first and second bulkheads together for transmitting and distributing forces acting on the first and second bulkheads between the first and second bulkheads when the upper assembly means is in its first position.

12. The improved railroad car described in claim 11 wherein at least a portion of the one and the other ends of the structural members of the upper assembly means overlies the upper ends of the bulkheads adjacent thereto.

13. The improved railroad car described in claim 12 wherein first and second rack means are mounted on the upper ends of the first and second bulkheads, respectively; wherein third and fourth rack means are mounted on the one and the other overlying end portions of the upper assembly means, respectively; wherein the rack means are positioned and arranged so that the first and second rack means are in engagement with the third and fourth rack means, respectively, when the upper assembly means is in its first position.

14. The improved railroad car described in claim 12 wherein each end portion of each of the structural members includes a bearing surface; wherein the upper ends of the first and second bulkheads include bearing surfaces which are complimentary to and are adapted for surface-to-surface contact between the bearing surfaces on the adjacent structural members of the upper assembly.

15. The improved railroad car described in claim 12 wherein each end portion of each of the structural members includes a bearing surface, the plane of which is inclined with respect to the vertical and with respect to the bearing surface on the opposite end portion of the structural member; wherein the upper ends of the first and second bulkheads include bearing surfaces which are complimentary to and are adapted for surface-to-surface contact between the bearing surfaces on the adjacent structural members of the upper assembly.

16. The improved railroad car described in claim 15 wherein each end portion of each of the structural members includes a pair of bearing surfaces, the planes of which are inclined with respect to the vertical and with respect to each other; wherein each of the upper ends of the first and second bulkheads include a pair of bearing surfaces which are complimentary to and are adapted for surface-to-surface contact between the pair of bearing surfaces on the adjacent end portion of the structural member of the upper assembly.

17. The improved railroad car described in claim 11 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads; and wherein the movable structural members of the upper assembly means act as tension members when the railroad car is bumped; wherein the structural member of the connecting means acts as a compression member when the railroad car is bumped.

18. The improved railroad car described in claim 11 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads; and wherein the movable structural members of the upper assembly means act as compression members when the railroad car is bumped; wherein the structural member of the

connecting means acts as a tension member when the railroad car is bumped.

19. The improved railroad car described in claim 2 wherein the lower restraining means includes a plurality of substantially horizontally disposed floor retaining members mounted on the upper surface of the floor means, wherein the upper edges of the floor retaining members are spaced above the plane of the upper surface of the floor means; wherein the floor retaining members define a plurality of compartments on the upper surface of the floor means, with the size and shape of each such compartment being substantially the same as the size and shape of the lower ends of the lowermost containers in the sets of stacked containers so that the lower end of lowermost container may be fit within a compartment and be restrained therein against horizontal movement relative to the upper surface of the floor means.

20. The improved railroad car described in claim 19 wherein floor retaining members are spaced between adjacent sets of stacked containers and together with the means for preventing relative movement between the upper ends of the containers, prevent the adjacent sets of stacked containers from contacting each other during transport.

21. The improved railroad car described in claim 2 wherein the means for preventing relative movement between upper ends of the uppermost containers of the sets of stacked containers includes a plurality of mounting means carried by the upper assembly means and adapted to contact upper portions of the uppermost containers of the sets of stacked containers and to prevent vertical movement of the sets of stacked containers.

22. The improved railroad car described in claim 21 wherein pins project upwardly from and extend upwardly above the horizontal plane of the upper ends of the uppermost containers of the sets of stacked containers; wherein the mounting means includes a plurality of mounting assemblies which are carried by the upper assembly means, the mounting assemblies having recesses formed therein which are positioned and constructed so as to receive the pins therein.

23. The improved railroad car described in claim 22 wherein the material which defines the recesses in the mounting assemblies is a relatively resilient material so that the material can take the moments imposed upon the mounting assemblies by the pins as a result of the railroad car being bumped.

24. The improved railroad car described in claim 23 wherein the material is an elastomer having upper and lower horizontally disposed layers, with the layers having different hardnesses.

25. The improved railroad car described in claim 24 wherein the upper layer of the elastomer is less resilient than the lower layer thereof; wherein the use of the elastomer provides compensation for differing heights of the sets of stacked containers; and wherein the elastomer tends to absorb or dampen the forces imposed thereon.

26. The improved railroad car described in claim 2 wherein the means for moving the upper assembly means includes a power actuated linkage assembly which is connected with the upper assembly means.

27. The improved railroad car described in claim 26 wherein a plurality of linkage assemblies are utilized to raise and lower the upper assembly means vertically while maintaining the plane of the upper assembly means substantially parallel to the plane of the upper surface of the floor means; and wherein each of the linkage assemblies comprise:

first and second substantially identical links which are pivotally connected at their upper ends to opposite sides of the underside of the upper assembly means;

third and fourth substantially identical links which are pivotally connected at their one ends with the lower ends of the first and second links, the other ends of the third and fourth links being pivotally connected to fixed pivot points which are spaced from each other and which are spaced between the upper surface of the floor means and the upper assembly means;

fifth and sixth substantially identical links which are pivotally connected at their one ends to the one ends of the third and fourth links and which are pivotally connected at their other ends to the reciprocally movable power output shaft.

28. The improved railroad car described in claim 27 wherein the axes of the fixed pivot points are parallel, horizontally disposed and spaced from the upper surface of the floor means a distance slightly greater than the length of the second and third links; wherein the power output shaft is vertically movable, is positioned between the fixed pivot points and is arranged so that its axis is perpendicular to the plane of the fixed pivot points and intersects the longitudinal centerline of the railroad car; wherein at least one of the linkage assemblies is disposed between adjacent sets of stacked containers; and wherein the lengths of the first and second links are adjustable.

29. The improved railroad car described in claim 3 wherein the connecting means includes at least one structural member which extends longitudinally between the first and second bulkheads; wherein the upper assembly means is positioned above the floor means a distance greater than the height of the upper ends of the stacked containers when the upper assembly means is in its second position; and wherein the upper assembly means is moved substantially vertically between its first and second positions.

30. The improved railroad car described in claim 29 wherein the movable structural members of the upper assembly means act as tension members when the railroad car is bumped; and wherein the structural member of the connecting means acts as a compression member when the railroad car is bumped.

31. The improved railroad car described in claim 29 wherein the movable structural members of the upper assembly means act as compression members when the railroad car is bumped; and wherein the structural member of the connecting means acts as a tension member when the railroad car is bumped.

32. The improved railroad car described in claim 29 wherein the structural members are tubular in cross-section.

33. The improved railroad car described in claim 29 wherein the upper assembly means functions as a roof for the railroad car and overlies the floor means

between the first and second bulkheads when the upper assembly means is in its first position.

34. The improved railroad car described in claim 29 wherein the lower restraining means includes a plurality of substantially horizontally disposed floor retaining members mounted on the upper surface of the floor means; wherein the upper edges of the floor retaining members are spaced above the plane of the upper surface of the floor means; wherein the floor retaining members define a plurality of compartments on the upper surface of the floor means, with the size and shape of each such compartment being substantially the same as the size and shape of the lower ends of the lowermost containers in the sets of stacked containers so that the lower end of the lowermost container may be fitted within a compartment and be restrained therein against horizontal movement relative to the upper surface of the floor means.

35. The improved railroad car described in claim 34 wherein the means for preventing relative movement between upper ends of the uppermost containers of the sets of stacked containers includes a plurality of mounting means carried by the upper assembly means and adapted to contact upper portions of the uppermost containers of the sets of stacked containers and to prevent vertical movement of the sets of stacked containers; wherein floor retaining members are spaced between adjacent sets of stacked containers and together with the means for preventing relative movement between the upper ends of the containers, prevent the adjacent sets of stacked containers from contacting each other during transport.

36. The improved railroad car described in claim 35 wherein means are positioned between the upper ends of the first and second bulkheads and the adjacent end portions of the structural members of the upper assembly means for causing engagement between the upper ends of the first and second bulkheads and the adjacent end portions of the structural members of the upper assembly means when the upper assembly means is in its first position so as to prevent relative horizontal movement between the first and second bulkheads and the end portions of the structural members of the upper assembly means so that the structural members of the upper assembly means acts as at least a portion of the means for connecting the upper ends of the first and second bulkheads together for transmitting and distributing forces acting on the first and second bulkheads between first and second bulkheads when the upper assembly means is in its first position.

37. The improved railroad car described in claim 36 wherein at least a portion of the one and the other ends of the structural members of the upper assembly means overlies the upper ends of the bulkheads adjacent thereto; wherein each end portion of each of the structural members includes a bearing surface; wherein the upper ends of the first and second bulkheads include bearing surfaces which are complementary to and are adapted for surface-to-surface contact between the bearing surfaces on the adjacent structural members of the upper assembly.

38. The improved railroad car described in claim 37 wherein the means for moving the upper assembly means includes a power actuated linkage assembly which is connected with the upper assembly means; wherein the upper assembly means functions as a roof for the railroad car and overlies the floor means between the first and second bulkheads when the upper assembly means is in its first position; and wherein the upper assembly means is moved substantially vertically between its first and second positions.

39. The improved railroad car described in claim 38 wherein pins project upwardly from and extend upwardly above the horizontal plane of the upper ends of the uppermost containers of the sets of stacked containers; and wherein the mounting means includes a plurality of mounting assemblies which are carried by the upper assembly means, the mounting assemblies having recesses formed therein which are positioned and constructed so as to receive the pins therein.

40. The improved railroad car described in claim 39 wherein the material which defines the recesses in the mounting assemblies is a relatively resilient material.

41. The improved railroad car described in claim 40 wherein the material is an elastomer material having upper and lower horizontally disposed layers, with the layers having different hardnesses; wherein the upper layer of the elastomer is less resilient than the lower layer thereof; wherein the use of the elastomer provides compensation for differing heights of the sets of stacked containers; and wherein the elastomer tends to absorb or dampen the forces imposed thereon by the pins as a result of the railroad car being bumped.

42. The improved railroad car described in claim 38 wherein a plurality of linkage assemblies are utilized to raise and lower the upper assembly means vertically while maintaining the plane of the upper assembly means substantially parallel to the plane of the upper surface of the floor means; and wherein each of the linkage assemblies comprise:

first and second substantially identical links which are pivotally connected at their upper ends to opposite sides of the underside of the upper assembly means;

third and fourth substantially identical links which are pivotally connected at their one ends with the lower ends of the first and second links, the other ends of the third and fourth links being pivotally connected to fixed pivot points which are spaced from each other and which are spaced between the upper surface of the floor means and the upper assembly means;

fifth and sixth substantially identical links which are pivotally connected at their one ends to the one ends of the third and fourth links and which are pivotally connected at their other end to the reciprocally movable motor output shaft; wherein the axes of the fixed pivot points are parallel, horizontally disposed and spaced from the upper surface of the floor means a distance slightly greater than the length of the second and third links, wherein the power output shaft is vertically movable, is positioned between the fixed pivot points and is arranged so that its axis is perpendicular to the plane of the fixed pivot points and intersects the longitudinal centerline of the railroad car; and wherein at least one of the linkage assemblies is disposed between adjacent sets of stacked containers.

43. The improved railroad car described in claim 42 wherein the lengths of the first and second links are adjustable; wherein pins project upwardly from and extend upwardly above the horizontal plane of the upper ends of the uppermost containers of the sets of stacked containers; and wherein the mounting means includes a plurality of mounting assemblies which are carried by the upper assembly means, the mounting assemblies having recesses formed therein which are positioned and constructed so as to receive the pins therein; wherein the material which defines the recesses in the mounting assemblies is a relatively resilient material so that the material can take movements imposed upon the mounting assemblies by the pins as a result of the railroad car being bumped; wherein the resilient material is an elastomer having upper and lower horizontally disposed layers, with the layers having different hardnesses; wherein the upper layer of the elastomer is less resilient than the lower layer thereof; wherein the use of the elastomer provides compensation for differing heights of the sets of stacked containers; and wherein the elastomer tends to absorb or dampen the forces imposed thereon by the pins.

44. The improved railroad car described in claim 43 wherein the movable structural members of the upper assembly means act as tension members when the railroad car is bumped; and wherein the structural member of the connecting means acts as a compression member when the railroad car is bumped.

45. The improved railroad car described in claim 43 wherein the movable structural members of the upper assembly means act as compression members when the railroad car is bumped; and wherein the structural member of the connecting means acts as a tension member when the railroad car is bumped.

46. The improved railroad car described in claim 43 wherein a motor means actuates the linkage assembly which is connected with the upper assembly means; and wherein the motor means is positioned adjacent to the upper surface of the floor means and between the upper surface of the floor means and the upper assembly means.

* * * * *