July 14, 1970 J. E. GUTRIDGE 3,520,256

RAILROAD CAR WITH MOVABLE LOAD-REINFORCING MEANS

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FIG. 6

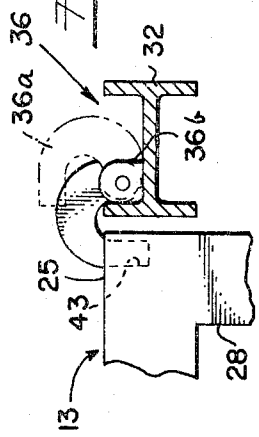


FIG. 1

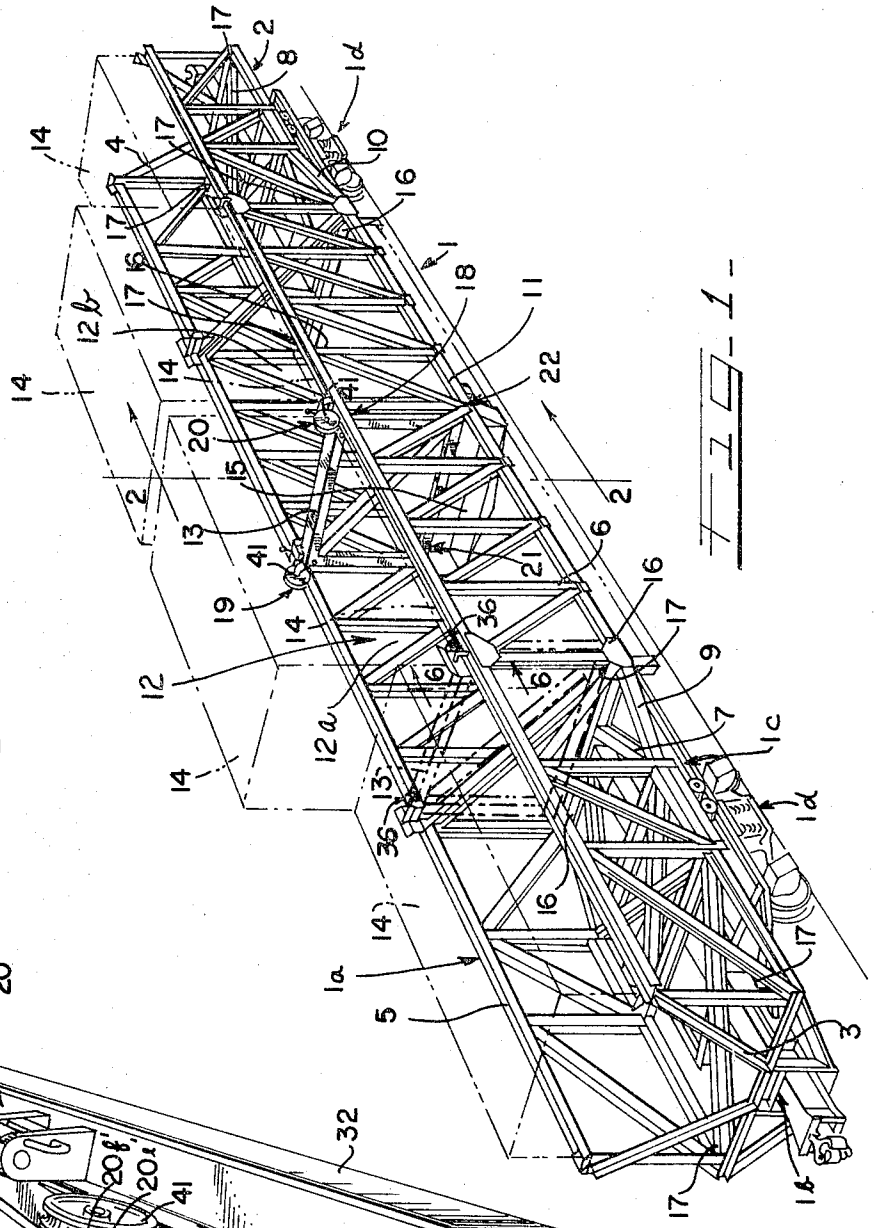
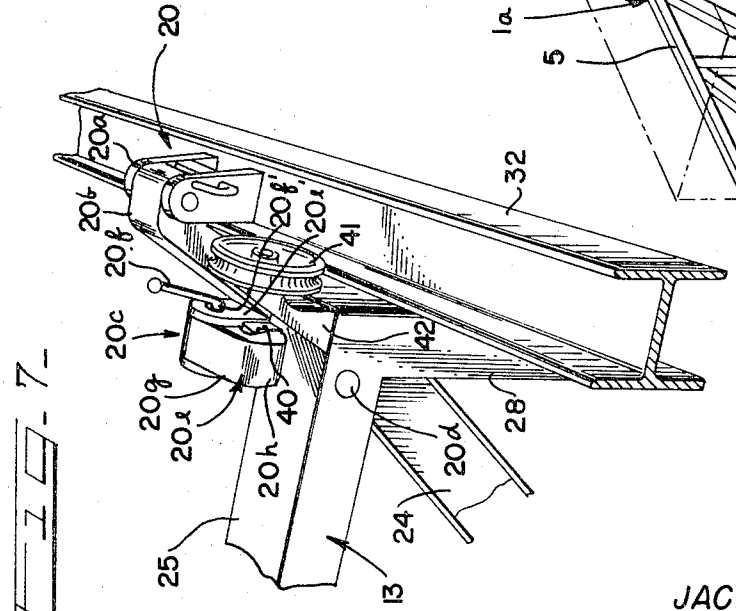


FIG. 7



INVENTOR
JACK E. GUTRIDGE
BY Richard J. Myers
ATT'Y.

July 14, 1970 J. E. GUTRIDGE 3,520,256

RAILROAD CAR WITH MOVABLE LOAD-REINFORCING MEANS

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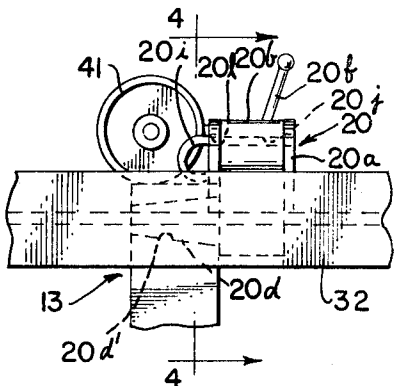


FIG. 3

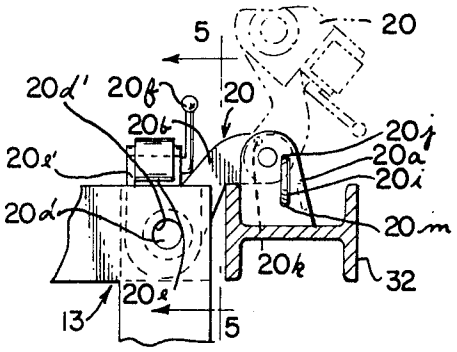


FIG. 4

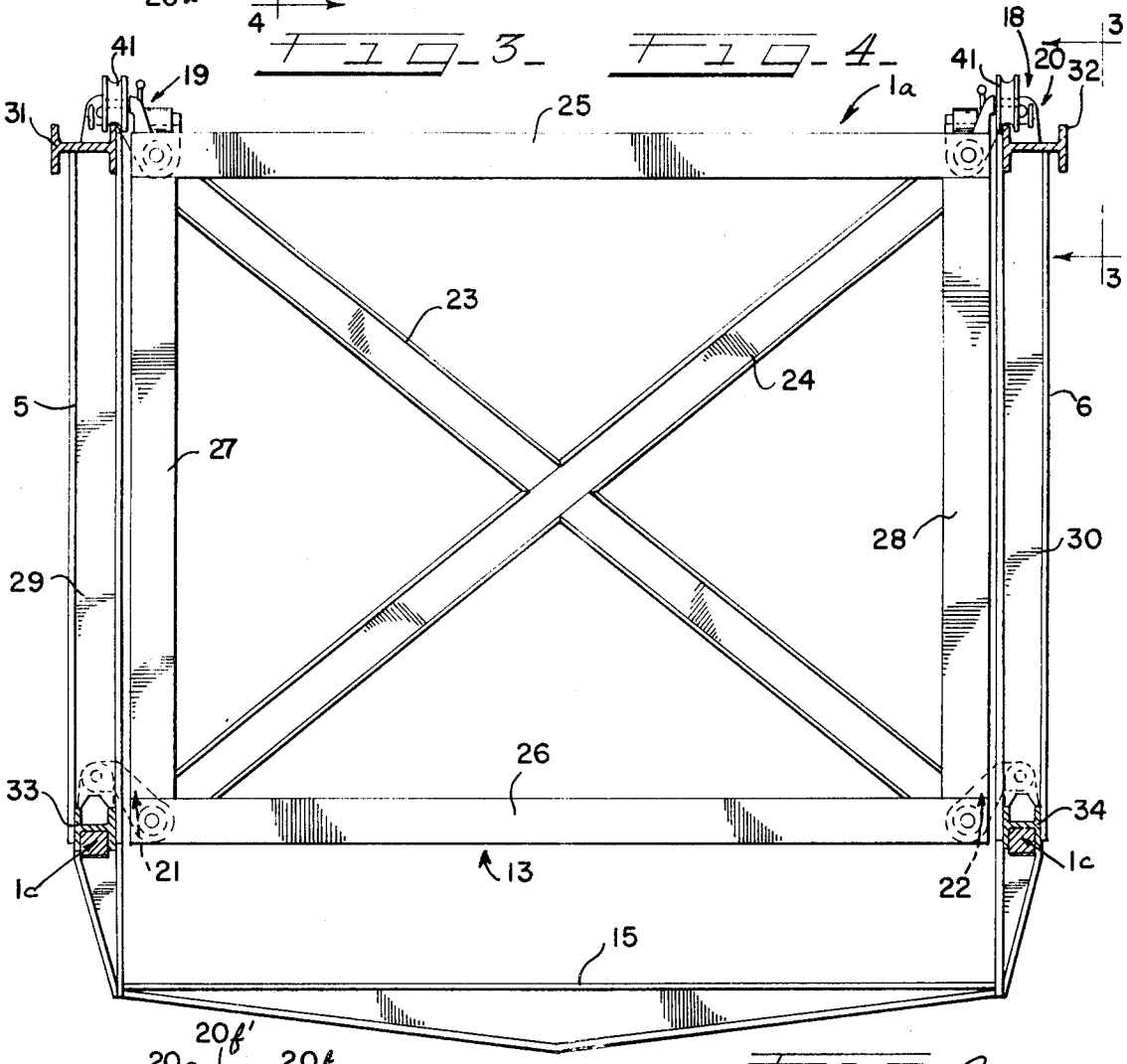


FIG. 2

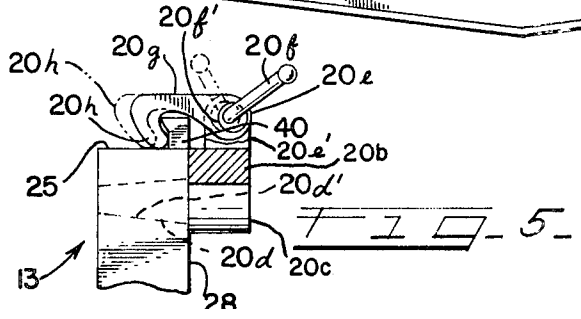


FIG. 5

INVENTOR
JACK E. GUTRIDGE
BY Richard J. Myers
ATT'Y

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RAILROAD CAR WITH MOVABLE LOAD-REINFORCING MEANS

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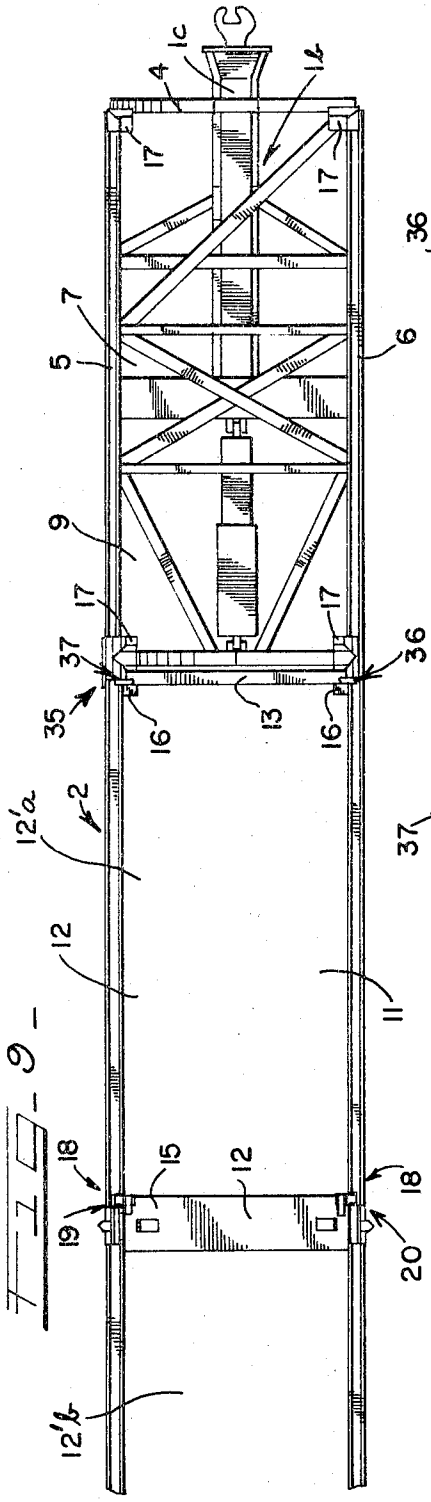


FIG. 9

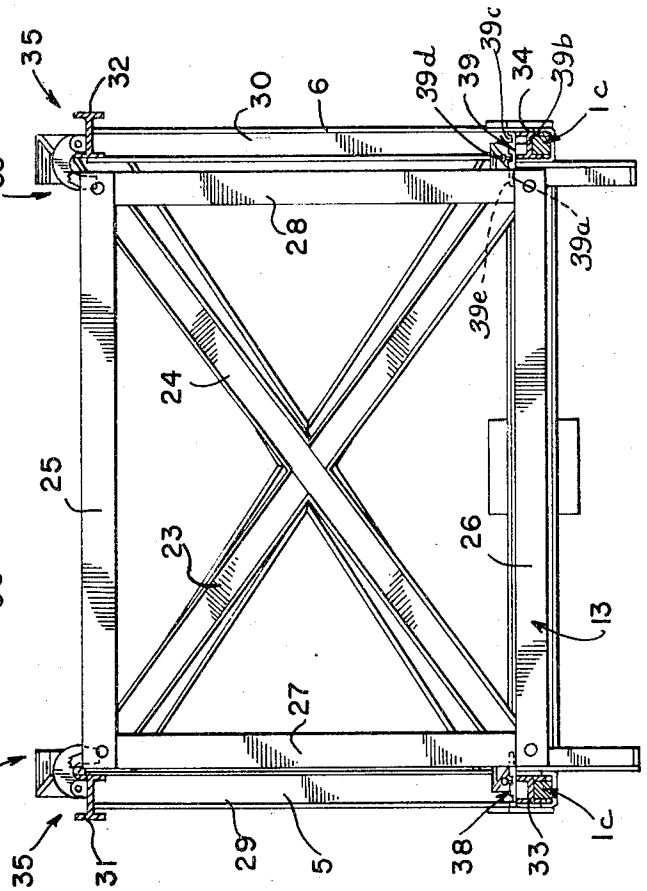


FIG. 8

INVENTOR
JACK E. GUTRIDGE
BY Richard J. Myers
ATT'Y.

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3,520,256

RAILROAD CAR WITH MOVABLE LOAD-REINFORCING MEANS

Jack E. Gutridge, Dyer, Ind., assignor to Pullman Incorporated, Chicago, Ill., a corporation of Delaware

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Int. Cl. B61d 3/06; B65j 1/22
U.S. Cl. 105—366 10 Claims

ABSTRACT OF THE DISCLOSURE

A railroad car having an open top and comprising a central container receiving well defined by end and side walls, container support means located in the bottom of the well including a pair of end corner container supports and a central support, a movable re-inforcing bulkhead being selectively positionable at said central support and at one of the end supports, means for carrying the bulkhead on the side walls between the center and end of the well and lock means on the side walls to lock the bulkhead at the center and at the end of the well stiffening the side walls torsionally and laterally when the well receives a pair of longitudinally extending tandem aligned container means supported at the ends and center of the well.

BACKGROUND OF INVENTION

Field of invention

This invention relates to improved railroad construction and in particular is directed to railroad cars that carry lading bearing containers where the car is of the open top type and the containers have been loaded into the car from an overhead position.

Description of the prior art

The are of construction of high capacity containers cars is known, as for instance, from U.S. Pat. No. 3,319,583, wherein lading bearing containers are stored within an open top car that is provided with a central depressed lading area or well that receives multiple containers that exert vertical loading forces at the ends of the well, as well as in the central portions of the well, and it is necessary to strengthen the central portions of the car under certain loading conditions and yet under other loading conditions to adapt the car well for handling containers where there is no load force exerted on the central portion of the car well. It is in this problem area that the invention presents the solution.

SUMMARY

This invention is related to an improved railroad car construction that is selectively adaptable to the storage of one continuous container within the well of the high capacity container car of the open top type car and in the alternate to be adapted to receiving a pair of longitudinally aligned tandem containers of more or less equal length which exert downward bearing forces at the central portion of the well, as well as at the ends of the well. In particular, the inventive construction provides for a movable reinforcing member or bulkhead that may be positioned medially of the end wall of the container well car or at one of the ends of the well of the container car, the movable bulkhead or gate being provided with means for carrying the bulkhead along or over the sides of the car well between a central locked position and an end locked or stored position. The bulkhead in the central position reinforces the sidewalls so that the sidewalls do not buckle or laterally sway or are not subjected to

torsional force due to the lading forces of the tandem containers exerting a force against the bottom central portions of the side walls. The movable reinforcing member is held in the central well position by pivotal locking elements mounted on the side walls at the centers thereof. The movable bulkhead is further provided with locking means located at the end of the well on the side walls. The movable gate or bulkhead is secured at the center of the car with the lock elements to transmit torsional car body loads due to the tandem containers from the side walls and through the gate structure, the gate stiffening the car side stress members torsionally and laterally. Further roller means on the bulkhead or gate engage the tops of the sidewalls to permit movement of the gate between the center and an end of the car. These and other objects of the invention will become apparent from reference to the following description, appended claims, and attached drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the railroad car provided with the novel movable load-reinforcing means;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a partial sectional view taken along line 3—3 of FIG. 2 illustrating the movable bulkhead in the center of car well locked position;

FIG. 4 is a partial view taken along line 4—4 of FIG. 3;

FIG. 5 is a partial sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is an enlarged partial sectional view of the locking of the end of car well locking means;

FIG. 7 is a partial perspective view illustrating the center of well locking means for the movable bulkhead;

FIG. 8 is a view of the movable bulkhead and the end of car lock means locking the movable bulkhead at the end of the car well as shown in dotted line position in FIG. 1; and

FIG. 9 is a partial plane view of the car showing the movable bulkhead in the end of car position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings there is shown a railroad car **1** of the high capacity container type or open gondola construction wherein the upright wall structures of the car body are skeletal in nature and wherein the car is provided with a central depressed well for receiving containers therein as well as elevated end sections for receiving containers (see FIG. 1). Such a construction is shown in U.S. Pat. No. 3,319,583 and comprises a car body **1***a* carried by a car underframe **1***b* provided with a pair of ribbon sills **1***c* and trucks **1***d* (see FIGS. 1, 2, 8 and 9). The car body **1***a* is of a skeletal framework construction **2** provided with end frames or walls **3**, **4** and sideframes or walls **5**, **6**, end open elevated floor sections **7**, **8**, slope sections **9**, **10** and a central section **11**. The central section **11** comprises a container well **12** as defined by the central portion of the side walls **5**, **6** and intermediate or end well walls or end frames **12***a* and **12***b* (FIG. 1). A novel movable bulkhead for structure reinforcing means **13** is located centrally within the well and defines two separate central well compartments **12'***a* and **12'***b* (FIG. 9), each well section **12'***a* and **12'***b* being provided with a pair of vertically stacked, longitudinally extending containers **14** (FIG. 1) which, for purposes of illustration here, are 20 feet in length. Should the movable bulkhead **13** be moved to one end of the well **12** leaving an elongated unobstructed central well compartment, then a pair of doubly stacked 40 foot containers could

be placed in the well. The container storage space or well **12** is provided with a centrally located container support connected to the central bottom portions of the side wall **5** and **6** and is designated as **15**. The four end corners of the wells have at their bottoms corner end supports **16** (FIGS. 1 and 9) for support of container means. Further container support means are provided for storage of containers **14** in the ends or elevated sections **7**, **8** and are designated as **17**. Center of well bulkhead or reinforcing structure lock means **18** is provided at the center of car or well **12** and includes, as best viewed in FIGS. 1 and 2, top left lock means **19**, top right lock means **20**, bottom left lock means **21**, and bottom right lock means **21**, all of which are mounted on the upper and lower portions of the side walls **5** and **6** as indicated. Each of the lock means **19**, **20**, **21** and **22** is identical in construction to the other and cooperatively locks into the upper and lower laterals of the movable bulkhead **13** and, therefore, a description of the top right lock means **20** will suffice for the other lock means, appreciating that the collective purpose of these lock means is to tie the reinforcing means or bulkhead **13** into the side wall structures **5** and **6** of the car in order to prevent lateral deflection or torsional loading on the side walls when the half-size or **20** foot containers are placed in each of the well compartments **12'***a* and **12'***b* such that the containers exert a downward force on the central support **15** and thereby tend to deflect the side walls. The deflection is prevented by physically rigidly tying the cross member or bulkhead **13** into the side walls of the car. The top right lock means **20**, as seen in FIGS. 2–5, 7 and 9, comprises a bi-legged upright support structure **20***a* pivotally carrying a support arm **20***b* that extends downwardly and carries gate lock **20***c* that has an outwardly tapering latch cone **20***d* extendable into conical opening **20***d'* in the top beam **25** of the bulkhead **13**. The cone **20***d* extends out perpendicularly from the pivotal arm **20***b* that carries it. At the end of the arm **20***b* and above the large cone **20***d* and mounted on the arm **20***b* is a pivotal over-center catch **20***e* that is pivotally mounted on the arm **20***b*. The catch **20***e* is provided with a catch support **20***e'*, in the form of a pair of trunnions, that pivotally carries it and is mounted on the arm **20***b*. An eccentric lever **20***f* is fixedly mounted eccentrically on journals **20***f'* which are rotatively carried in the trunnions of support **20***e'*. The eccentric lever **20***f* is fixedly attached to latch arm **20***g*. Movement of lever **20***f* moves latch **20***g* in an eccentric path relative to rotatable journals **20***f'*. The latch arm **20***g* has a hook end **20***h* that engages over the abutment or stop **40** on top of the beam **25** of the gate or bulkhead **13** (see FIG. 5). As shown in FIGS. 3 and 4, U-shaped lock **20***i* has one of its legs always inserted into guide hole **20***m* and the other leg inserted into fixed hole **20***l* and then into either position hole **20***j* or **20***k* for locking of the lock means **20** in the down or solid line position or in the elevated or dotted line position, as shown in FIG. 4. The components and arrangement described in this paragraph are similarly found on the other locks **19**, **21** and **22**.

The movable bulkhead or reinforcing means **13** comprises diagonal intersecting strut members or cross beams **23**, **24** and top and bottom transverse chord beams **25**, **26** and left and right upright beams **27** and **28** (as best seen in FIG. 8). When the movable bulkhead is locked to the central portion of the well **12**, it lies adjacent the center left and right side posts **29** and **30** of the car body which is further provided with left and right topside chords **31** and **32** and left and right bottom chords **33** and **34** to define the side walls **5** and **6** (see FIG. 8).

End well lock means **35** are located at one end of the well **12** and comprise a plurality of four locks, top end well locks **36** and **37** and bottom end well locks **38** and **39** mounted on the side walls **5** and **6** at the end of the well **12** as seen in FIGS. 1, 6, 8 and 9 and description of the end lock **36** will suffice for the lock **37** since each is similar to one another. The lock **36** comprises a pivotally mounted U-shaped locking arm **36***a* that moves from the dotted line or stored position to the solid line or locked position in slot **43** in the bulkhead **13** (see FIG. 6). The arm **36***a* is held to the top chord **32** by the pivotal mounting or anchor **36***b*.

The end well locks **38** and **39** are located at the bottom of the end of the well as distinguished from the end locks **37** and **36** which are located at the top of the side wall. Each lock **38** and **39** is similar to the other and therefore, description of lock **39** will suffice for lock **38**. The lock **39** comprises a bolt and latch type lock with the bolt **39***a* on the car side wall slidable in car side wall mounted latch **39***b* having latch grooves **39***c* for holding the bolt locking pin **39***d* in position in a bottom opening **39***e* in bulkhead or gate **13**.

The gate or bulkhead may be moved between the central lock means **18** or the end well lock means **35** by gate rollers **41**, **41** on each top side of the lateral ends of the bulkhead **13**. The rollers **41**, **41** are held by their respective roller supports **42**, **42** (FIG. 7) mounted on the lateral top ends of the bulkhead **13**. The rollers ride over the inner flanges of the side top chords **31** and **32** respectively between the center and the end of the well **12** for placing the bulkhead or reinforcing member **13** either in the central position, as shown in solid line in FIG. 1, or in the end stored position in dotted line in FIG. 1. When the bulkhead is centrally located and locked to the side walls it permits half-size containers to be stored on either side of the bulkhead in the compartments **13***a* and **13***b* with the tandem aligned container being supported on supports **15** and **16**. If it should be decided to carry containers of twice the length than, say, the 20-foot containers, such as 40-foot containers, then the reinforcing means for the bulkhead **13** is moved to the end of the well and locked there by lock means **35** and then the 40-foot container which spans the length of the well is placed within the well held by the corner supports **16** only.

The foregoing description and drawings are given merely to explain and illustrate the invention, and the invention is not to be limited thereto, since those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. A railroad car of the open top type comprising:

a central container receiving well being defined by the end and side walls,

container support means being located in the bottom of the well including a pair of container end supports and a container central support connecting with the side walls,

a movable container load reinforcing bulkhead being selectively positionable substantially at the central support and substantially at one of the end supports,

central lock means mounted on the upper and lower portions of the side walls substantially adjacent the central support whereby the upper and lower portions of said bulkhead may be locked to the upper and lower portions of the side walls stiffening the side walls torsionally and laterally for the well to receive a pair of longitudinally extending tandem aligned pair of generally half well length containers supported at the center and ends of the well, said central lock means having upper and lower releasably locking means extending longitudinally of the car for engagement with the bulkhead and clamping transversely of the car with said bulkhead in the in-use locking position for the stiffening of the side walls torsionally and laterally, and

end lock means mounted on the side walls substantially at the end thereof for receiving and locking said reinforcing bulkhead at the end of the well in the

stored position for accommodating substantially full well length containers supported by the end supports.

2. The invention according to claim 1, and

said lock means substantially at the central support being pivotally mounted and swingable vertically about the longitudinal axis of the car from the out-of-use position to the in-use locking position.

3. The invention according to claim 1, and

said locking means comprising a plurality of pivotal lock arrangements for stiffening being pivotally mounted on the upper and lower parts of said side wall and centrally thereof,

said bulkhead having a plurality of lock receiving means for complemental cooperation with the lock arrangements, and

each lock arrangement being pivotal in transverse planes and carrying at its end a bulkhead coupling structure extending in the longitudinal direction of car movement and adapted for engagement with the lock receiving means on said movable bulkhead.

4. The invention according to claim 3, and

said bulkhead coupling structure being a cone-shaped member and said lock receiving means having aperture means for receiving said cone-shaped member.

5. The invention according to claim 1, and

said means for moving the bulkhead from the central to the end position comprising roller means carried on the upper portion of the lateral ends of said bulkhead and engageable with the top of the side walls for movement of the bulkhead from the central to the end position.

6. The invention according to claim 1, and

said bulkhead having top aperture means,

said end lock means comprising pivotal hook elements mounted on upper portion of said side wall adjacent said well end and swingable from unlocking to locking positions into said bulkhead aperture means on top of said bulkhead.

7. The invention according to claim 1, and

said bulkhead having bottom portion openings,

said end lock means comprising end latch means mounted at the bottom portion of the side walls and receivable in openings in the bottom portion of said bulkhead and having means for locking said end latch within said bulkhead openings.

8. A railroad car of the open top type comprising:

a central container receiving well being defined by the end and side walls,

container support means being located in the bottom of the well including a pair of container end supports and a central support,

a movable container load reinforcing bulkhead being selectively positionable substantially at the central support and substantially at one of the end supports,

central lock means mounted on the side walls substantially adjacent the central support whereby said bulkhead may be locked to the side walls stiffening the side walls torsionally and laterally for the well to receive a pair of longitudinally extending tandem aligned pair of containers supported at the center and ends of the well, and

end lock means mounted on the side walls substantially at the end thereof for receiving and locking said reinforcing bulkhead at the end of the well in the stored position for accommodating substantially full well length containers supported by the end supports,

said central lock means comprising a pivotal lock means comprising a pivotal lock arrangement pivotally mounted on the upper and lower parts of said side wall and centrally thereof,

said bulkhead having a lock receiving means,

said locking structure being pivotal in transverse planes and carrying at its end a bulkhead coupling structure extending in the longitudinal direction of car movement and adapted for engagement with the lock receiving means on said movable bulkhead,

latch means being carried on said central lock means adjacent said bulkhead coupling structure for moving the bulkhead coupling structure carried thereby into tight locking position with said bulkhead.

9. The invention according to claim 8, and

said latch means being movably mounted to be moved into tight locked engagement with the bulkhead.

10. The invention according to claim 8, and

said latch means being eccentrically mounted on the central lock means and being longitudinally movable for tight engagement with the bulkhead.

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DRAYTON E. HOFFMAN, Primary Examiner

U.S. Cl. X.R.

105—376