June 17, 1969 J. T. KASPRZYCKI ET AL 3,450,066

RAILWAY TANK CAR

Filed May 20, 1966 Sheet 1 of 3

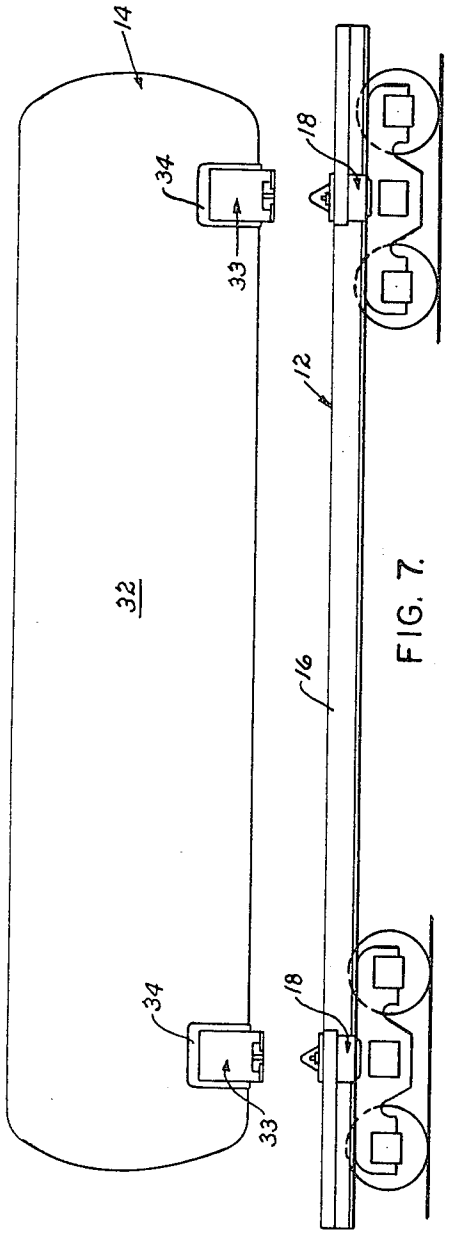


FIG. 7.

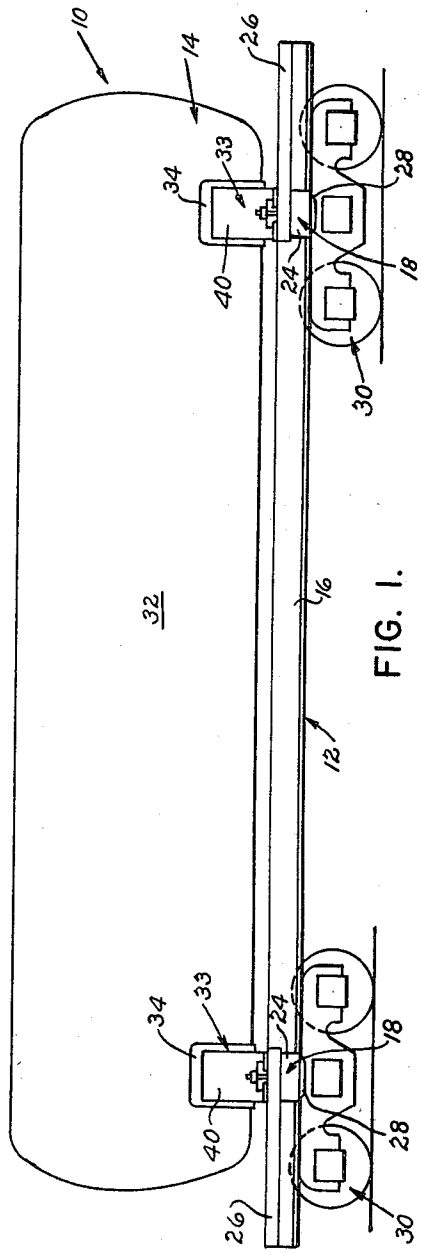


FIG. 1.

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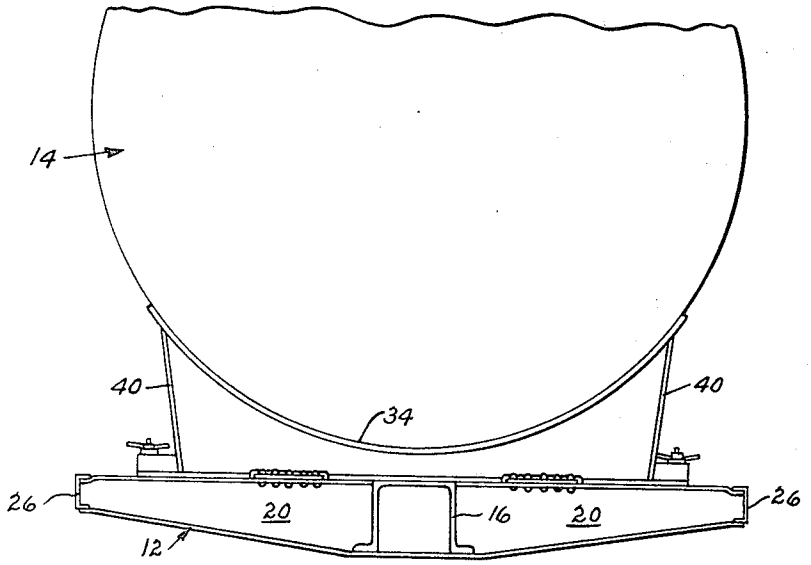
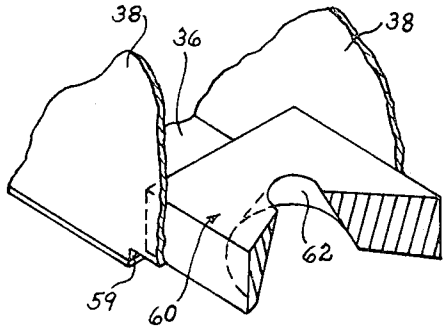


FIG. 2.



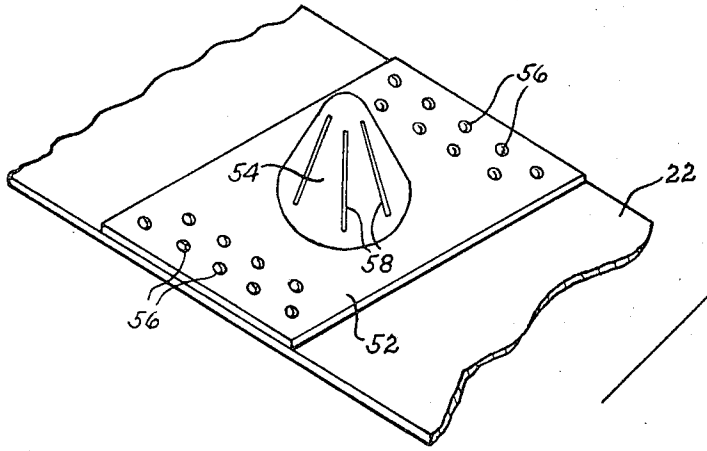


FIG. 6.

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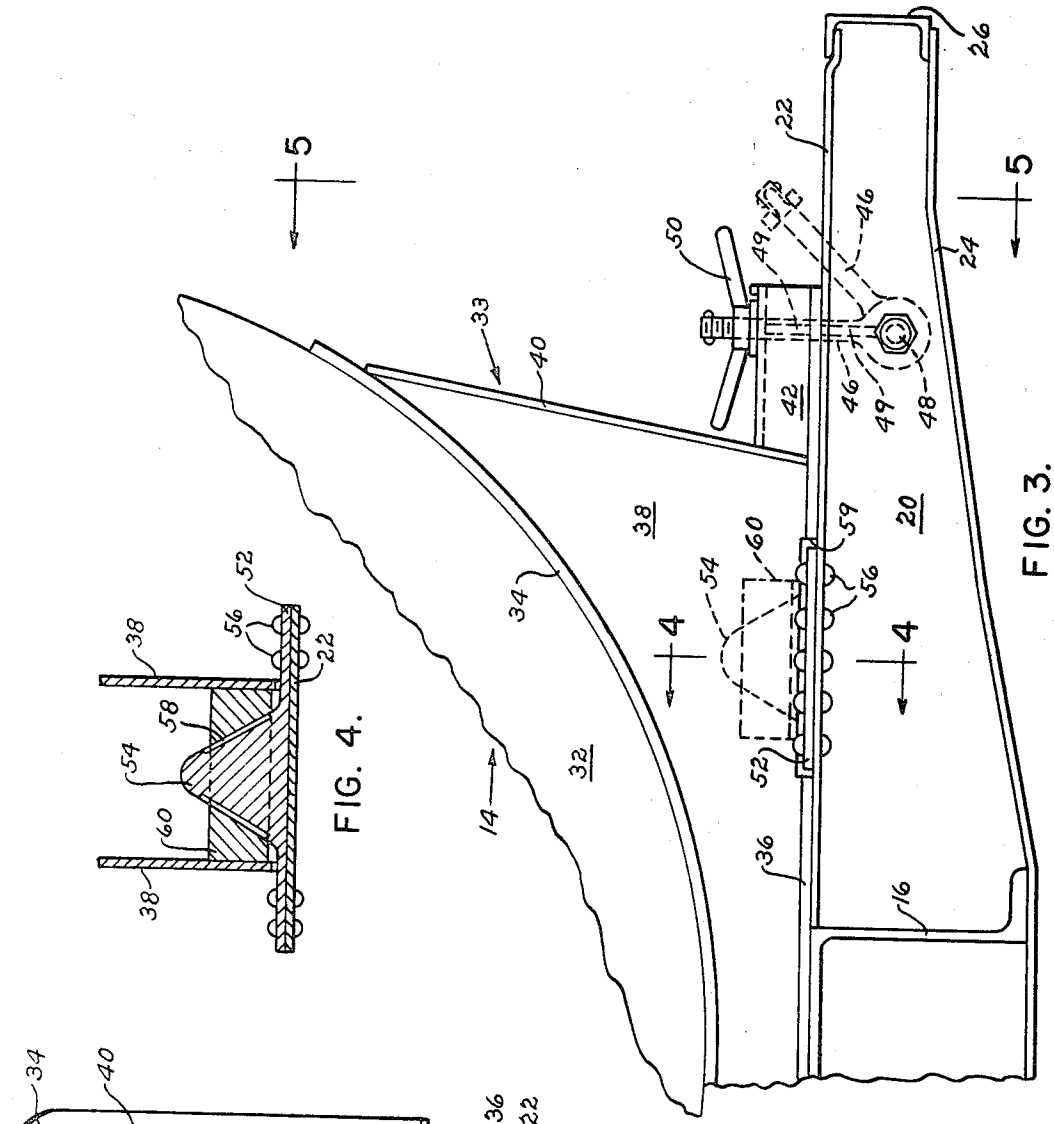


FIG. 3.

FIG. 4.

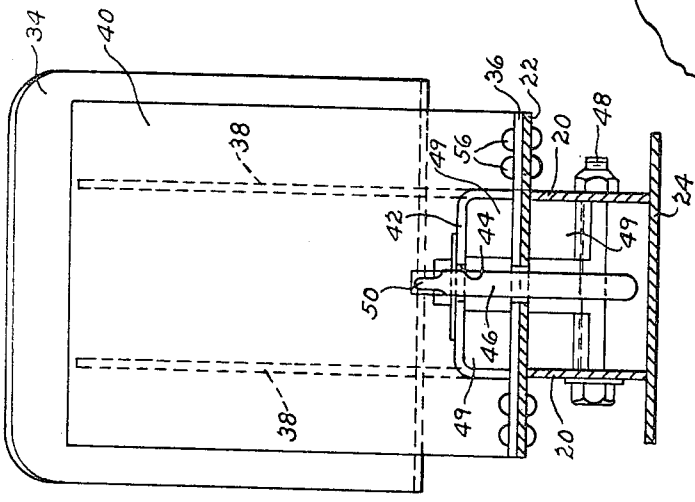


FIG. 5.

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3,450,066

RAILWAY TANK CAR

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U.S. Cl. 105—362 1 Claim

ABSTRACT OF THE DISCLOSURE

A railway tank car having a tank structure releasably secured to the underframe and being removable from the underframe, if desired. The supports for the tank structure comprise generally conically-shaped projections on the underframe bolster which transfer forces between the tank structure and underframe while permitting the tank structure to be easily removed from the underframe with a minimum of binding.

BACKGROUND AND DESCRIPTION OF THE INVENTION

Heretofore, tanks or tank structures have been fixed to the center sill of the underframe by riveting. In order to remove the shell or tank structure from the underframe structure it has been necessary to remove the rivets.

The present invention is particularly directed to a railway tank car in which the tank or shell structure is removably secured to the underframe structure and may be readily and easily disconnected from the underframe structure in a minimum of time. For example, it is highly desirable to have a disconnectable shell structure when railway tank cars are ferried or shipped over water or the like. With the present invention, it is only necessary to remove the shell structure from the underframe structure and to ferry the shell structure alone. It is sometimes desirable to remove the shell structure from the underframe structure when the railway tank cars are used for prolonged periods of time in facilities with limited track space. In such instances, the underframe structure may be removed to a different location while the shell structure may be positioned adjacent the track.

It is an object of the present invention to provide a railway tank car in which the shell or tank structure is removably secured to the underframe structure.

It is a further object of this invention to provide such a railway tank car in which force transfer means are provided to transmit generally horizontal forces between the tank structure and underframe structure.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

FIGURE 1 is a side elevation of a railway tank car comprising the present invention and illustrating a tank structure removably connected to an underframe structure;

FIGURE 2 is a partial end elevation of the railway tank car of FIGURE 1 removed from the truck assemblies;

FIGURE 3 is an enlarged fragment of FIGURE 2 showing the hold-down means for releasably securing the tank structure to the underframe structure;

FIGURE 4 is a section taken generally along line 4—4 of FIGURE 3 and showing means to transmit forces between the tank structure and the underframe structure;

FIGURE 5 is a section taken generally along line 5—5 of FIGURE 3 and showing the hold-down means for releasably secured the shell structure to the underframe structure;

FIGURE 6 is an enlarged perspective, partly in section, showing the interfitting portions of the force transmitting means between the shell structure and the underframe structure after the shell structure has been separated from the underframe structure; and

FIGURE 7 is a side elevation illustrating the tank structure removed from the underframe structure.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings and more particularly to FIGURE 1, a railway tank car is generally indicated **10** and includes an underframe structure **12** and a removable shell or tank structure generally indicated **14**. Underframe structure **12** comprises a hat-shaped center sill **16** extending the length of railway car **10** and an underframe bolster structure **18** adjacent each end of center sill **16**. Forming each underframe bolster structure **18** is a pair of spaced vertical webs **20** secured between a bolster top cover plate **22** and a bolster lower cover plate **24**. A stub side sill **26** extends between webs **20** along each side of each bolster **18**. A center plate **28** on each lower bolster cover plate **24** is supported on a subjacent truck assembly generally indicated **30**.

Removable tank structure **14** includes a generally cylindrical tank shell **32** having a tank bolster structure **33** adjacent each end thereof in vertical alignment with subjacent underframe bolster structures **18**. Each tank bolster structure **33** comprises a saddle plate **34** secured by welding to tank shell **32**, a lower horizontal cover plate **36** adapted to fit in face-to-face relation with the underframe bolster top cover plate **22**, and a pair of tank bolster web plates **38** secured between saddle plate **34** and lower tank bolster cover plate **36**. A tank side plate **40** of tank bolster structure **33** is secured on each side of each saddle plate **34** between lower cover plate **36** and the adjacent saddle plate **34**.

To releasibly secure tank structure **14** to underframe structure **12** and referring particularly to FIGURES 3 and 5, a channel-shaped extension **42** is secured to tank bolster lower cover plate **36** outwardly of each side plate **40**. An outwardly opening slot **44** in the upper web of each channel-shaped extension **42** is adapted to receive an eye or swing bolt indicated at **46**. Mounting eye bolt **46** for swinging or pivotal movement between underframe bolster webs **20** is a threaded pin **48**. Vertical stiffeners **49** extend alongside eye bolt **46** and are secured to extension **42**, webs **20** and adjacent cover plates **22**, **36**. The upper end of swing bolt **46** is threaded and a turn wheel **50** is threaded thereon to draw extension **42** tight against bolster top cover plate **22** when handwheel **50** is tightened.

To position tank structure **14** accurately with respect to underframe structure **12** and to permit tank structure **14** to be easily lifted from underframe structure **12** when swing bolts **46** are disengaged, a support pad **52** having a conical projection **54** is riveted by rivets **56** to bolster top cover plate **22** as shown in FIGURE 6. A plurality of slits **58** along the surface of each projection **54** extend in a straight-line direction to intersect the vertex formed by the conical projection. Welded between tank webs **38** at a cutout portion **59** in lower cover plate **36** is a mounting block generally designated **60** and having a conical shaped opening **62** therein adapted to fit over projection **54** as shown particularly in FIGURE 4. Slits **58** permit tank structure **14** to be lifted from support pads **52** with a minimum of binding. Shear forces are transmitted from tank structure **14** to support pads **52**, and thence to underframe structure **12**. In the event of unusually high shear forces such as might result from a collision, rivets **56** are designed to shear at such a predetermined high stress to permit separation of underframe structure **12** from shell structure **14**.

To remove shell structure **14** from underframe structure **12**, the four handwheels **50** are untightened manually and swing bolts **46** removed from slots **44**. Then, shell structure **14** may be lifted from underframe structure **12**.

From the foregoing, a railway tank car **10** has been provided in which a detachable or removable shell structure **14** may be removed from underframe structure **12** in a minimum of time and with a minimum of binding.

In view of the foregoing, it will be seen that the several objects of the invention are achieved and other advantageous results obtained.

As various changes could be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a railway car, an underframe structure comprising a center sill extending generally the length of the tank car and an underframe bolster structure adjacent each end of the center sill, each underframe bolster structure having a top cover plate, a tank structure having a saddle plate and associated tank bolster structure adjacent each end thereof, said tank bolster structures being vertically aligned with the underframe bolster structures and being supported on the top cover plates of the underframe bolster structures, a tank mounting pad riveted to the top cover plate of each underframe bolster structure on each side

of the tank car, a conically-shaped projection extending upwardly from each tank mounting pad, said tank bolster structures having generally conically-shaped pockets fitting on and receiving said conically-shaped projections to transmit generally horizontal forces between the tank structure and said underframe structure through said projections, said conically-shaped projections having slits therein to minimize binding between the tank structure and the underframe structure upon removal of the tank structure, and releasable hold-down means between the underframe structure and the tank structure to releasably secure the tank structure to the underframe structure.

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U.S. Cl. X.R.

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