United States Patent

[11] 3,557,708

[72] Inventor **Ronald P. Bolte**
Saint Louis City, Mo.

[21] Appl. No. **759,380**
[22] Filed **Sept. 12, 1968**
[45] Patented **Jan. 26, 1971**

[73] Assignee **ACF Industries, Incorporated**
New York, N.Y.
a corporation of New Jersey

[54] **ARTICULATED RAILWAY TANK CARS**
3 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **105/4,**
105/199, 105/358, 105/360, 105/362
[51] **Int. Cl.** **B61d 5/06,**
B61d 5/16, B61f 3/12
[50] **Field of Search** 105/3, 4,
159, 358, 360, 362, 34, 199

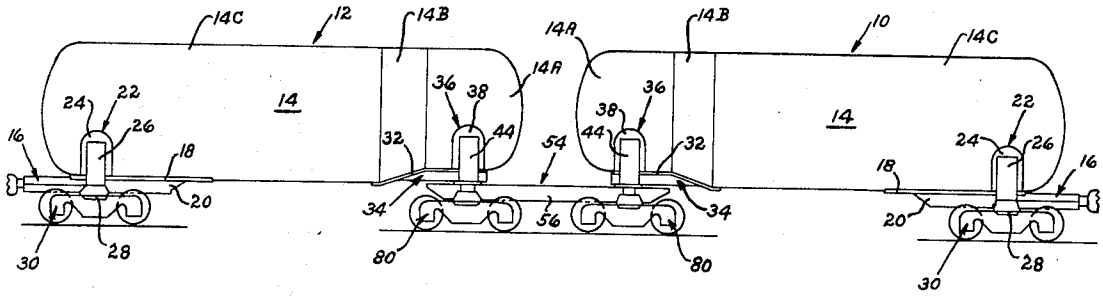
[56] **References Cited**

UNITED STATES PATENTS

3,476,040	11/1969	Karakashian et al.	105/4
1,972,934	9/1934	Hedgcock	105/183
2,170,581	8/1939	West et al.	105/159
2,920,580	1/1960	Williams	105/4X
3,277,843	10/1966	Horner et al.	105/360
3,474,740	10/1968	Varnes	105/360

Primary Examiner—Arthur L. LaPoint
Assistant Examiner—Howard Beltran
Attorney—Eugene N. Riddle

ABSTRACT: An articulated structure for adjacent ends of two railway car bodies including a pair of four-wheeled trucks connected by a span sill structure supported for relative pivotal movement on center plates of the pair of trucks. The sill structure has a pair of center plates thereon and support the two railway car bodies for relative pivotal movement thereon. The railway car bodies are particularly adapted as railway tank car bodies having their adjacent ends of a reduced diameter with stub center sill structures secured to the reduced diameter end portions and permit the connection of two tank car bodies each having a capacity of twenty-five thousand (25,000) gallons or more thereby providing a total capacity in the two articulated cars of over fifty thousand (50,000) gallons.



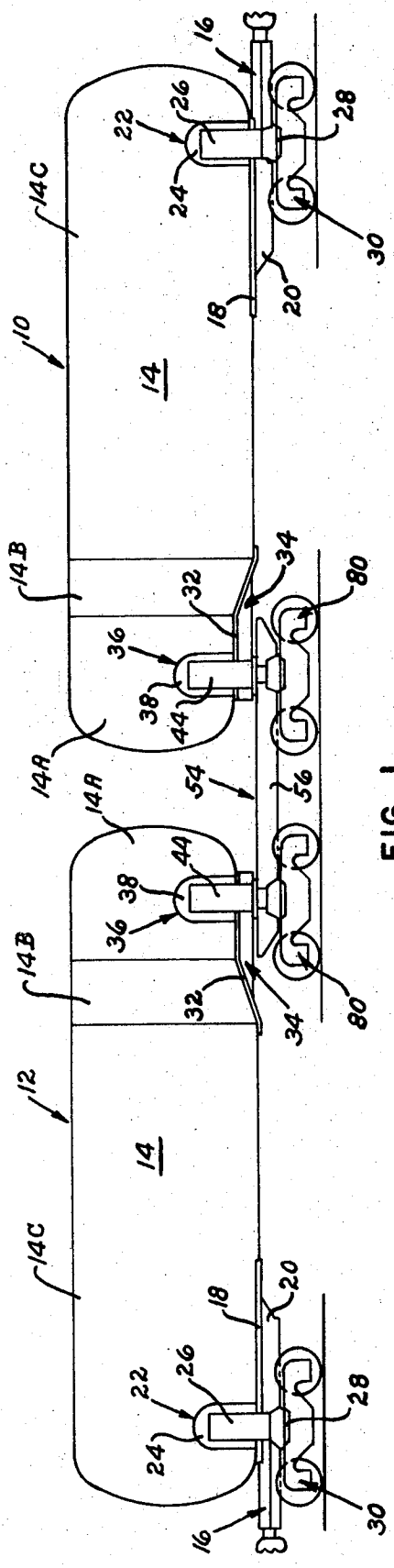


FIG. 1.

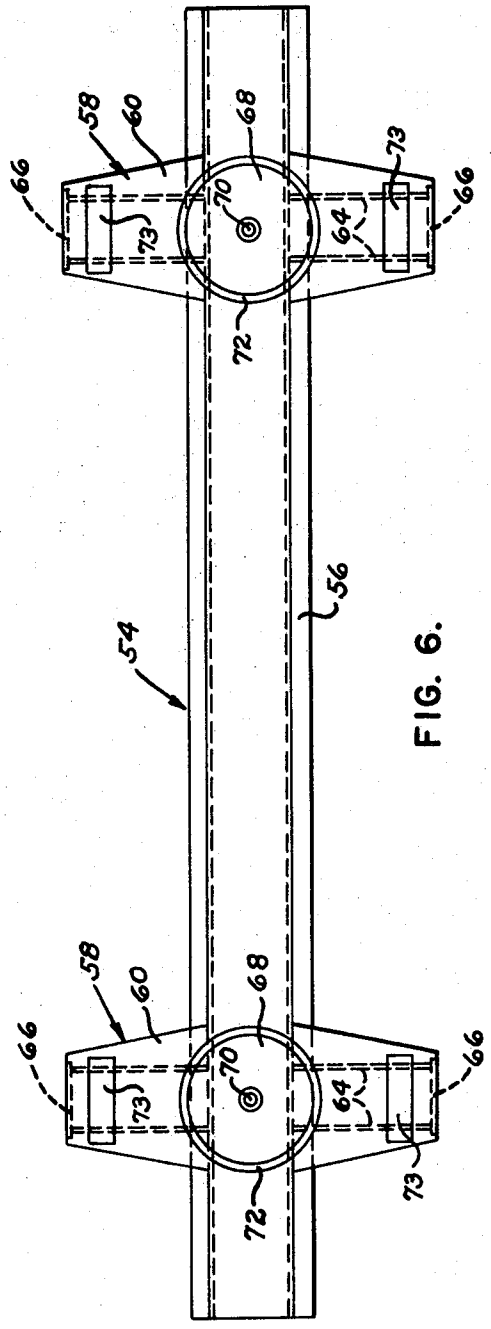


FIG. 6.

INVENTOR.

RONALD P. BOLTE

BY Eugene N. Riddle

ATTORNEY

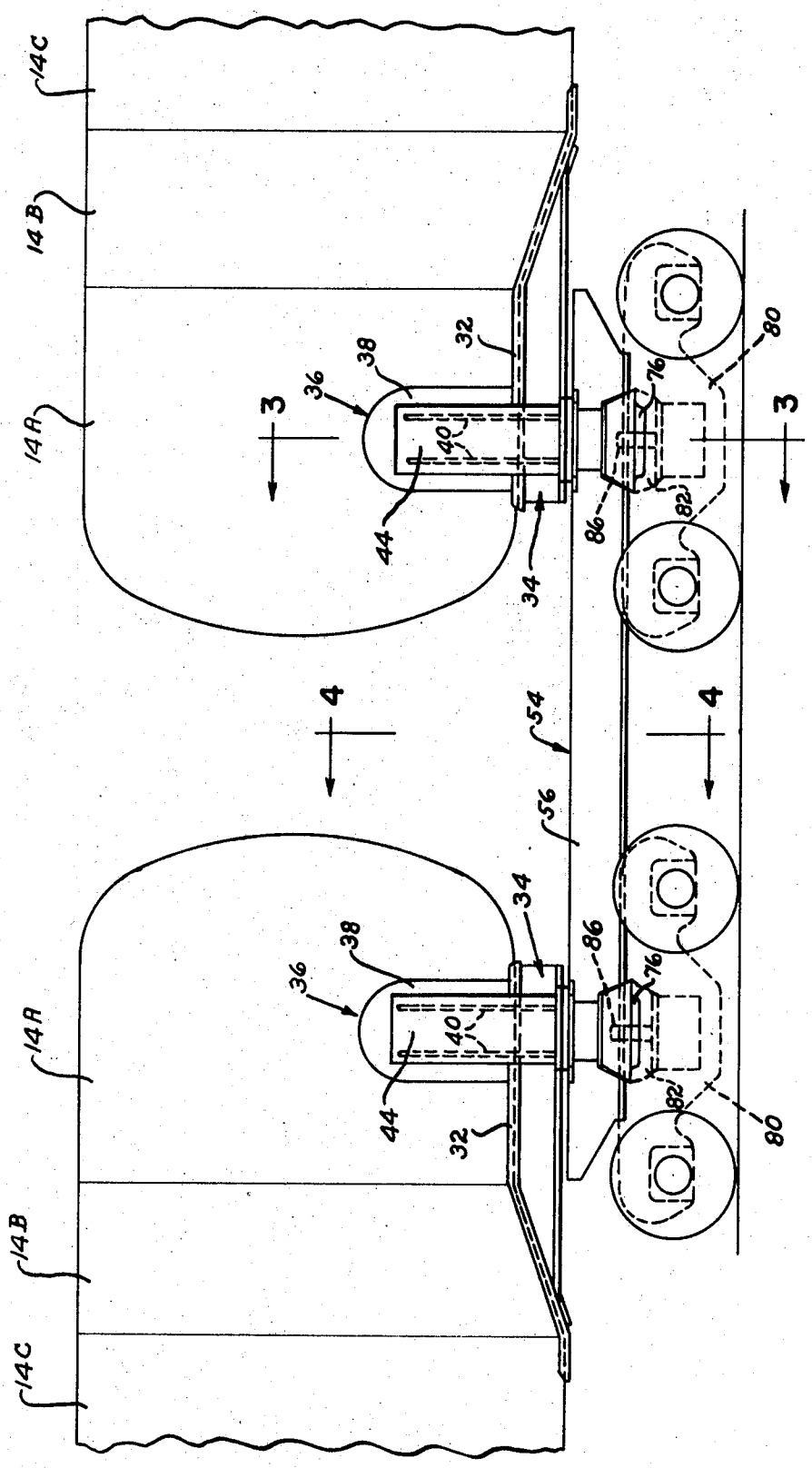


FIG. 2.

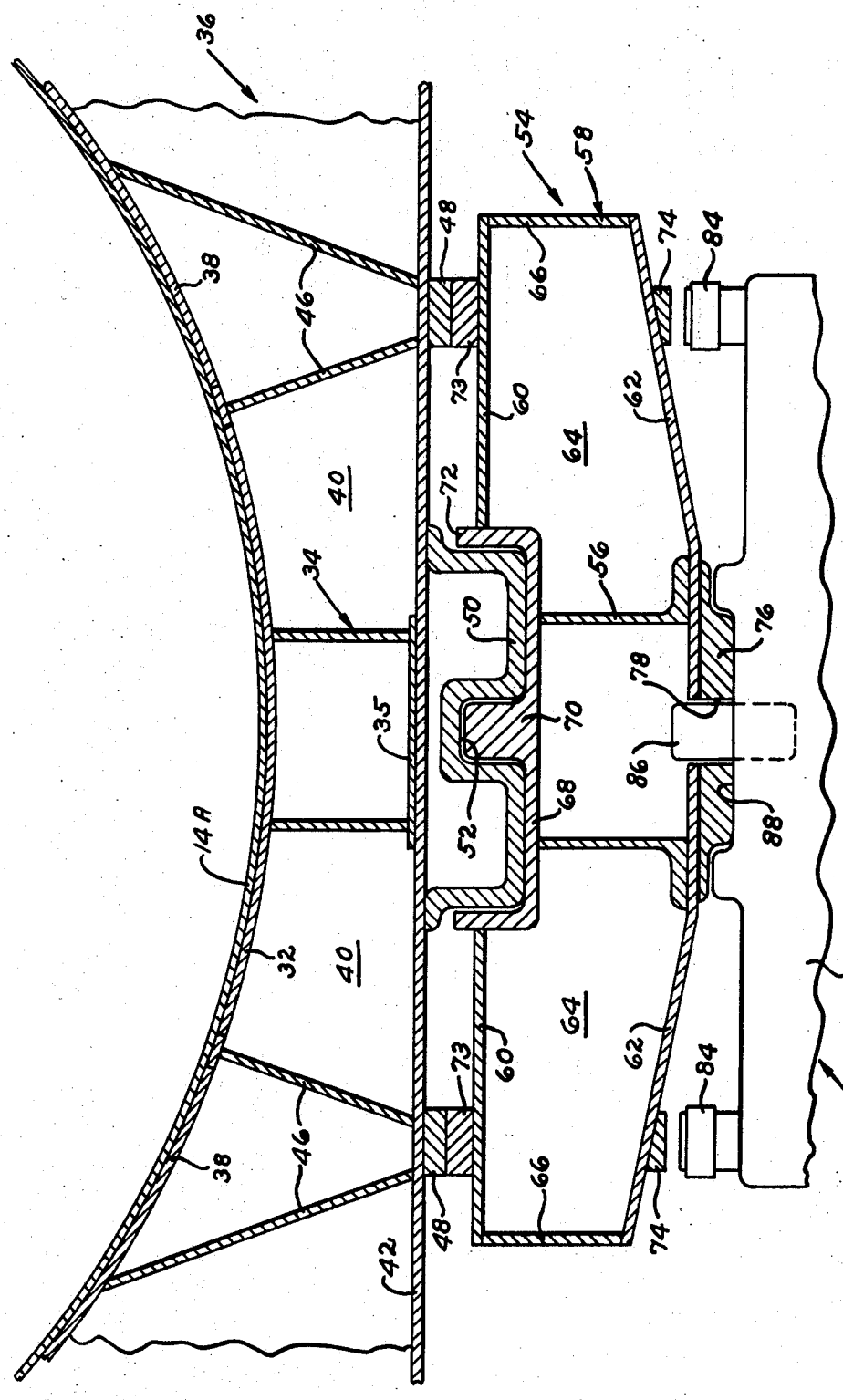

36
54
58
48
74
84
38
46
66
73
60
62
64
40
72
34
56
50
76
78
35
70
86
68
88
52
14A
32
82
42
80

FIG. 3.

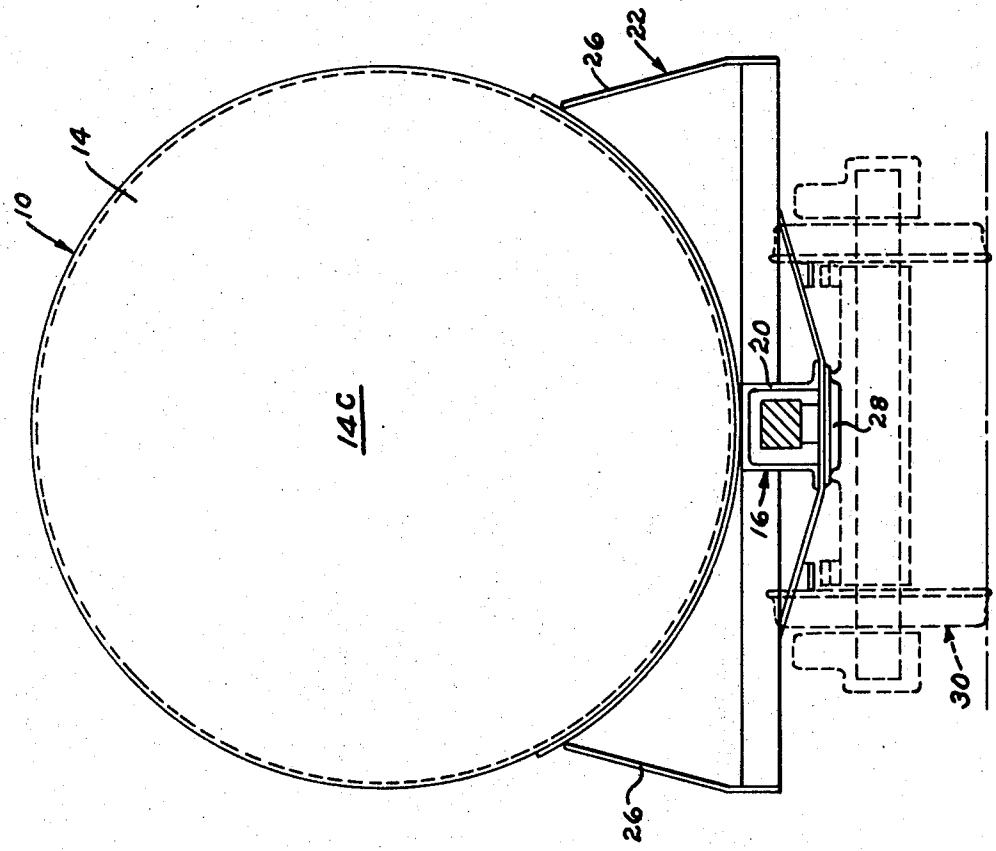

10
14
14C
16
20
22
26
28
30

FIG. 5.

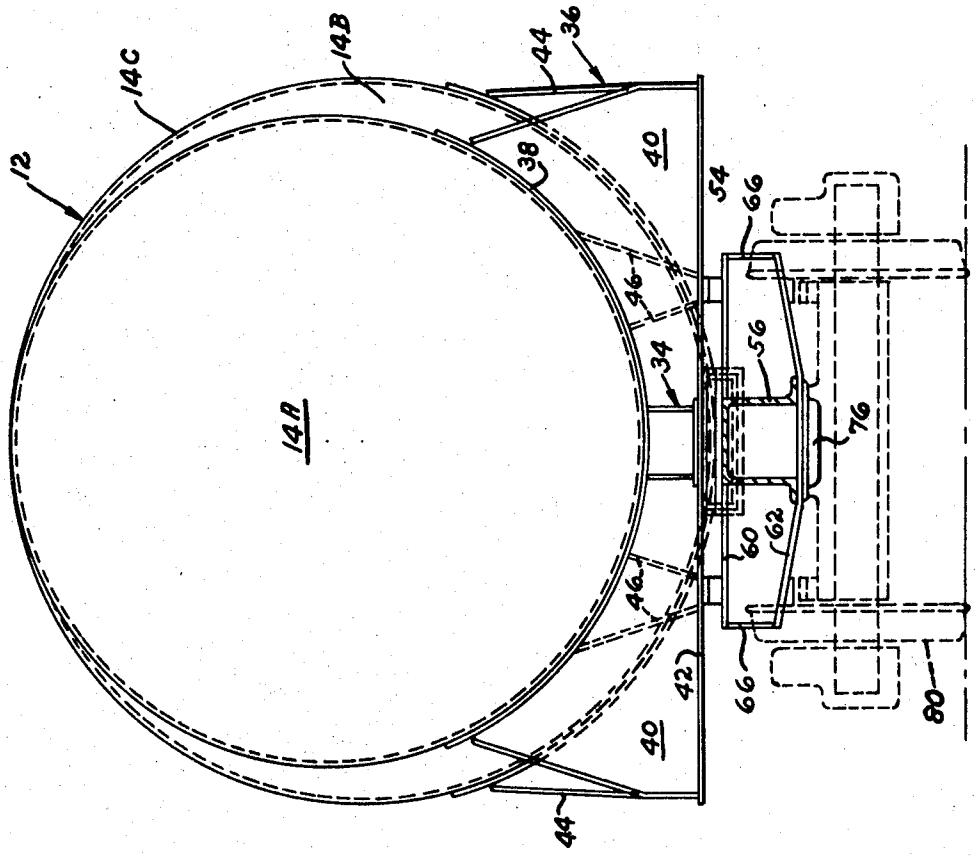

12
14C
14B
14A
36
38
40
42
44
46
54
56
60
62
66
76
80

FIG. 4.

ARTICULATED RAILWAY TANK CARS

BACKGROUND AND DESCRIPTION OF THE INVENTION

Heretofore, large capacity railway tank cars of forty thousand (40,000) gallons and over have been provided. However, such tank cars require a relatively long length between truck centers which reduces the maximum diameter tank employed. The present invention permits a maximum diameter tank as two tank car bodies of a relatively short length are provided. Thus, large capacities as high as seventy thousand (70,000) gallons may be employed in the present design with tanks of a maximum diameter as illustrated in plate B of AAR (Association of American Railroads) clearance diagrams.

The present invention comprises an articulated structure for interconnecting and supporting adjacent ends of two railway tank car bodies, each of said adjacent ends of said tank car bodies including a tank shell of a reduced diameter having a fixed stub center sill structure and an integral tank bolster secured thereto, a pair of four-wheel trucks each having a center plate thereon, a span sill structure extending between said pair of trucks and having a pair of center plates on the underside thereof coacting with the center plates of said trucks to support the span sill structure for pivotal movement thereon, a pair of center plates on the upper surface of said span center sill structure in vertical alignment with the center plates on the underside thereof, and a center plate on the tank bolster of each railway tank car body coacting with the center plates on the upper surface of the span sill structure to support the car bodies for pivotal movement thereon.

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:

FIG. 1 is a side elevation of the articulated structure showing adjacent ends of two railway tank car bodies connected thereto;

FIG. 2 is an enlarged fragment of FIG. 1 showing the articulated structure illustrated in FIG. 1;

FIG. 3 is a section taken generally along line 3–3 of FIG. 2;

FIG. 4 is a section taken generally along line 4–4 of FIG. 2;

FIG. 5 is an end elevation of one of the railway car bodies; and

FIG. 6 is a plan of the span sill structure shown removed from the articulated structure.

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

Referring to the drawings for a better understanding of this invention, a pair of railway tank car bodies are indicated generally **10** and **12** each having a tank shell **14**. Each tank shell **14** includes a reduced diameter inner end portion **14A**, a transition portion **14B**, and a main body cylindrical portion **14C**. Secured beneath the outer end portion of each shell **14** is a fixed stub center sill structure generally indicated **16** each including a saddle plate **18**, a generally hat-shaped center sill **20** secured beneath the saddle plate, and a support cradle or tank bolster structure generally indicated **22**. Support cradle **22** includes a cradle pad or plate **24** of an arcuate shape fitting along the outer surface of the associated shell **14** and outer side body bolster plates **26** extending downwardly from cradle pad **24**. A center plate **28** of tank bolster structure **22** is supported on a suitable wheeled truck **30**.

An end stub center sill structure is secured to each inner reduced diameter portion **14A** and includes a saddle plate **32** extending from main body cylindrical portion **14C**, across transition portion **14B**, to reduced diameter end section **14A**. A center sill **34** is secured beneath saddle plate **32** and has a lower plate **35** to form a box shape with saddle plate **32**.

As shown in FIG. 3, a tank bolster structure or cradle support generally indicated **36** is secured to each reduced diameter section **14A** and includes a cradle pad **38** of an arcuate

shape fitting along the outer surface of reduced diameter portion **14** and having a cutout portion receiving saddle plate **32**. Vertically extending webs **40** extend in a direction transversely of each car body between cradle pad **38** and a lower body bolster plate **42**. A side body bolster plate **44** extends between each outer end of lower bolster plate **42** and saddle plate **38**. Intermediate reinforcing members **46** extend between lower cover plate **42** and saddle plate **38**. Side bearing pads **48** are secured beneath lower plate **42** adjacent reinforcing members **46**. A center plate **50** is secured to the underside of lower cover plate **42** and has a central opening **52** therein.

Mounted beneath the tank body bolster structure **36** and comprising the present invention is a span or connecting sill structure generally indicated **54**. Span sill structure **54** comprises a hat-shaped span sill **56** having a bolster structure **58** adjacent each end thereof extending transversely of span sill **56**. Each bolster structure **58** is generally identical and includes an upper cover plate **60**, a lower cover plate **62**, a pair of vertically extending transverse webs **64**, and a vertical side plate **66** extending between cover plates **60** and **62**. An upper bowl-shaped center plate **68** receives superjacent center plate **50** and has a center pin **70** received within opening **52** of center plate **50** to permit relative pivotal movement as shown in FIG. 3. A rim of circumferential flange **72** extends about the circumference of center plate **68**. Side bearings pads **73** are secured to the upper surface of upper web plate **60** in bearing contact with superjacent side bearing pads **48**. A side bearing **74** is secured to the lower surface of lower cover plate **62** adjacent each side thereof. A center plate **76** is provided on lower cover plate **62** and has a central opening **78** therein.

Mounted beneath each lower center plate **76** is a four-wheeled truck generally indicated **80** and having a truck bolster **82** thereon. Side bearings **84** on the upper surface of truck bolster **82** are positioned beneath side bearings **74**. A center pin **86** extending from a bowl-shaped bearing or center plate **88** on truck bolster **82** is received within opening **78**. Thus, the reduced diameter end portions **14A** of tank car bodies **10** and **12** are supported for relative pivotal movement on span sill structure **54**. Span sill structure **54** is, in turn, supported for pivotal movement on wheeled trucks **80**. Span sill structure **54** is axially aligned with outer end stub center sill structure **16** as trucks **30** and **80** are generally identical four-wheel trucks. Thus, inner stub center sill structures **34** fixed to the reduced diameter end portions **14A** of tank car bodies **10** and **12** are at a height greater than the height of outer end stub sill structure **16**.

As a specific, but nonlimiting, example of an articulated tank car structure comprising the present invention, tank shells **14** may be of a total length of fifty-five (55) feet each having a capacity of 30,000 gallons or a total capacity of 60,000 gallons for the entire articulated structure. Span sill structure **54** may have a total length of around eighteen (18) feet with a distance between truck centers of trucks **80** of around twelve (12) feet. The outside diameter of shells **14** may be one hundred and twenty (120) inches with a reduced diameter portion **14A** of around one hundred and four (104) inches.

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

I claim:

1. An articulated railway tank car structure comprising, a pair of tank car shells closely positioned in end-to-end relation to each other and having inner end portions of a substantially lesser diameter than the remote outer end portions thereof, each reduced inner end portion having a fixed stub center sill structure and an integral body bolster secured thereto, a pair of four-wheel trucks each having a bolster including a center plate thereon, a connecting sill structure extending between said pair of trucks and having a pair of center plates on the underside thereof coacting with the center plates of said trucks to support the connecting sill structure for pivotal movement thereon, a pair of center plates on the upper surface of said

connecting sill structure in vertical alignment with the center plates on the underside thereof, a center plate on the body bolster of each railway tank car shell coacting with the center plate on the upper surface of the connecting sill structure to support the tank car shells for pivotal movement thereon, and a bolster structure on the connecting sill structure adjacent each pair of vertically aligned center plates thereon extending outwardly transversely of the shells, each bolster structure on the connecting sill structure having upper and lower cover plates with side bearings thereon, said body bolsters and said truck bolsters having side bearings coacting with the side bearings on said connecting sill structure.

2. An articulated railway tank car structure comprising, a pair of tank car shells closely positioned in end-to-end relation to each other and having inner end portions of a substantially lesser diameter than the remote outer end portions thereof, each reduced inner end portion having a fixed stub center sill

structure and an integral body bolster secured thereto, a pair of trucks each having a bolster including a center plate thereon, a connecting sill structure extending between said pair of trucks and having a pair of center plates on the underside thereof coacting with the center plates of said trucks to support the connecting sill structure for pivotal movement thereon, a pair of center plates on the upper surface of said connecting sill structure in vertical alignment with the center plates on the underside thereof, and a center plate on the body bolster of each railway tank car shell coacting with the center plate on the upper surface of the connecting sill structure to support the tank car shells for pivotal movement thereon.

3. An articulated railway tank car structure as set forth in claim 2 wherein the outer end portion of each tank shell has a fixed stub center sill structure thereon axially aligned with the connecting sill structure.