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TANK CAR

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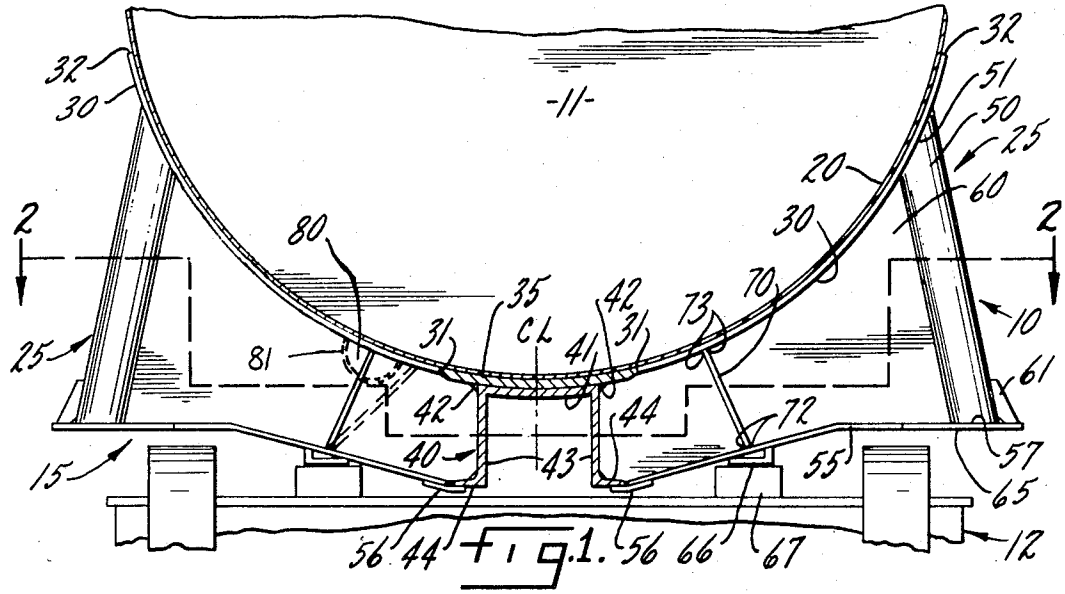

Fig. 1.

Fig. 2.

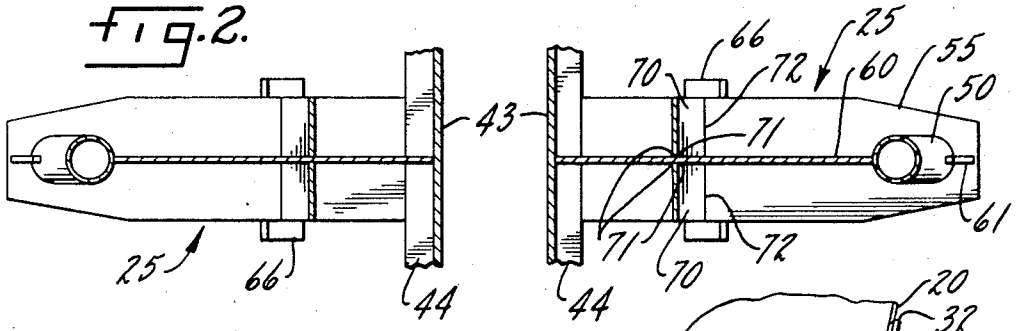

Fig. 3.

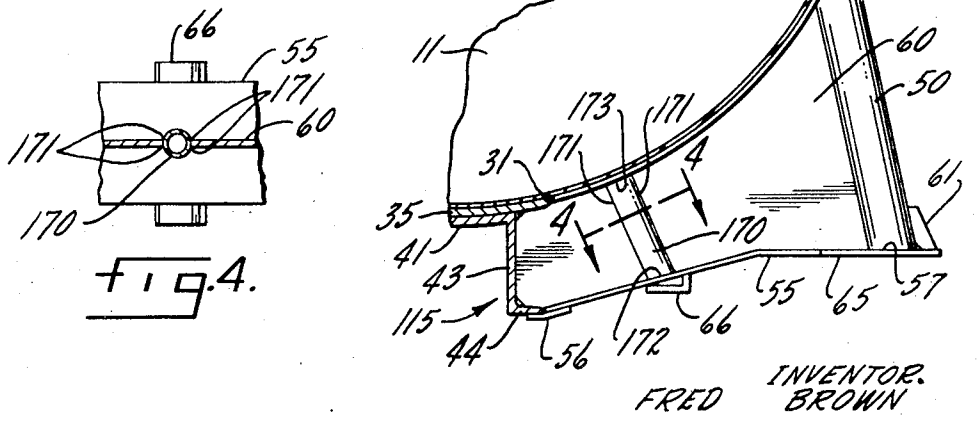

Fig. 4.

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TANK CAR

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ABSTRACT OF THE DISCLOSURE

A bolster construction for supporting a railway tank body from its wheel trucks. Inwardly inclined tubular compression members extend between base plates supported from the truck and arcuate saddle plates underlying the tank body. Generally flat web plate means extend between and are welded to the tubular compression members, the saddle plates, and the base plates. The tubular compression members serve as primary load transition means and the web plate means serve to spread the load between the base plate and the saddle plate.

This invention relates in general to railway tank cars. It deals more particularly with body bolsters conventionally employed in railway tank cars.

A body bolster is normally used at each end of a railway tank car to distribute the load from the wear plates to the shell. The wear plates are, of course, supported immediately from the wheel trucks of the tank car. The body bolsters also serve as jacking members when it is necessary to raise the tank body off the wheel trucks.

An object of the present invention is to provide a new and improved body bolster construction.

Another object is to provide a body bolster construction having a superior load transition characteristic for transferring loads from the wheel truck to the tank body.

It is still another object to provide a body bolster construction which is considerably simpler and less expensive than broadly similar constructions heretofore employed. It is a further object to provide a lightweight body bolster construction which is considerably less bulky than the constructions presently in use.

It is yet a further object to provide a body bolster construction which easily facilitates the use of tank body heating tubes and the like.

The foregoing and other objects are realized in accord with the present invention by providing a body bolster construction basically fabricated from a single web thickness and tubular compression members in the form of pipe closures. The combination provides a lightweight, non-bulky, inexpensive body bolster which, nevertheless, affords load transition characteristics from truck to tank body, comparable with cast transition members and double web bolsters now in common use in the railroad industry.

The invention, together with its construction and method of operation, taken with these and other objects, is illustrated more or less diagrammatically in the accompanying drawings, in which:

FIGURE 1 is an elevational view of the bolster construction embodying features of the present invention, showing its relation to a tank body and a railway car truck; both only partially shown;

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

FIGURE 3 is an elevational view of one-half of a bolster construction embodying a modified form of the invention; and

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1.

Referring now to the drawing, and particularly to FIGURE 1, a portion of a broadly conventional railway tank car is illustrated generally at **10**. The tank car **10** includes a tank body **11** supported from a pair of conventional wheel trucks **12** (only one shown) by corresponding identical body bolsters (only one shown) embodying features of the present invention.

The tank body **11** itself comprises a tank shell **20** which is substantially cylindrical and constructed in a conventional manner of steel plate. The shell **20** is centered over and seats snugly between opposed sections **25** of a body bolster **15** on each end of the tank car **10**. Each of the body bolsters **15** is identical in construction. Furthermore, each section **25** of each body bolster **15** is identical in construction. Accordingly, only one body bolster section **25** is described in detail and corresponding reference numerals are applied to corresponding components of each.

Each body bolster section **25** includes a bolster saddle plate **30** contoured to the radius of curvature of the tank shell **20**. The bolster saddle plate **30** is preferably one-half inch steel plate and is approximately eighteen inches wide. The plate **30** extends from a lower end **31** adjacent the vertical center line CL of the tank shell **20**, upwardly along the side of the shell to an upper end **32** immediately below the widest portion of the shell.

Extending along the bottom of the tank shell **20**, and also contoured to its radius, is a bottom plate **35**. The bottom plate **35** is welded to the bottom of the shell **20** along its axis and also to the lower ends **31** of each of the bolster saddle plates **30** bracketing it, as illustrated.

Depending from the bottom plate **35** is a heavy steel channel member **40**. The channel member **40** supports the bottom plate **35** on its arcuate base **41**, which is welded to the bottom plate by fillet welds **42**. The depending legs **43** of the channel members **40** have outwardly extending flanges **44** formed at their lower ends. The flanges **44** define the lower-inner extremity of each bolster section **25**.

Extending downwardly from adjacent the upper end **32** of each bolster plate **30**, and inclined slightly outwardly, is a bolster pipe **50**. Each bolster pipe **50** is a conventional steel pipe welded to the outer surface of the bolster plate **30** at a corresponding upper end, as at **51**. In this light, the upper end **52** of the pipe **50** lends itself readily to being contoured for another advantage of the invention. Each pipe **50** extends downwardly from the bolster plate **30** to a bolster base plate **55** which spans the distance between the corresponding flange **44** on the center channel **40** and the lower end of the pipe **50**. The pipes **50** are here six inches in diameter, but this may vary with the size of the tank car **10**.

Each bolster base plate **55** is connected to the flange **44** by a welded plate **56**, welded to the lower surface of each, as illustrated in FIGURE 1. At the outer end of the plate **55**, its upper surface supports and is welded to the lower end of the pipe **50**, as at **57**.

The area between the corresponding leg **43** of the channel member **40**, the bolster pipe **50**, and the arcuate bolster saddle **30**, as well as the mounting angle bolster plate **55** in each bolster section is occupied by a single thickness steel plate web **60**. The web **60**, which is in the present illustration (but might vary in thickness with tank car **10** size) one-half inch thick, is welded to the corresponding channel leg **43**, saddle plate **30**, pipe **50**, and plate **55**, along its edges. A fillet plate **61** is welded to the outer surface of the lower end of each bolster pipe **50** and to the underhanging upper surface of the plate **55** to enhance the integrity of each bolster section **25**. Only single fillet plates **61** are shown, but two spaced plates **61** are frequently used.

Welded to the lower surface **65** of each of the mounting angle base plates **55** is an angle iron wear plate **66**. In the alternative, the wear plates **66** might be solid blocks or layered plates, for example. The wear plates **66** are conventionally spaced slightly from bearing plates **67** on the wheel truck **12**.

Positioned over the wear plates **66** and bracketing the web **60** in each bolster section **25** is a pair of identical web stiffener plates **70** of one-half inch steel (though they also might vary in thickness) welded along one side **71** to the web **60**, along their lower edges **72** to the mounting angle plate **55**, and along their upper edges **73** to the arcuate bolster plate **30**. The stiffener plates **70** stiffen the bolster sections **25** in that area where the greatest stresses are developed; in other words in the load transfer area.

Although web stiffener plates **70** are employed in the form of the invention illustrated in FIGURES 1 and 2, and described above, the invention also contemplates using pipe stiffeners, such as in the bolster section embodiment illustrated at **115** in FIGURE 3. In this form of the invention, stiffening of the web **60** is accomplished by sectioning it and inserting a short segment of pipe **170** in the web. The opposite sides **171** of the pipe segment **170** are welded to corresponding edges of the sectioned web **60**, the lower edge **172** to the angle member **55**, and the upper edge **173** to the bolster member **30** (see FIGURE 4).

It will now be seen that two simple, compact, and inexpensive body bolster constructions **15** and **115** have been illustrated and described. Each of these bolster constructions costs approximately one hundred dollars ($100) *less* per car set than the traditional double web bolsters presently in use, and even a greater savings is realized over conventional single web bolsters. Each element of the bolster constructions **15** and **115** performs a function effectively. The pipes **50** are excellent compression members, while the webs **60** with their stiffening plates **70** or pipes **170** distribute the shell **20** load.

Furthermore, since only a single thickness web **60** is employed in each bolster section it is no problem to cut apertures **80** (only one shown in dotted lines) for tank body heater pipes (not shown) in the webs. When apertures **80** are cut in the web **61**, it is desirable to weld reinforcing plates **81** in them as illustrated. In such case the stiffener plates **70** are preferably inclined inwardly slightly more toward the channel member **40** to avoid the reinforcing plates **81**. Leakage problems ordinarily encountered where heater pipes pass through double web bolsters are greatly reduced.

While the embodiment described herein is at present considered to be preferred, it is understood that various modifications and improvments may be made therein.

What is claimed is:

1. A bolster construction for supporting the weight of a tank body from a wheel truck in a railway tank car comprising:

(a) arcuate saddle means underlying the body and extending transversely thereof,

(b) base means adapted to be supported from the truck,

(c) generally flat web means extending between said saddle means and joined to each of said saddle means and said base means along upper and lower edge means of said web means, and said base means,

(d) and a tubular compression member joined to each generally vertically disposed outer edge means of said web means and extending between said saddle means and said base means,

(e) said tubular compression members serving as primary load transition means and said web means serving to spread the load between said base means and said saddle means.

2. The bolster construction of claim **1** further characterized in that:

(a) said web means comprises generally flat plate means welded to said saddle means, said base means, and said tubular compression members.

3. The bolster construction of claim **1** further characterized in that:

(a) each of said tubular compression members comprises a circular cylindrical pipe having its upper end cut on a bias in the shape of and welded to said arcuate saddle means.

4. The bolster construction of claim **2** further characterized in that:

(a) said plate web means is stiffened vertically by web stiffener means secured to and extending transversely of said plate web means.

5. A bolster construction for supporting the weight of a tank body from a wheel truck in a railway tank car, comprising:

(a) arcuate saddle plate means underlying the body and extending transversely thereof up each side of the body,

(b) base plate means underlying and spaced from said saddle plate means,

(c) said base plate means adapted to be supported from a truck,

(d) generally flat plate web means disposed between said saddle plate means and said base plate means,

(e) a tubular compression member secured to each generally vertically disposed outer edge of said web means and extending in inwardly inclined relationship between said base means and said saddle means,

(f) and a web stiffener welded to said plate web means on each side of the center line of the body and extending generally between said base plate and said saddle plate means,

(g) said tubular compression members serving as primary load transistion means and said web means serving to spread the load between said base means and said saddle means.

6. The bolster construction of claim **5** further characterized in that:

(a) each of said tubular compression member means comprises a circular cylindrical pipe having its upper end cut on a bias in the shape of and welded to said arcuate saddle means.

7. The bolster construction of claim **6** further characterized in that:

(a) said web stiffeners each comprise a pair of plates edge-welded to said plate web means in perpendicular relationship thereto.

8. The bolster construction of claim **6** further characterized in that:

(a) said web stiffeners each comprise a pipe member extending transversely through said web plate means and welded thereto.

9. The bolster construction of claim **6** further characterized in that:

(a) said plate web means comprise a pair of web plates lying substantially in the same plane and spaced laterally of the body by a longitudinally extending structural member,

(b) said web means being welded to said structural member.

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