

H. C. PRIEBE.
TANK CAR.

APPLICATION FILED DEC. 4, 1911.

1,056,053.

Patented Mar. 18, 1913.

4 SHEETS—SHEET 1.

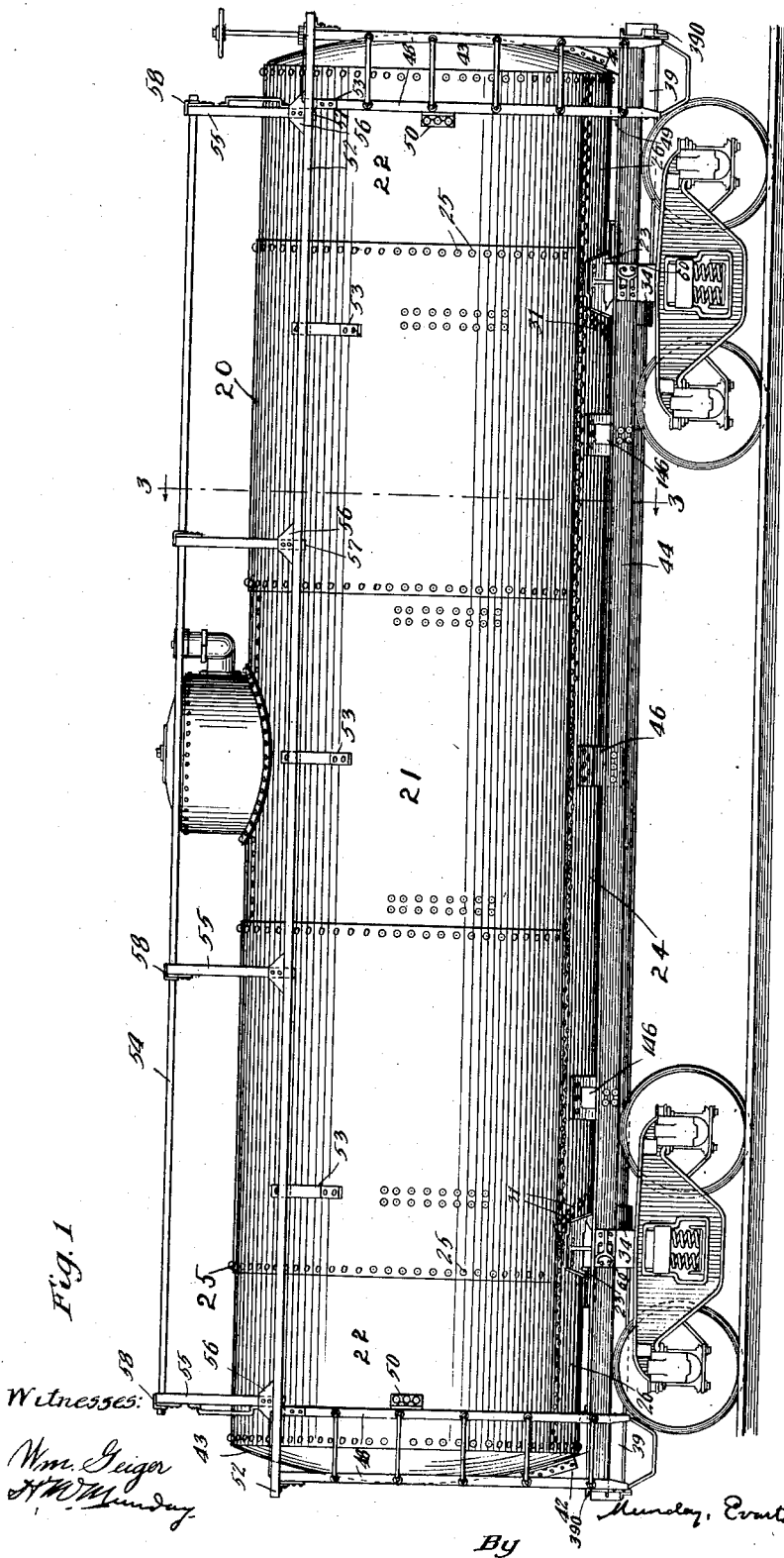


Fig. 1

Witnesses:

Wm. Geiger
H. M. Munday

By

Inventor:
Herman C. Pribe

Munday, Evans, Adcock & Clark

Attys.

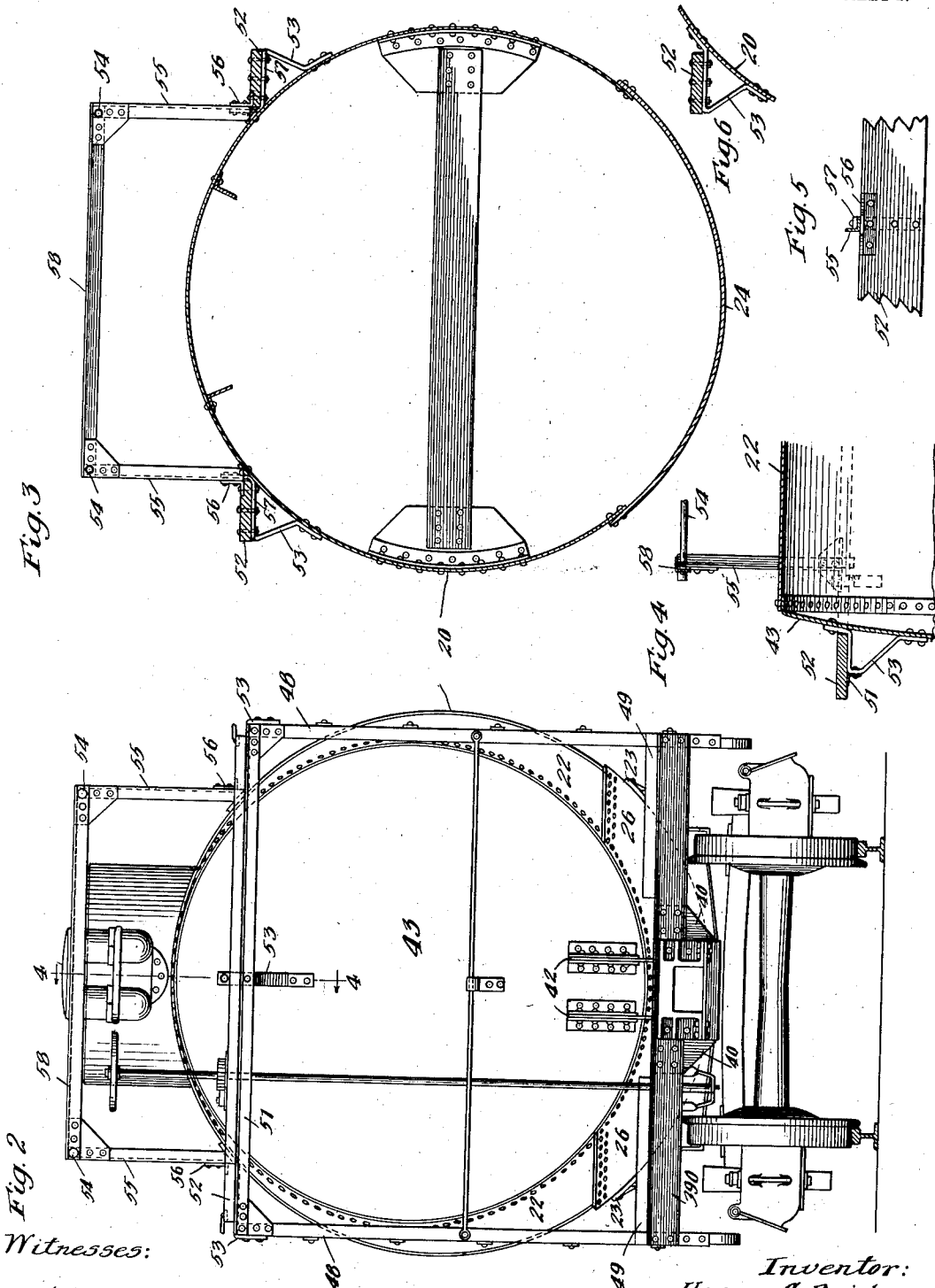
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4 SHEETS—SHEET 2.

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Witnesses:

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4 SHEETS—SHEET 3.

Fig. 7

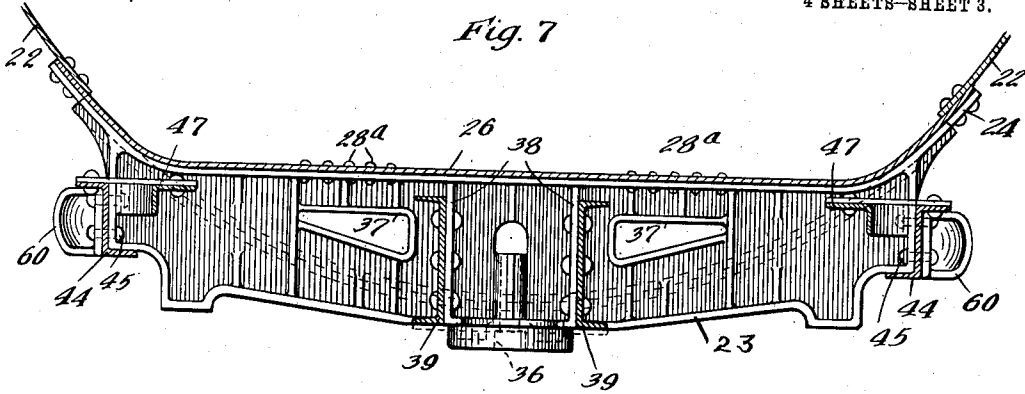


Fig. 8

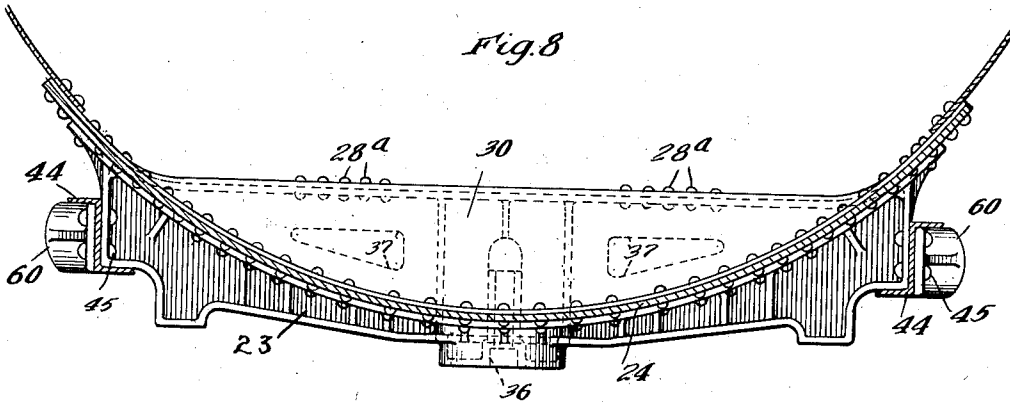
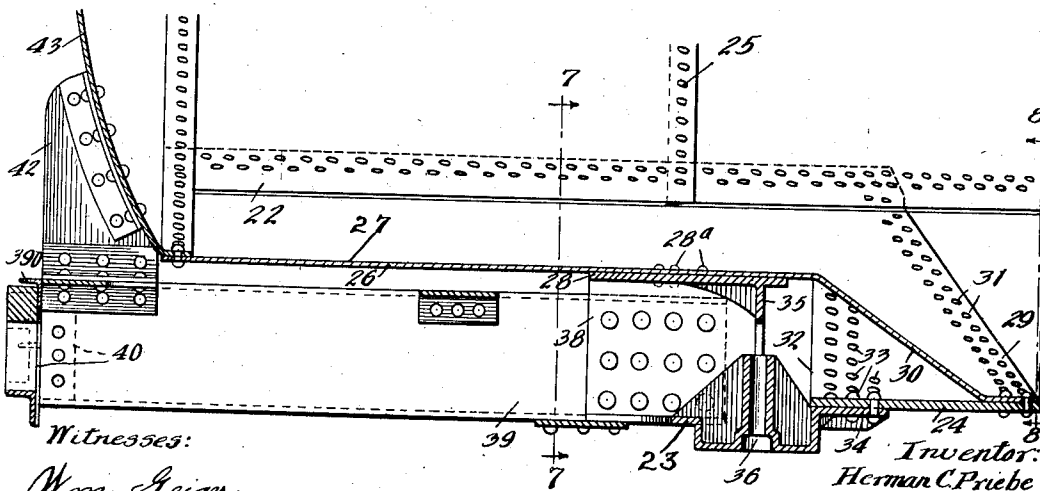


Fig. 9



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4 SHEETS-SHEET 4.

Fig. 10

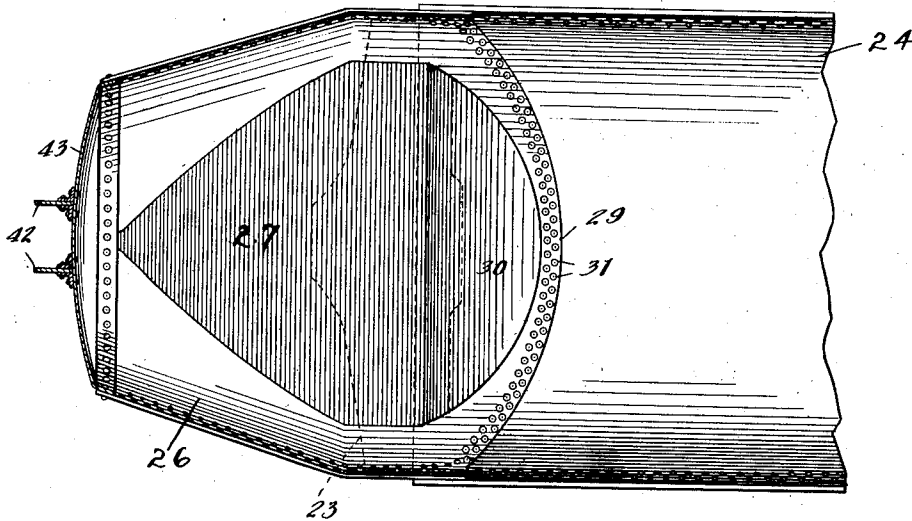


Fig. 11

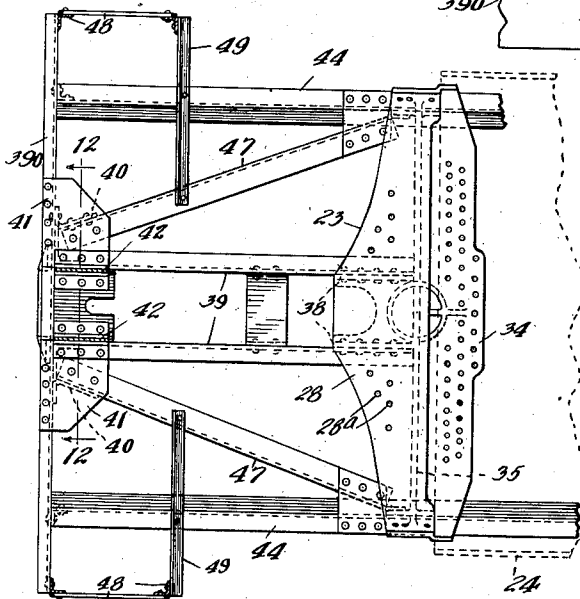


Fig. 12

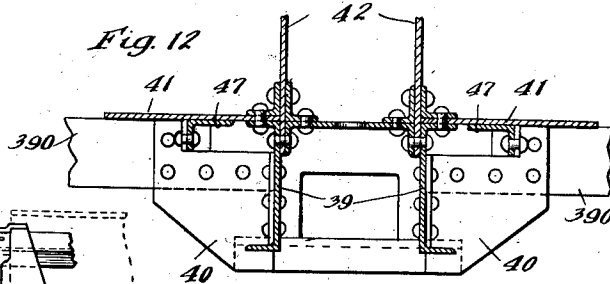
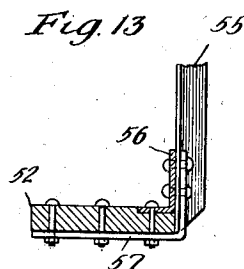


Fig. 13



Witnesses:

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UNITED STATES PATENT OFFICE.

HERMAN C. PRIEBE, OF CHICAGO, ILLINOIS.

TANK-CAR.

1,056,053.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed December 4, 1911. Serial No. 663,715.

To all whom it may concern:

Be it known that I, HERMAN C. PRIEBE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tank-Cars, of which the following is a specification.

This invention relates to tank car construction.

10 The object of the invention is to provide a tank car construction in which the tank shall have a very large capacity and at the same time have a low center of gravity, whereby danger of tipping or derailling of
15 the car in transit will be minimized, and also to provide a structure which will have the necessary rigidity and resistance to all strains which occur in service, whether of pulling, buffing or twisting that tend to
20 spring the joints of the tank and cause leakage.

Still another object of my invention is to provide a tank car construction having a tank, a portion of which is set below the line
25 of draft and having its bottom portion or bottom plate secured to the body bolsters, and at the same time avoiding the use of center sills within the tank, and in which the buffing and pulling strains on the bot-
30 tom plate of the tank are relieved by longitudinal sills disposed exteriorly of the tank on opposite sides thereof near the bottom, spaced therefrom and preferably in a plane
35 above the lowest portion of the bottom tank plate between the body bolsters.

Other objects will in part be obvious or hereinafter more specifically explained, and the invention furthermore consists in the improvements in the parts and devices and
40 in the combinations of parts and devices hereinafter shown and described or claimed.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a tank car embodying my im-
45 provements. Fig. 2 is an end view of the structure shown in Fig. 1. Fig. 3 is a transverse, vertical section, taken on the line 3—3 of Fig. 1, the car frame being omitted. Fig. 4 is a detail longitudinal section, taken on
50 the line 4—4 of Fig. 2. Fig. 5 is a detail view, showing the manner of attaching the hand rail to the foot board. Fig. 6 is a detail, sectional view, showing the method of attaching the foot board to the side of the
55 tank. Fig. 7 is a transverse section, upon an enlarged scale, taken substantially on

the line 7—7 of Fig. 9. Fig. 8 is a similar sectional view, taken on the line 8—8 of Fig. 9. Fig. 9 is a vertical longitudinal section, upon an enlarged scale, taken at one end of
60 the car and centrally thereof. Fig. 10 is a horizontal, sectional view of one end of the tank. Fig. 11 is a plan view of the car frame at one end of the car, the tank being removed. Fig. 12 is a vertical section, upon
65 an enlarged scale, taken on the line 12—12 of Fig. 11. Fig. 13 is a detail, sectional view, showing the manner of attaching the hand rail to the foot board.

In the drawing, 20 designates the tank 70 which is of cylindrical shape, and in the structure which I have devised, will have a capacity larger than that of any tank car which has been in commercial use, so far as
75 I am aware, the capacity of the tank being upward of fourteen thousand gallons. For the purposes of a clearer understanding of the description, the tank 20 may be considered as composed of a central or intermediate
80 main portion 21 and reduced ends 22, 22. The central portion 21 of the tank from one body bolster 23 to the other, has its lower portion 24, which may be considered as a single bottom plate, extended below the line
85 of draft in order that the center of gravity of the tank may be lowered to insure proper safety. Each reduced end 22 is preferably tapered, as viewed in horizontal cross section,—Fig. 10,—and the upper plates thereof
90 are secured to the main portion 21, as by a series of rivets 25, see Fig. 1. Each end 22 is furthermore provided with a bottom plate 26, a portion 27 of which is flattened and is disposed horizontally, and which rests on
95 a flat saddle 28 formed preferably integrally with the body bolster 23, said bottom plate 26 being secured to the saddle as by means of rivets 28^a.

Intermediate the flat portion 27 and the inner edge 29 of each bottom plate 26 is a
100 downwardly extending portion 30 projecting within the main tank portion 21, and having its inner edge 29 secured to the bottom plate 24 as by rivets 31, which as shown in Fig. 9 extend in a curved line, and this
105 junction between the end of the bottom plate 26 with the main bottom plate 24 is removed from the edge 32 of the plate 24, thereby leaving a space between the portion 30 and adjacent portions of the bottom plate 26,
110 and the plate 24. The bottom plate 24 has each of its free ends secured as by rivets 33

to a segmental flange 34 formed preferably integrally with the body bolster 23, and it will be apparent that none of the rivets 33 extend within the tank into communication with the oil or other liquid being transported.

In use, the junction of the main bottom plate 24 with the body bolsters in tank cars not using center sills, undergoes the severest strains, and in constructions hitherto in use, where the rivets extend to the interior of the tank, leaks are often caused at this point, and it has sometimes been found necessary to cover these joints with interior patches or to employ some other device. By forming this junction exteriorly of the containing portion of the tank, or so that the rivets or other securing means do not come in contact with the contents, I do away with the necessity for patches and provide a structure whereby excessive and unusual strains may easily be withstood without danger of causing leaks, and at the same time, the circular flange laterally supports and stiffens each end of the main tank bottom plate.

Each body bolster 23 comprises preferably a steel casting having a web 35 provided with a king bolt socket 36 suitably braced, said web having the saddle 28 extending outwardly therefrom and the flange 34 formed on the inner side thereof, and the web may also be provided with perforations 37 whereby access may be had to the space between the bottom plates of the main and end sections of the tank. Also formed on each body bolster are outwardly projecting spaced flanges 38 located below the saddle 28, said flanges 38 having secured thereto draft sills 39, the latter being preferably in the form of channels. The bottom plate of each end is spaced from the draft sills, as clearly shown in Fig. 9, and attached to the ends of the draft sills are end sills 390 secured to the draft sills as by means of angle plates 40. Platform plates 41 are riveted to the end and draft sills and extending upwardly therefrom are spaced plates 42 securely attached to the heads 43 at each end of the tank to properly strengthen and brace the ends of the tank.

Longitudinal sills 44, preferably in the form of Z-bars, extend between the end sills and are secured to the body bolsters as at 45, said sills 44 being located above the lowest line of the bottom plate of the main portion of the tank and adjacent but preferably spaced from the sides of the tank. A plurality of spaced brace and supporting members 46 and 146 are attached to the longitudinal sills and the sides of the tank, whereby the load strain on the tank is transmitted to the sills. At each end of the car are provided diagonally disposed brace irons 47, each extending from the junction of a draft sill and the end sill to a point on the

longitudinal sills adjacent where the latter are secured to the body bolsters (See Fig. 11).

The car frame structure just described is light, yet strong and efficient, and performs an important function in attaining the objects of my invention. Hitherto, in tank cars not employing center sills, all the buffing and pulling strains have been borne entirely by the tank plates, with the result that they soon spring leaks, but in the structure which I have shown, the strains, instead of being carried by the bottom tank plate, are transmitted to the longitudinal sills chiefly through the diagonal base members. Another object attained by using longitudinal sills exteriorly of the tank in tank cars where portions of the tank are disposed below the line of draft, is that interior center sills are dispensed with and thus the capacity of the tank is increased and obstructions in the interior of the tank which prevent the ready outlet of the contents are avoided.

Located preferably at each of the four corners of the car are ladders 48, disposed lengthwise of the car and supported on extensions of the end sills and supporting irons 49. Each ladder is secured to the tank as by means of an angle plate 50. The running board or platform 52 comprises end portions extending between each pair of ladders at the ends of the tank which are supported on cross irons 51, said cross irons 51 being secured to the ladders 48 and to the end of the tank. The longitudinally extending portions of the foot-board are supported as by means of spaced brace angles 53 secured to the upper sides of the tank, said portions being furthermore additionally supported at the ends by means of the ladders 41.

Another feature of my invention is the novel method employed of supporting and securing the hand rail 54, which is held in spaced upright angle irons 55, each secured to the foot board or platform, preferably by means of an upper, triangular, angle plate 56 (see Fig. 5), and another angle iron 57 is secured to the inner side of the vertical flange of the upright and to the under side of the foot board. Additional cross brace irons 58 are secured to the uprights 55 and extend over the top of the tank. Hitherto, it has been customary to attach the hand rail directly to the tank, especially when the foot board is disposed at the lower portions of the tank, thereby increasing the number of perforations that must be made in the tank, and in such a structure it will be apparent that the severe pull on the gripping member tends to tear the rivets from the tank on account of the leverage, but in my construction, the strain is taken entirely by the platform and any

weight or strain on the latter is applied circumferentially of the tank through the brace angle irons 53, and hence there is less liability of tearing out a portion of an upper plate.

The brace and supporting members 46 are located centrally of the tank and the members 146 are disposed approximately three feet inwardly from each body bolster or at a point beyond the journal box, where they serve as jacking blocks, and this location is particularly desirable since in jacking the cars to remove the trucks, a solid foundation for the jack can be easily secured by laying a plank over the ends of the rail ties directly beneath the jacking blocks.

Push pole pocket castings 60 are secured to the longitudinal sills and to the body bolsters, as clearly shown in Figs. 7 and 8, opposite the central web of the body bolster. Hitherto it has been customary to locate the push pole pocket castings at the extreme corners of the cars, but this has proved disadvantageous, particularly on cars employing a light car frame, since in pushing, the strains bend the ends of the longitudinal sills inwardly and upwardly.

Having now described my invention, what I claim is:

1. In a tank car, in combination; body bolster castings; and a cylindrical tank having its reduced ends supported upon and secured to said bolsters, and having its bottom intermediate said bolsters dropped below the line of draft; the ends of such dropped bottom portion of the tank being circumferentially secured to and laterally supported and stiffened by said body bolsters, the ends of said dropped bottom portion, where secured to the body bolsters being spaced from the bottom plates of the reduced ends and extending beyond the seam between said end bottom plates and the dropped bottom portion; substantially as specified.

2. In a tank car, in combination; body bolsters, draft sills secured to said bolsters, a tank having reduced ends supported on said bolsters and having the bottom of the main portion of the tank dropped below the line of draft, the inner ends of the bottom plates of the reduced ends being secured to the bottom plate of the main portion of the tank on lines spaced from the end edges of the main bottom plate, the ends of the main bottom plate beyond each junction or seam being spaced from the bottom plates of the reduced ends and secured to the body bolsters.

3. In a tank car construction, in combination; body bolsters, draft sills secured to said bolsters, a tank having a main central portion and reduced ends, said ends being supported on and secured to the body bolsters, the bottom of the main portion being dropped below the line of draft and having

its ends secured to the body bolsters, the bottoms of the reduced ends being extended within and secured to the dropped bottom of the main portion, the ends of the dropped bottom, where secured to the body bolsters being spaced from the bottoms of the reduced ends.

4. In a tank car construction, in combination; body bolsters, draft sills secured to outwardly extending projections on said bolsters, each of said bolsters having a flat saddle portion and an inwardly extending segmental flange and a cylindric tank composed of an intermediate portion having the bottom thereof between the body bolsters dropped below the line of draft and having also reduced ends, each end having a flattened bottom plate resting upon and secured to the saddle portion of a body bolster, and said bottom plate extending inwardly and downwardly beyond the body bolster and secured to the bottom plate of the main portion of the tank, the ends of the bottom plate of the main portion of the tank extending beyond the inner edges of the bottom plates of the ends of the tank and being secured to the segmental flanges of the body bolsters.

5. In a tank car construction, in combination; a cylindric tank of upward of fourteen thousand gallons capacity, comprising an intermediate main and reduced end portions, body bolster castings, draft sills, the end portions extending over, and being spaced from said draft sills and resting upon the body bolsters, the bottom of the intermediate portion of the tank being dropped below the line of draft and having its end edges secured to curved flanges on the body bolsters, each reduced end having a bottom plate provided with a sloping portion extending within the end of the main tank member and secured thereto on a line removed from the end edge of the dropped bottom portion.

6. In a tank car construction, in combination; body bolsters, draft sills secured to said bolsters, a cylindric tank comprising an intermediate main and reduced end portions, the bottom of the main portion being dropped below the line of draft intermediate the body bolsters, each end comprising a bottom plate resting upon and secured to a body bolster, the inner end of each of said end bottom plates extending downwardly and within the end of the main portion of the tank and secured to the bottom thereof on a line removed from the ends of the dropped portion of the tank, each end extending over and spaced from the draft sills and plates connecting the heads of the tank with the draft sills.

7. In a tank car construction, in combination; body bolsters, draft sills secured to the body bolsters, a tank comprising a main portion having the bottom thereof interme-

- diate the bolsters dropped below the line of draft and said bottom secured to flanges on the body bolsters, and having reduced ends and a car frame extending between the body bolsters, said frame comprising longitudinal sills disposed exteriorly of the tank on each side thereof and secured to the body bolsters, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains. 70
8. In a tank car construction, in combination; body bolsters, draft sills secured to the body bolsters, a tank comprising a main portion having the bottom thereof intermediate the bolsters dropped below the line of draft and said bottom secured to flanges on the body bolsters, and having reduced ends, and a car frame extending between the body bolsters, said frame comprising longitudinal sills disposed exteriorly of the tank on each side thereof and secured to the body bolsters, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains, and spaced brace members disposed along the longitudinal sills and secured thereto and to the tank. 75
9. In a tank car construction, in combination; body bolsters, draft sills, a cylindric tank comprising a main intermediate and reduced end portions, said main portion having the bottom thereof dropped below the line of draft intermediate the body bolsters and being secured to curved flanges on the body bolsters, and the reduced ends resting upon said body bolsters, and a car frame comprising two longitudinal sills extending between the body bolsters and secured thereto, said longitudinal sills being disposed exteriorly of the tank, one on each side thereof, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains. 80
10. In a tank car construction, in combination; body bolsters, draft sills, a cylindric tank comprising a main intermediate and reduced end portions, said main portion having the bottom thereof dropped below the line of draft intermediate the body bolsters and being secured to curved flanges on the body bolsters, and the reduced ends resting upon said body bolsters, and a car frame comprising two longitudinal sills extending between the body bolsters and secured thereto, said longitudinal sills being disposed exteriorly of the tank, one on each side thereof, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains, and a plurality of spaced brace members disposed along each longitudinal sill and secured thereto and to the tank whereby the tank load strain is transmitted to the longitudinal sills. 85
11. In a tank car construction; body bolster castings, draft sills secured thereto, a cylindric tank of upward of fourteen thousand gallons capacity, comprising a main or intermediate portion and reduced end portions, said main portion having the bottom thereof dropped below the line of draft intermediate the body bolsters, and a car frame comprising longitudinal sills extending beyond and between the body bolsters and secured thereto and disposed exteriorly of the tank, and sills, and diagonally disposed brace members extending between the draft sills and the longitudinal sills intermediate the body bolsters and the end sills, said diagonal brace members being adapted to transmit the buffing and pulling strains from the draft sills to the longitudinal sills and relieve the tank of such strains. 90
12. In a tank car construction, in combination; body bolster castings, draft sills secured thereto, a cylindric tank of upward of fourteen thousand gallons capacity, comprising a main or intermediate portion and reduced end portions, said main portion having the bottom thereof dropped below the line of draft intermediate the body bolsters, and a car frame comprising longitudinal sills extending beyond and between the body bolsters and secured thereto and disposed exteriorly of the tank, end sills, and diagonally disposed brace members extending between the draft sills and the longitudinal sills intermediate the body bolsters and the end sills, said diagonal brace members being adapted to transmit the buffing and pulling strains from the draft sills to the longitudinal sills and relieve the tank of such strains, and brace members disposed along the longitudinal sills intermediate the body bolsters and secured to the intermediate portion of the tank and said longitudinal sills. 95
13. In a tank car, in combination; body bolsters, draft sills secured to said bolsters, a tank having reduced ends supported on said bolsters and having the bottom of the main portion of the tank dropped below the line of draft, the inner ends of the bottom plates of the reduced ends being secured to the bottom plate of the main portion of the tank on lines spaced from the end edges of the main bottom plate, the ends of the main bottom plate beyond the junction or seam being spaced from the bottom plates of the reduced ends and secured to the body bolsters, and a car frame comprising longitudinal sills disposed exteriorly of the tank and secured to the body bolsters, said longitudinal sills being spaced from and adapted to relieve the tank of buffing and pulling strains. 100
14. In a tank car construction, in combination; body bolsters, draft sills secured to outwardly extending projections on said bolsters, each of said bolsters having a flat saddle portion and an inwardly extending segmental flange and a cylindric tank composed of an intermediate portion having 105

the bottom thereof between the body bolsters dropped below the line of draft and having also reduced ends, each end having a flattened bottom plate resting upon and secured to the saddle portion of a body bolster, and said bottom plate extending inwardly and downwardly beyond the body bolster and secured to the bottom plate of the main portion of the tank, the ends of the bottom plate of the main portion of the tank extending beyond the inner edges of the bottom plates of the end of the tank and being secured to the segmental flanges of the body bolsters, and a car frame comprising two longitudinal sills extending between the body bolsters and secured thereto, said longitudinal sills being disposed exteriorly of the tank, one on each side thereof, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains.

15. In a tank car construction, in combination; a cylindric tank of upward of fourteen thousand gallons capacity, comprising an intermediate main and reduced end portions, body bolster castings, draft sills, the end portions extending over and being spaced from said draft sills and resting upon the body bolsters, the bottom of the intermediate portion of the tank being dropped below the line of draft and having its end edges secured to curved flanges on the body bolsters, said reduced ends having bottom plates provided with a sloping portion extending within the ends of the main tank member and secured thereto on a line removed from the end edges of the dropped bottom portions, and a car frame comprising longitudinal sills extending beyond and between the body bolsters and secured thereto and disposed exteriorly of the tank, end sills and diagonally disposed brace members each extending from the junction of the draft and end sills to the junction of the longitudinal sills with the body bolsters, said diagonal brace members being adapted to transmit the buffing and pulling strains from the draft sills to the longitudinal sills, and thereby relieve the tank from such strains.

16. In a tank car construction, in combination; body bolsters, draft sills secured to outwardly extending projections on said bolsters, each of said bolsters having a flat saddle portion and an inwardly extending segmental flange and a cylindric tank composed of an intermediate portion having the bottom thereof between the body bolsters dropped below the line of draft and having also reduced ends, each end having a flattened bottom plate resting upon and secured to the saddle portion of a body bolster, and said bottom plate extending inwardly and

downwardly beyond the body bolster and secured to the bottom plate of the main portion of the tank, the ends of the bottom plate of the main portion of the tank extending beyond the inner edges of the bottom plates of the end of the tank and being secured to the segmental flanges of the body bolsters, and a car frame comprising two longitudinal sills extending between the body bolsters and secured thereto, said longitudinal sills being disposed exteriorly of the tank, one on each side thereof, said longitudinal sills being adapted to relieve the tank of buffing and pulling strains, and a plurality of spaced brace members disposed along each longitudinal sill and secured thereto and to the tank.

17. In a tank car construction, in combination; body bolsters and a tank having a main and reduced end portions, the main portion having its bottom plate between the body bolsters dropped below the line of draft, the ends of said bottom plate being secured to the body bolsters, said reduced ends each having a bottom plate supported upon and secured to a body bolster, and the inner ends of said reduced end bottom plates being secured to the bottom plate of the main portion of the tank intermediate the body bolsters.

18. In a tank car construction, in combination; body bolsters, a cylindric tank having a main and reduced end portions, said main portion having its bottom plate dropped below the line of draft and extending between the body bolsters and secured at each end to flanges thereon, as by means of rivets, said rivets passing through the bottom plate and the flanges and being exposed at both ends so that they are free from contact with the contents of the tank.

19. In a tank car construction, in combination; body bolsters, a tank, said tank comprising a main and reduced end portions, the bottom plate of the main portion being dropped below the line of draft intermediate the body bolsters, longitudinal sills extending between and secured to the body bolsters and located exteriorly of the tank, bracing members secured to the longitudinal sills and to the tank, one of said bracing members being located at a point beyond the inner end of the journal box of the car truck whereby the same is adapted to serve as a jacking block.

In testimony whereof, I have hereunto subscribed my name in the presence of two subscribing witnesses.

HERMAN C. PRIEBE.

Witnesses:

PEARL ABRAMS,
ESTHER ABRAMS.

Correction in Letters Patent No. 1,056,053.

It is hereby certified that in Letters Patent No. 1,056,053, granted March 18, 1913, upon the application of Herman C. Priebe, of Chicago, Illinois, for an improvement in "Tank-Cars," an error appears in the printed specification requiring correction as follows: Page 4, line 73, first occurrence, for the word "and" read *end*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of August, A. D., 1913.

[SEAL.]

E. B. MOORE,

Commissioner of Patents.