J. McE. AMES.

UNDERFRAME FOR TANK CARS.

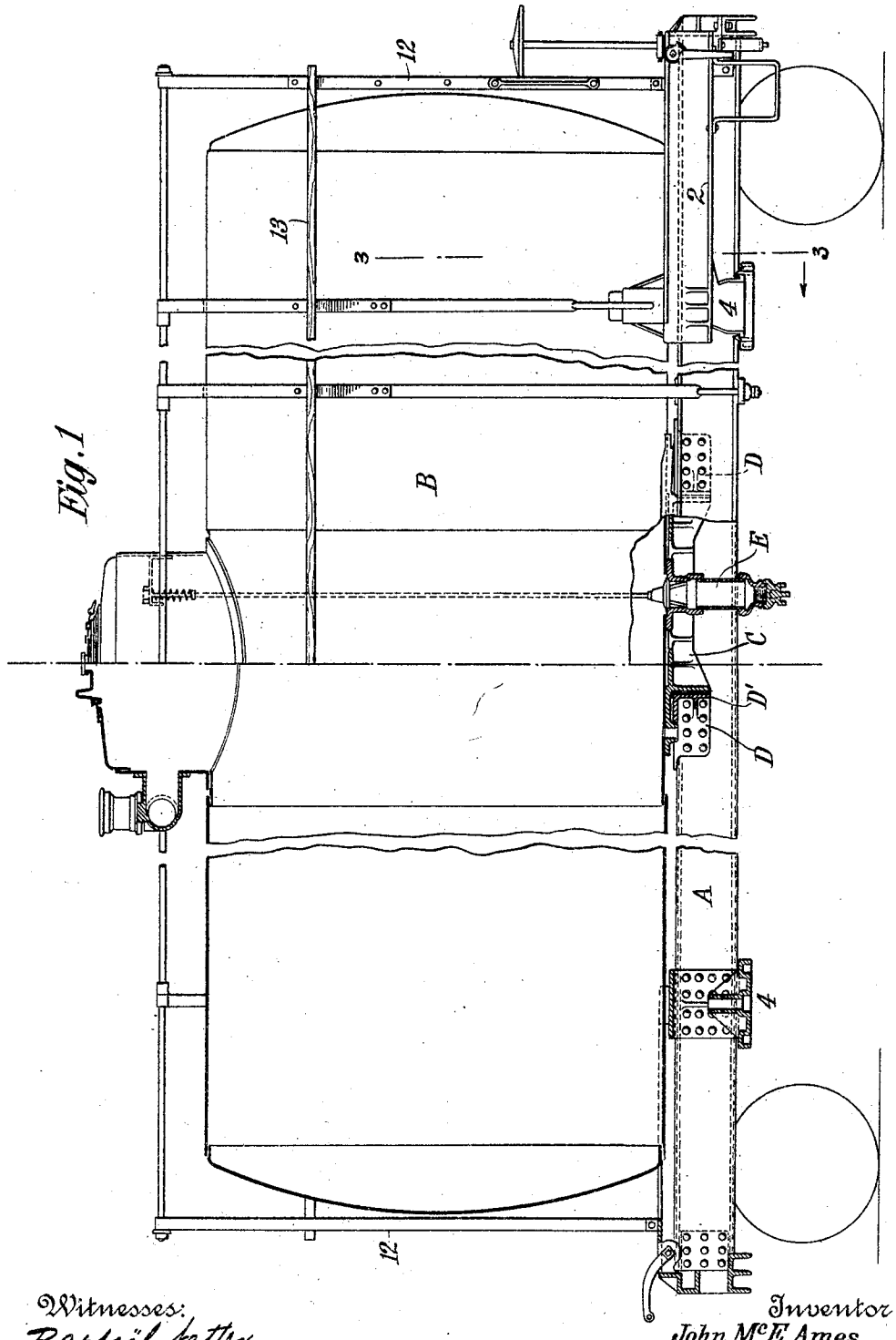
APPLICATION FILED AUG. 6, 1908.

**928,924.**

Patented July 27, 1909.

3 SHEETS—SHEET 1.

Fig. 1




Witnesses:
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3 SHEETS—SHEET 2.

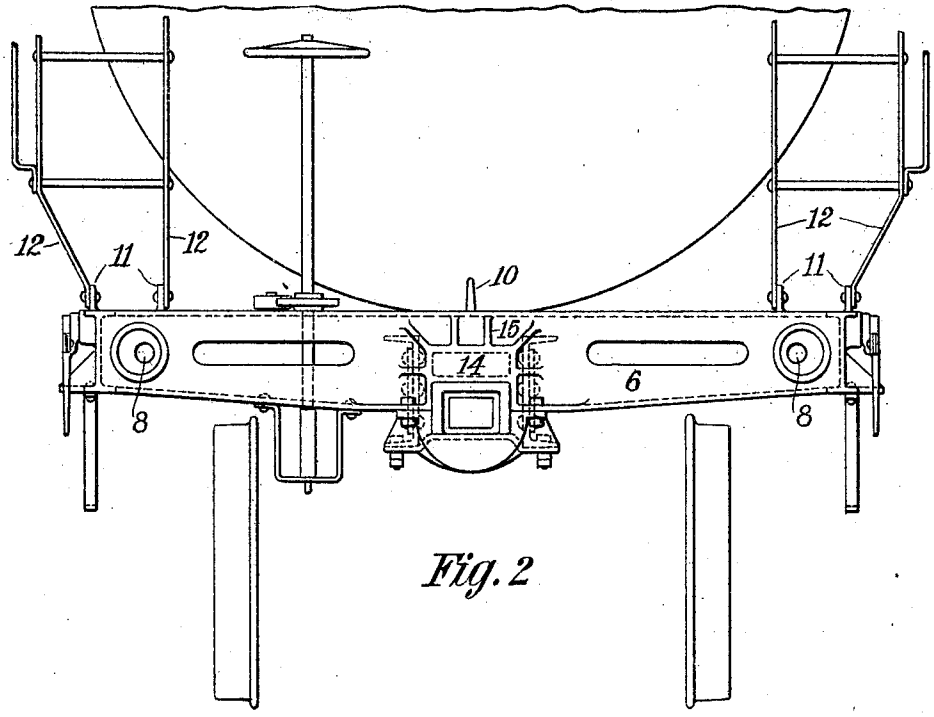
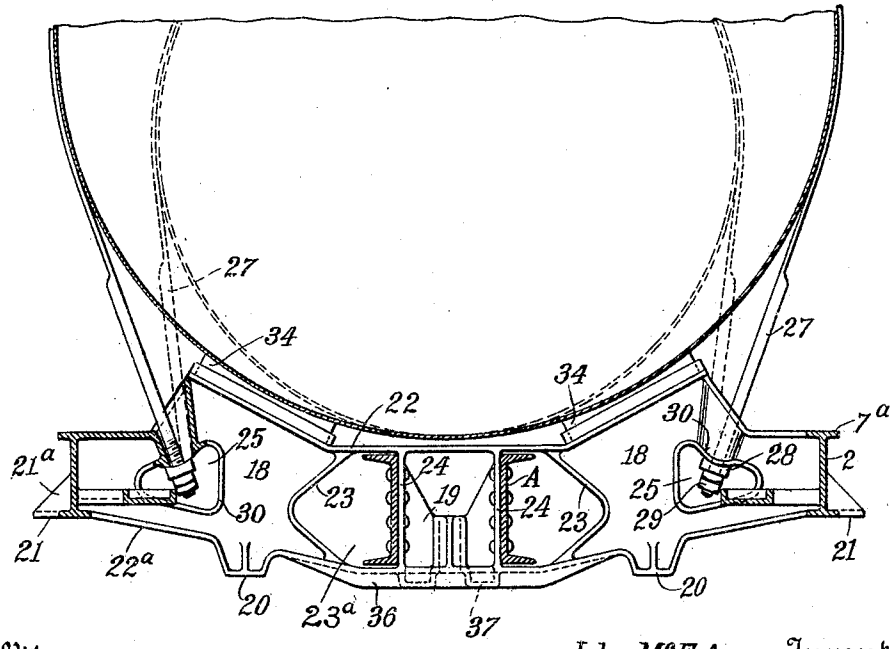



*Fig. 2*

*Fig. 3*

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3 SHEETS—SHEET 3.

Fig. 5

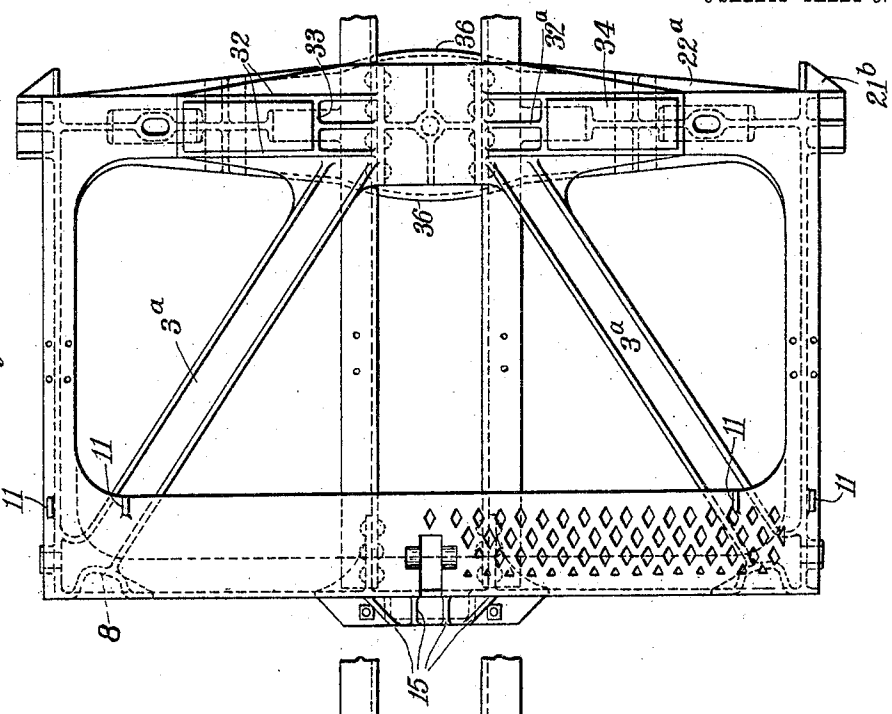
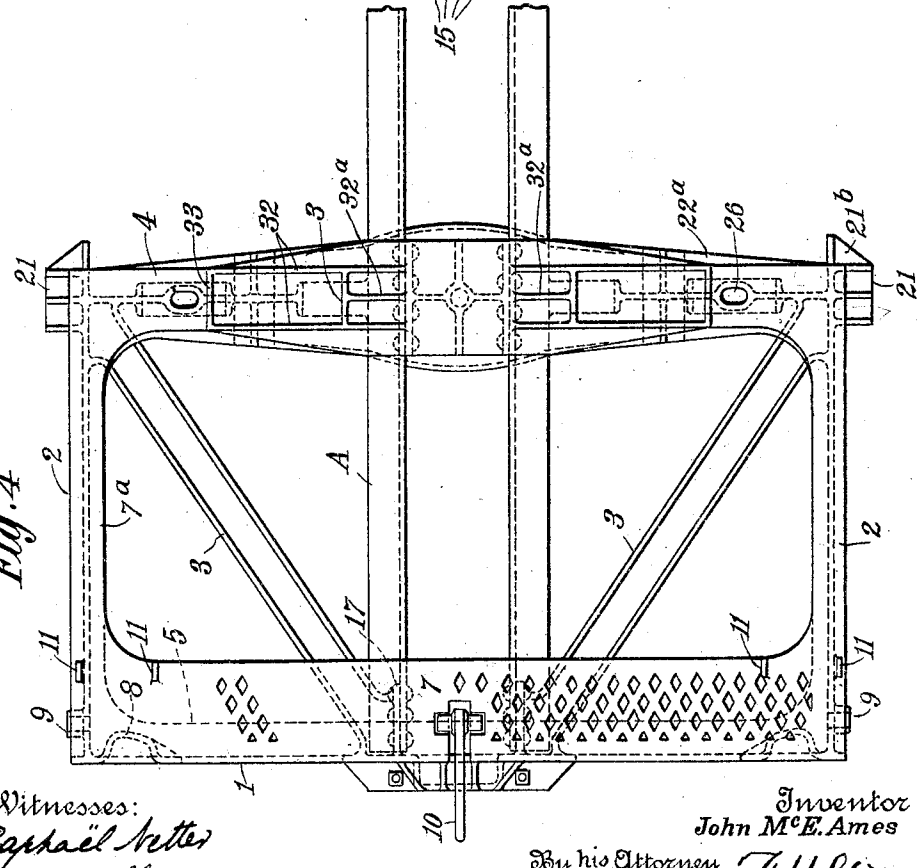



Fig. 4

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# UNITED STATES PATENT OFFICE.

JOHN McE. AMES, OF DONGAN HILLS, NEW YORK.

## UNDERFRAME FOR TANK-CARS.

No. 928,924. Specification of Letters Patent. Patented July 27, 1909.

Application filed August 6, 1908. Serial No. 447,201.

*To all whom it may concern:*

Be it known that I, JOHN McE. AMES, residing at Dongan Hills, Staten Island, New York, and being a citizen of the United States, have invented certain new and useful Improvements in Underframes for Tank-Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof will occur to persons skilled in the art.

In said drawings: Figure 1 is a composite view showing a central longitudinal sectional view of a tank car provided with my invention, at the left and at the right a side elevational view of the car with fragments of the body and underframe broken away; Fig. 2 is an end elevational view of the underframe with a fragment of the tank mounted thereon; Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1; Fig. 4 is a plan view of the end portion of an underframe including my invention; and Fig. 5 is a plan view of a slightly modified form thereof.

The object of the invention is to provide an underframe in which the end portion thereof including the end sills, bolsters, short side sills connecting the bolsters and end sills, and diagonal braces running from the bolsters to the end sills shall be all of one integral casting which is adapted to be connected with suitable commercially shaped center sills, which center sills extend preferably from end sill to end sill.

Referring to the parts, A A indicate center sills which in the present construction are formed of commercially rolled channels with their flanges disposed outwardly and extending as shown herein from end sill to end sill, though it is understood that any other arrangement of the center sills and any other shapes may be substituted therefor without departing from the spirit of the present invention.

B indicates a tank which is mounted on the combined body bolster and tank cradles.

C is a casting which is secured to the underside of the tank in such position and of such size as to extend downwardly between the center sills A.

D D are stop castings which are riveted to the center sills and are provided with depending flanges D′ which are adapted to contact with corresponding downwardly projecting flanges formed integral with the stop casting C before referred to.

The usual outlet valve E is provided for egress of fluids from the interior of the tank.

Referring particularly to the end portion of the underframe, 1 is the end sill, 2—2 are the short side sills and 3—3 are the diagonal braces which extend from the end sills to the bolsters 4.

The end sill is preferably of channel shape in cross section with the bottom flange 5, vertical web portions 6, and top flange 7 which top flange is wider than the bottom flange and extends transversely of the underframe, as shown in Figs. 4—5 so as to connect with the top flanges 7ª of the relatively I-shaped side sills 2 thereby forming a cover plate which is adapted to serve as an end platform.

Formed integrally with the web portion 6 of the end sill are push-pole pockets 8, while bearings 9 are also provided integral with the end casting, in which bearings 9 are carried the transversely extending rods—not shown—for operating an uncoupling device 10, best shown in Figs. 1 and 4.

Projecting upwardly from the plate 7 are lugs 11 with which are connected the vertical straps 12 of the end ladders which lead from the platforms or plate 7 to the running boards 13 which extend along the side of the tank above the middle line thereof, as best shown in Fig. 1.

Cast integral with the end sills are buffers 14 which are provided with radiating strengthening flanges 15.

The diagonal braces 3, shown in Fig. 4, extend from the middle portion of the end sill to the outer end portions of the bolsters and are provided at their outer ends with vertical flanges 17 with which said center sills are connected, while the rear end portions of said diagonal braces are connected with the webs of the side sills and with the

webs of said bolsters. This arrangement is slightly modified in Fig. 5, wherein the diagonal braces 3ª extend forwardly from the middle portions of the bolsters to just back of the push-pole pockets 8, thereby reinforcing the end sill at said push-pole pockets.

Referring to the bolster, it is to be observed that the bolster of this construction is preferably an integral casting comprising the web portions 18, center filler portion 19, side bearings 20, and jacking plates 21. Surrounding the web portions 18 is a multiform perimetrical flange 22 with intermediate connecting flanges 23 and 24, there being an opening provided in the body portion of the bolster between said flanges 23 and 24 for the passage of the center sills A, which center sills are riveted to the vertical flanges 24 which form in effect strut members uniting the upper and lower portions of said perimetric flanges 22, while the offset flanges 23 serve the same function in strengthening the bolster.

At each side of the middle portion of the bolster there is provided a flanged opening 25 to which leads from above a frustoconical shaped opening 26 adapted to receive the tank bands 27 and as this underframe is intended to be used with tanks of different diameters it is desirable that the openings 26 shall be wider at the top than at the bottom to accommodate the tank bands used to anchor tanks of different diameters upon the underframe.

For a better understanding of the function of the conical openings 26, I have shown in full and dotted lines in Fig. 3, two tanks of different diameter with tank bands entering the openings 26. These tank bands project through the openings 26 and into the transversely extending openings 25 wherein washers 28 and nuts 29, or any equivalent locking means, are provided upon the ends of the tank bands to anchor them in position.

It is to be observed that the upper portion of the flange 30 surrounding the openings 25 is slightly convex to afford a better seat for the said washers.

Referring to Figs. 4 and 5, it is to be noted that there are flanges 32 extending longitudinally of the intermediate portions of the top of the bolster which with transversely extending flanges 33 serve to form sockets for the tank supporting timbers 34, shown in Fig. 3, there being longitudinal extensions of the flanges or ribs 32 between the inner end portions of said timber sockets and the part of the bolster which lies outside of the center sills, and there being an intermediate pair of ribs 32ª between the ribs 32 thereat.

The under side of the bolster is provided with flanges 22ª which extend from the side sill bottom flanges across the lower face of said bolster, while down-turned flanges 36 between the side bearings 20 are integral with the flanges 22ª.

It is to be noted that the bottom portion of the bolster between the down-turned flanges 36 is wider than at the ends and between these flanges 36 there is provided an integral cast center bearing member 37 below the center filler 19 which coöperates with said center filler 19 and its radiating and transverse ribs to strengthen the central part of the bolster.

The jacking plate for casting 21 is provided with a plurality of obliquely disposed ribs 21ª and has a rearward extension 21ᵇ, as best shown in Figs. 4 and 5, said rearward extension projecting beyond the bolsters 4.

Between the flanges 23 and 24 are exaggerated openings 23ª in the bolster, through which pass the center sills A. These openings 23ª are about 12 inches wide and about 15 inches high in the bolsters already manufactured and are adapted to permit the passage of 15 inch center sills through the bolster after the draft lugs, not shown, are secured to said center sills and also provide a sufficient space for the insertion of riveting tools after the center sills are placed in position whereby power actuated tools may be used to rivet the center sills to the sill flanges 24 of the bolster. To accomplish this it is necessary that the opening 23ª be wider than the center sills passing therethrough, as shown in Fig. 3, thereby providing space to permit lateral movement of the center sills in said opening 23ª.

What is claimed as new is:—

1. In a metal underframe, a cast bolster comprising a perimetric flange with longitudinally separated web portions and sill connection vertical flanges separated from said web portions, integral end sills and short side sills and separately formed center sills extending to said end sill.

2. In a metal underframe, a cast bolster comprising a perimetric flange with longitudinally separated web portions and sill connection vertical flanges separated from said web portions, integral end sills and short side sills and separately formed center sills extending through said bolster to said end sill and riveted to said vertical flanges.

3. In a metal underframe, a cast bolster comprising a perimetric flange with longitudinally separated web portions and sill connection vertical flanges separated from said web portions, integral end sills and short side sills and separately formed center sills extending through said bolster to said end sill and riveted between said vertical flanges and said web portions.

4. In a metal underframe, a cast bolster comprising a perimetric flange with longitudinally separated web portions and sill connection vertical flanges separated from

said web portions, integral end sills and short side sills and separately formed center sills formed of continuous flanged members of channel shape extending from end sill to end sill.

5. In a cast metal car underframe, an integral bolster, an end sill and side sills extending from bolster to end sills with a vertically disposed flange at two sides of the middle of said bolster and separately formed draft sills connected with said vertical flanges and with said end sill.

6. In a cast metal car underframe, an integral end sill, bolster and short side sills, said bolster having longitudinally extending timber sockets therein.

7. In a cast metal car underframe, an integral end sill, bolster and short side sills, said end sill being of relatively channel shaped section and having a wide upper flange adapted to serve as an end platform.

8. In a cast metal car underframe, an integral end sill, bolster and short side sills, said end sill being of relatively channel shaped section with integral push-pole pockets and diagonal braces from near said pockets to said bolster.

9. In a tank car, an underframe comprising a pair of cast bolsters connected with cast end sills by integral side sills with center sill connection flanges integral with said bolster, center sills, a casting with flanges projecting between said center sills, stop members secured to said center sills forwardly and rearwardly of said flanged casting and a tank secured to said flanged casting.

10. In a tank car underframe, an integral bolster, side sills and end sill with longitudinally disposed tank bearing sockets in the upper face of said bolster.

11. In a tank car underframe of cast metal, an integral end sill, side sills, combined body bolster and tank cradle, sill connection flanges forming part of said bolster and separately formed center sills secured to said flanges.

12. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said end sill having integral push-pole pockets formed therein.

13. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said end sill being provided with a relatively wide upper flange serving as a car end platform.

14. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said end sill having bearings integral therewith for an uncoupling rod.

15. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, and diagonal braces connecting said end sill and bolster.

16. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said side sills being relatively I-shaped in transverse section.

17. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said tank cradle having longitudinally extending timber pockets therein.

18. In a tank car underframe of cast metal, an integral end sill, side sills and combined body bolster and tank cradle, said tank cradle being reinforced by a bolster center bearing with side flanges serving as struts and center sill connection means.

19. In an end framing of cast metal, a channel shaped end sill with integral push-pole pockets and a flanged buffer, relatively I-shaped side sill members and a bolster with tank band openings through its upper portion.

20. In an end framing of cast metal, a channel shaped end sill with integral push-pole pockets and a flanged buffer, relatively I-shaped side sill members and a bolster with tank band openings through its upper portion, said openings being relatively conical.

21. In an end framing of cast metal, a channel shaped end sill with integral push-pole pockets and a flanged buffer, relatively I-shaped side sill members and a bolster with tank band openings through its upper portion, said openings being wider at their upper portion.

22. In an end framing of cast metal, a channel shaped end sill with integral push-pole pockets and a flanged buffer, relatively I-shaped side sill members and a bolster with tank band openings through its upper portion, and transverse openings through the webs of said bolster below the first mentioned openings.

23. In a car underframe of cast metal, an integral end sill, side sills, diagonal braces from end sills rearwardly to the bolster and a bolster with separated web portions and multiform flange and provided with vertical flattened strut members serving as center sill connecting means, said center sills comprising separately formed shapes.

24. In a car underframe comprising a cast metal end sill, side sills and bolster in one piece, flanged longitudinally extending timber sockets at the upper part of said bolster with downwardly extending flanges forwardly and rearwardly of said bolster and having a center bearing on the under side of said bolster.

25. In an integrally formed car underframe end portion of cast metal, an end sill, side sills and a bolster with vertical and transverse meeting perforations.

26. In an integrally formed car underframe end portion of cast metal, an end sill, side sills and a bolster with vertical and transverse meeting perforations and intermediate web portions.

27. In an integrally formed car underframe end portion of cast metal, an end sill, side sills and a bolster with vertical and transverse meeting perforations, and separated web portions with flanges substantially surrounding said web portions.

28. In a car underframe end portion of cast metal, an end sill, side sills and a bolster with vertical and transverse meeting perforations, with separated web portions having perimetrical flanges and intermediate vertical flanges serving as sill connection means.

29. In a car underframe end portion of cast metal, integral end sills, side sills and bolster, said bolster being of greater elevation at its intermediate portions than at its ends or middle portion.

30. In a car underframe end portion of cast metal, integral end sills, side sills and bolster, said bolster being of greater elevation at its intermediate portions than at its ends or middle portion and being provided with depending flanges extending longitudinally of its middle portion.

31. In a car underframe end portion of cast metal, integral end sills, side sills and bolster, said bolster being of greater elevation at its intermediate portions than at its ends or middle portion and having a multiform flange at its lower side.

32. In a car underframe end portion of cast metal, integral end sills, side sills and bolster, said bolster being of greater elevation at its intermediate portions than at its ends or middle portion, the bolster having a multiform flange and an integral laterally extending jacking flange.

33. In a car underframe end portion comprising an integral casting, an end sill, flanged side sill members, flanges for connection with center sills, a flanged bolster with separated openings therethrough and vertically disposed strut flanges in said bolster adapted for connection with center sills.

34. In a car underframe end portion comprising an integral casting, an end sill, flanged side sill members, the end sill having flanges for connection with center sills, a flanged bolster with separated openings therethrough and a center filler member comprising a pin seat with vertically disposed flanges at each side thereof adapted for connection with center sills.

35. In a car underframe, a cast end portion comprising a bolster which is relatively deeper at each side of its middle portion than at its ends and has cast side sills and diagonal braces extending forwardly from the bolster to end sills of cast metal.

36. In a car underframe, a cast end portion comprising a bolster which is relatively deeper at each side of its middle portion than at its ends and has cast diagonal braces extending forwardly therefrom to end sills of cast metal, center sills connected to said end sills, said bolster having an intermediate strut portion for connection with center sills and a pin bearing within said strut portion.

37. In a cast end portion of a car underframe, a bolster forming a tank cradle and having cradle timber pockets extending longitudinally of the upper face of said bolster.

38. In a cast end portion of a car underframe, a bolster forming a tank cradle and having conical openings therein for the reception of tank bands.

39. In a cast end portion of a car underframe, a bolster forming a tank cradle and having openings therein to receive tank bands, said openings being wider at their upper portion than at the lower portion.

40. In a cast end portion of a car underframe, a bolster forming a tank cradle and having integral center bearing and jacking plates.

41. In a cast end portion of a car underframe, a bolster forming a tank cradle and having integral side bearings and jacking plates and with longitudinally extending flanges between said side bearings.

42. In a cast end portion of a car underframe, a bolster forming a tank cradle and having an end platform connected with said bolster by integral diagonal braces.

43. In a cast end portion of a car underframe, a bolster forming a tank cradle and having side sills and end sills of flanged shape with center sill connection flanges integral with said end sill.

44. In a cast end portion of a car underframe, a bolster forming a tank cradle and having side sills and end sills of flanged shape with push-pole pockets and bearings for an uncoupler rod integral with said end sill.

45. In a cast end portion of a car underframe, a bolster forming a tank cradle and having longitudinal flanges on its upper face with transverse flanges forming sockets thereon.

46. In a cast end portion of a car underframe, a bolster forming a tank cradle and having curved longitudinal flanges along its lower side and straight longitudinal flanges on its upper face.

47. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills connected by an integral platform plate.

48. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills con-

nected by an integral platform plate and diagonal braces between said bolster and end sill.

49. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills connected by an integral platform plate, said end sills having a top flange connected with the side sills and forming a platform plate and having a bottom flange to aid in supporting separately formed center sills.

50. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills connected by an integral platform plate, said end sills having horizontal and vertical flanges respectively as strengthening means and for connection with center sills.

51. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills connected by an integral platform plate, said end sill and side sills being provided with an end platform flange.

52. In a car underframe end portion of cast metal, a combined bolster and tank cradle having cradle timber pockets in its upper face, with end sills and side sills connected by an integral platform plate, said end sills and side sills being provided with a transversely extending platform flange and having ladder connection means thereon.

53. In a car underframe, a bolster comprising a center filler member provided with longitudinally disposed sill attaching flanges extending forwardly and rearwardly of a pin opening in said filler member, with center sill openings at each side of said filler member and center sills projected through said sill openings, said openings being sufficiently wider than said sills to permit movement of said sills transversely of the car and said sills being secured to said sill attaching flanges.

54. In a car underframe an integral bolster comprising web portions and a center filler member provided with longitudinally disposed sill attaching flanges extending forwardly and rearwardly of a pin opening in said filler member, with exaggerated openings between the webs and the flanges of said filler member of sufficient width to permit of the passage through said openings of center sills longitudinally and permit subsequent movement of said center sills in said openings transversely of the car, for attachment to said sill attaching flanges.

55. In a car underframe, the combination comprising center sills and a bolster, said bolster having a center filler and separated web portions, there being an exaggerated opening in said bolster at each side of said center filler to permit machine riveting of said sills to said filler.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN McE. AMES.

Witnesses:
FRANK V. COOPER,
F. H. GIBBS.