Jan. 2, 1923.

1,440,637

V. E. SISSON.
RAILWAY CAR.
ORIGINAL FILED OCT. 17, 1917.

3 SHEETS-SHEET 1

Fig. 1.

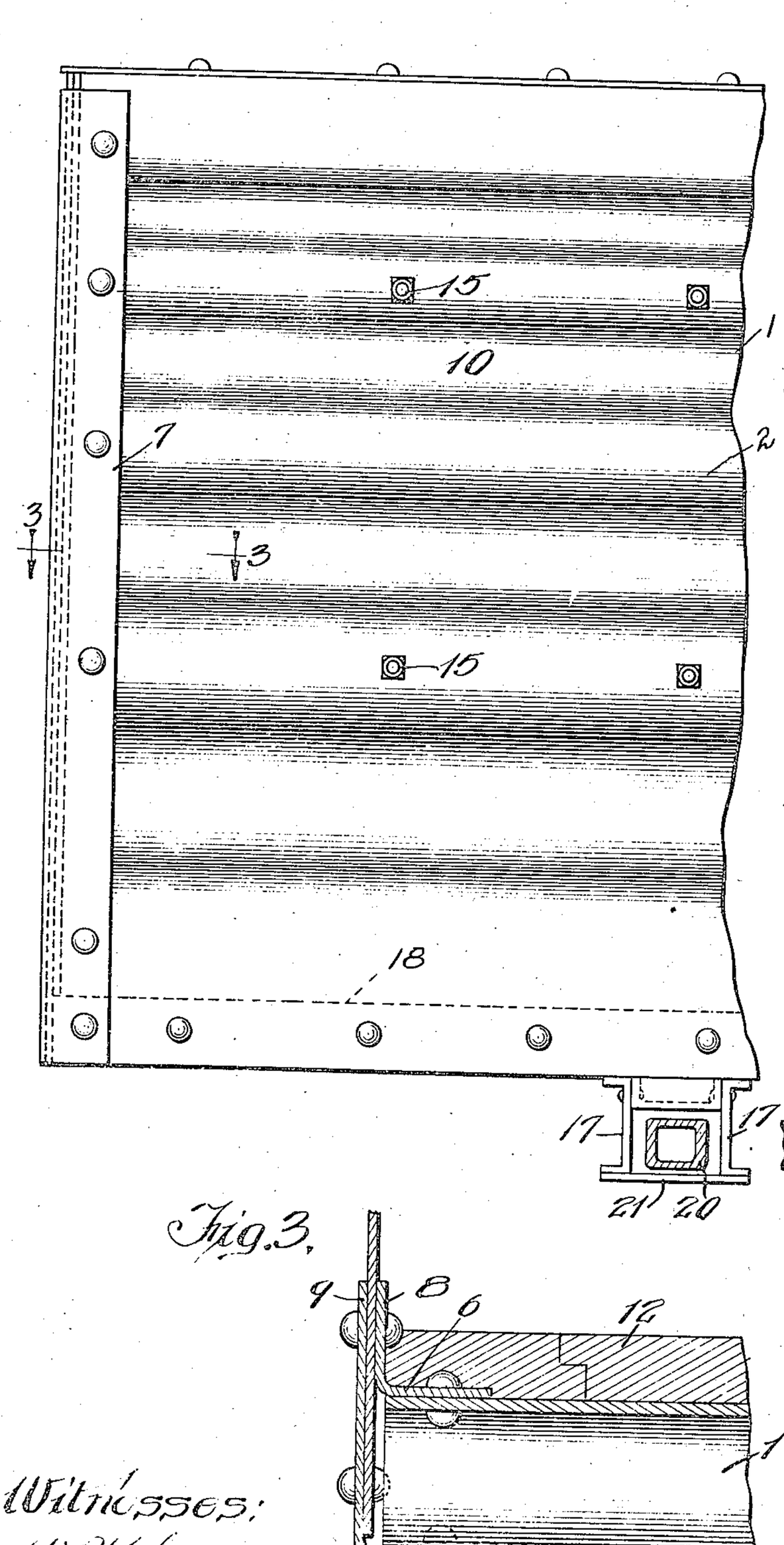

Fig. 2.

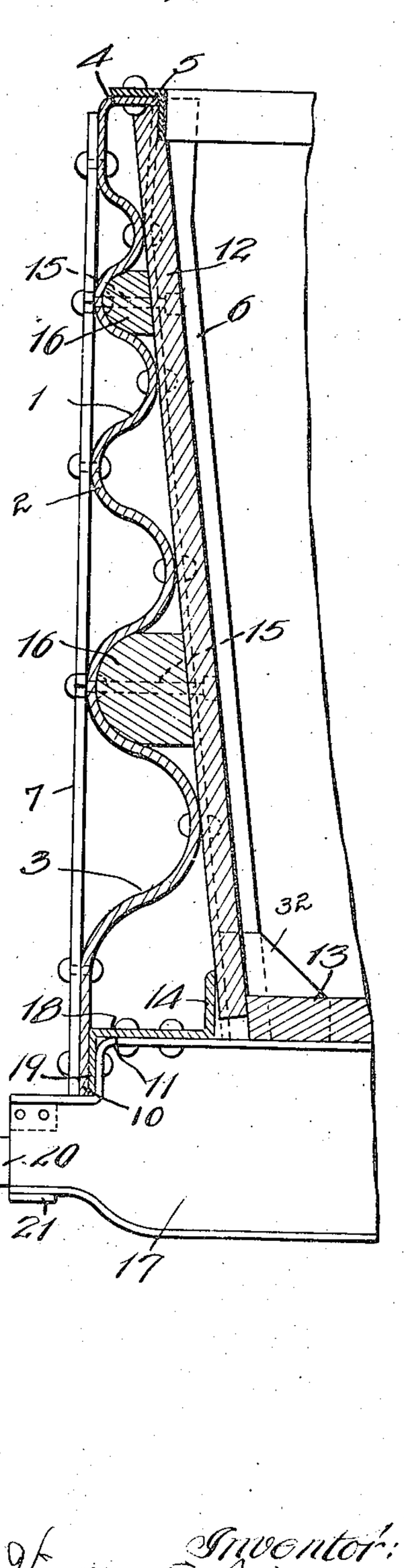

Fig. 3.

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3 SHEETS-SHEET 2

Fig. 4.

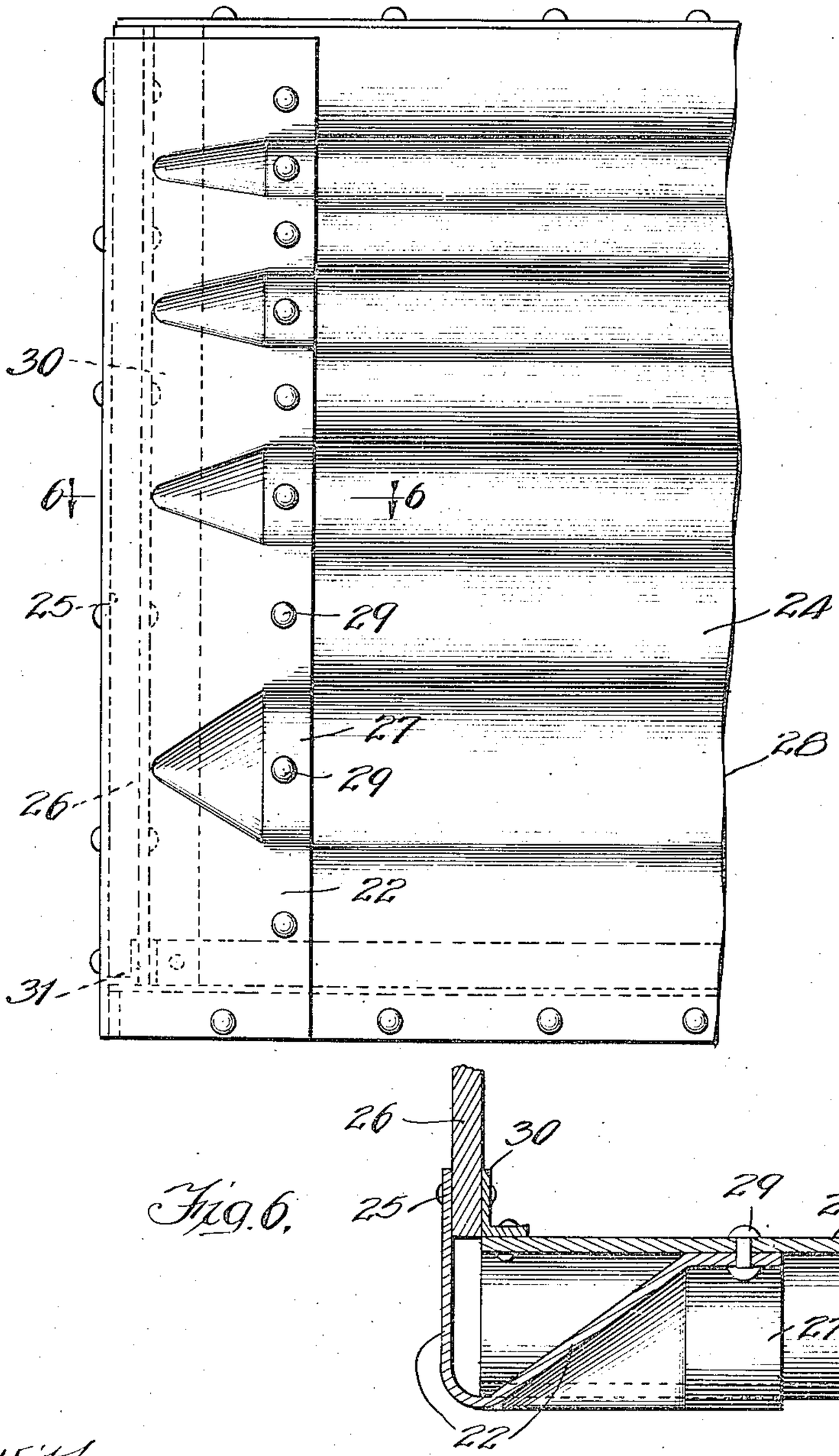


Fig. 5.

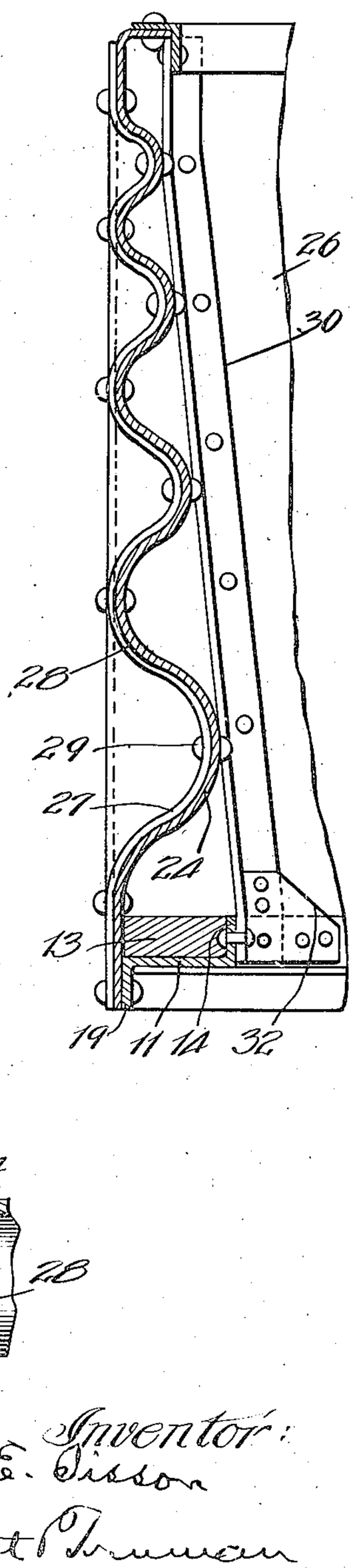
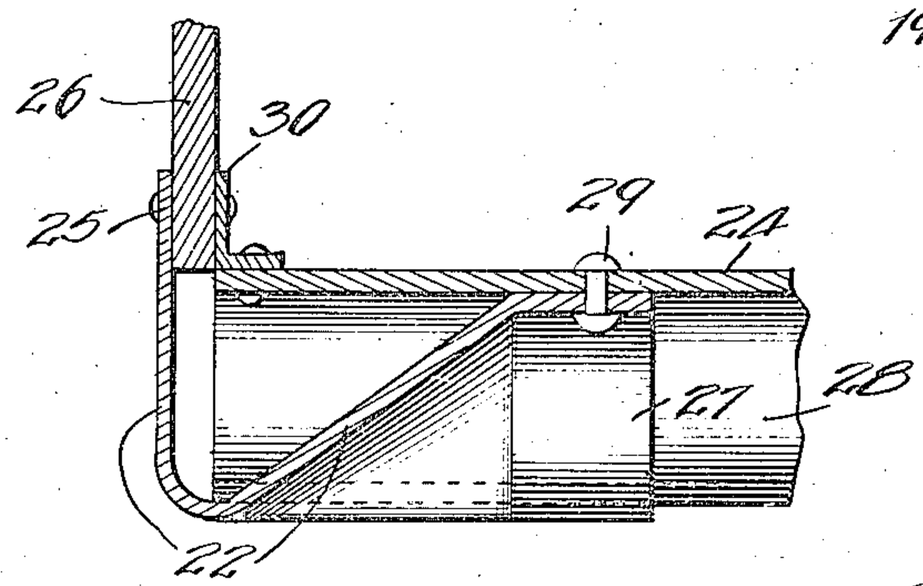


Fig. 6.



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RAILWAY CAR.
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3 SHEETS-SHEET 3

Fig. 7.

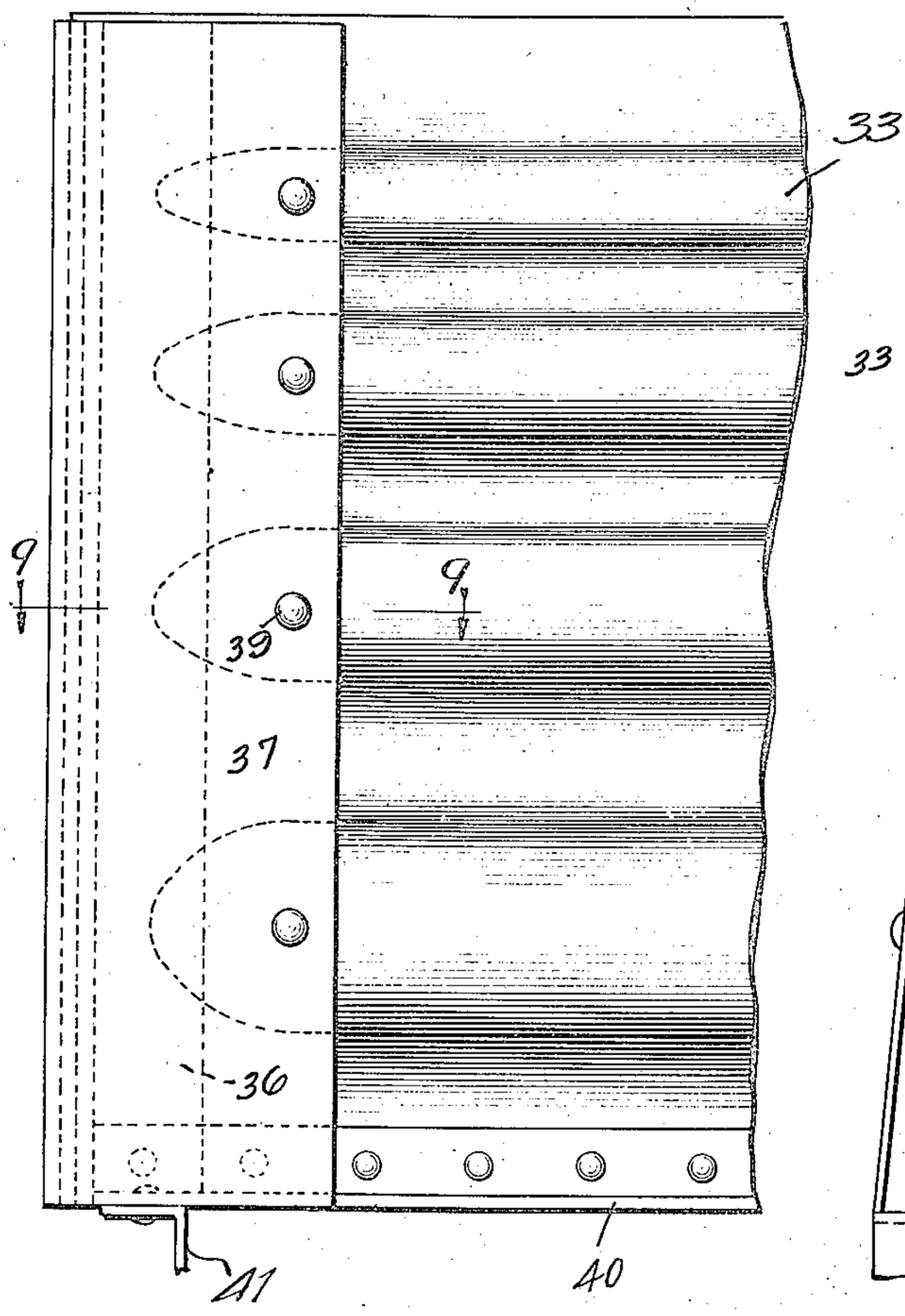


Fig. 8.

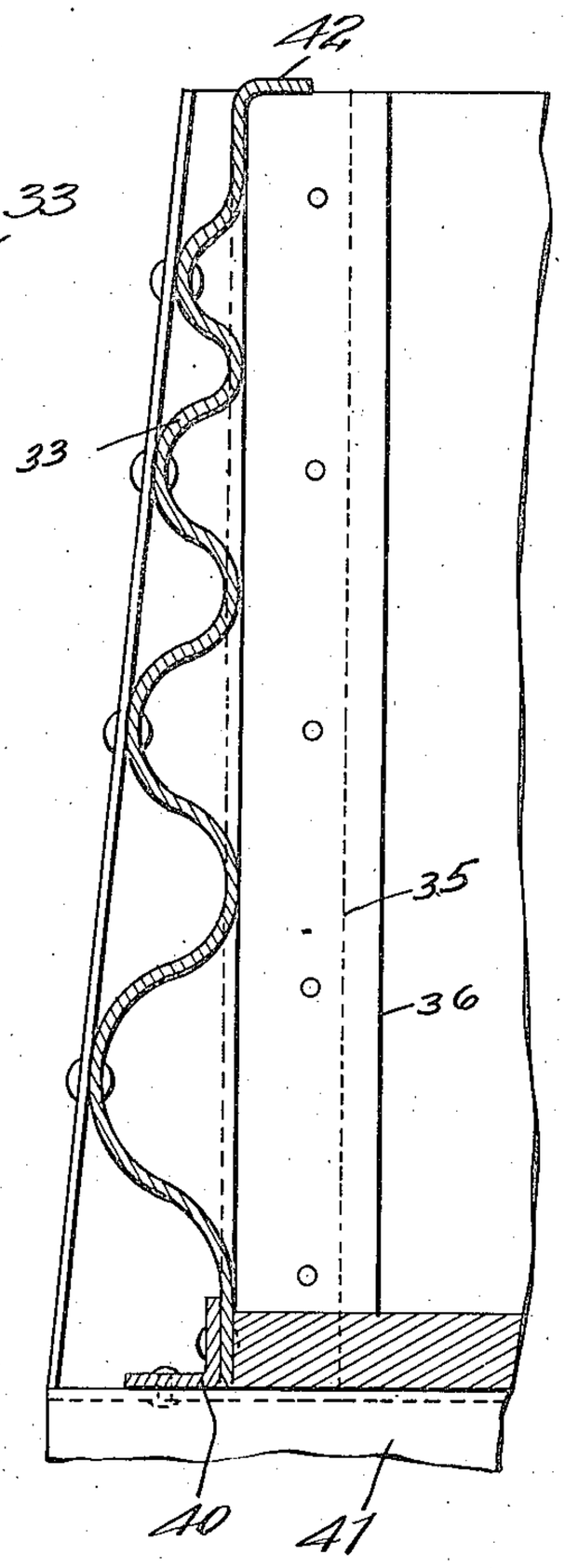


Fig. 9.

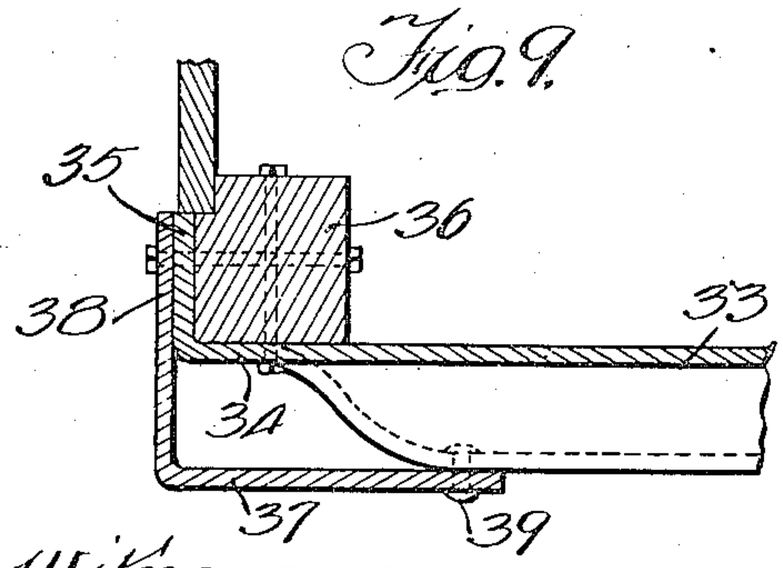
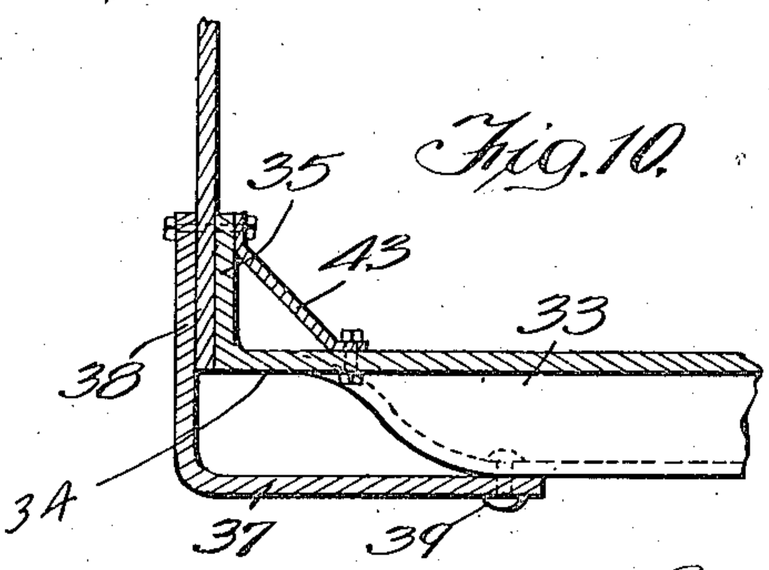


Fig. 10.



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Patented Jan. 2, 1923. 1,440,637

UNITED STATES PATENT OFFICE.

VINTON E. SISSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO WALTER P. MURPHY, OF CHICAGO, ILLINOIS.

RAILWAY CAR.

Application filed October 17, 1917, Serial No. 197,107. Renewed May 31, 1921. Serial No. 473,779.

To all whom it may concern:

Be it known that I, VINTON E. SISSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway Cars, of which the following is a specification.

My invention relates to railway cars, particularly cars of the gondola type although applicable to other types of cars, and has for its object to provide a new and improved car end structure which will be inexpensive to manufacture and which will have the necessary strength and rigidity to withstand the various stresses to which car ends are subjected when in service. Where the contents of a car consist of material in bulk, such as coal or crushed stone, for example, the greatest stress imposed on the car end is in the region of the lower half of the end. This portion of the car end is also subjected to severe stresses incident to the cargo thrust due to the sudden starting or stopping of the car, particularly when the cargo consists of heavy movable objects such as railroad rails or car wheels. Accordingly it is an object of my invention to provide a car end structure which is so formed and reinforced as to be strongest in the region of greatest stress. My invention also contemplates the provision of a suitable lining which cooperates with the other elements of the end structure so as to reinforce the same.

My invention consists in the novel arrangement, construction and combination of parts hereinafter described and claimed for carrying out the above stated objects and such other incidental objects as will appear from the following description.

My invention is illustrated, in certain preferred embodiments, in the accompanying drawings, wherein

Fig. 1 is an elevation of my end structure applied to a gondola car.

Fig. 2 is a vertical section thereof.

Fig. 3 is a horizontal section on line 3—3 of Fig. 1.

Fig. 4 is an end elevation of a gondola car having a modified form of end structure.

Fig. 5 is a vertical section thereof.

Fig. 6 is a horizontal section on line 6—6 of Fig. 4.

Fig. 7 is another modification of my end structure as applied to a gondola car.

Fig. 8 is a vertical section thereof.

Fig. 9 is a horizontal section on line 9—9 of Fig. 7, and

Fig. 10 is a section similar to that shown in Fig. 9 showing a modified form of end post.

Like characters of reference indicate like parts in the several figures of the drawings.

Considering first Figs. 1 to 3 inclusive, of the drawings, 1 is an end panel consisting, in the embodiment of the invention shown, of a single sheet having a series of horizontally disposed corrugations 2 running from edge to edge of the sheet. The corrugations preferably increase in depth uniformly from the top to the bottom of the sheet, as shown at 3 in Fig. 2, so as to provide the greatest strength at the lower part of the end. The upper edge of the sheet is bent inwardly to provide a horizontal flange 4 which is riveted to an angular end plate reinforcing member 5 which runs across the top of the car. The ends of said reinforcing member are preferably bent at the corners of the car and secured to the side walls thereof. The vertical edges of the sheet are secured to the car body between pairs of angular attaching members 6 and 7. As shown in Fig. 3, these attaching members are provided with flanges 8 and 9 which are riveted to opposite faces of the side sheet or to the car body, as the case may be. The margins of the end sheet extend between the attaching members and for this purpose the inner attaching members 6 are inclined so as to contact with the inner portions of each corrugation. The attaching members are preferably riveted to the end sheet at several points of contact, that is, at the corrugations as shown, so as to provide, in effect, a restrained beam. The lower portion of the end sheet is provided with a flat margin 10 which is riveted to the Z-bar end sill 11, as shown in Figs. 1 and 2.

In this construction I have shown the end provided with a wooden lining consisting of boards 12 extending at right angles to the corrugations 2. The upper ends of the boards extend back of the angular reinforcing member 5 and the lower ends of said boards fit into a groove provided between the flooring 13 and the vertical flange 14 of the Z-bar 11. If desired, the lining may be further secured to the end sheet by means of bolts 15 which pass through the filler blocks 16 and end sheet 2. It will

be observed that by attaching the lining to the end sheet in this manner the end is insured against leakage between the corrugated edges and the attaching members, and is also reinforced in a manner to prevent the corrugations from spreading, intermediate their ends, under strains due to the cargo thrusts. It will also be noted that the lower edge of the lining bearing against the Z-bar end sill will transmit a certain portion of the stress due to cargo thrusts directly to the end sill. 17, 17 designate the draft sills of the car which are preferably channel-shaped in cross-section and are riveted to the horizontal web 18 and downwardly projecting flange 19 of the Z-bar 11. The coupler 20 may be supported in any suitable manner between the draft sills, for example, by means of the metal strip or coupler carrier iron 21 secured to the lower horizontal flanges of the draft sills.

In Figs. 4, 5 and 6, I have shown a modified form of end construction in which the outer attaching members 22 are corrugated so as to fit the corrugations in the end sheet 24. In this modification the outer attaching members 22 are provided with flanges 25 secured to the car sides 26 in much the same manner as shown in Figs. 1, 2 and 3. The other portions of the members 22 overlap the side margins of the end sheet at 27 and, as stated, are corrugated to fit the corrugations 28. The end sheet and attaching members are preferably riveted at each corrugation by rivets 29. The inner attaching members 30 are secured to the inner face of the side sheet, as shown in Fig. 6. These attaching members may be made either straight, contacting with the end sheet only at the inmost points of the corrugations, or they may, if desired, be corrugated as in the case of the outer attaching members. The end sheet 24 is secured to the car body along its upper and lower edges in the same manner as shown in Figs. 1, 2 and 3. The lower end of the inner attaching members 30 are preferably secured to the side sills 31 by means of the gussets 32. In this construction it will ordinarily be unnecessary to use a lining to prevent leakage between the ends of the corrugations and the attaching members as all joints are tightly closed by means of the corrugations in the attaching member. It will be obvious, however, that this construction could be reinforced, if desired, by the use of a lining substantially the same as that illustrated in Figs. 1, 2 and 3. I do not make specific claim herein to the form of the invention shown in Figs. 4, 5 and 6 as this modification forms the subject matter of a divisional application filed June 9, 1922, Serial No. 567,019.

In the modification shown in Figs. 7 to 10 inclusive, the ends of the corrugations in the end sheet 33 terminate within the edges of the sheet, thus leaving a flat margin 34 along the vertical edges of the sheet. The marginal portions are preferably bent at right angles to the body of the sheet to provide angular attaching flanges 35 which are secured to the corner posts 36. In this construction I also preferably provide angular attaching and stiffening members 37, the flanges 38 of which are secured to the corner posts. It will be seen from Fig. 8 that in this construction the corrugations, increasing uniformly in depth, extend outwardly from the plane of the car end. Accordingly the attaching members 37 must be constructed with the flanges 38 wider at the bottom than at the top in order to properly secure the margins of the end sheet to the car. The lower edge of the sheet is riveted to the end sill 40 which, in turn, is secured to the side sills 41 and draft sills (not shown) in any suitable manner. The upper edge of the end sheet is provided with a horizontal flange 42 extending across the top of the car and secured thereto.

In the modification shown in Fig. 10, I use a modified form of corner post 43. This is in the nature of a gusset stay which extends to the height of the car side and is riveted to the end sheet and to the side sheet and attaching flanges.

In the modifications shown in Figs. 7 to 10, leakage is prevented by the flat margins extending along the sides and bottom of the sheet in a manner to provide a tight joint between the sheet and the car sides and bottom. The construction shown in Figs. 7 to 10, inclusive, is not claimed specifically herein as it is the subject matter of a divisional application filed April 18, 1921, Serial No. 462,147.

In the drawings I have shown an end sheet in which the corrugations merge one into the other and increase in depth from the top to the bottom. This is for the purpose of increasing the strength of the end sheet at the bottom, or near the bottom, where the greatest stress is imposed due to cargo thrusts caused by shifting of the contents of the car, and also due to internal pressure which is in the nature of a hydrostatic pressure formed by contents of the car which are not self sustaining as, for instance, coal or ore.

I claim:

1. In an end structure for railway cars, a metal end sheet having a series of horizontal corrugations of varying depth, the deeper corrugations being near the floor of the car.

2. In an end structure for railway cars, a metal sheet having a series of horizontal corrugations therein, the depths of which increase from the top to the bottom of the sheet.

3. In a gondola car, a sheet metal end structure having therein horizontal corru-

gations of varying depth and width, the deeper corrugations being near the floor of the car.

4. In a gondola car, a sheet metal end structure having therein a series of horizontal corrugations, the depths of which increase from the top of said structure to the bottom thereof.

5. In a gondola car, a sheet metal end structure having a plurality of corrugations formed therein which are each of substantially uniform cross section from end to end and which merge into one another, the depths of said corrugations increasing from the top of the structure to the bottom thereof.

6. In a gondola car, an end sheet having a plurality of horizontal corrugations therein which merge into one another and which progressively increase in depth from the top of said sheet toward the bottom.

7. In an end structure for railway cars, the combination with an end sheet having horizontal corrugations therein increasing in depth toward the bottom of the sheet, of means for attaching said sheet to the car comprising flanges extending at an angle to the sheet and overlapping the respective sides of the car.

8. In an end structure for railway cars, the combination with an end sheet having horizontal corrugations therein increasing in depth toward the bottom of the sheet, of separately formed attaching members overlapping the margins of the sheet and having flanges thereon secured to the body of the car.

9. The combination with a gondola car, of a metal end sheet formed with transverse corrugations therein increasing in depth toward an edge of the sheet, and pairs of angular attaching members one pair at each side of the sheet between which said sides are fastened.

10. The combination in a gondola car, of an end sheet flanged at its upper edge and having horizontal corrugations formed therein and increasing in depth toward the bottom thereof, pairs of converging angular attaching members overlapping the respective sides of the sheet and between which said sheet is secured, and a marginal reinforcing member secured to the flange on said sheet and running across the car.

11. The combination in a gondola car, of a sheet metal end structure flanged at its upper edge and having transverse corrugations formed therein which increase in depth toward the bottom thereof, pairs of converging angular attaching members overlapping the respective sides of the sheet and between which said sheet is secured, and an angular reinforcing member running across the top of said car and secured to the flange on said sheet.

12. The combination in a gondola car, of an end sheet flanged at its upper edge and having transverse corrugations formed therein the depth of which increases toward the bottom of the sheet, pairs of angular attaching members overlapping the respective sides of the sheet and between which said sheet is secured, and an end plate to which the upper flanged edge of said sheet is fastened.

13. The combination, in a gondola car, of an end structure having horizontal corrugations formed therein which increases in depth toward the bottom of said sheet, pairs of angular attaching members overlapping the respective sides of said structure and between which said structure is secured, and an end plate running across the top of the car to which the upper edge of said structure is attached.

14. The combination, in a gondola car, of a metal end structure having corrugations therein which increase in depth toward the bottom thereof, pairs of attaching members overlapping the respective sides of the sheet and between which said structure is fastened, an end plate and a Z-bar end sill to which said sheet is secured, and a lining attached at intervals to said structure and extending across the car.

15. The combination with a gondola car, of an end sheet secured thereto and formed with corrugations extending inwardly from the plane of the car end and increasing in depth toward the bottom of said sheet and angular attaching members overlapping the margins of said sheet and having flanges thereon secured to the body of the car.

16. A car wall construction comprising a sheet metal panel formed with corrugations which extend to an edge of the same, and means for fastening said panel to the car framing comprising a member having a flat surface extending along said edge and secured at intervals to the ends of said corrugations.

17. The combination with a gondola car, of an end structure comprising an end sheet formed with corrugations which extend to the edges of the sheet and increase in depth from top to bottom of said sheet, a pair of attaching flanges provided with side flanges secured to the car body between which the corrugated edge of said sheet is secured.

18. An end structure for gondola cars comprising a sheet metal panel extending across the end of the car and formed with corrugations which run to opposite edges of the panel and progressively increase in depth from top to bottom thereof, and pairs of angular attaching members, one pair of each of said edges between which said edges are fastened.

19. In a gondola car, a sheet metal panel having horizontal corrugations running to

opposite edges thereof increasing in depth toward an edge of the sheet, and pairs of attaching members, one pair at each side of said sheet which overlaps said edges on both sides thereof and to which said edges are fastened so that the corrugations form in effect beams fixed at the ends.

20. In a gondola car, an end sheet having a plurality of horizontal corrugations formed therein and extending to the edges of the sheet which merge one into the other and which progressively increase in depth from the top of said sheet toward the bottom.

21. The combination with a gondola car, of a metal end sheet formed with transverse corrugations therein of varying depths, and a pair of attaching members for securing said sheet to the car comprising angular members which overlap said corrugations and are secured at intervals thereto so that the corrugations form in effect restrained beams.

22. The combination with a gondola car, of a metal end sheet formed with transverse corrugations therein which extend to the edges of the sheet, and a pair of attaching members for securing said sheet to the car comprising angular members having straight edges which overlap said corrugations and are secured at intervals thereto.

23. The combination with a gondola car, of a metal end sheet formed with transverse corrugations therein which extend to the edges of the sheet and increase in depth toward the lower edge of said sheet, and a pair of attaching members for securing said sheet to the car comprising angular members which overlap said corrugations and are secured at intervals thereto.

24. The combination with a gondola car, of a metal end sheet formed with transverse corrugations which extend to the edges of the sheet and increase in depth toward the lower edge of said sheet, and pairs of flat, angular attaching members, one pair at each side of the sheet which overlap and are secured to said corrugations.

25. The combination, in a gondola car, of an end structure having horizontal corrugations formed therein which extend to the edges of the sheet and increase in depth toward the bottom of said sheet, pairs of angular attaching members overlappisg the respective sides of the car and between which said structure is secured, and an angular rigidifying member extending from side to side of the car to which the upper edge of said structure is attached.

26. The combination, in a gondola car, of an end structure having horizontal corrugations formed therein which extend to the edges of the sheet and increase in depth toward the bottom of said sheet, pairs of angular attaching members overlapping the respective sides of the car and between which said structure is secured, and an angular, rigidifying member extending from side to side of the car and secured to the upper edge of said sheet and to said attaching members and side wall structure, respectively.

27. The combination, in a gondola car, of a metal end structure having corrugations therein which increase in depth toward the bottom thereof, pairs of attaching members overlapping the respective sides of the car between which said structure is fastened, an end plate and a Z-bar end sill to which said sheet is secured, and a lining attached at intervals to said structure and adapted to bear against said Z-bar.

28. The combination, in a gondola car, of a metal end structure having corrugations therein which increase in depth toward the bottom thereof, inner and outer angular attaching members overlapping the respective sides of the car and between which said structure is fastened, an angular rigidifying member extending along the upper edge of the sheet, a Z-bar end sill to which said sheet is secured, and a lining attached at intervals to said structure and adapted to bear against said inner attaching members and Z-bar.

29. The combination, in a gondola car, of a metal end structure having corrugations therein which increase in depth toward the bottom thereof, inner and outer angular attaching members overlapping the respective sides of the car and between which said structure is fastened, an angular rigidifying member extending along the upper edge of the sheet, a Z-bar end sill to which said sheet is secured, and a lining which extends up under said angular rigidifying member and which is attached at intervals to said structure and adapted to bear against said inner attaching members and said Z-bar.

30. In a gondola car, the combination with the end frame and side wall structure, of a metal end sheet having corrugations therein which increase in depth toward the bottom thereof, an angular rigidifying member extending from side to side of the car and secured to the upper edge of said end sheet, a Z-bar end sill to which the lower edge of said sheet is secured, and pairs of attaching members for securing the vertical edges of said sheet to the car comprising inner angular members secured to the angular rigidifying members and the side frame of said car structure.

31. In a gondola car, a sheet metal panel provided with a series of corrugations extending to the edges of the sheet, and pairs of attaching members which overlap said corrugations and are secured at intervals thereto, and a lining consisting of boards

arranged transversely to said corrugations and secured at intervals thereto so as to form in effect fixed beams intermediate the edges of said corrugations.

32. The combination with a gondola car, of a metal end sheet formed with a plurality of corrugations therein of progressively different depths, severally, toward an edge of the sheet, and attaching members for securing said end sheet to the car.

33. The combination with a gondola car, of a metal end sheet formed with a plurality of transverse corrugations therein of progressively different depths, severally, toward the lower edge of the sheet, and attaching members for securing said end sheet to the car.

34. A car wall construction comprising a sheet metal panel formed with corrugations which extend to an edge of the same, and means for fastening said panel to the car framing comprising an angle bar having a flat flange extending along said edge and secured at intervals to said corrugations.

35. A car wall construction comprising a sheet metal panel formed with corrugations which extend to an edge of the same, and means for fastening said panel to the car framing comprising a pair of members having flat surfaces lying against said edge of the panel, on opposite sides thereof, and secured at intervals to the ends of said corrugations.

36. A car wall construction comprising a sheet metal panel formed with corrugations which extend to an edge of the same, and means for fastening said panel to the car framing comprising a pair of angle bars having flat flanges lying along said edge of the panel, on opposite sides thereof, and secured at intervals to the ends of said corrugations.

37. A sheet metal railway car end formed with a plurality of substantially horizontally disposed corrugations of which those in the bottom portion of the end are of greater cross sectional area than those in the top portion thereof, to afford the greatest reinforcement where the cargo thrust is greatest.

38. A sheet metal railway car end formed with a plurality of substantially horizontally disposed corrugations of progressively increasing cross sectional area from the top of the end to the bottom so as to provide a reinforcement for the end which is proportioned to the usual cargo thrusts at different levels.

39. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations of which those near the bottom of the panel are of greater cross sectional area than those near the top, and angular members for securing the vertical edges of the end panel to the side walls.

40. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations which extend to the edges of the panel, those near the bottom of the panel being of greater cross sectional area than those near the top, and angular members for securing the vertical edges of the end panel to the side walls.

41. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations of which those near the bottom of the panel are of greater cross sectional area than those near the top, and a pair of angular members at each side of the car for securing the edges of said panel to the side walls of the car.

42. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations which extend to the edges of the panel, those near the bottom of the panel being of greater cross sectional area than those near the top, and a pair of angular members at each side of the car overlapping the panel on opposite sides and securing the same to the side wall of the car.

43. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations of progressively increasing cross sectional area from the top of the panel to the bottom so as to provide a reinforcement for the end wall which is proportioned to the usual cargo thrusts at different levels.

44. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations of progressively increasing cross sectional area from the top of the panel to the bottom and extending to the edges of the panel, and angular members for securing said edges of the panel to the side walls of the car.

45. In combination with the side walls of a railway car, an end wall construction comprising a sheet metal panel formed with substantially horizontally disposed corrugations of progressively increasing cross sectional area from the top of the panel to the bottom and extending to the edges of the panel, and a pair of angular members at each side of the car overlapping the edge of the panel and securing the same to the adjacent side wall of the car.

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