July 7, 1931. G. G. GILPIN 1,813,537

CAR CONSTRUCTION

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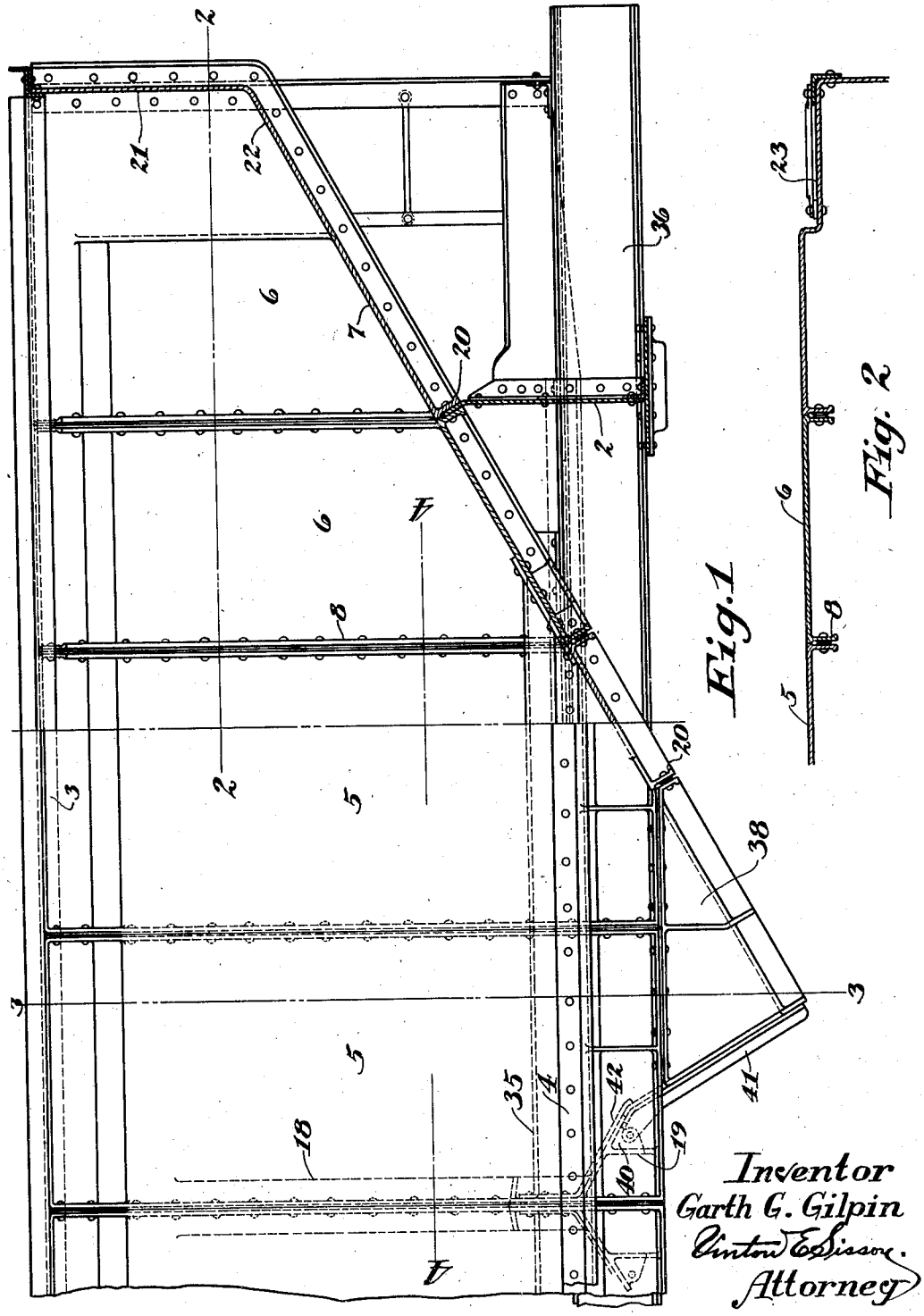


Fig. 1

Fig. 2

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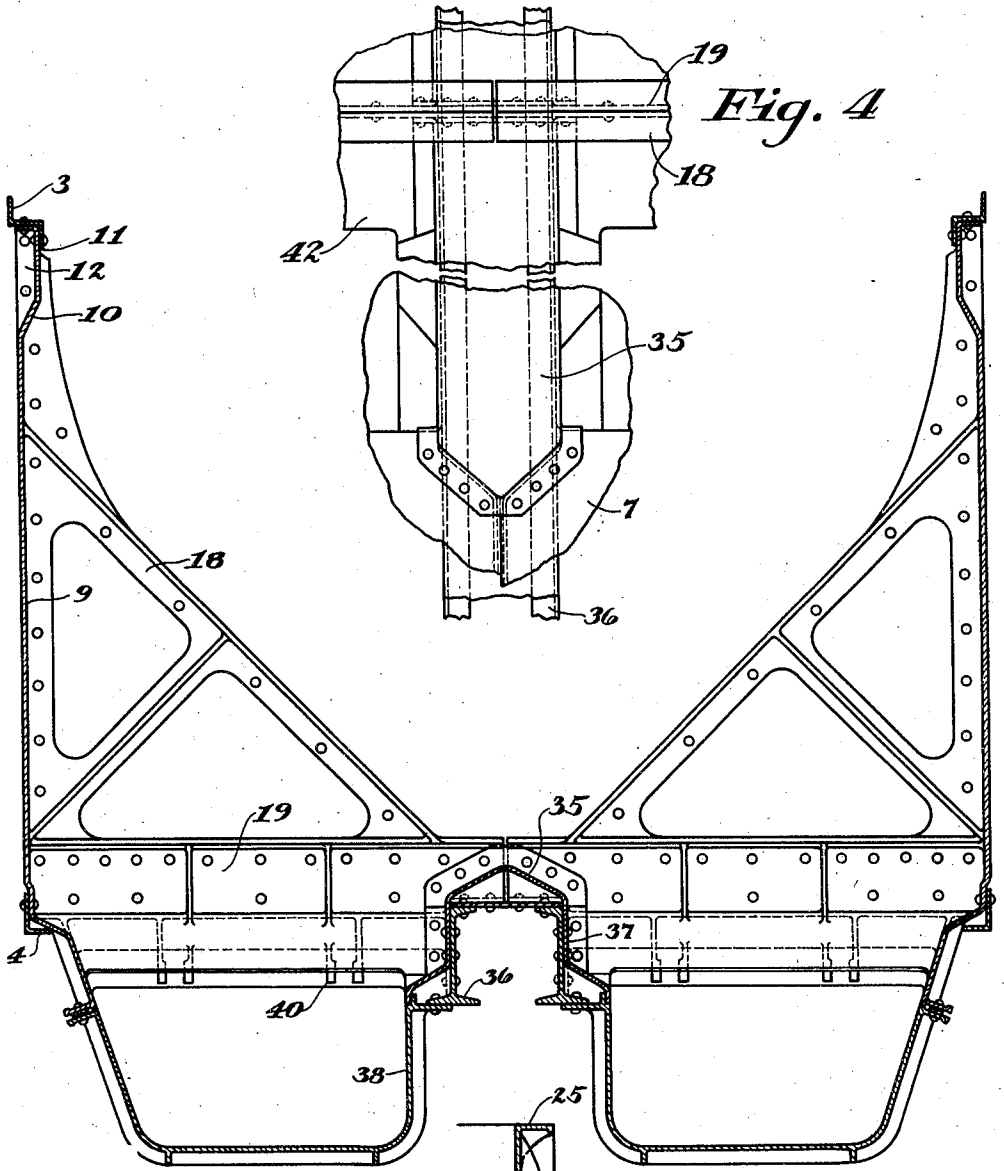


Fig. 4

Fig. 3

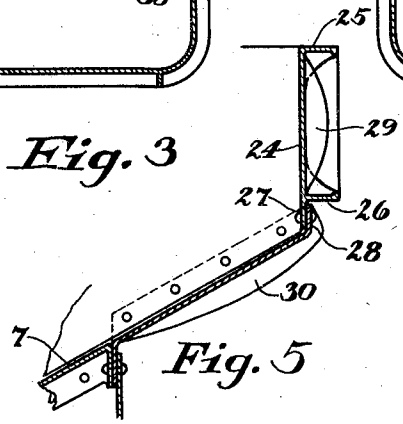


Fig. 5

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CAR CONSTRUCTION

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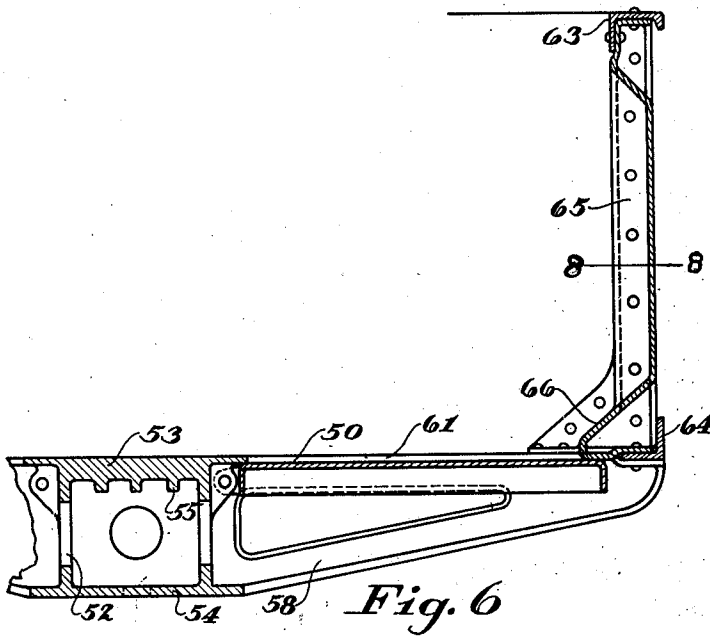


Fig. 6

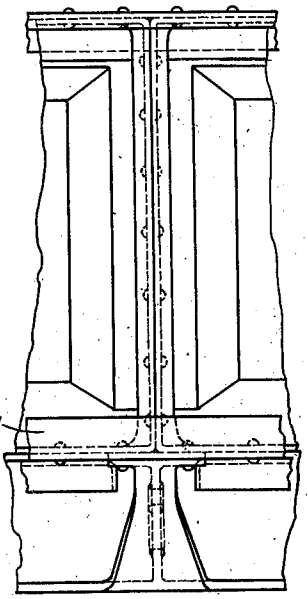


Fig. 7

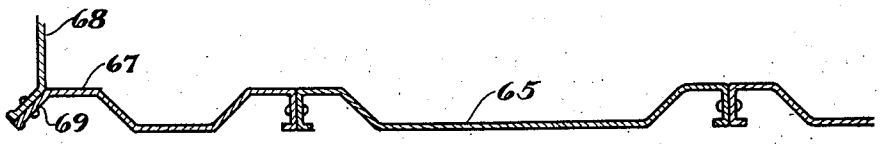


Fig. 8.

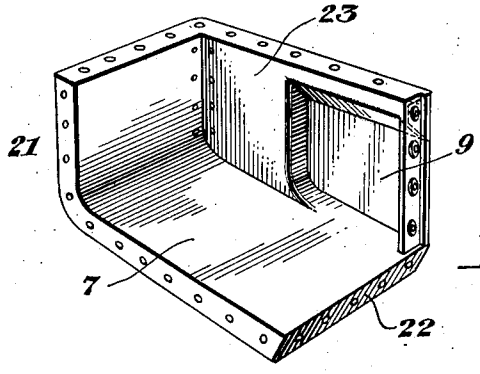


Fig. 15.

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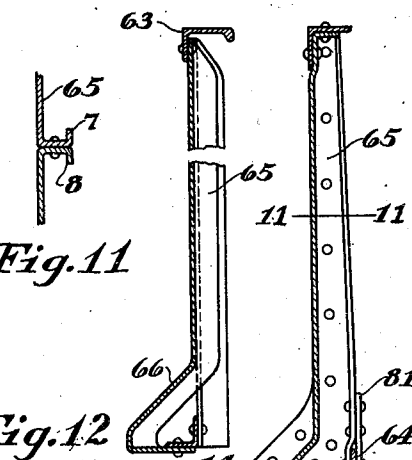


Fig. 11

Fig. 12

Fig. 9

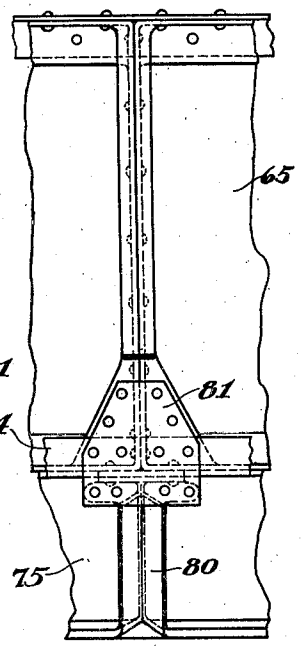


Fig. 10

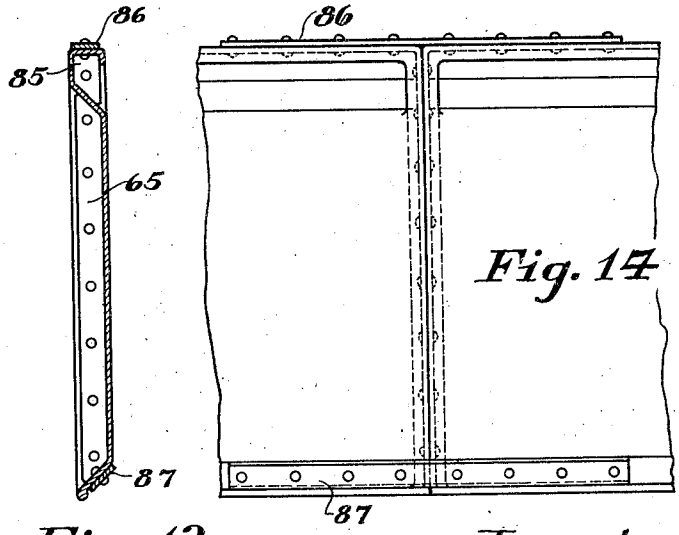


Fig. 13

Fig. 14

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UNITED STATES PATENT OFFICE

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CAR CONSTRUCTION

Application filed May 16, 1929. Serial No. 363,550.

By nature of their requirements railway freight cars are out of doors substantially all the time, therefore, are subjected to corrosive action of the elements, and while paint and other non-corrosive coatings have been applied to the car parts, such protection not only has been found to be expensive in time and money, but the lading removes the coating. This is particularly true of the inside of open type cars which are turned upside down in unloading machines causing the load to slide across the inside surface of the car body and also when the discharging load slides across the surface of a drop door and also when the long lading rests upon the lowered drop end gate of a gondola car the friction therebetween caused by the movement of the car also removes the protective coating from the end gate. Furthermore, certain ladings, such as sulphur, wet coal, which forms sulphuric acid, and saline water (in refrigerator and stock cars) cause rolled steel or iron to corrode. On account of its increased strength rolled steel in the form of plates and bars has supplanted wood in car construction but the corrosive action of the elements eats away the rolled steel or iron material reducing their strength and their length of life. This applies to both the load carrying members, such as sills, plates and diaphragms and also to the lading retaining members, such as side and end walls, floors, hoppers, hopper doors, etc. It has been found that cast metal, particularly cast steel, has more than twice the resistance to corrosion than rolled steel, therefore, one of the objects of the invention is to make the car part of cast metal, preferably cast steel, to enable the car part to resist corrosion, and furthermore, to produce a construction wherein the metal can be disposed and positioned to accommodate the stresses set up by the car in service. Such a cast construction necessitates a minimum amount of material for strength requirements.

Another object is to eliminate the cost and delay in fabricating the numerous component parts of the present structural steel car parts.

Another object of forming the car part of cast metal is to eliminate the possibility of loose connections which would permit relative motion between the component parts of the car part, as it is common knowledge that the vibration of the car in motion, due to rough and uneven track, and steel wheels rolling on steel rails, together with longer trains and high speeds in present day practice, cause riveted joints and built up sections to work loose and the railroads look with favor upon any device which reduces the number of parts and joints, as these are the weak parts of the car and the more such weak parts are eliminated, the longer the life of the car.

In the drawings:

Fig. 1 shows a part elevation and part section of a hopper car provided with my improvements.

Fig. 2 is a section on line 2—2 of Fig. 1.

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

Fig. 4 is a plan view of the center construction.

Fig. 5 shows a modified end wall.

Fig. 6 is a section of a general service car with my improvements applied thereon.

Fig. 7 is a partial side elevation of Fig. 6.

Fig. 8 is a section on line 8—8 of Fig. 6 with a section of the end wall included.

Fig. 9 shows a modified gondola car with my improvements.

Fig. 10 is a partial side elevation of Fig. 9.

Fig. 11 is a section on line 11—11 of Fig. 9.

Fig. 12 shows a modified construction.

Figs. 13 and 14 show a modified car construction.

Fig. 15 shows an integral casting comprising a part of the side wall, end wall and sloping floor.

Figs. 1 to 5 inclusive show my improvements applied to a railway hopper car. The side walls of this type car carry the load to

the body bolsters 2, and in the form shown, each side wall comprises a girder, consisting of a rolled steel top chord 3, a rolled steel bottom chord 4 (sometimes called side sill) and a cast metal web formed with integral stiffeners. The web comprises a plurality of panels secured to the top chord at one end with the opposite ends of the central panel or panels 5 secured to the bottom chords and with the panels 6 adjacent the ends of the car extending downwardly only to the sloping floor 7 to which they are secured. Each panel is provided with a flange 8 which is secured to a flange of the adjacent panel, which not only forms the means of connection therebetween, but also forms the stiffener for the side girder, which function is usually performed by an additional side stake. In my construction the side stakes are omitted. These flanges preferably project inwardly toward the car so that the webs 9 of the girders on the opposite sides of the car will be as far apart as possible to provide maximum cubical capacity of the car, as the webs of the girders are also the retaining walls for the load. The upper part of the web 10 is deflected inwardly toward the car and secured to an inner part 11 of the upper chord and at this portion of the panel the connecting flanges 12 project outwardly from the car. Flange 12 is, in fact, a continuation of flange 8. This construction permits the car to be turned upside down in a dumping machine without retaining any of the load in the car.

One or more of the panels are provided with preferably integral brackets 18 with their lower portion secured to the cross bearers 19 of the car, and in fact, these braces may be cast integral with the cross bearers. These braces prevent the side girder from deflecting under load and also reinforce the web or retaining wall against the outward force of the load.

The sloping floor 7 consists of a plurality of cast metal panels which are provided with downwardly projecting flanges 20 secured to corresponding flanges on the adjacent panels, which perform the function of the usual floor stiffeners. One of these pairs of flanges is preferably located adjacent the body bolster 2 and secured thereto.

The end wall 21 is preferably of ribbed cast metal and formed integrally with the upper panel 22 of the sloping floor 7. I prefer to form the upper corners of integral castings comprising part of the end wall; part of the side wall and part of the sloping floor, as shown in Fig. 15. A portion 23 of this casting is preferably offset or indented to accommodate the ladder and grab irons so that the outer portion of these ladders or grab irons is flush with the outer surface of the retaining wall.

Fig. 5 shows a modified form wherein the end wall 24 consists of a cast metal panel provided with upper 25 and lower 26 stiffening flanges and a depending flange 27 for attachment of the flange 28 of the sloping floor panel. Stiffening ribs 29 are also provided to reinforce the web of the end wall. Fig. 5 also shows the longitudinal stiffening flange 30 of the sloping floor.

I also provide a cast metal hood 35 which covers the center sills 36 or center construction between the opposite sloping floors 7 to which it is secured. See Figs. 3 and 4. This hood prevents the moist lading from coming in contact with the rolled steel center sills which would cause corrosion; further, the sloping top portions assist in discharging the lading into the hoppers. These hoods may extend downwardly (37) and cover the sides of the center sills, as well as their top portions and the cast metal hoppers 38 are preferably secured to these downwardly extending portions of the hood as well as to the center sills 36.

The cross bearers 19 are also preferably formed of cast metal and may extend between the opposite side walls or may extend from side wall to center sill and are arranged to accommodate the hood (see Figs. 3 and 4) and also formed with hinge butts 40 for the hopper doors 41. The cross diaphragms have sloping top portions 42 to discharge the lading into the hopper and if the side braces 18 are formed separately they are arranged to provide means of attachment thereto.

Figs. 6 to 14 show my improvements applied to an open top gondola car

The side wall of a general service car shown in these figures comprises rolled steel top chord 63, rolled steel bottom chord 64 or side sill and a plurality of panels 65 forming the web of the girder and retaining wall for the load and are formed similarly to the construction heretofore described for the hopper car. The lower portion of these panels is provided with an inclined surface 66 forming a chute to discharge the load toward the door opening, which inclined surface is provided with a return bend portion for attachment to the lower chord. The end of the side panel 67 is secured to the side end panel 68 by means of diagonal flanges 69 secured together, as shown in Fig. 8.

Figs. 9 to 12 inclusive show a modified form of my improvement as applied to a "general service" car. The side wall comprises the usual tension member 64 and compression member 63 and the web member 65, the web comprising a plurality of cast metal panels having outwardly projecting flanges 8 secured together, which flanges are formed with reflanges 70 to strengthen and stiffen the construction. The lower portion of each panel is provided with a sloping portion 66 to discharge the lading into the door opening. I also provide a gusset member 81 to secure

the cast metal panel 65, cross bearer 78 and the lower chord 64 together.

Figs. 13 and 14 show a modified construction wherein the top chord and bottom chord are omitted and the upper part 85 of the panels 65 is formed of box girder construction to take care of the compression, which function is usually performed by the top chord. If desirable, the adjacent panels may be secured together by the splice member 86. A similar construction is provided at the lower portion of the side wall wherein the adjacent panels are secured together by the splice member 87.

Fig. 15 has been described heretofore.

The accompanying drawings 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 within the scope of the claims will occur to persons skilled in the art.

I claim:

1. In a railway car of the hopper type, a side wall comprising a top chord, a bottom chord, and a plurality of cast metal panels secured to said chords, said panels provided with flanges, said flanges being secured to corresponding flanges on adjacent panels to perform the functions of the usual side stakes.

2. In a railway car of the hopper type, a side wall comprising a top chord, a bottom chord, and a plurality of cast metal panels secured to said chords, said panels provided with inwardly projecting flanges and outwardly projecting flanges, said flanges being secured to corresponding flanges on adjacent panels to perform the functions of the usual side stakes.

3. In a railway car of the hopper type, a side wall comprising a top chord, a bottom chord, a plurality of cast metal panels secured to said chords, said panels provided with flanges, said flanges being secured to corresponding flanges on adjacent panels to perform the functions of the usual side stakes, and a sloping floor comprising a plurality of cast metal panels, said panels provided with downwardly projecting flanges secured to corresponding flanges on adjacent panels to perform the functions of the usual floor stiffeners.

4. In a railway car, a side wall comprising a plurality of cast metal panels secured together and formed to perform the functions of the usual side stakes.

5. A girder forming the side wall of a railway car comprising a rolled steel top chord, a rolled steel bottom chord, and a cast metal web.

6. A girder forming the side wall of a railway car comprising a rolled steel top chord, a rolled steel bottom chord, and a cast metal web, said web comprising a plurality of panels having their adjacent marginal portions so formed and secured together to provide the stiffeners for the web of the girder.

7. A girder forming the side wall of a railway car comprising a rolled steel top chord, a rolled steel bottom chord, and a cast metal web formed with integral stiffeners for the web of the girder.

8. In a railway car, an integral casting forming part of the end wall, part of the side wall, and part of the sloping floor.

GARTH G. GILPIN.