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CAR CONSTRUCTION

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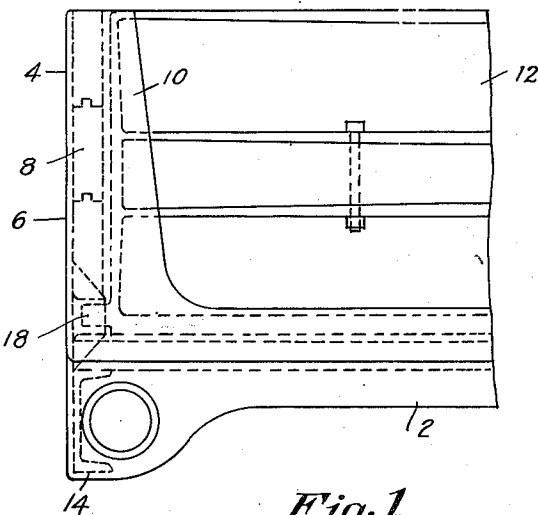


Fig. 1

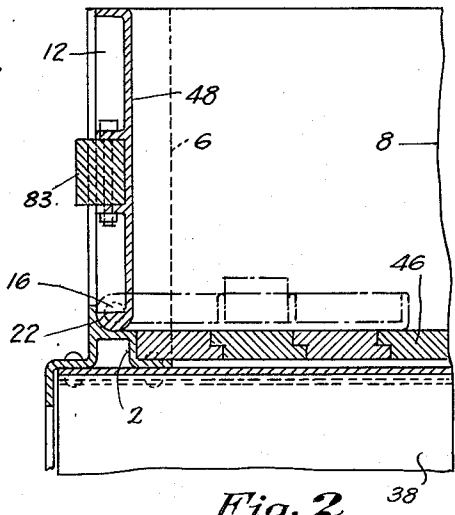


Fig. 2

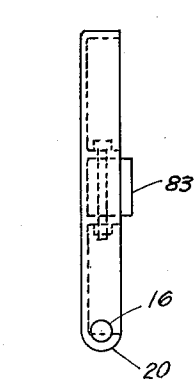


Fig. 5

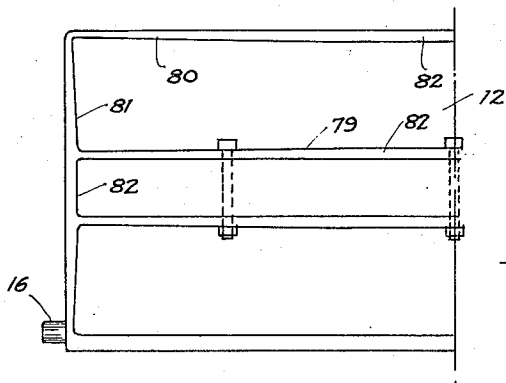


Fig. 3

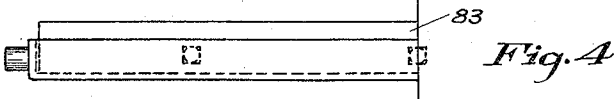


Fig. 4

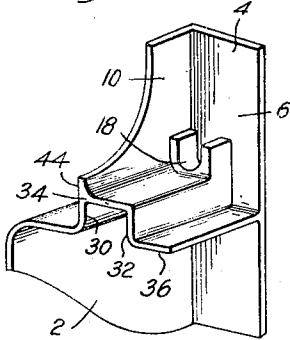


Fig. 6

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# UNITED STATES PATENT OFFICE

2,061,318

## CAR CONSTRUCTION

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Original application October 20, 1928, Serial No. 313,906. Divided and this application June 23, 1933, Serial No. 677,334

27 Claims. (Cl. 105-404)

My invention relates to the construction of railway freight cars, and more particularly to the walls, floors or doors thereof whether such parts are rigidly secured to the car proper or hinged thereto, and comprises integral cast metal members forming a frame in combination with preferably cast metal panels or units which form the load retaining portions of the walls, floors or doors of the car and which are rigidly and removably secured to the frame.

One of the objects of the invention is to form such a frame (or a panel) of cast metal having the structural members and the means for attaching them to the other parts of the car formed integrally and to distribute the metal in the frame to accommodate the various service stresses with the least amount of metal, thereby obtaining a very light but efficient structure, resulting in increased life of the device and reduction in maintenance cost as compared to the composite structures now in use.

Another object is to provide a drop end gate for a "mill-type" railway gondola car by providing pintles or trunnions at the lower corners of the end wall of the car adjacent the floor of the car which pivotally engage sockets in an adjacent part of the car, such as the side wall, corner post or end sill. Another object is to provide means to support the weight of the drop end gate in upright or closed position, preferably independently of the hinging means.

Another object is to provide an end frame for such a car having integral end sill, corner post and means to accommodate the hinging means of a drop end gate.

Another object is to provide a cast metal corner post having integral means for attachment to the side wall and integral means for forming an abutment for a drop end gate which post preferably also has means to accommodate a hinging means for a drop end gate.

By nature of their requirements railway freight train cars are out of doors substantially all of 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 the 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.

My invention not only relates to the feature of having a car part consisting of a cast frame in combination with a plurality of cast metal panels, but also consists of forming these cast metal panels of specific configuration to obtain certain advantages, particularly the disposition of the metal to accommodate service stresses and to resist corrosion, and another object is to hinge such a cast metal panel to the body of the car to form a door.

In the drawing:

Figs. 1 and 2 show a typical application of my invention to a railway car.

Figs. 3, 4, and 5 show a drop end door or end gate of a preferred construction according to my invention.

Fig. 6 is a fragmentary view of the corner post and end sill.

The drawing shows the preferred form of my invention wherein the end frame casting consists of a cross bar or end sill 2 with integral upright corner posts 4. Each corner post 4 comprises a flange 6 extending longitudinally of the car for attachment of the side wall 8 of the car and another flange 10 substantially normal thereto adapted to provide an abutment for the drop end gate 12 when in upright or closed position, as shown in Fig. 2 in solid lines, and preferably also when in lowered or open position, as shown in Fig. 2 in dot and dash lines. The flange 6 extends below the end sill (2) for attachment to the side sill 14 of the car. The panel or drop end gate 12 has a pintle or trunnion 16 which engages a socket 18 in the end frame either in the cross bar portion 2 or the corner post portion 4 thereof to form a hinge construction. The bottom 20 of the panel is preferably semi-cylindrical concentric with the hinge point of the pintle and engages an arcuate surface 22 in the cast metal end sill. I prefer to arrange this construction so that the vertical weight of the door and also the horizontal load thrust are taken by the end sill 2 and not by the pintle 16 so that the pintle is merely a guiding hinge. The drop end gate is preferably provided with outwardly extending marginal flanges 24—26 engaging the corner posts when the gate is in upright position, so as to present a smooth surface 28 toward the interior of the car. In drop end gates it is preferable that they be as thin as possible so instead of increasing the depth of the reinforcing ribs 29 and the side flanges 24—26 I prefer to increase them in width adjacent their middle portions (32), thereby increasing their strength without increasing their depth. Sometimes the long lading is allowed to rest directly upon the door when it is in a lowered position causing considerable friction between the load and the door, therefore, I prefer to provide a wooden supporting or anti-friction strip 33 of greater depth than the gate to support such long lading. The strip 33 is bolted to one of the ribs or preferably positioned between two of the ribs and bolted thereto, as illustrated. I prefer to position these bolts so that they can be installed after the door is in a lowered position, and furthermore, if bolts passed through the door the heads of the bolts would damage the wooden floor.

The accompanying drawing illustrates 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.

This is a division of my co-pending application Serial No. 313,906, filed October 20, 1923.

I claim:

1. In a railway car, a one piece casting comprising an end sill, and spaced apart corner posts, said end sill consisting of a web secured to the longitudinal frame members of the car and formed with a semi-cylindrical recess in combination with a panel hinged to the end sill and

adapted to engage said posts when in upright position, said panel having a semi-cylindrical portion movably engaging said recess, said recess and said portion extending longitudinally the length of the panel.

2. In a railway car, the combination of a floor, opposite side walls having inwardly projecting parts at one end thereof, a member extending between the side walls adjacent the floor having an upper arcuate surface, sockets in the walls adjacent the floor, and a drop end gate having its vertical margins abutting said parts when in upright position, said end gate having a pair of aligned pintles adjacent the lower margin thereof engaging said sockets, said end gate having its lower margin arcuate and concentric with said pintles and engaging the arcuate surface of the member to partially support the end gate when being raised.

3. In a railway car, the combination of opposite side walls having inwardly projecting parts at one end thereof, a member extending between the side walls having an upper arcuate surface, a drop end gate having its vertical margins abutting said parts when in upright position, said end gate having its lower margin arcuate and engaging the arcuate surface of the member to partially support the end gate when being raised, and means to retain the arcuate lower margin of the door in engagement with said arcuate surface of the member.

4. In a railway car, the combination of a floor, opposite side walls, each wall provided with an inwardly projecting flange and a socket adjacent the floor of the car, and a drop end gate adapted to engage said flanges which resist outward movement of the gate when in upright position, said gate adapted to rest upon said floor when in lowered position, said gate having a bottom member with an integral pintle at each end thereof, said pintles engaging said sockets to form a hinge construction.

5. In a railway car, the combination of a floor, spaced apart side walls, a corner post secured to each side wall having an inwardly projecting flange and having a socket therein adjacent the floor of the car, and a drop end gate adapted to engage said flanges when in upright position to resist outward movement of the gate, said gate being substantially the same length as the distance between said side walls and provided with a pintle at each end thereof and adjacent the lower margin of the gate which extend beyond the end of the gate and engage said sockets respectively to form a hinge construction whereby the gate when in horizontal position may lie upon said floor.

6. In a railway car, the combination of a floor, spaced apart side walls, a corner post secured to each side wall having an inwardly projecting flange and having a socket therein adjacent the floor of the car with the opening thereof substantially flush with the inside of the side wall, and a drop end gate having a horizontal length substantially equal to the distance between the side walls, said end gate adapted to engage said flanges when in upright position to resist outward movement of the gate, said gate being provided with a pintle at each end thereof and adjacent the lower margin of the gate which extend beyond the end of the gate and engage said sockets respectively to form a hinge construction whereby the gate when in horizontal position may lie upon said floor.

7. In a railway car, the combination of spaced apart corner posts, and a drop end gate hinged to said corner posts and means positioned between said corner posts to support the vertical weight of the gate when closed independently of the floor of the car.

8. In a railway car, the combination of spaced apart corner posts, and a drop end gate hinged to said corner posts, said posts provided with means to support the vertical weight of the gate when closed.

9. In a railway car, the combination of spaced apart corner posts, and a drop end gate hinged to said corner posts, said posts provided with means to support the vertical weight of the gate when closed independently of the hinging means.

10. In a railway car, the combination of spaced apart corner posts, a drop end gate hinged to said corner posts, said posts provided with means to support the vertical weight of the gate when closed independently of the hinging means, said posts provided with means to resist the horizontal load thrust against the gate when in upright position independently of the hinging means, and means to resist the inertia thrusts of the end gate when in lowered position independently of the hinging means.

11. A cast metal corner post for a railway car consisting of an integral casting comprising a flange for attachment of the side wall, another flange substantially normal to the first mentioned flange adapted to provide an abutment for a drop end gate, and a portion positioned to partially support a drop end gate when in upright position.

12. A cast metal corner post for a railway car consisting of an integral casting comprising a flange for attachment of the side wall, another flange substantially normal to the first mentioned flange adapted to provide an abutment for a drop end gate, and a portion positioned to partially support a drop end gate when in upright position and to partially support said drop end gate when in lowered position.

13. A cast metal corner post for a railway car consisting of an integral casting comprising a flange for attachment of the side wall, another flange substantially normal to the first mentioned flange adapted to provide an abutment for a drop end gate, a socket integral with the first mentioned flange adapted for engagement with a pintle of a drop end gate, and a portion positioned to support a drop end gate when in upright position and to partially support said drop end gate when in lowered position.

14. In a railway car, the combination of spaced apart corner posts, a drop end gate, and a member extending sidewise of the car between said corner posts independently of the floor of the car, said gate hinged to the posts so that the member will support the weight of the door when in an upright position and partially support the weight of the door when in a lowered position.

15. A car end formed of a substantially U-shaped integral metal casting consisting of a cross bar and corner posts, said cross bar comprising a web, spaced apart walls, and outwardly extending flanges at the lower margin of said walls.

16. A car end formed of a substantially U-shaped integral metal casting consisting of a cross bar and corner posts, said cross bar com-

prising a web, spaced apart walls, and outwardly extending flanges at the lower margins of said walls, each of said flanges being secured to the underframe of the car, the upper surface of said web being substantially flush with the top of the floor of the car.

17. A cast metal corner post for a railway car consisting of an integral casting comprising a flange for attachment of the side wall, another flange substantially normal to the first mentioned flange adapted to provide an abutment for a drop end gate, and a substantially horizontal web connecting said flanges adapted to support said drop end gate when in upright position.

18. In a railway car having spaced apart corner posts, each post comprising a flange attached to the adjacent side wall of the car, and another flange substantially normal, to the first mentioned flange adapted to form an abutment for a drop end door in combination with a horizontal member extending between and secured to both flanges of both corner posts, said member adapted to support a drop end gate when in upright position independently of the floor of the car.

19. In a railway car having spaced apart corner posts, each post comprising a flange attached to the adjacent side wall of the car, and another flange substantially normal to the first mentioned flange adapted to form an abutment for a drop end door in combination with a horizontal member extending between and secured to both flanges of both corner posts, said member adapted to support a drop end gate for the entire length of the end gate when in upright position independently of the floor of the car.

20. In a railway car having spaced apart corner posts, each post comprising a flange attached to the adjacent side wall of the car, another flange substantially normal to the first mentioned flange adapted to form an abutment for a drop end door in combination with a horizontal member extending between and secured to both flanges of both corner posts, said member adapted to support a drop end gate when in upright position independently of the floor of the car, and a substantially vertical member extending between and secured to the first mentioned flanges of both corner posts.

21. A railway car end formed of a substantially U-shaped metal casting consisting of an end sill and spaced apart corner posts, each of said posts comprising a flange extending longitudinally of the car and a flange extending laterally of the car, said end sill comprising a substantially horizontal portion connecting the flanges of each post respectively so as to form a gusset therebetween in combination with a drop end gate supported by said portion when in upright position.

22. A railway gondola car having a drop end door adapted when in open position to overlap the floor of the car, a one piece casting comprising an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which merges into both of said flanges of both of said corner posts, said inwardly projecting portion constituting a support for the door when the latter is in closed position.

23. A railway gondola car having a drop end door adapted when in open position to overlap the floor of the car, a one piece casting comprising an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which merges into both of said flanges of both of said corner posts, said inwardly projecting portion constituting a support for the door when the latter is in closed position and also when said door is in open position.

24. In a railway car, a one piece casting comprising an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which merges into both of said flanges of both of said corner posts, said inwardly projecting portion constituting a support for the door when the latter is in closed position.

25. In a railway car, a one piece casting comprising an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which merges into both of said flanges of both of said corner posts, said inwardly

projecting portion constituting a support for the door when the latter is in closed position, each of said posts provided with a trunnion pocket adjacent said inwardly projecting portion.

26. A railway gondola car having a drop end door adapted when in open position to overlap the floor of the car, a one piece casting comprising an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which merges into both of said flanges of both of said corner posts, said inwardly projecting portion constituting a support for the door when the latter is in closed position, each of said posts provided with a trunnion pocket adjacent said inwardly projecting portion, said door provided with trunnions engaging said pockets.

27. A railway gondola car having a drop end door adapted when in open position to overlap the floor of the car, an end sill and spaced apart corner posts, each of said corner posts having a flange adapted to be secured to the adjacent side of the car and a flange adapted to overlap the outer face of the door when the latter is in closed position, said end sill having a substantially vertical portion and an inwardly projecting substantially horizontal portion which is connected to both of said flanges of both of said corner posts, said inwardly projecting portion constituting a support for the door when the latter is in closed position.

GARTH G. GILPIN.