Oct. 13, 1925.

1,556,757

A. CHRISTIANSON ET AL

RAILWAY CAR

Filed April 18, 1922

3 Sheets-Sheet 1

FIG. 1

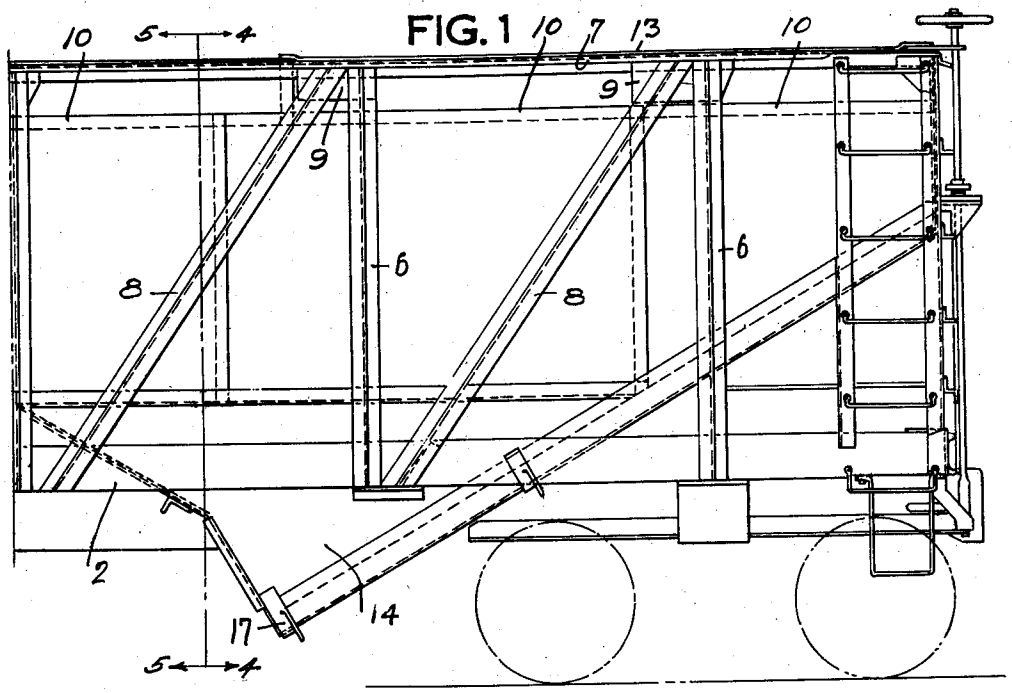
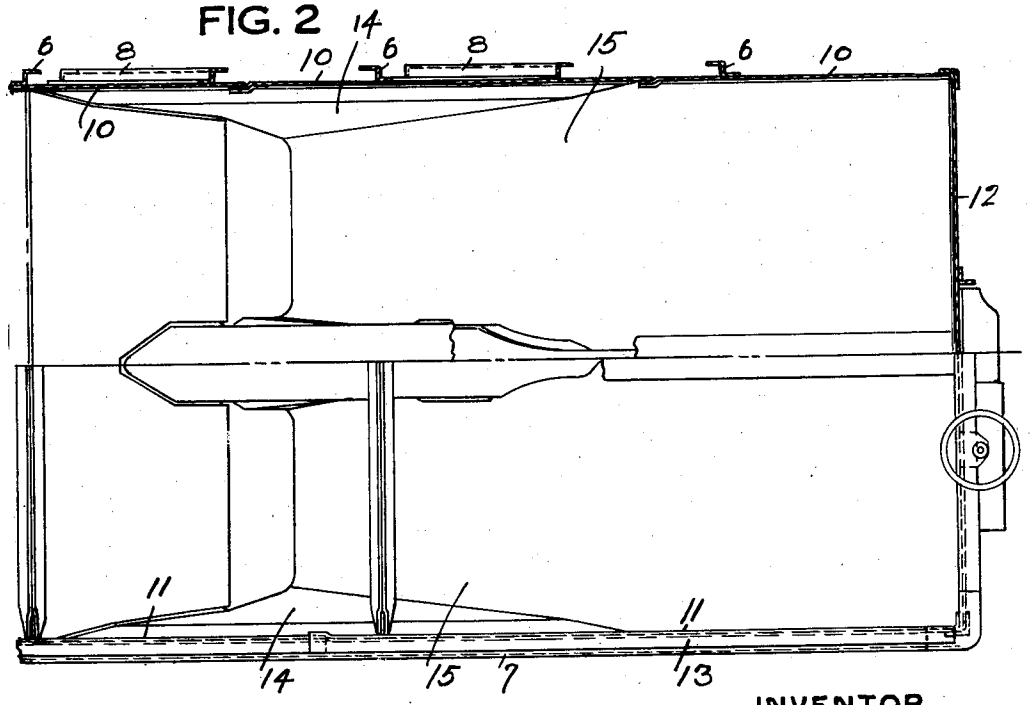


FIG. 2



INVENTOR

Andrew Christianson
and Harry L. Anderson
By Ray Potter Bonner
Attys

Oct. 13, 1925. 1,556,757

A. CHRISTIANSON ET AL

RAILWAY CAR

Filed April 18, 1922 3 Sheets-Sheet 2

FIG. 3

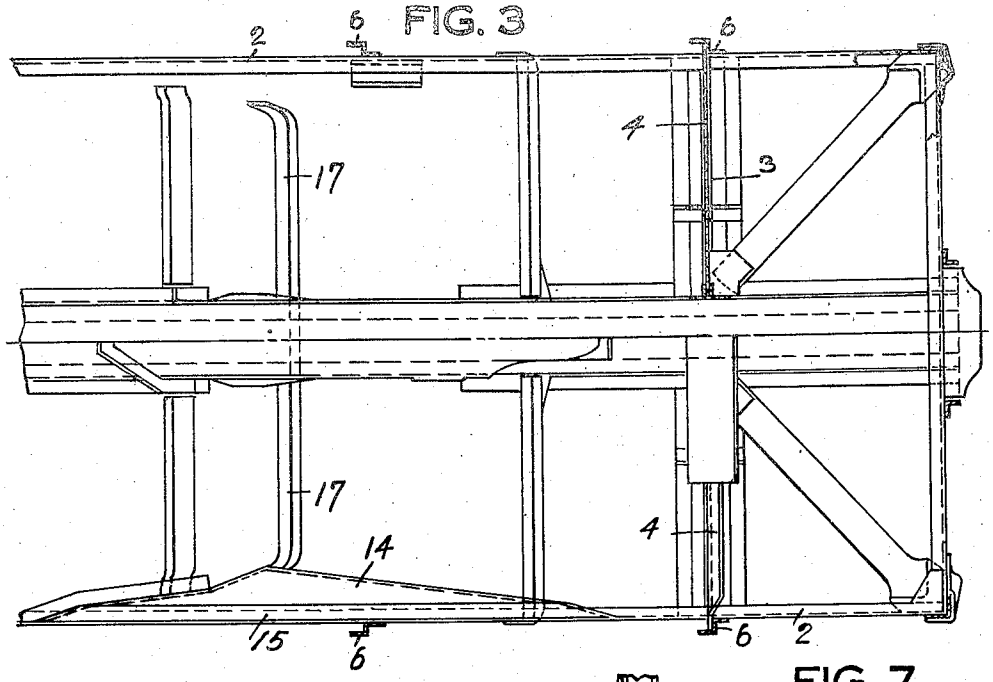


FIG. 6

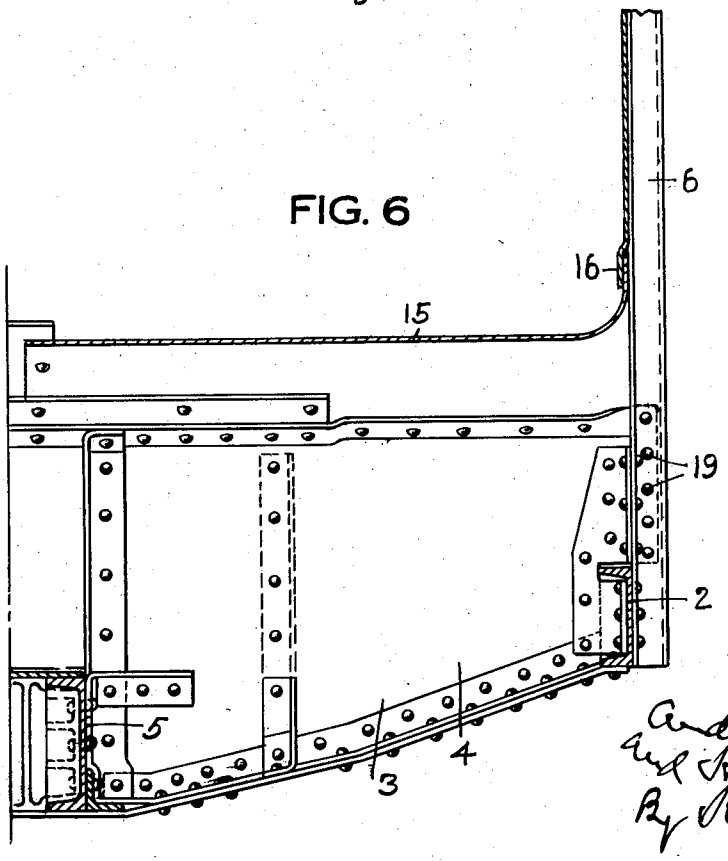
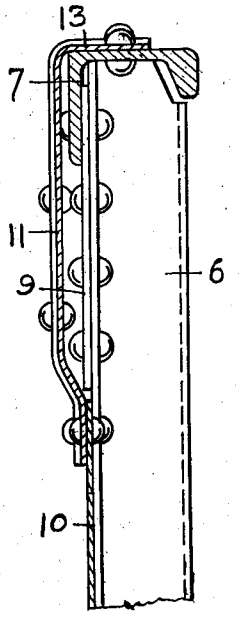


FIG. 7



INVENTOR

Andrew Christianson
and Harry J. Anderson
By Clay Sutton & Brown
Attys

Oct. 13, 1925.

1,556,757

A. CHRISTIANSON ET AL

RAILWAY CAR

Filed April 18, 1922

3 Sheets-Sheet 3

FIG. 4

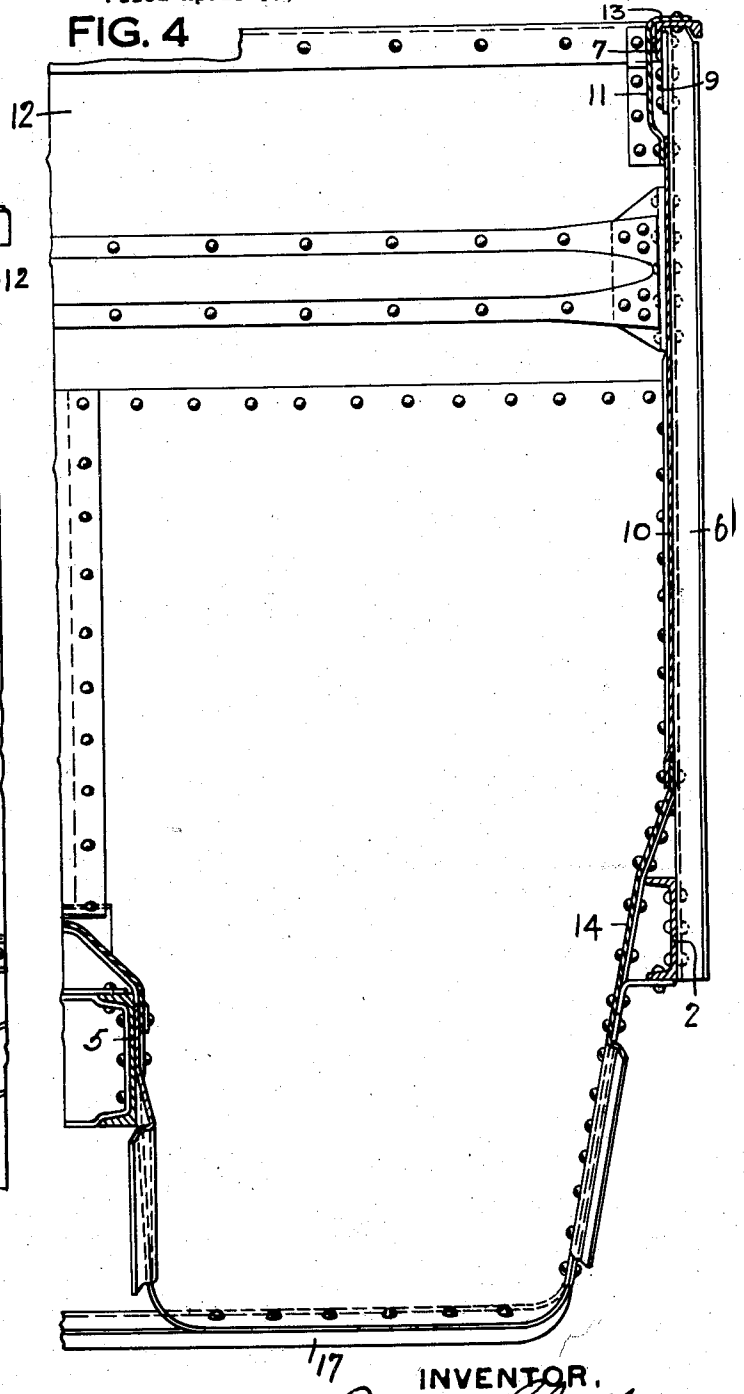
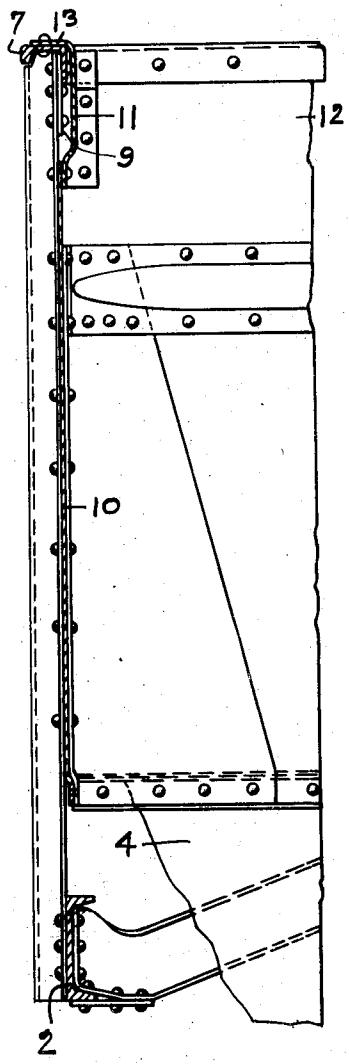


FIG. 5



INVENTOR.

Andrew Christianson

and Harry J. Anderson

By Ray Fitler Brown

Attys

Patented Oct. 13, 1925. 1,556,757

UNITED STATES PATENT OFFICE.

ANDREW CHRISTIANSON AND HARRY T. ANDERSON, OF BUTLER, PENNSYLVANIA, ASSIGNORS TO STANDARD STEEL CAR COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY CAR.

Application filed April 18, 1922. Serial No. 554,736

To all whom it may concern:

Be it known that we, ANDREW CHRISTIANSON and HARRY T. ANDERSON, citizens of the United States, and residents of Butler, in the county of Butler and State of Pennsylvania, have invented a new and useful Improvement in Railway Cars; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to railway-cars, and more especially to steel or metal cars of the open type, such as hopper-bottom and gondola-cars.

Heretofore in cars of this type the sides have formed the load-carrying members and were subjected to rapid deterioration due principally to the carrying of coal with its sulphuric acid action tending to eat into and destroy the metal and rivets connecting the different parts. In designing cars of this type, it has been the practice to construct the sides of the car of open-hearth steel plates with top and bottom chords of rolled angles and stiffened vertically by metal posts, providing a carside which was in effect a plate-girder which enabled it to carry the load without the necessity of using side sills. Deterioration seriously impairs the use of these plate-girder sides as load-carrying members as, unless the web-plates act as a unit, the top and bottom chords are of very little use. Furthermore, the plates or web-members of the plate-girder sides being riveted to the upper and lower bottom chords or angles, made it impossible to repair the sides without renewing the whole girder, so that repair work was done at great cost of labor and material.

The object of our invention is chiefly to provide a design of car of the open type in which the side-sheets are for use only as a load-container, and consequently can be reduced in thickness, thereby reducing the weight without sacrificing strength, thereby producing a car which is light, and so decrease the dead-weight with a proportional increase in live-weight.

A further object of our invention is to provide for the removal of the side-sheets for repair-work without interfering with the side-frame of the car, and furthermore to protect the rivets connecting the different members of the side-frame on the inside of the car from the sulphuric-acid or other deteriorative, thereby greatly increasing the life of the car.

To these ends our invention comprises the novel features hereinafter set forth and claimed.

In the accompanying drawing, Fig. 1 is a side elevation of half a car of the hopper-type, showing our invention applied thereto; Fig. 2 is a plan view partly in section; Fig. 3 is a view of the underframing; Fig. 4 is an enlarged cross section on the line 4—4, Fig. 1, looking in the direction of the arrow; Fig. 5 is a like section on the line 5—5, Fig. 1, looking in the direction of the arrow; Fig. 6 is an enlarged section at the bolster; and Fig. 7 is a detail of the top-chord and protecting cover.

We have illustrated our invention in connection with a hopper-car, although it is apparent that its application is not limited to a car of this particular type, but may be applied to gondola or other cars of the open-type.

In the drawing the numeral 2 designates the side-sills, which may be of rolled channels with the flanges turned inwardly, said side-sills being connected to the bolsters 3 made up of web-plates 4 and the customary angles and stiffened members. The customary center-sills 5 extend longitudinally centrally of the car from bolster to bolster.

The side-frames are made up of the vertical stakes or posts 6 which are riveted at their load ends to the side-sills 2. These stakes may be in the form of rolled Z-bars, as illustrated, or in any other form desired. The upper ends of the stakes 6 are riveted to the downwardly extending angles of the top-chords or angle-bars 7. The diagonal Z-bar braces 8 are riveted at their lower ends to the side-sills 2, or bottom chords, and at their upper ends are connected to the top chords or angles 7, gusset-plates 9 being employed to connect the vertical stakes with said diagonals. Where these posts and braces are made of pressed metal, the gussets may be eliminated, the upper ends of the diagonals being flattened out to connect with the upper ends of the vertical posts.

The side sheets 10 are preferably made of copper-bearing steel which has greater resisting power against the action of the sulphuric-acid, or other corrosive, and said plates are riveted at their upper ends to the

protecting plate 11 which covers the rivets connecting the vertical stakes 6 and braces 8, and protects the same from the lading. This protecting plate 11 may be made up of sections, or in one piece to run the entire length of the inside of the car, as desired, although it is preferred to make this protecting plate in three sections, the end-sections to be flanged to form a connection to the end-sheets 12 of the car.

This protecting plate 11 is inwardly bent, as at 13, at its upper end, and is riveted to the horizontal flange of the top-chord 7.

The lower ends of the side-sheets 10 are riveted to the outside hopper-sheets 14, as shown in Fig. 4, and in making this connection the hopper-sheets lap over on the outside of the side-sheets, thereby eliminating the ledge which would occur by having the hopper sheet on the inside of the side-sheet, which has been customary heretofore, said ledge forming a shoulder for the collection of the lading, and thereby increasing deterioration at the riveted joint of the side and hopper-sheets.

From the above manner of connecting the side-sheets along their tops to the protecting plate 11, and along their bottoms to the hopper-sheets, said side-sheets act only as a load-container and can therefore be reduced in thickness and weight. Furthermore, if said side-sheets wear out they can be readily replaced without interfering with the side frame of the car and replaced by new sheets. In this manner the weight of the car is greatly decreased without sacrificing strength, which decreases the dead-weight with a proportional increase in live-weight.

The floor sheets 15 extend up on the outside of the side-sheets 10 and hopper sheets 14, as shown at 16, which is particularly advantageous in flat-bottom gondola-cars, as it provides for the riveted joint above water which may settle in the bottom of the car, and so prevents rusting and corrosion at the joint which in time will weaken the structure so that it will result in the collapse of the bottom-sheet. This also provides for a larger radius at the floor line of hopper cars which naturally assists in the flow of the lading in discharging the contents of the car. Furthermore, by having the bottom outside of the side sheet, as at 16, no ledge is formed in the collection of lading which will result in the deterioration of the joint at this point.

In order to reinforce and strengthen the floor, we provide reinforcing sheets 17 which are continuous and extend across the floor, the ends being bent, as at 18, to form a connection with the side hopper-sheets 14.

The bolster web-plate 4 is connected to the side-stake 6 at that point by rivets 19 where said side-stakes are formed of Z-bars.

What we claim is:

1. In a metallic open-top car, side-frames comprising top and bottom-chords, vertical and diagonal members connecting said chords, an inside plate connected to the top-chord, side container-sheets connected to said plate along their upper edges, and hopper-sheets to which the lower ends of said container-sheets are directly connected.

2. In a metallic car of the open-top type, a side-frame comprising top and bottom-chords, vertical and diagonal members connecting said chords, a protecting plate connected to the top-chord covering the connections of said vertical and diagonal members to said top-chord and to each other, side container-sheets connected at their upper ends to said protecting plate, and hopper-sheets to which the lower ends of said container-sheets are directly connected.

3. In a metallic car of the open-top type, a side frame comprising top and bottom chords, vertical and diagonal members connected to said chords and to each other at the upper ends, side-sheets, and a protecting member connected to the top chord and extending down on the inside over the points of connection of said vertical and diagonal members to the top-chord and to each other.

4. In a metallic car of the open-top type, a side frame comprising top and bottom chords, brace members connected to said chords and to each other at the upper ends, side sheets, and a protecting member connected to the top chord and extending down on the inside over the points of connection of said brace members to the top-chord and to each other.

In testimony whereof we, the said ANDREW CHRISTIANSON and HARRY T. ANDERSON, have hereunto set our hands.

ANDREW CHRISTIANSON.
HARRY T. ANDERSON.