W. P. MURPHY.

METAL END STRUCTURE FOR RAILWAY CARS.

APPLICATION FILED JAN. 5, 1912.

1,067,053.

Patented July 8, 1913.

2 SHEETS—SHEET 1.

Fig. 2.

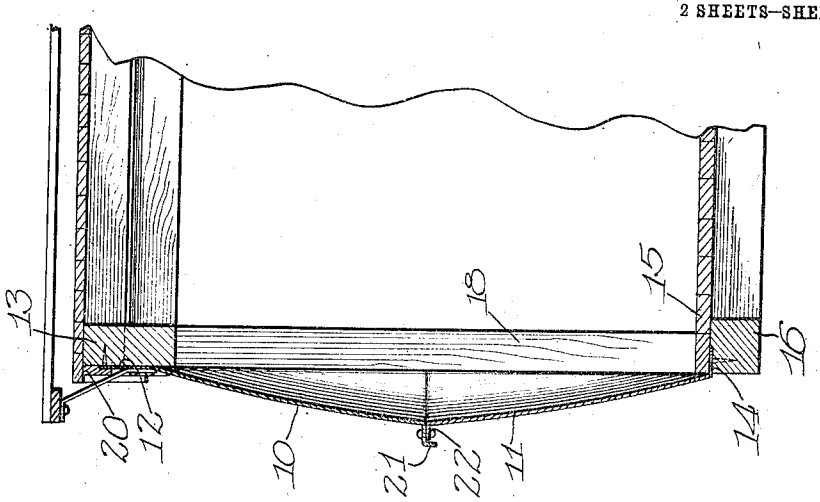
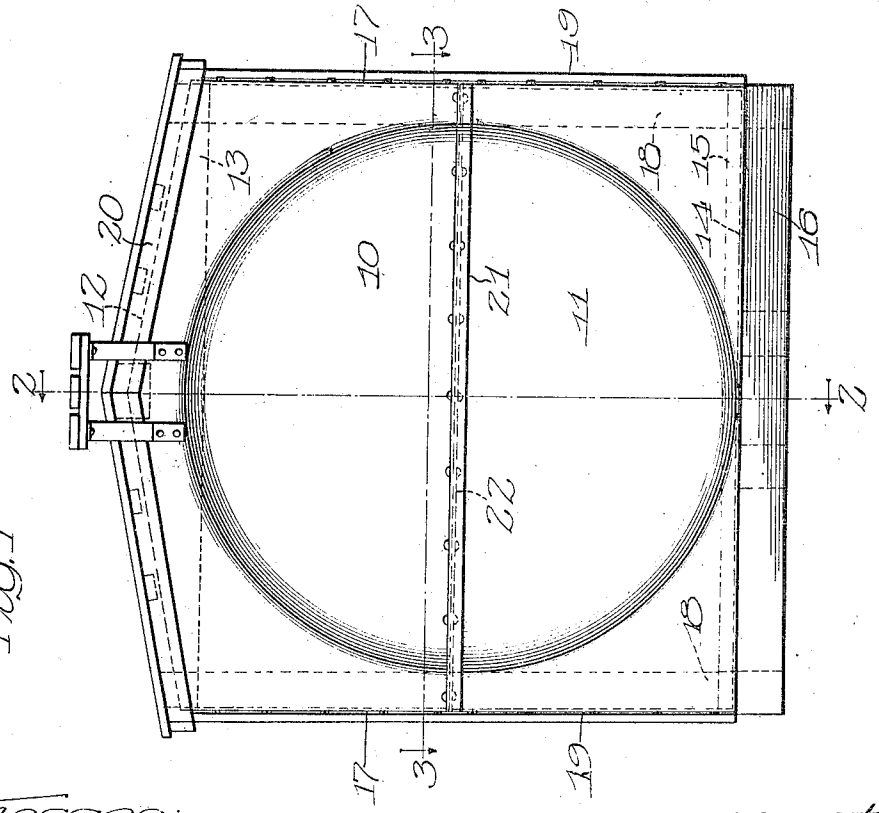


Fig. 1



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2 SHEETS—SHEET 2.

Fig. 3.

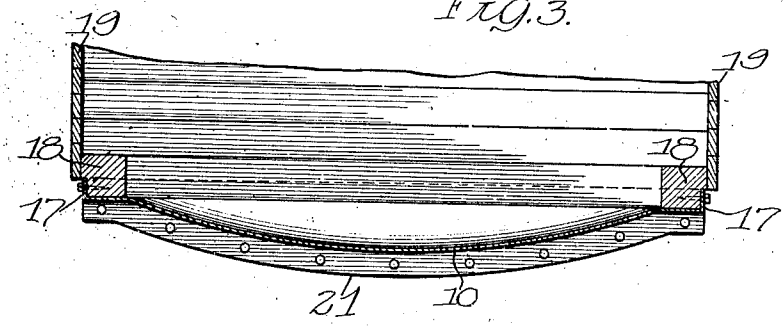


Fig. 4.

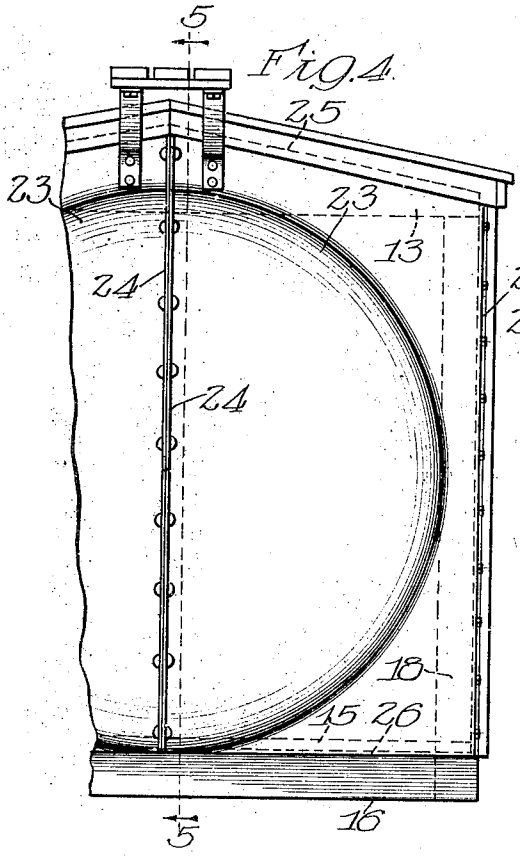
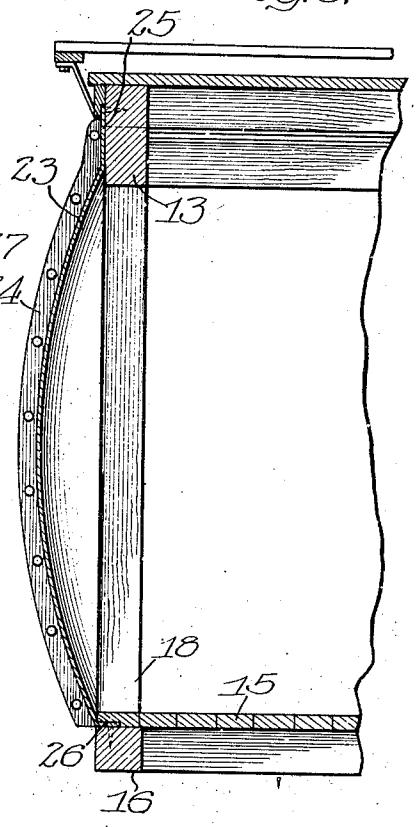


Fig. 5.



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UNITED STATES PATENT OFFICE.

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METAL END STRUCTURE FOR RAILWAY-CARS.

1,067,053. Specification of Letters Patent. Patented July 8, 1913.

Application filed January 5, 1912. Serial No. 669,638.

To all whom it may concern:

Be it known that I, WALTER P. MURPHY, 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 Metal End Structures for Railway-Cars, of which the following is a specification.

My invention relates to railway cars, and has for its object to provide a novel end structure for the same which is made entirely of metal; which can, if desired, be secured to the ordinary wooden box car to take the place of the usual wooden end; which will be absolutely water proof; which, furthermore, by its peculiar design and configuration is well adapted to withstand the strains and shocks to which the ends of freight cars are subjected in service; and which, finally, can be cheaply manufactured and readily and conveniently attached either to a car when first constructed or to an old car when the wooden end of the same has become so much damaged and injured as to require replacement.

The ends of freight cars are subjected in service to very violent and heavy shocks and strains due particularly to the thrusts of the cargoes of the cars when the train starts or stops, and these shocks and strains are very likely, in the case of wooden box cars of ordinary construction, to soon prove destructive to the ends of the car by breaking out the sheathing or tearing it from the framework to which it is attached. This tendency of the load within the car to injure and destroy the ends by repeated vibratory movements and concussions is, of course, enhanced by a defective condition of the draft gears which may result either from the use of springs which are too light or from the normal weakening of the draft spring which inevitably comes with continued use. Any considerable injury to the end sheathing of a wooden box car, besides involving the expense of repair, gives opportunity for theft and what is perhaps more important, incapacitates the car for use in carrying grain in bulk without the danger of loss by leakage. It has been said that on the average every box car in the United States makes six trips a year as a grain carrier, and whether or not this be an absolutely accurate statement it is true that box cars are very largely used for that purpose and statistics show that the losses of grain in transit due to leakage and particularly to leakage through the broken or otherwise defective ends of the cars is very considerable. In providing an end structure for box cars it is, therefore, of the utmost importance, first, that the configuration of the end should be such as to minimize the destructive character of the thrusts of the cargo and, second, that the end should be so attached to the body of the car that it cannot be detached, dislodged or forced away from the same so as to permit even a small leakage of grain when the car is employed as a grain carrier. In addition, the end structure must be water proof and should be comparatively cheap to manufacture and easily attachable to a car of ordinary construction either when the same is originally built or in replacement of a broken or damaged wooden end. An end structure effectively accomplishing these desirable results is shown in the accompanying drawings in which—

Figure 1 is an end elevation of a car, showing one preferred embodiment of my invention; Fig. 2, a sectional view taken on line 2—2 of Fig. 1, looking in the direction of the arrows; Fig. 3, a sectional plan taken on line 3—3 of Fig. 1; Fig. 4, a fragmentary end elevation showing a modification, and Fig. 5, a sectional view taken on line 5—5 of Fig. 4, looking in the direction of the arrows.

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

Referring first to Figs. 1 to 3 inclusive, 10 designates an upper plate and 11 a lower plate, these plates being curved or shaped so that they form together a uniformly protuberant or convex end structure closing the end of the car. By giving the end of the car this configuration it will be seen that the thrust of the cargo, when the car is stopped or started, is not and cannot be exerted directly, that is to say, perpendicularly or radially against any point on the area of the end except at its mathematical center; or in other words, the thrust of the cargo always has a lateral component which is absorbed, diminishing the forward thrust and so minimizing the tendency of the cargo to break out the end or tear it from its attachment to the car. For example, if the car is loaded in part, say, with lengths of pipe, or other articles of the sort peculiarly liable, by their

tendency to shift longitudinally, to damage the ends of the car, the impingement of the ends of the pipe will be against the inner surface of the end on non-radial lines so that the blow struck is not a direct blow but to a certain extent a glancing blow; and this will be true no matter in what place in the car the pipe or other article may be, whether at one side or the other, or higher or lower unless, of course, it chance to lie exactly in line with the mathematical center of the curved surface. If under these circumstances the thrust against the end is continued it can be only on condition that the pipe or other article which is exerting the thrust be capable of shifting toward the center of the car and, of course, each part of the load of the car counteracts and checks the tendency of every other part to so move. In this way the thrust of the cargo on the end and the danger of the latter being broken out or torn from its attachments are minimized. It will be understood that with the end of the car rectangular the convexity need not and preferably will not be carried into the corners. The extreme corners of the end structure will, under ordinary circumstances, be strong enough to take any stress that may be exerted against them due to the fact that the end structure is securely attached at all its edges to the car body; though if desired the corners of the plates might be suitably corrugated or otherwise reinforced.

The upper edge of sheet 10 is preferably formed with a flat flange 12 which is secured to the end plate 13 of the car in any suitable manner. The lower margin of sheet 11 is preferably inturned to form a flange 14 which intervenes between the flooring 15 of the car and the end sill 16 to which latter it is secured by any suitable fastening devices. Similarly the side margins of the sheets are formed with the angular flanges 17 which are secured to the corner posts 18, the latter being preferably gained out, as shown in Fig. 3, so as to bring the flanges of the plates and their attaching devices within the planes of the side sheathing 19. A fascia 20 is provided which overlaps the flange 12 on the upper plate 10.

In order to insure a water tight connection between the plates 10 and 11 the former may be formed with an angular flange 21 to which is riveted the outstanding flange 22 on the meeting edge of the lower plate.

In Figs. 4 and 5 I have shown a modified construction in which the end structure is made up of two plates or sections 23 each extending from top to bottom of the car and being joined together along a central vertical line, the plates or sections being formed with flanges 24 at their meeting edges which are riveted one to another. The end thus constituted is uniformly protuberant or convex as in the case of the construction previously described, and is preferably formed at its margins with the flange 25 for attachment to the end plate, the flange 26 for attachment to the end sill, and the flanges 27 at the sides for attachment to the corner posts.

By providing the structures above described with the inturned flanges 14, 26, which intervene between the flooring and the framework of the car, for example the end sill, there is no danger of the car leaking at this point when filled with grain in bulk. The end structure of my invention is preferably made in more than one section because of the difficulty and expense of forming as large a structure as this of one sheet of metal.

I claim:

1. The combination with a railway box car, of a metal end structure for the same comprising two sheets of metal and means for securing said sheets together which provides also a reinforcing rib extending diametrically across the end structure, the margins of said end structure being flat and the center part being uniformly protuberant or convex for the purpose specified, and means for securing said end structure to the car.

2. A metal end structure for railway box cars which is uniformly protuberant or convex for the purpose specified and is provided with flanges at its sides and top adapted to be secured to the corner posts and end plate, respectively, of the car, and with an inturned flange at the bottom which intervenes between the flooring of the car and the end sill and is secured to the latter.

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