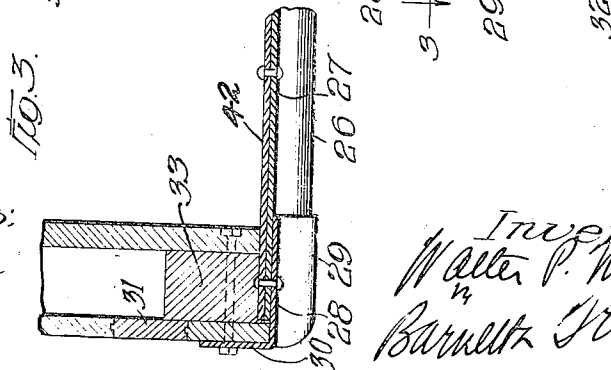
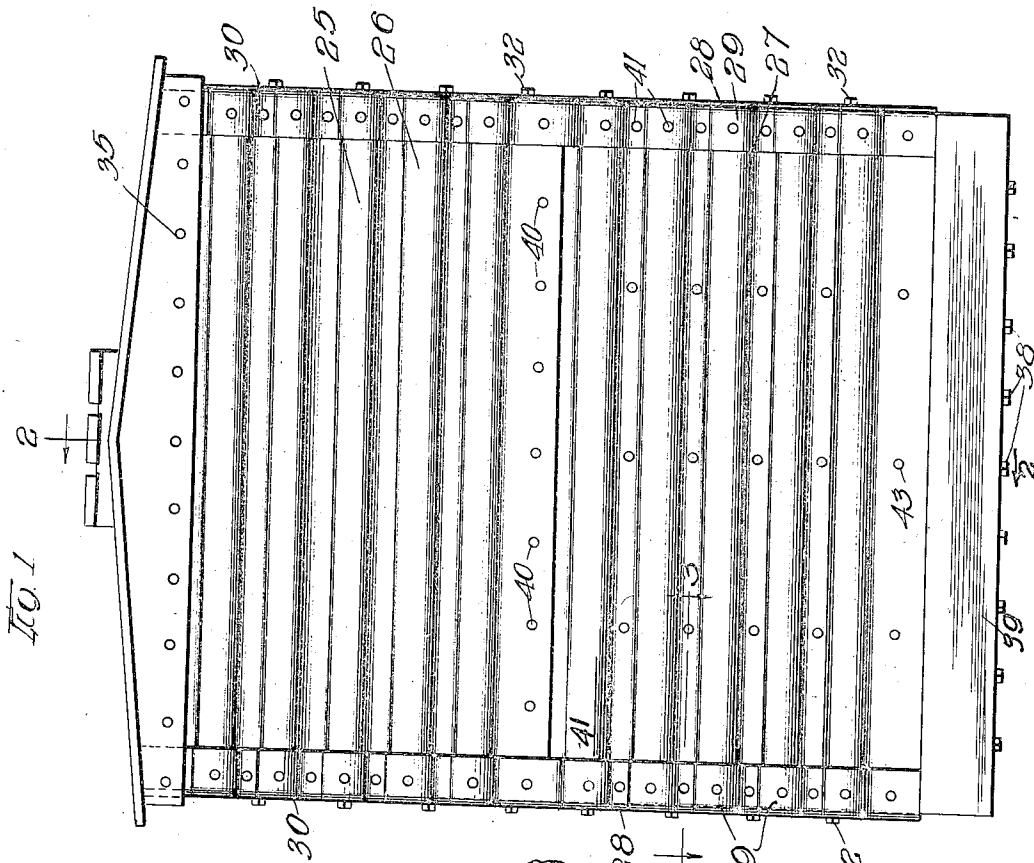
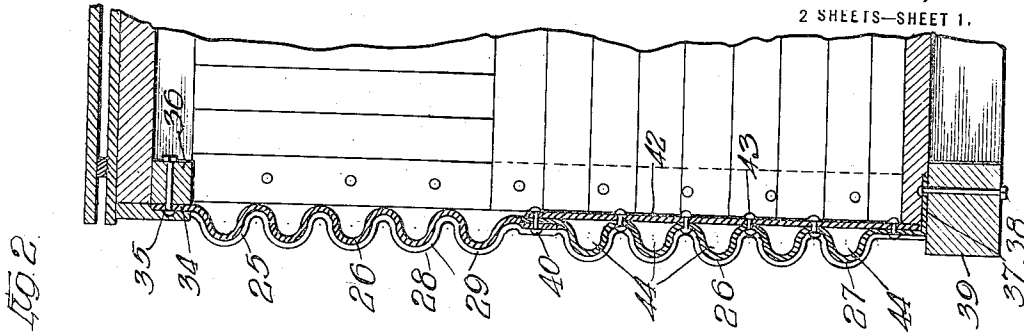


1,410,710.

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METAL END STRUCTURE FOR RAILWAY CARS.  
APPLICATION FILED JUNE 17, 1919.

Patented Mar. 28, 1922.

2 SHEETS—SHEET 1.



Witnessed:  
Harry R. White  
W. P. Kilroy

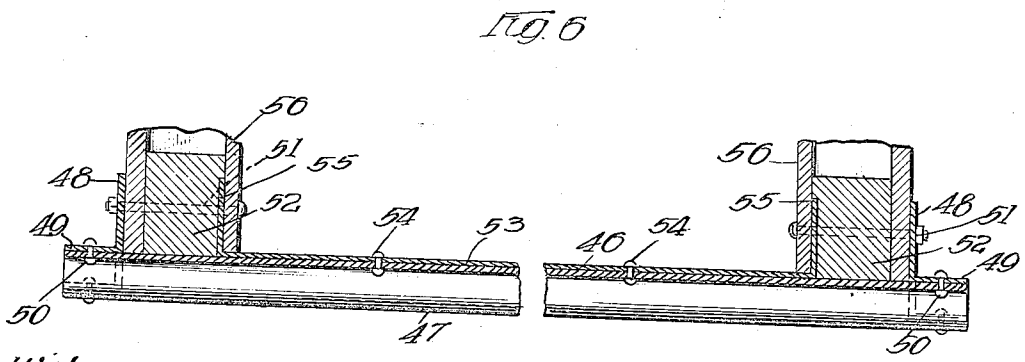
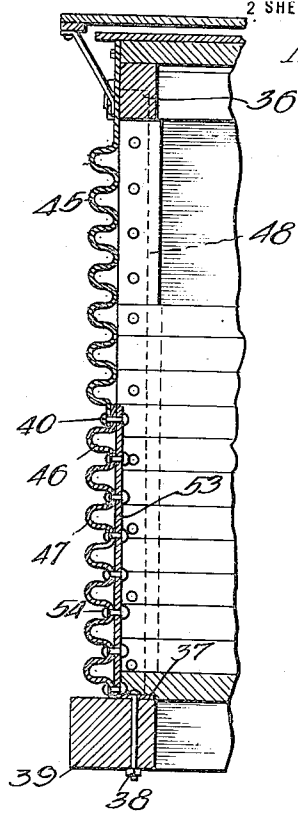
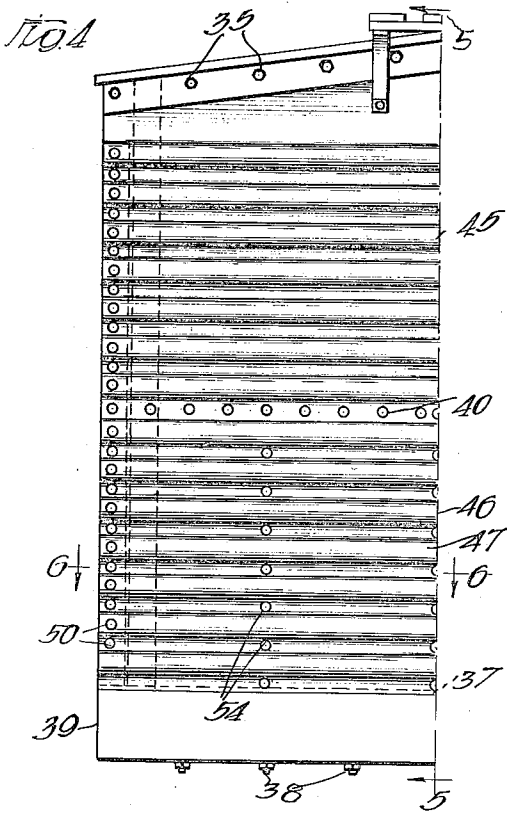
Inventor:  
Walter P. Murphy  
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Witnesses:  
 Henry P. L. White.  
 W. P. Kilroy

Inventor:  
 W. P. Murphy  
 By Barrett & Gorman  
 Attys

# UNITED STATES PATENT OFFICE.

WALTER P. MURPHY, OF NEW YORK, N. Y.

## METAL END STRUCTURE FOR RAILWAY CARS.

1,410,710.

Specification of Letters Patent. Patented Mar. 28, 1922.

Original application filed July 25, 1917, Serial No. 192,767. Patent No. 1,313,106, dated August 12, 1919.

Divided and this application filed June 17, 1919. Serial No. 304,830.

*To all whom it may concern:*

Be it known that I, WALTER P. MURPHY, a citizen of the United States, residing at New York city, in the county of New York and State of New York, 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 end structures for railway cars and has for its object to provide a reinforced sheet metal end structure which may be made relatively light in weight without sacrificing the strength and rigidity required in constructions of this character to resist the strains due to shifting of the cargo and other causes.

When loading a railway car the heavier parts of the cargo are usually placed in the bottom of the car. In the event of any shifting of the cargo, such for example, as is caused by the sudden starting or stopping of the car, the lower part of the car end is subjected to greater strains than the upper portion. One of the specific objects of this invention is to provide a novel and inexpensive reinforcing means for a corrugated sheet metal car end structure whereby the structure will be strongest at the points where strength is most needed to resist the severe shocks and strains to which a car end is subjected while in service.

The invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is an end view, in elevation, of a sheet metal car end structure constructed in accordance with the invention;

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is an end view in elevation of a railway car illustrating a modified form of end structure;

Fig. 5 is a vertical section taken on line 5—5 of the structure shown in Fig. 4; and

Fig. 6 is a sectional view, taken on the line 6—6 of Fig. 4.

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

Referring to Figs. 1 to 3 inclusive of the drawing, the structure therein shown consists of an upper end sheet 25 formed with horizontally disposed contiguous ribs or corrugations 26 which extend from side to side

of the sheet, and lower sheet 27 similarly corrugated, and side attaching members 28 which are formed with corrugations 29 adapted to fit over the extremities of the corrugations 26 and provided, preferably, with angularly disposed flanges 30 which overlap the side sheathing 31 of the car and are secured to the body by means of bolts 32, for example, which pass through the corner posts 33. The upper sheet is preferably formed with a flat upper margin 34 which is secured by bolts 35 to the end plate 36 of the car. The lower sheet is preferably formed at the bottom with an inturned flange 37 which extends under the flooring of the car and is secured by means of bolts 38 to the end sill 39. The upper sheet overlaps the lower sheet and is secured thereto by rivets 40. The corrugations of the side or attaching members 28 fit closely over the corrugated extremities of the end sheet, the side members being secured to the sheets by rivets 41. As the sheets 25, 27 are formed with contiguous corrugations or ribs which extend in each case from one side of the sheet to the other, it is possible to perform the operation of corrugating the sheets by cold process without stretching the metal, as would be necessary if the sheets had to be provided with flat or non-corrugated margins at the sides. The idea of extending the corrugations to the edges of the sheet permits the sheet to be rolled instead of pressed and thereby cheapens the manufacture of the end structure, though it will be obvious that the reinforcing means for the lower part of the car, as will be hereinafter described, may be applied equally well to an end sheet in which the corrugations terminate within the edges of the sheet. The side members 28 because of their configuration, have considerable load bearing strength so that they may serve as load bearing elements. In this or analogous constructions in which the attaching angles are separate from the end sheets, it is not necessary to make the end sheets conform in width exactly to the width of the car. Any slight variation in the width of different cars will be taken care of by the overlap of the attaching angles on the end sheets. If thick enough metal is used the wooden corner posts may be dispensed with or used simply as nailing strips. In order to reinforce the lower portion of

the end so as to withstand strains incident to the shifting of the cargo and other causes, I have preferably shown a sheet metal lining 42 which is preferably riveted to each inwardly projecting corrugation of the lower sheet 27 by rivets 43. The sheet metal lining 42 being secured to the lower end sheet 27 in this manner provides a series of box girders 44 which extend from side to side of the car so as to strengthen and rigidify the end structure at the lower part of the car. The sheet metal lining in the construction shown in the drawing extends only part way up the end, though it will be obvious that the said lining may be extended higher up than that illustrated without departing from the invention.

In Figs. 4, 5 and 6, I have shown a modified construction in which the end sheets 45, 46, project beyond the sides of the car. These are formed with horizontal corrugations 47 which extend to the edges of the sheet, and are secured to the sides of the car by angular attaching members 48 which are formed with corrugations 49 adapted to fit the corrugations 47 of the sheet. The corrugated portions of the attaching member are preferably riveted to the sheet by rivets 50 and are secured to the car by means of bolts 51 which extend through the corner posts 52 of the car.

In these figures I have shown a metal lining 53 which in addition to closing the corrugations in the end sheet and reinforcing the same, as described in connection with Figs. 1 to 3 inclusive, also provides a cross brace between the corner posts 52 of the car. This sheet metal lining is riveted, as indicated at 54, to the inwardly projecting corrugations of the end sheet in substantially the same manner as described in connection with Figs. 1 to 3, inclusive, and is provided along its vertical edges with angular flanges 55 which preferably extend between the lining boards 56 and corner posts 52 of the car. These flanges are secured to the end posts by means of the bolts 51.

This application is a division of application Serial No. 182,767, filed July 25, 1917 (patented as 1,313,106, August 12, 1919) and, as to Figs. 1, 2 and 3 hereof, is a division of application Serial No. 733,369 filed November 25, 1912 (patented as 1,236,744, August 14, 1917) through the copendency of said applications 733,369 and 182,767.

I claim:

1. The combination with the framing of a railway car, of an end structure for the car comprising a sheet metal panel made up of two sheets placed face to face and secured together at intervals, one of said sheets being formed with reinforcing corrugations adapted to transmit stress to said framing, one of said sheets being provided with angular attaching flanges which stand at right

angles to the plane of the end and which are adapted to overlap and be secured to said car framing.

2. The combination with the framing of a railway car, of an end structure for the car comprising a sheet metal panel made by two sheets placed face to face and secured together at intervals, one of said sheets being formed with reinforcing corrugations adapted to transmit stress to said framing, the vertical edges of one of said sheets being provided with means for attaching the same to the car framing.

3. The combination with the corner posts of a railway car, of an end structure for the car comprising a sheet metal panel made up of two sheets placed face to face and secured together at intervals, one of said sheets being formed with corrugations which extend across the car from side to side thereof so as to transmit stress to said corner posts, said sheets being provided along their vertical edges with attaching flanges which stand at right angles to the plane of the end and which are adapted to overlap and be secured to opposite sides of the corner posts.

4. The combination with the railway car, of an end structure comprising a corrugated end sheet, and a metal sheet lying against the corrugated sheet and secured to the corrugations thereof so as to constitute a truss for the same.

5. The combination with a railway car, of an end structure comprising a corrugated end sheet, and a flat sheet lying against the corrugated sheet and secured to the corrugations of said sheet so as to constitute a truss for the same.

6. The combination with a railway car, of an end structure comprising a sheet metal panel formed with a plurality of corrugations and a flat sheet lying against the corrugated sheet so as to cover a plurality of said corrugations and secured to said sheet between certain of said corrugations.

7. The combination with a railway car, of an end structure comprising a corrugated metal end sheet, a lining and stiffening element which lies against the inside of said corrugated sheet and is secured at intervals to the corrugations thereof so as to constitute a truss across the same.

8. The combination with a railway car, of an end structure comprising a corrugated metal end sheet having inwardly extending corrugations, and a lining and stiffening element which lies against the inside of said corrugated sheet and is secured at intervals to the corrugations of said sheet so as to constitute a truss across the same.

9. The combination with a railway car, of an end structure comprising a sheet metal panel formed with a plurality of sinuous corrugations, a lining and stiffening ele-

ment which lies against the inside of said corrugated sheet and is secured at intervals to the inwardly projecting portion of said corrugations so as to constitute a truss across the sheet.

10. An end structure for a railway car, comprising two sheets of metal arranged face to face and secured together at intervals, one of said sheets being formed with a plurality of reinforcing corrugations, said end structure being provided with means constituting flat stiffening and attaching margins which lie substantially transverse of the corrugations.

11. An end structure for a railway car, comprising two sheets of metal arranged face to face and secured together at intervals, one of said sheets being formed with a plurality of reinforcing corrugations extending horizontally across the sheet, said end structure being provided with means constituting flat stiffening and attaching margins which lie substantially transverse of the corrugations.

12. An end structure for a railway car, comprising two sheets of metal arranged face to face and secured together at intervals one of said sheets being flat and the other being formed with a plurality of reinforcing corrugations, said end structure being provided with means constituting flat stiffening and attaching margins which are substantially at right angles to the plane of the end.

13. An end structure of a railway car, comprising two sheets of metal arranged face to face and secured together at intervals, one of said sheets being flat and the other being formed with a plurality of reinforcing corrugations, said end structure being provided with means constituting flat

stiffening and attaching margins which are at substantially right angles to the plane of the end.

14. A car end consisting of a sheet metal panel provided with a plurality of corrugations which merge one into the other so that the end consists of a plurality of beams each one transmitting stresses thereon to the adjacent beam and a sheet metal lining extending over a plurality of said beams and secured thereto on opposite sides of said beams.

15. A car end consisting of a sheet metal panel formed with a plurality of horizontal corrugations which merge one into the other, and a sheet metal lining secured to said end sheet on opposite sides of certain of said corrugations whereby a plurality of box girders extend across the end from side to side thereof.

16. The combination with a railway car, of an end structure comprising an end sheet the edges of which terminate within the sides of the car and formed with corrugations extending to the edges of said sheet, angular attaching members secured to the sides of the car and formed with corrugations adapted to fit the corrugations of said sheet, and a sheet metal lining secured to the inner face of said end sheet.

17. The combination with a railway car, of an end structure comprising a corrugated end sheet, and a flat sheet lying against the corrugated sheet and secured to the corrugations of said sheet.

18. In a car construction an end wall comprising a corrugated plate and a flat plate secured together and to the car body, one of said plates having a lower integral flange secured to the car under-framing.

WALTER P. MURPHY.