G. H. FORSYTH.

CAR.

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1,081,928. Patented Dec. 16, 1913.

Fig. 1.

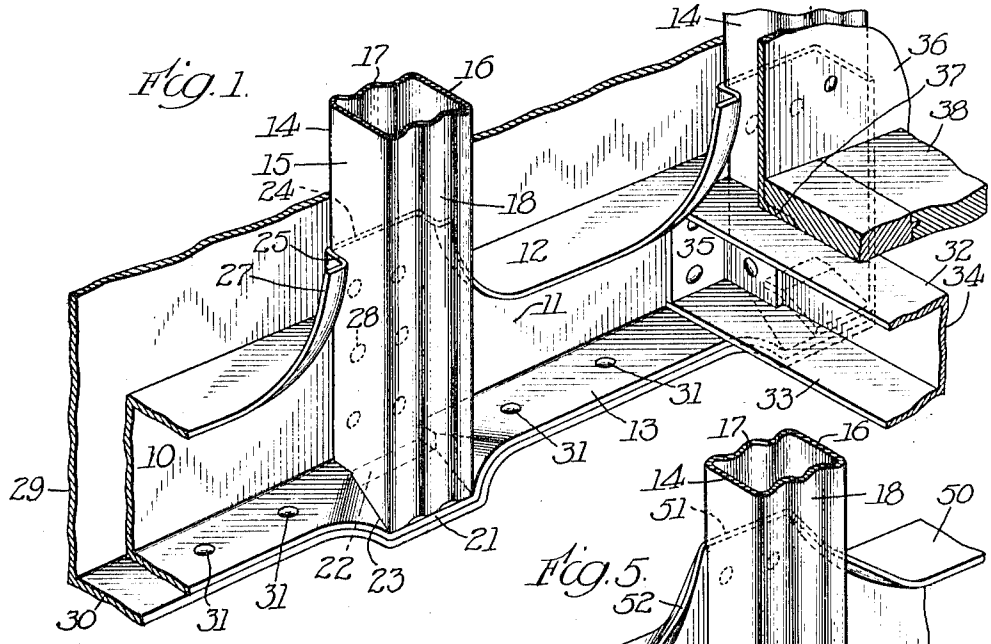


Fig. 2.

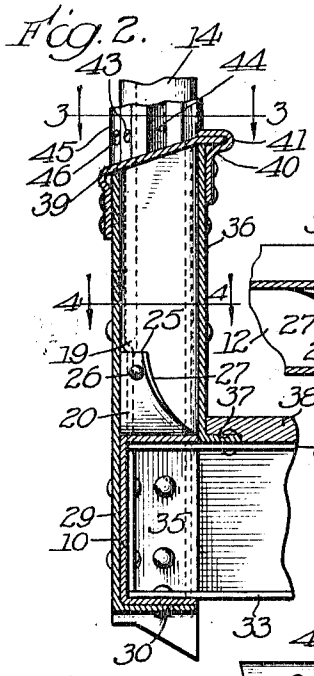


Fig. 3.

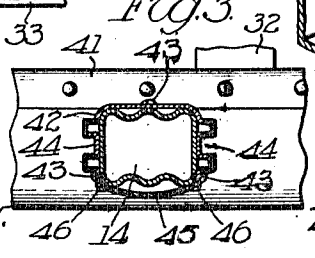


Fig. 4.

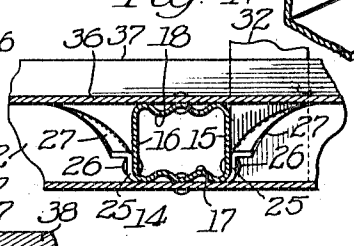


Fig. 5.

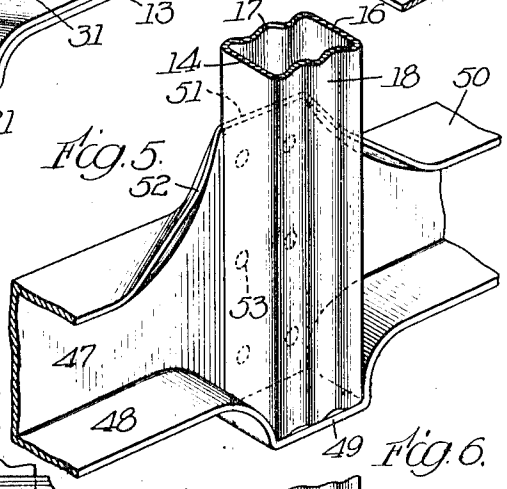
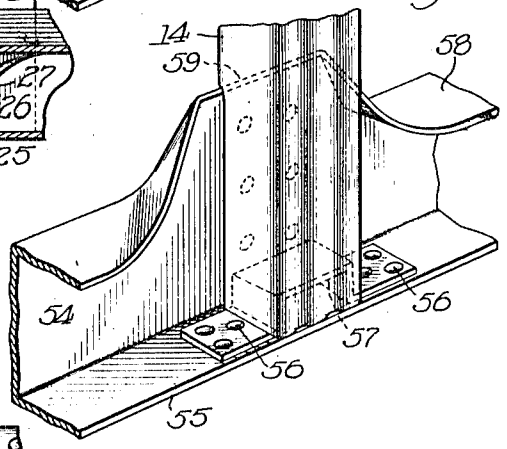


Fig. 6.



Witnesses:
Robert F. Weir
Clara L. Morrow.

Inventor:
George H. Forsyth
By Smith Brown Bell & Fuller
attys.

UNITED STATES PATENT OFFICE.

GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

CAR.

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Application filed June 10, 1909. Serial No. 501,240.

To all whom it may concern:

Be it known that I, GEORGE H. FORSYTH, 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 Cars, of which the following is a specification.

The leading aim and object of the present invention is the improvement of the frame and the appurtenant construction of railway cars, the invention concerning more especially, though not exclusively, street railway cars.

In general the novel features of construction constituting an embodiment of this invention reside more particularly in the structural characteristics of the various elements of the car and the combination and association of such parts. The side-sills, vertical posts, transverse beams, outer and inner cover-plates, flooring, and post capping are all made either individually or in their relation and coöperation to the other parts of the structure.

It is my desire and purpose to secure great strength in a car of this kind, combined with ease and economy of manufacture, sheet-metal being used wherever feasible and desirable because of the facility with which it may be advantageously employed, both because of its comparatively light weight and the strength which it possesses when bent or formed into the various shapes indicated in detail hereinafter.

For a full and complete understanding of the invention reference should be made to the accompanying drawing, which forms a part of this specification and throughout the various views of which like reference characters refer to the same parts.

In the drawing Figure 1 is a fragmentary perspective view of the parts of a car construction embodying this invention; Fig. 2 is a fragmentary vertical section through the side of the car; Fig. 3 is a horizontal section on line 3—3 of Fig. 2; Fig. 4 is a similar section on line 4—4 of Fig. 2; Fig. 5 illustrates in perspective a modified form of connection between the side-sill and vertical post; and Fig. 6 is a similar view of a still further modified construction.

Referring to Figs. 1, 2 and 4, it will be noticed that the channel side-sill 10 is disposed with its web 11 in a vertical plane, its top and bottom flanges 12 and 13, respectively, being presented inwardly. As is usual in car constructions, vertical posts are employed and are secured by rivets or otherwise to the side-sill. In the present instance I have indicated the employment of hollow sheet-metal posts 14, the transverse faces 15 and 16 of which are plane, while the outer and inner faces 17 and 18 are longitudinally-corrugated for the purpose of stiffening and strengthening the post, as will be readily understood. The corrugations on the inner face 18 ordinarily extend to the bottom of the post, while those on the outer face 17, as is indicated in Fig. 2, terminate at the point 19, leaving the lower portion of the outer face 20 substantially plane and somewhat inwardly off-set to facilitate its riveting or other connection with the side-sill.

In the structure shown in Figs. 1 and 2 at the points where the posts are attached to the side-sill, the bottom flange 13 of the latter is depressed at 21 to provide a pocket or seat for the reception of the foot of the post, such seat having an inner bottom member 22 substantially-horizontal and depressed with respect to the normal position of the flange 13, and an outer portion 23 downwardly-inclined as shown. Each post 14 has its lower end trimmed or cut so as to neatly fit within such pocket or socket. The top flange 12 of the side-sill at those points where the posts are fastened to the sill is pressed up or bent into the shape indicated in Fig. 1, so as to form for each post a substantially-vertical section 24 lying in the plane of the web or plate portion 11 of the sill and acting to give the latter added depth and strength at such portions. This off-set or pressed part of the top flange also has inwardly-extended parts 25 lying against and riveted to the plane sides 15 and 16 of the post, as is indicated at 26 (Fig. 2). The extreme inner edges of these portions 25 are supplied or equipped with the stiffening and bracing flanges 27, which operate, as will be readily understood, to assist in strengthening and bracing the post and the connection between the post and sill. A plurality of rivets 28 are employed to fasten the lower end of the outer wall of the post to the web 11 of the channel side-sill and to the upward extension or strengthening portion 24. The outer metallic cover-plate 29 is attached, in any approved manner, to the posts, and has at its lower edge an inturned flange 30 lying beneath and shaped to con-

form to the bottom flange 13 of the side-sill, such superposed flanges being riveted together at 31. The pair of side-sills or beams are cross-connected together at intervals, at their pair of posts if feasible or desirable, by a channel cross-beam 32, the bottom flange 33 of which at its ends may rest on the top faces of the flanges 13, while its vertical web or plate 34 lies against one of the plane transverse faces of the post, such as 15, the end of said cross-beam being held in place by an angle bracket 35 riveted, as is indicated, to the web of the side-sill and to one wall of the hollow corrugated post by rivets passing through the web 34. Inner metallic cover-plates 36 are employed, the same being directly riveted to the posts 14 and each having at its lower end an inturned flange 37 resting on the top flanges of the transverse beams 32, and acting between such beams as a support for the ends of the wooden floor planks 38. Where windows are to be employed between the posts, the plates 29 and 36 have associated therewith the coöperating or bent plates 39 and 40 riveted thereto and constituting the window sill, the plate 40 being bent, as is indicated in Fig. 2, so as to overlap the inner end of the plate 39, and forming a window ledge 41 of neat and simple construction. The inner and two transverse faces of the posts 14 above such window ledges are covered by bent plates 42 held thereto by screws 43, and being shaped to provide guides or runways 44 for the window sashes. The outer faces of such posts are covered and protected by convex metallic sheet cappings 45 detachably secured to the posts by screws 46, such curved covering plates concealing the corrugated formation of the posts.

It should be apparent from this description and the illustration that the side-sills of such a car embodying this invention are deepened and strengthened at the points where the vertical hollow posts are riveted thereto; that is, the webs or vertical plate portions of the channel side-sills are provided with extensions increasing their depth, the metal for such extensions being obtained by pressing or bending the side-sill flanges out of their normal planes. It will also be apparent that, owing to the corrugations of the posts, they possess great strength with the employment of a minimum amount of metal, and it will be furthermore apparent that the side-sills are cross-connected by efficient and effective means for giving the car the proper rigidity and strength. I have aimed also in a construction of this kind to supply a simple construction for supporting the ends of the floor boards or planks, and have arrived at a simple solution of the problem of covering the faces of the hollow posts, both inner and outer, with cappings or sheet-metal jackets which can be readily taken off and replaced if they become damaged or injured for any reason.

In some cases it may be desirable to have the seat or socket for the bottom end of the hollow post wholly in a horizontal plane or in a plane at right angles to the web or plate portion of the sill, and in Fig. 5 I have illustrated a modified form of side-sill 47, the lower marginal flange 48 of which is depressed or bent downwardly to form a socket or seat 49 with a flat bottom for the accommodation and reception of the lower end of the post, which in this instance may be cut off square or at right angles to its axis. In this particular construction the top flange 50 of the side-sill is pressed or deflected upwardly to provide a portion 51 in the plane of the web 47, such part being connected to the portions of the flange in its normal plane by inclined integral braces or brackets 52 which do not hug the post tightly and are not intended to be riveted directly to its side faces. In a construction of this character the part 51 lying in the plane of and above the web of the channel sill has a considerably longer base disposed lengthwise the sill where it joins the web, and for that reason the side-sill or beam as a whole at such point probably possesses greater strength than in the construction indicated in Fig. 1. As in the previous instance, the outer wall of the hollow corrugated post 14 is riveted to the web of the sill and to the extension or pressed flange portion 51 by the rivets 53.

In some cases it may be preferable to leave the bottom flange of the channel side-sill unmodified, and in Fig. 6 I have shown such a construction wherein the channel side-sill 54 has the ordinary bottom marginal longitudinal flange 55, to which is riveted at 56 a bent plate 57 forming a rest for and fitting within the lower end of the hollow post 14, such bent plate acting to assist in maintaining the lower end of the post in proper position and in the desired relation with the side-sill. This manner of holding the lower end of the post is simply illustrated as one way of accomplishing this result, but it is to be understood that various other expedients may be just as readily employed. In this especial embodiment of the invention the top flange 58 of the side-sill is pressed up out of its normal plane and into the plane of the side-sill web much as it is in the structure illustrated in Fig. 5, and differs therefrom only in that the upper web extension 59, corresponding to the part 51 of Fig. 5, is of greater width than the post 14 riveted thereto. In this way I aim to give increased strength and strain-resisting power to those portions of the sill to which the posts are riveted or otherwise attached, it being apparent that the load-sustaining ability of a side-sill of this character is substantially proportional to the depth of its web or ver-

tical plate part, the flanges in the various constructions indicated acting as stiffening means to hold or maintain these webs or plate portions in their normal planes and to prevent their buckling, warping, or twisting under the action of the strain and load to which they are subjected. Of course, these stiffening flanges are omitted where the top flange of the side-sill is bent or pressed up into the plane of the web, but its function is carried out and the loss of strength and rigidity neutralized or overcome by the posts themselves, which act, as will be readily understood, to brace and stiffen the parts of the side-sill to which they are attached. In those instances where the top flange of the side-sill is cut away for the accommodation and reception of a post, such a sill at that point is considerably weakened, but in my construction the metal which would ordinarily be cut away is turned or pressed up into the plane of the web, acting to increase the depth of the latter and correspondingly increase its load-sustaining power.

To those skilled in this art it will be understood that this invention, while illustrated on the drawing as being capable of a plurality of embodiments, is not limited and restricted to the precise constructions shown and described, since the invention is susceptible of a large number of embodiments or of incorporation in a considerable number of constructions, and therefore it should be noted that the various minor mechanical features of the car construction herein set forth in detail may be modified and changed within comparatively wide limits without departure from the substance of the invention and without the sacrifice of any of its substantial benefits.

I claim:

1. In a railway car construction, the combination of a flanged structural member having an integral plate portion, a post secured to the said plate portion, the member at the point of connection of the post therewith having a portion of its flange bent into substantially the plane of the plate portion to form a lateral extension thereof with wings extending obliquely from the connection of such extension with the post to the inner edge of the flange, whereby to lend additional strength and brace the post connection, substantially as described.

2. In a railway car construction, the combination of a flanged structural metal member having a plate portion, and a hollow post secured to said plate portion, said member at the connection of said post therewith having a part of its flange in substantially the plane of said plate portion to lend added strength at such point, substantially as described.

3. In a railway car construction, the combination of a flanged structural metal member having a plate or web portion, and a hollow longitudinally-corrugated car post secured to said plate portion, said member at the connection of the post therewith having a part of its flange bent into substantially the plane of said plate portion to give added strength at such point, substantially as described.

4. In a railway car construction, the combination with a structural metal member having a web and a pair of longitudinal flanges, of a hollow metal car post secured to said web and held in position on one of said flanges, the other flange at the connection of said post with said member being bent into substantially the plane of said web to lend added strength at such point, substantially as described.

5. In a railway car construction, the combination with a structural metal member having a web and a pair of marginal longitudinal flanges, of a second member secured to the web of said first member, one flange of said first member being off-set to form a seat or socket for the end of said second member, the other flange of said first member being bent out of its normal plane into substantially the plane of the web to lend added strength at such point, substantially as described.

6. In a railway car construction, the combination of a channel bar having one flange off-set to form a post seat or socket, the other flange of said channel bar adjacent to said seat or socket being bent or deflected out of its normal plane into substantially the plane of the web of the channel bar to lend added strength at such point, and a hollow post having an end resting in said seat or socket and fastened to the web of said channel bar, substantially as described.

7. In a railway car construction, the combination of a hollow longitudinally-corrugated metal post, and a metal covering or capping detachably secured to said post whereby upon injury to said capping or covering the latter may be readily removed and repaired or a new one substituted therefor, substantially as described.

GEORGE H. FORSYTH.

Witnesses:
E. MOLITOR,
ALLEN W. MOORE.