July 11, 1939. E. J. W. RAGSDALE 2,165,576

VEHICLE BODY

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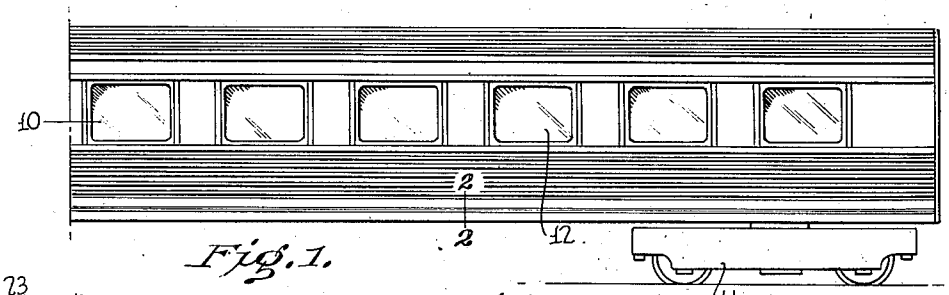


Fig. 1.

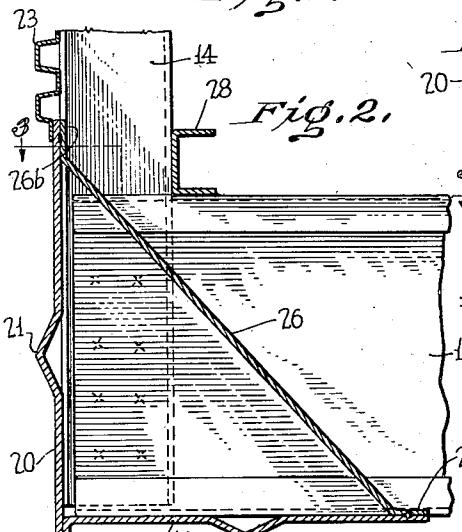


Fig. 2.

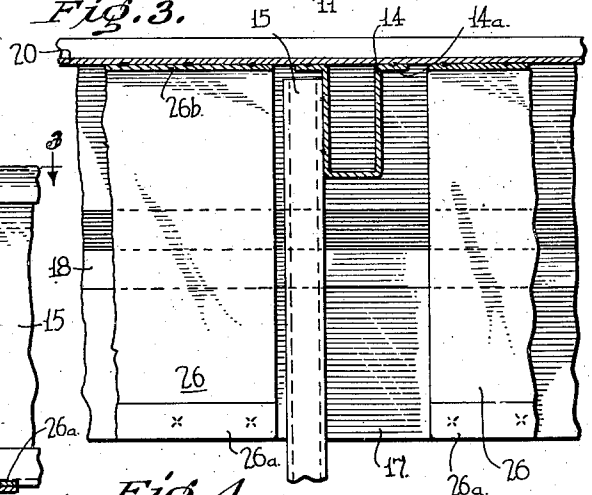


Fig. 3.

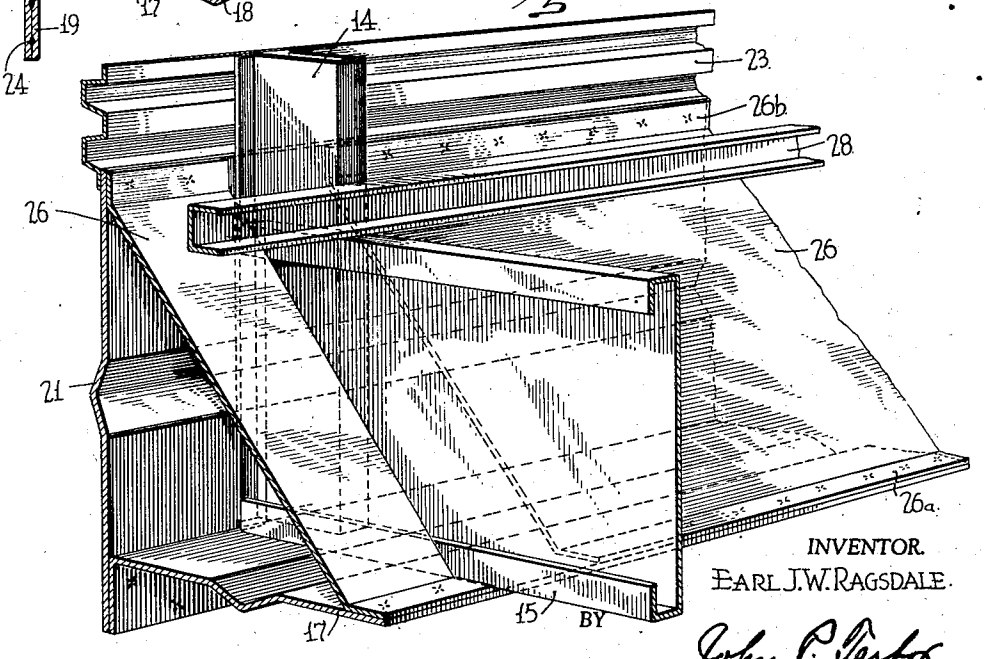


Fig. 4.

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VEHICLE BODY

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6 Claims. (Cl. 105—397)

This invention relates to improvements in vehicle bodies and more particularly to improvements in the supporting structure therefor.

One of the objects of the present invention is to provide an improved body structure for a vehicle, as of the rail car type, which is of light weight and yet of substantial strength. Such object is attained in part by providing a side sill or lower chord structure of hollow, substantially closed cross section which has high columnar strength and is adapted to resist either the normal tension loads or the abnormal compression loads of the car body.

Another object of the invention is to provide an improved beam type side frame structure, more particularly for side buff cars having great longitudinal strength and being readily formed from rolled metal sections fabricated by welding.

Further objects and advantages of the present invention will appear from the following description of a preferred form of embodiment thereof taken in connection with the attached drawings, in which:

Fig. 1 is a side elevation of a part of a vehicle of the rail car type;

Fig. 2 is a vertical transverse cross section taken substantially on the line 2—2 of Fig. 1 and showing the details of the side sill or lower chord of the frame;

Fig. 3 is a horizontal cross section taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is an inside perspective view generally showing the assembly of the joint between the posts, floor beams and side frame.

In a preferred form of embodiment of my invention, the vehicle body 10 is mounted on supporting trucks 11 of a known type. The body 10 is normally subjected to substantial loads, primarily of a longitudinal nature due to draft and buffing, and the longitudinal reaction of the vertical forces. In light weight construction, I find that a beam type side frame to be most efficient, especially as certain supporting strength is necessarily inherent for the sheathing. A truss type beam is most satisfactory for this side frame, inasmuch as it allows great flexibility for arrangement of the windows 12.

With the truss type side frames as one form, or in a modified plate girder structure, the side frame consists primarily of posts 14 intermediate the windows, such posts being the principal supports for the floor beams 15 which may be joined thereto through the overlapping web portions as by welding.

The side frames also have a lower chord structure, and in the improved construction, this is of simplified form but of great longitudinal strength both in tension and compression. Under normal circumstances, the lower chord member is in tension and due to the high tension values possible, the members need not be excessively heavy. Under collision loads, however, the lower chord is changed to compression resistance and especially on side buff cars, the direct loading may be very great.

My preferred construction is of built up angular cross section, being formed of separate plates, one of which is substantially vertical and serves as the outer rail 20 and is attached to the posts 14, preferably by welding. If desired, it may have a central bead 21 for decorative appearance and to reduce the flat pitch ratio.

This outer rail 20 is of relatively heavy material and is used principally at the bottom of the side frames and is not intended to extend up the posts very much. Savings in weight can be obtained by this arrangement and the side frame sheathing 23, which may be of corrugated or other form, can be of lighter gauge. If desired, the sheathing 23 can be directly welded to the posts forming a type of plate girder, or otherwise suitable diagonals can be used between the respective posts.

The lower chord also includes a substantially horizontal plate 17, which may have a central or other bead 18, also to reduce the flat pitch ratio. This plate 17 is attached, as by welding, to each of the floor beams 15. It has an angular marginal portion 19, through which it is attached to a marginal portion of the lower rail 20, by welding as shown at 24. This plate is substantially as heavy as the lower rail 20.

In addition to the plates 17 and 20, I also prefer to use a stabilizing web 26 forming a triangular cross section with the plates 17 and 20, such web having flanges 26a and 26b which are attached to the extremities of plates 17 and 20. As shown in Fig. 4, the reinforcing web 26 extends between floor beams 15 and stabilizes the plates 17 and 20 substantially throughout their length.

The triangular cross section resulting from the substantially vertical plate 20 and the substantially horizontal plate 17 and the stabilizing web 26 is of very substantial longitudinal strength and is adapted to act, not only as the principal tension member of the side frame for all normal stresses that may be placed upon it, but it is especially adapted to resist compression loads due to longitudinal shocks. Where the buffing members are attached to the ends of the side frames, the

stabilized triangular cross section has the necessary column strength and yet has a relatively light weight and other longitudinal members are normally unnecessary. It is to be understood, however, that for extremely high loads, stringers, one of which is indicated at 28 and which is attached to the floor beams for support of a flooring (not shown), may be availed of in distributing end shocks.

While I have shown a preferred form of embodiment of my invention, I am aware that modifications may be made thereto and I, therefore, desire a broad interpretation of my invention within the scope and spirit of the disclosure herein and of the claims appended hereinafter.

What I claim is:

1. A truss type side frame for a vehicle body having a lower chord of hollow right triangular cross section, the legs of the cross section forming the outer face of the body and providing wide faces extending, respectively, vertically and horizontally for overlapping securement respectively to posts and floor beams, the hypothenuse of the triangular cross section being interrupted for the passage of floor beams and posts.

2. A truss type side frame for a vehicle body having a lower chord of hollow right triangular cross section, said chord including a relatively heavy substantially vertical plate forming the outer face of the body, a relatively heavy substantially horizontal plate and a stabilizing web, the width of said vertical and horizontal plates being such as to provide a wide overlapping securement, respectively to posts and floor beams, the hypothenuse of the triangular section being interrupted for the passage of floor beams and posts.

3. In a vehicle body, side frames of truss form including spaced posts, a longitudinally extending substantially vertical plate attached to said posts and forming the outer face of the body and means to form a right triangular cross section chord with said plate including a through-running substantially horizontal plate, and stabilizing webs interconnecting the remote margins of the vertical and horizontal plates between the posts, the stabilizing webs being interrupted for the passage of the posts.

4. In a vehicle body, side frame posts and floor beams overlapping and secured together in their overlap, a substantially horizontal plate joined through a wide overlap to said floor beams and other longitudinally extending means including a through-running substantially vertical outer face plate secured to said horizontal plate and the posts, and stabilizing webs interconnecting the remote margins of the vertical and horizontal plates between floor beams.

5. In a vehicle body, side frame posts and floor beams overlapping and secured together in their overlap, a substantially horizontal plate extending below said floor beams and having a wide overlapping engagement therewith through which it is secured thereto, and other longitudinally extending members secured to said plate and forming a substantially right triangular hollow cross section chord member therewith, one of said members being a substantially vertical plate having a wide overlap with and attached to the posts and forming the outer face of the body, and another member being secured to the remote margins of said substantially horizontal and vertical plates and extending between floor beams and posts.

6. A side sill for a vehicle body side frame comprising a wide plate-like lower rail forming the outer face of the body, and a plate of angle cross section having a wide and a narrow branch, said plate being attached to the lower rail through the narrow branch of its angle cross section and with the wide branch forming an arm extending substantially at right angles to said rail, and means to stabilize said angle including posts and floor beams connected together in their overlapping ends and overlapping, respectively said wide lower rail and said arm and secured thereto, and plate webs interconnecting the remote margins of said rail and plate, whereby said side sill is adapted to resist high compression loads.

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