Nov. 20, 1951 O. A. KUHLER 2,575,454

RAILWAY CAR FRAMING STRUCTURE

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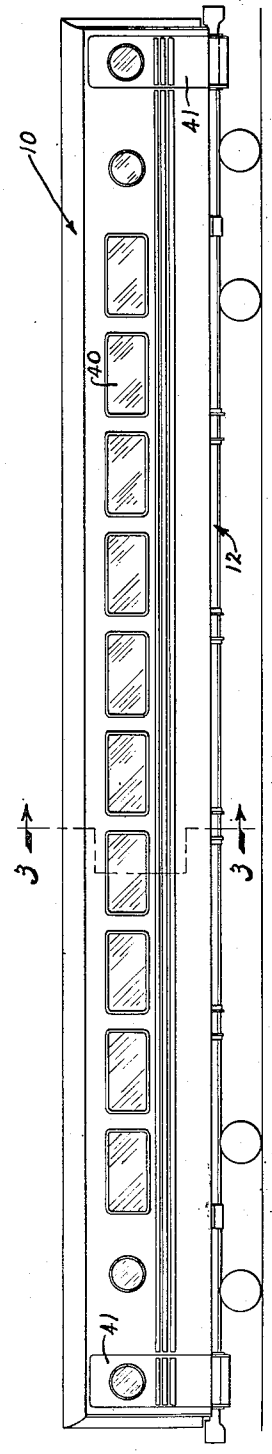

FIG. 1.

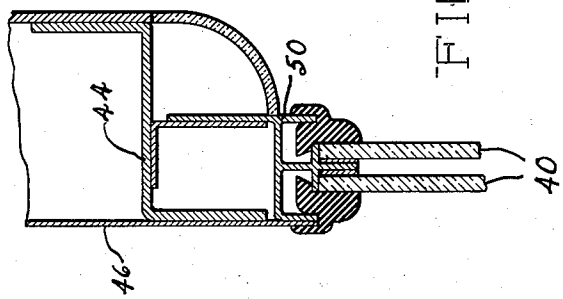

FIG. 5.

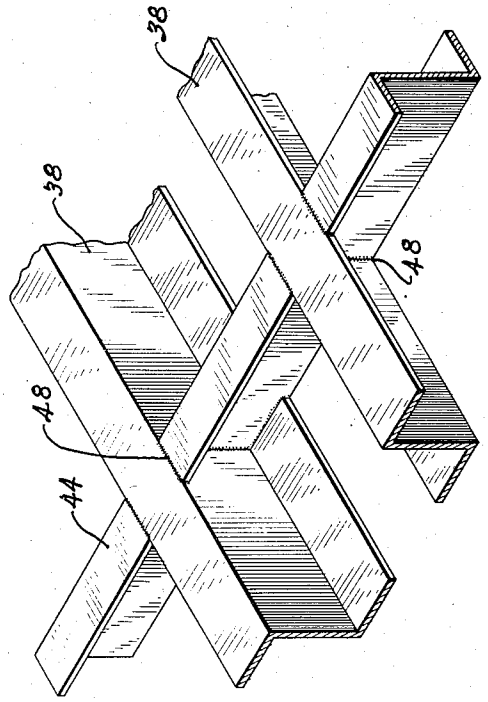

FIG. 6.

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RAILWAY CAR FRAMING STRUCTURE

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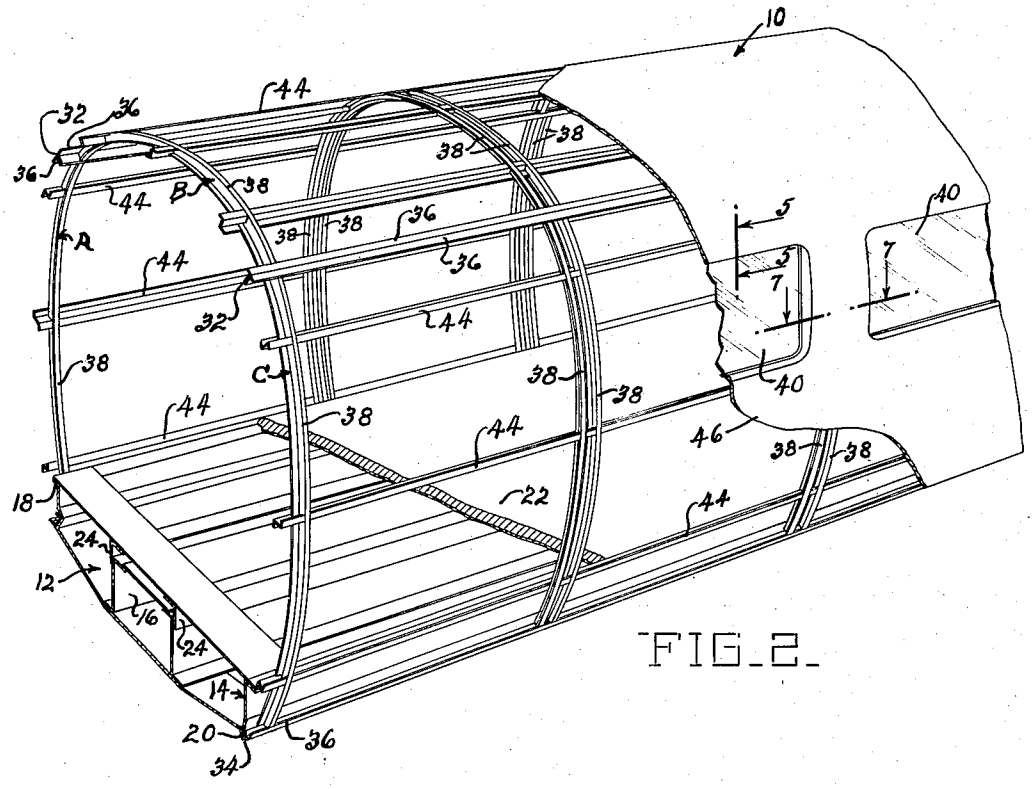

FIG_2_

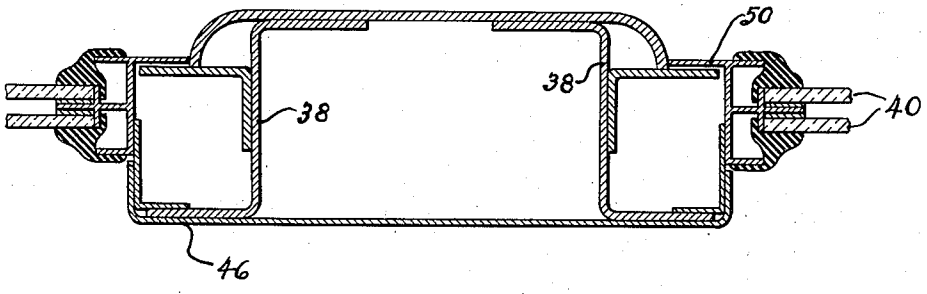

FIG_7_

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RAILWAY CAR FRAMING STRUCTURE

Filed March 29, 1947 3 Sheets-Sheet 3

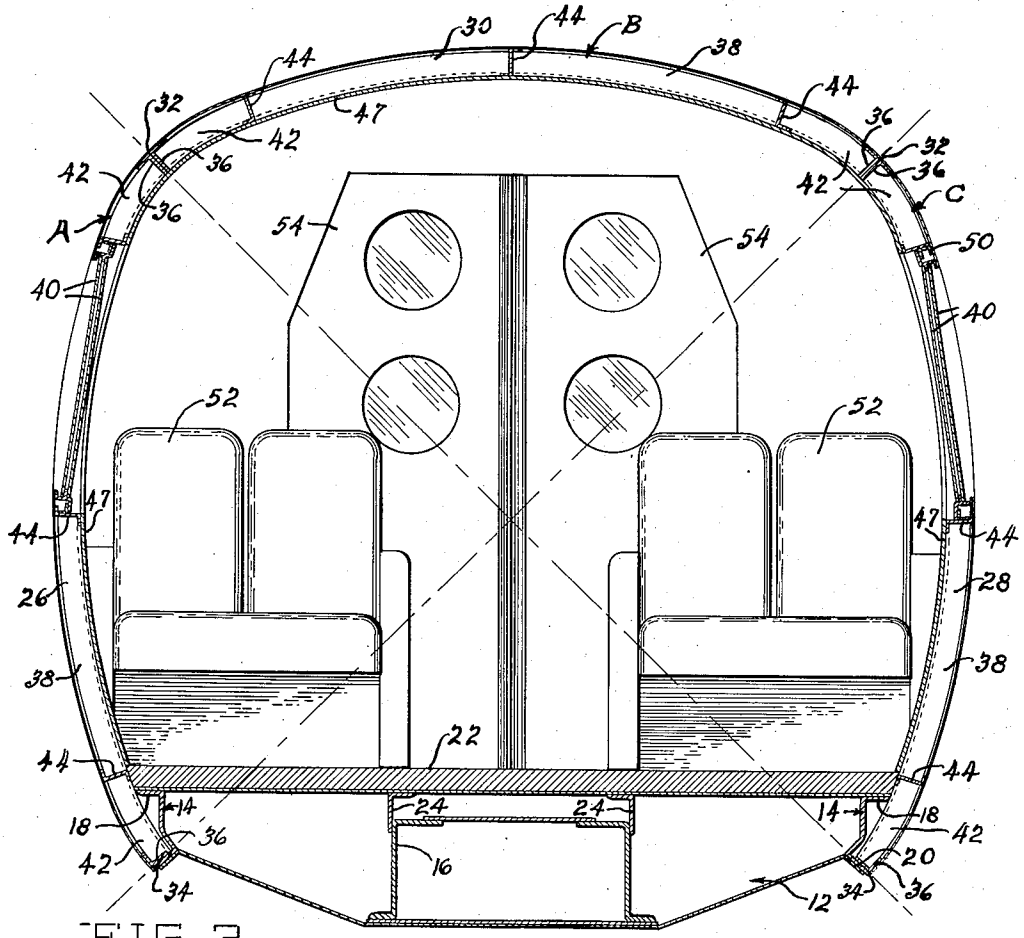

FIG_3_

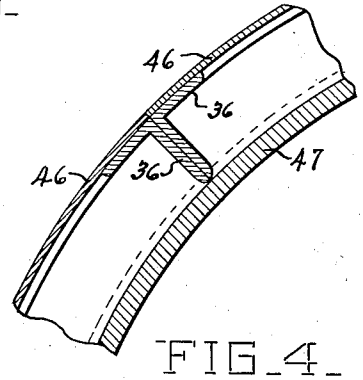

FIG_4_

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UNITED STATES PATENT OFFICE

2,575,454

RAILWAY CAR FRAMING STRUCTURE

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Application March 29, 1947, Serial No. 738,071

5 Claims. (Cl. 105—397)

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This invention relates to railway car construction and particularly to skeleton framing structure for cars of the streamline type.

In railway cars as now built, the framing for the roof section of the car is of different structure and shape than the framing for the side wall sections, requiring different structural elements and the use of different jigs and templates for assembly. This practice obviously adds to the cost of both the material and labor necessary for production and assembly of the car.

It is an object of this invention to provide a skeleton framing structure for railway cars comprising three sections each of which is formed, at least in part, of identical corresponding structural elements, thus simplifying construction of the car and reducing the cost of manufacture.

Another object of the invention is the provision of a skeleton framing sub-structure adapted for interchangeable use either as a side wall framing section or as a roof framing section by merely omitting or including a small number of the minor structural elements.

A further object of the invention is to provide a skeleton framing structure formed of three similarly curved framing sections which, when assembled together, provide a tubular-shaped structure having maximum strength and capable of providing an even distribution of the compressive stresses.

These and other objects of the invention will be apparent to those skilled in the art from a study of the following description and accompanying drawings, in which:

Figure 1 is a side elevational view of a railway car constructed in accordance with the present invention.

Figure 2 is a perspective view taken transversely through the car and showing the skeleton framing structure incorporating the invention.

Figure 3 is a view taken on line 3—3 of Figure 1.

Figure 4 is a blown-up sectional view showing the connection of adjacent framing sections.

Figure 5 is a view taken on line 5—5 of Figure 2.

Figure 6 is a large scale view showing the manner of joining together certain structural elements of one of the framing sections; and

Figure 7 is a view taken on line 7—7 of Figure 2.

Referring now to the drawings in detail, the invention is shown as embodied in a railway car generally indicated at 10, having an underframe 12 including side sills 14 and a center sill 16. The side sills 14 are formed to provide upper and lower flanges 18 and 20, respectively, a floor 22 being supported by the upper side sill flanges 18 and by angle bars 24 secured to the center sill.

The skeleton framing structure for the car is made up of three identically curved framing sections A, B, and C joined together, the two side wall sections being indicated at 26 and 28 and the roof section at 30. The roof framing section 30 is connected at opposite sides, as shown at 32, with the upper edge portions of the side wall sections 26 and 28, while the lower edge portions of the side wall sections are secured to the lower side sill flanges 20, as indicated at 34, thus mounting the framing structure on the underframe 12.

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Each of the three curved framing sections A, B and C comprises identical main longitudinal structural side members 36, extending the full length of the car body. These main structural members may be of any suitable form, but preferably are continuous angle bars, as shown. Connected with these identical longitudinal main side members, at the same predetermined spaced points in each framing section, are pairs of identical curved transverse structural members 38. The spacing of these pairs of identical curved members is governed by the desired width and location of windows 40, and of vestibule doors 41. In other words, the curved members of each framing section are uniformly spaced apart and so arranged as to permit location of any desired type and size of windows and doors between adjacent pairs of the members. The transverse structural members 38 may be bent to any desired curvature, so long as the curvature of each is identical, and preferably are also slightly bowed at their end portions, as indicated at 42. It will be seen that up to this point the framing sections A, B and C are of identical structure, and adapted for interchangeable use either as a roof framing section or as side wall framing sections.

Extending between and connected to adjacent spaced pairs of these identical curved members 38 of each framing section, are intermediate longitudinal structural members 44. These members, like the curved members 38, are identical to each other and are also positioned at uniformly spaced points in each framing section, suiting the desired size and location of the windows. The intermediate members 44 are located in exactly the same position in all three of the framing sections A, B and C, except that in the side wall sections A and C they are omitted to permit application of the vestibule doors 41. That is, in the region of the vestibule doors between the adjacent pairs of curved structural members at opposite end portions of the side wall framing sections A and C, these intermediate members 44 are not used. However, the members 44 are applied at the end portions of the roof framing section B, and with this exception, the three sections are of identical structure and shape. In the instance shown, the intermediate members 44 are connected centrally of and bisect adjacent pairs of the curved members, and also at spaced equi-distant points to either side of the center of the curved mem-

bers 38. However, this arrangement is merely for purposes of illustration and any desired arrangement of both longitudinal and transverse structural members may be used suiting the location and size of windows and doors. The transverse curved members 38 and intermediate members 44, as clearly shown in Figure 6, are Z bars; but these members may be of any other suitable type having attaching portions for application thereto of outside panels or skin 46 and interior lining 47. The various structural members are connected together by welding, as indicated at 48, the outside skin of the car being riveted or welded to the outer legs of the main longitudinal angle members and to the outer flanges of the Z bars.

It will be seen that when the framing sections are used to form the side wall sections of the car, the spaces between certain adjacent structural members are adapted to receive suitable sash frame structure 50. When utilized as the roof framing section, these spaces between adjacent members of the frame structure will of course be covered by the outside panels or skin 46. It will also be seen that the spaced pairs of curved transverse members 38 serve as carlines when in the roof framing section, while they serve as side posts when in the side wall framing sections of the car.

As shown in Figure 3, the car is provided with seats 52, of any desired or suitable type, and sliding doors 54 located between the vestibules and the main interior portion of the car.

The framing sections A, B and C are constructed and assembled to form the car skeleton framing structure on a suitable jig, preferably of the rotatable type. The jig is designed to receive the main longitudinal side angle members 36 for each section. Two pairs of these members are first placed in proper spaced relationship on the jig, after which the other side members are placed in proper position and the curved transverse and intermediate structural members then welded in place. The jig is designed to receive a pair of the main angle members at each side of the framing section which is to form the car roof section. The adjacent inwardly directed legs of each pair of angle members are then welded together, and the skeleton framing structure hoisted from the jig as a unit and mounted on the car underframe, the lower main side members of the side wall sections being welded to the side sill lower flanges 20.

The framing sections A, B and C, being identical in curvature and of the same contour in cross section, when assembled together form a skeleton frame structure of tubular shape. This shape gives maximum strength to the structure and permits uniform distribution and absorption of compressive stresses.

While the invention has been described more or less in detail, it will be apparent to those skilled in the art that various modifications may be made without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. A railway car framing main structure comprising three skeleton framing sub-structures adapted for interchangeable use either as side wall framing sections or as a roof framing section, each of said framing sub-structures being so constructed and arranged as to be cooperatively associated with the other framing sub-structures and including identical corresponding structural members.

2. A railway car skeleton framing sub-structure comprising a pair of main longitudinal members forming the sides thereof, spaced pairs of curved transverse members joining said pair of main longitudinal members, and spaced intermediate longitudinal members extending between and connected with adjacent spaced pairs of said curved transverse members, said framing sub-structure being adapted for interchangeable use either as a side wall framing section of the car by omitting certain of said intermediate longitudinal members to provide for doorways in the side wall section or as the roof framing section of the car by including said omitted intermediate longitudinal members.

3. In a railway car, two side wall framing sub-structures and a roof framing sub-structure joined together and forming the skeleton framing main structure of the car, said sub-structures each being formed of spaced longitudinal and curved transverse structural members identical to the corresponding longitudinal and transverse structural members in each of the other two sub-structures except that certain of said longitudinal members included in the roof framing structure are omitted in the two side wall framing structures to provide for doorways therein.

4. A skeleton framing main structure for railway cars comprising three curved skeleton framing sub-structures joined together and providing two side wall framing sections and a roof framing section, said sub-structures being identical to each other in curvature and dimensions and each being formed of structural members identical to the corresponding structural members in each of the other two sub-structures except that certain of said structural members adjacent the ends of the sub-structures forming the two side wall framing sections are omitted to provide for doorways therein.

5. In a railway car skeleton framing main structure, two side wall framing sections and a roof framing section, said framing sections each being formed of a pair of main longitudinal side members, spaced curved transverse members joining said pair of main longitudinal side members, and spaced intermediate longitudinal members extending between and connected with said curved transverse members, said framing sections being identical to each other in structure except that certain of said intermediate longitudinal members adjacent the ends of the side wall framing sections are omitted to provide for doorways therein, and means securing the main longitudinal side members of the roof framing section to the adjacent main longitudinal side members of the side wall framing sections.

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