

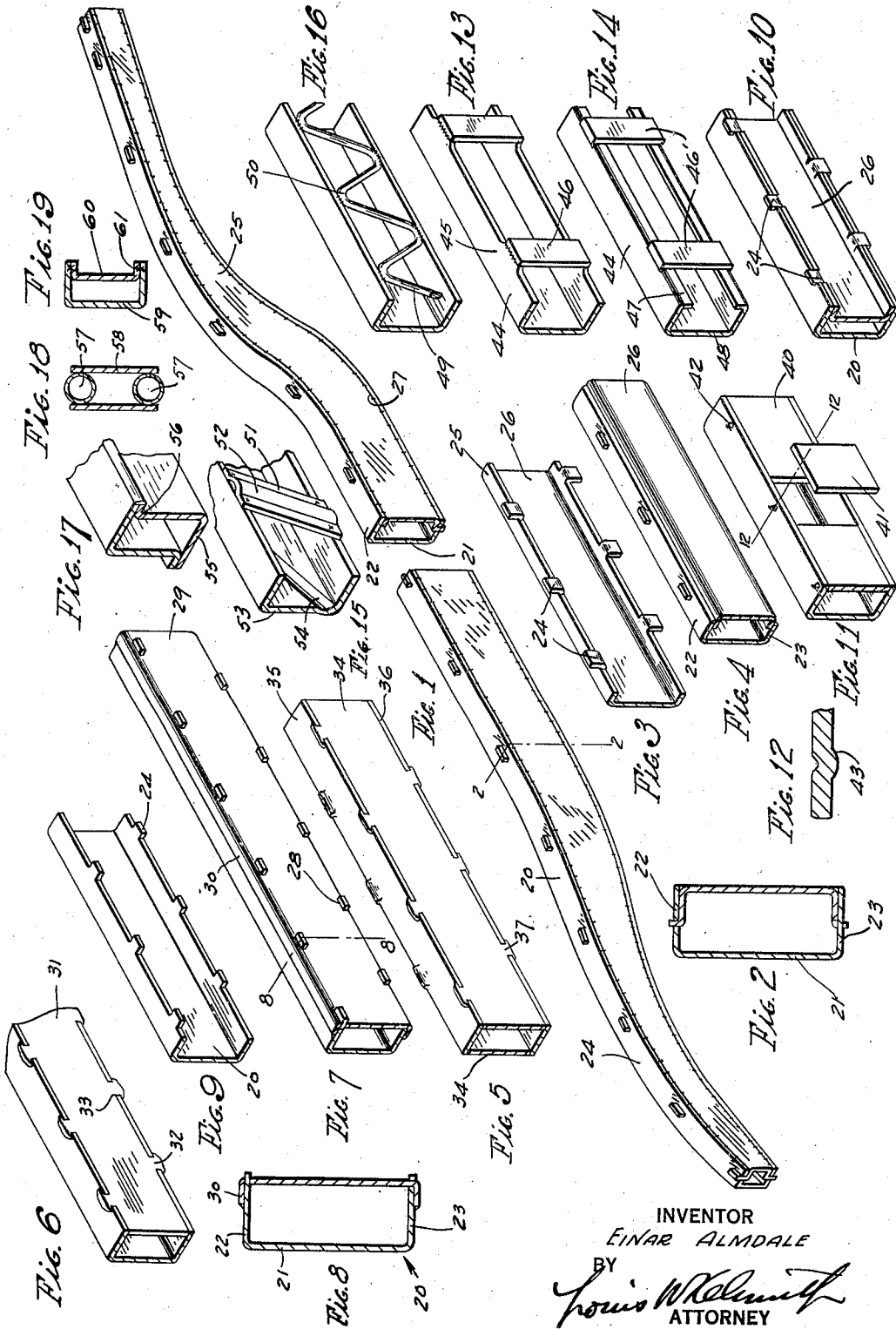
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CHASSIS SIDE RAIL

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CHASSIS SIDE RAIL

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This invention relates to new and useful improvements in motor vehicle chassis members.

An important object of the invention is to increase the resistance of such members to beam load, torsion and deflection in spite of the use of lighter gauge stock than heretofore employed.

Another object of the invention is to build up on the constructions which have been recognized in the past as being most desirable from the standpoint of efficiency and manufacturing equipment to produce side rails which will meet present demands.

More explicitly, the invention contemplates the improved means for uniting essential components into a box section chassis member having the above desired and other characteristics.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawing forming a part of the application and wherein like numerals are employed to designate like parts throughout the several views,

Fig. 1 is a perspective view of one form of chassis member divided between its ends to illustrate the detail construction,

Fig. 2 is an enlarged transverse section of the same taken on the line 2—2 of Fig. 1,

Fig. 3 is a perspective view of a portion of the length of the reinforcing section,

Fig. 4 is a similar view of this reinforcing section assembled in a channel section,

Fig. 5 is a similar view of a modified form illustrating the section built up from flat plates,

Fig. 6 is a similar view of a modification thereof built up from a channel section and a flat web section,

Fig. 7 is a perspective view of another modification,

Fig. 8 is a transverse section of the same, showing a different manner of attaching the reinforcing section,

Fig. 9 is a perspective view of a channel section employed in the construction of the box section rail,

Fig. 10 is a modification thereof, showing the same associated with a channel section,

Fig. 11 is a modified form of box section employing butt-welding,

Fig. 12 is a transverse section taken on the line 12—12 of Fig. 11,

Fig. 13 is a perspective view of a portion of a chassis member illustrating a modified form of strut in lieu of a completely closed web,

Fig. 14 is a similar view of another modification,

Fig. 15 is a similar view of a further modification,

Fig. 16 is a similar view of another modified form of the invention,

Fig. 17 is a similar view of a still further modified form in which two like sections are united to provide a closed box section chassis member.

Fig. 18 is a transverse section of a further modified form of closed box section for chassis members,

Fig. 19 is another modified form of invention employing two channel sections for constituting the closed box section chassis member.

Referring now more particularly to the drawing for details and with special reference to Figs. 1 and 2, a side rail or automotive frame is designated by the numeral 20 and is composed of a channel section having a vertical web 21 and top and bottom flanges 22 and 23 respectively. This channel section is provided with kick-up or offset portions 24 and 25 at front and rear as is customary and is made of very light gauge stock, as light as $\frac{1}{8}$ of an inch and still meet all demands of present day construction when combined with other features of the invention. The flanges of this channel section are provided adjacent their free edges with a series of suitably spaced apertures for the reception of similarly positioned lugs 24 turned vertically from the free edges of flanges 25 of a smaller channel section 26 which we will term a reinforcing section or web. This reinforcing section is positioned between the flanges of the channel section with the flanges 25 thereof extending toward the web 21 of the channel section prior to the latter being brought to final channel cross section, or this reinforcing web may be positioned by springing the flanges 22 and 23 outwardly sufficiently to enable the passage of the lugs 24 and their insertion through the openings in the flanges of the channel section as illustrated in Fig. 1. This reinforcing section converts the rail into a completely closed box cross section with the flanges 25 in supporting engagement with the flanges of the channel section 21. The lugs 24 may project any suitable distance beyond the outer surface of the channel flanges as illustrated and may be bent over, upset or burned down and welded to the surrounding edges of the openings to securely fasten the component parts of the rail together. If desired, these lugs may be flush with the outer surfaces of the flanges of the side rail and may be welded to the edges of their respective openings in addition to which the extreme longitudinal edges of the flanges 22 and 23 may be welded at intervals throughout their

lengths to the corners of the channel reinforcing section 26 as indicated at 27.

As a modification, the main channel section of the rail as shown in Figs. 7, 8 and 9 may have its flanges provided with lugs 24 adapted for reception in openings 28 in the web of a reinforcing section 29 and fastened in place as in the preceding modification. In this instance, however, the flanges 30 of the reinforcing web portion overlap the flanges 22 and 23 of the main section.

In Fig. 6, a reinforcing web section 31 is illustrated as being perfectly flat with its two longitudinal margins provided at spaced intervals with lugs 32 adapted to be received in notches 33 of flanges of a main channel section and fastened into place by upsetting, welding or in any other suitable manner. In this instance, it will be noted that the longitudinal edges of the reinforcing web 31 between the lugs 32 are received within the main channel section and support the inner surfaces of the free margins of the flanges thereof.

Fig. 4 shows a still further modification in which the web of reinforcing section 26 extends out beyond the plane of the free edges of flanges 22 and 23 to further increase the section of the completed wall.

In Fig. 5, the rail is illustrated as being composed of four perfectly flat strips, the side ones 34 of which are provided at opposite longitudinal edges with integral lugs extending in the same plane therewith and arranged in staggered relationship as shown for reception in notches provided in the free edges of top and bottom plates 35 and 36. These integral lugs 37 may be welded to the top and bottom plates and the edges of these members may be spot or tack welded.

In the form shown in Fig. 11, a perfectly flat plate or plates 40 and 41 are positioned with their longitudinal edges tack or spot welded as at 42 to the inner surface of a channel flange adjacent their extreme margins. As shown in Fig. 12, the flanges of the channel section may be provided with projections 43 for projection welding to the edges of the flat plates 40 and 41.

In Fig. 10, the reinforcing member 26 is shown nested within the channel section 20 but with its flanges extending outwardly in the same direction as the flanges of the channel section. The lugs 24 provided on the reinforcing section may be secured to the main channel section in any of the foregoing manners.

In Fig. 13, the flanges 44 of a channel section are provided with integral projections 45 extending in the same plane with the flanges and are adapted to be welded to the ends of the vertical struts 46 positioned at intervals along the section.

In Fig. 14, the margins 47 of the flanges 44 are turned inwardly to parallel the web 48 and struts 46' are welded to the outer surfaces of these inward-turned flanges. Fig. 16 shows a modification of this type of reinforcement and instead of a plurality of separate struts, a chord member 49 made from circular stock and bent into serpentine formation is welded at its apices 50 to the inner surfaces of the free edges of flanges of a main channel section. In this manner the extreme fibers of the flanges are supported and the strength of the section over the usual channel section is materially increased from the standpoint of torsion and deflection. A modification of Figs. 13 and 16 is shown in Fig. 15 wherein the diagonal braces of Fig. 16 are replaced by diagonal struts 51 welded to the edges of the flanges of the channel section and having longitudinal

reinforcing ribs 52 formed lengthwise of the same. In conjunction with these diagonal struts, the web 53 of the channel section may be embossed outwardly of the channel with the diagonal ribs 54 or any other arrangement suitable for building up the strength of the light gauge section. This embossing in the web may be carried out through the various modifications heretofore described as well as in conjunction with the reinforcing webs.

Fig. 17 illustrates another form of box section side rail which is composed of two like substantially Z-shaped sections, each having a relatively wide flange 55 and a comparatively short one 56 adapted to be secured together in any suitable manner but preferably by spot welding the wider flange to the shorter one of the complementary Z-section. However, these flanges may be secured together by rivets or by laying a bead of welded metal along the exposed vertical edges, or they may in fact be melted down at their edges so that the melted metal of the two runs together and forms a seam. In this manner, outwardly projecting shoulders are provided on diagonal corners of the box section rail or cross member.

In Fig. 18, a box section frame member is provided from a pair of spaced tubular members 57 to opposite sides of which are welded flat plates 58. This provides an extremely rigid box section as there are in fact three completely closed box sections provided throughout the length of the member, two by the tubular members 57 and the third by the space enclosed by these tubular members and the two side plates 58.

In Fig. 19 a frame member is formed into box section by a channel shaped member 59 having nested therein a corresponding smaller channel section reinforcement 60 with the free margins of each extending in the same direction to be welded together as at 61 in any suitable manner.

In all of the modifications employing a reinforcing web, the same may be extended for the full length of the member or it may be divided into a plurality of separate plates or struts as shown in Figs. 11 and 13.

I claim:

1. A box section vehicle side rail member comprising a channel section having longitudinal bends therein providing kickup portions, and a correspondingly shaped channel shaped web section closing in the channel and forming the member into closed box cross section, said sections having overlapping flanges welded together at their edges, and one of said sections having openings and the other having integral projections along its edges extending into said openings.

2. A box section vehicle frame member comprising a channel section, and a channel shaped web section closing in the channel and forming the member into closed box cross section, one of said sections having openings and the other having integral projections along its edges in the plane of its flanges and extending into said openings and welded to the edges thereof.

3. A box section vehicle side rail member comprising a channel section having longitudinal bends therein providing kickup portions, and a correspondingly shaped channel shaped web section closing in the channel and forming the member into closed box cross section, said sections having overlapping flanges welded together at their edges, one of said sections having openings and the other having integral projections along its edges extending into said openings and

welded to the edges of the openings to interlock the sections together.

- 5 4. A box section vehicle side rail comprising a channel section having longitudinal bends therein providing kickup portions and a second correspondingly shaped channel section having flanges overlapping the flanges of the first named section and welded along the contiguous edges, said sections having integral interlocking elements.
- 10 5. A box section vehicle frame member comprising a channel section having its parallel flanges extending in one direction, a second channel section having its flanges extending in the opposite direction and nested within the first
- 15 section, the flanges of the first section having spaced openings therein, the flanges of the second section having projections therefrom to enter

said openings, and the free edges of the first section being welded to the corners of the second section.

6. A box section vehicle side rail comprising a channel section having longitudinal bends therein providing kickup portions and having its flanges extending in one direction, a second correspondingly shaped channel section having its flanges extending in the same direction as the flanges of the first section and welded together at their edges, the flanges of the first section having their edges provided with notches, and the flanges of the second section having integral projections fitting within said notches and welded to the edges thereof.

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