

Nov. 10, 1942.

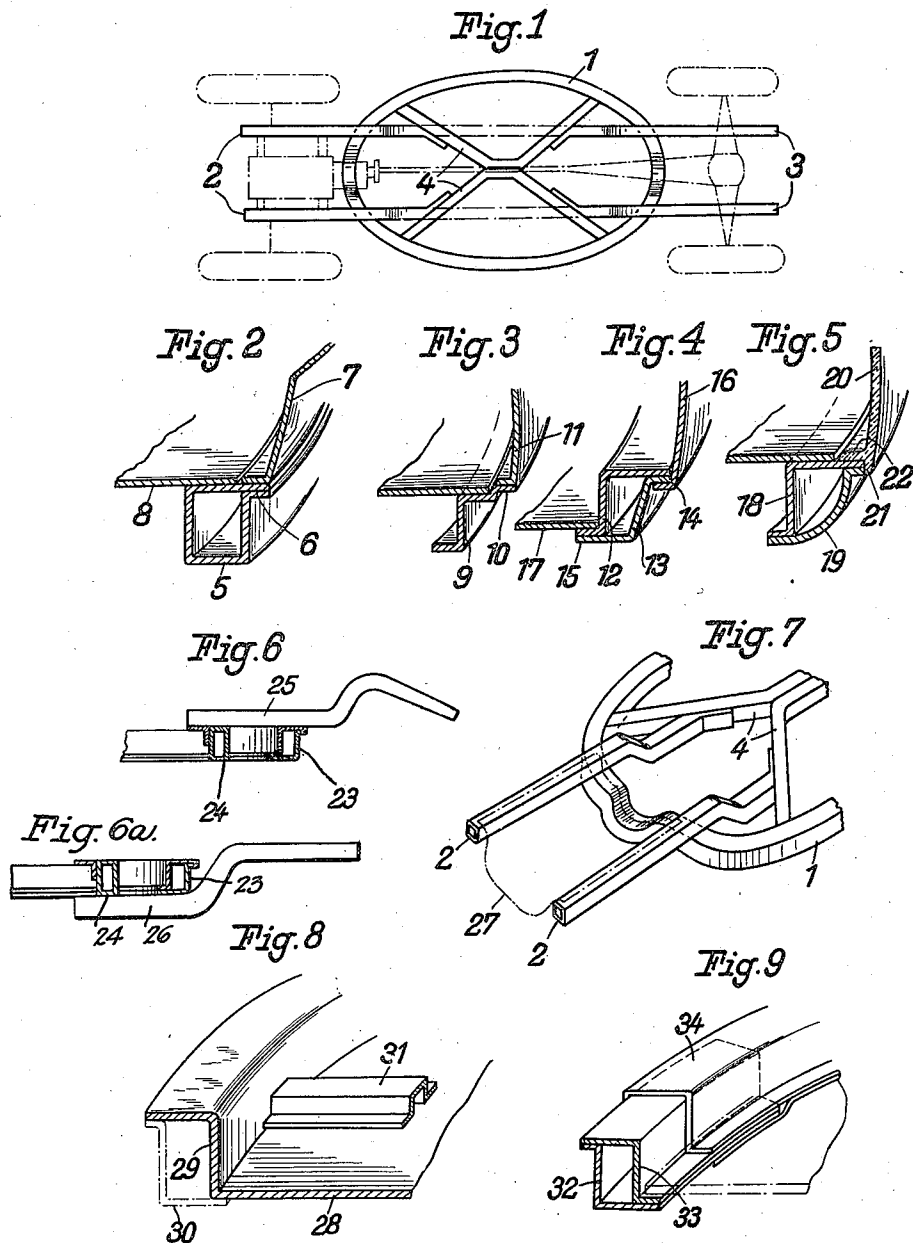
K. SCHÄFER

2,301,330

CHASSIS OR CAR BODY UNDERFRAME

Filed Dec. 16, 1939

3 Sheets-Sheet 1



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Fig. 10

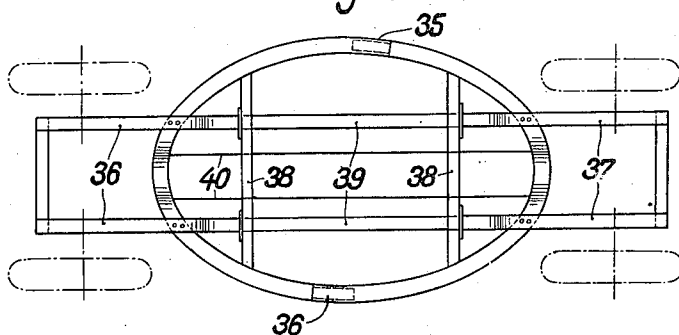


Fig. 11

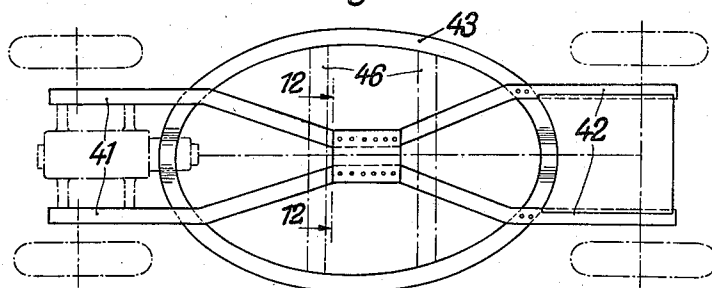


Fig. 12

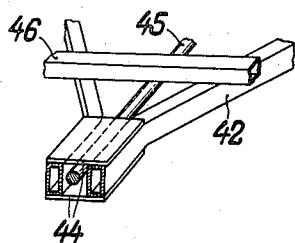


Fig. 13

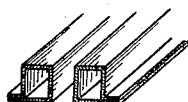


Fig. 14



Fig. 15



Fig. 16

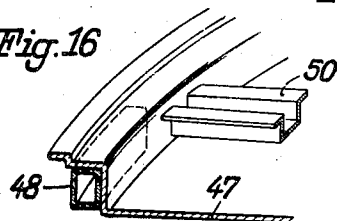
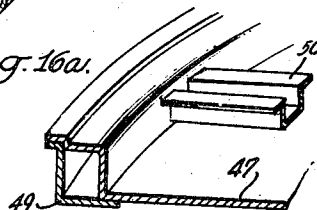


Fig. 16a.



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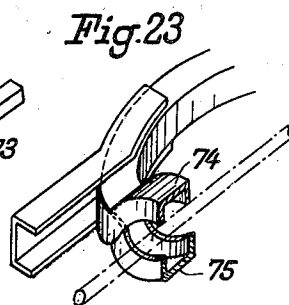
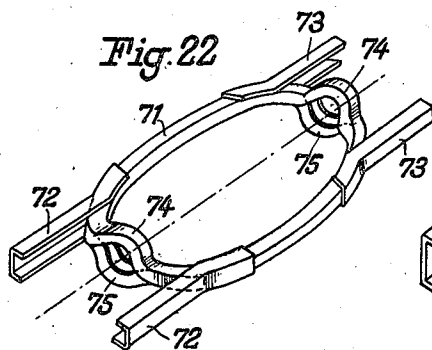
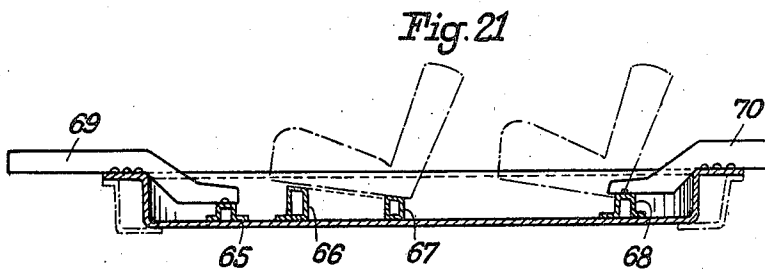
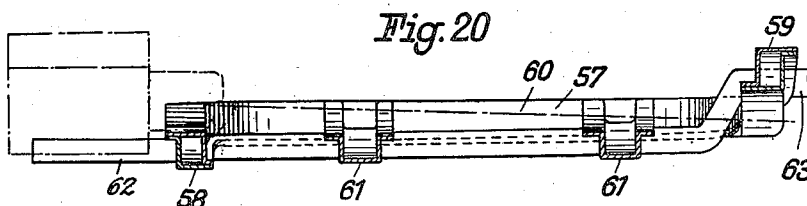
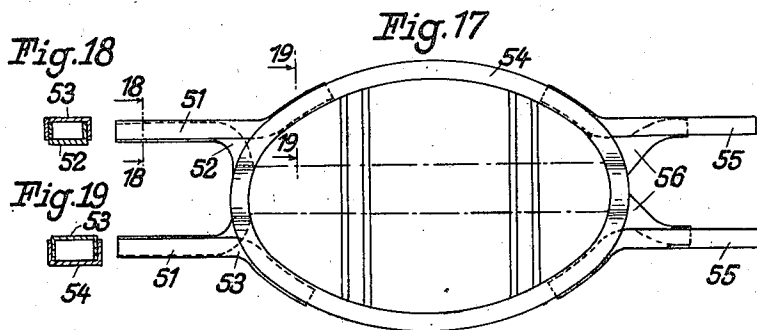
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UNITED STATES PATENT OFFICE

2,301,330

CHASSIS OR CAR BODY UNDERFRAME

Kurt Schäfer, Berlin-Eichkamp, Germany, assignor to Edward G. Budd Manufacturing Company, Philadelphia, Pa.

Application December 16, 1939, Serial No. 309,529
In Germany December 12, 1938

18 Claims. (Cl. 280—106)

The invention relates to a chassis or car body underframe, its particular object being the fact that the substantially flat frame adapted to be used in connection with a conventional body assembly is self-contained, round, preferably oval, i. e., of such a shape as to be substantially concave at all points, seen from the center of the frame.

Projections extending forwardly and rearwardly and used for supporting the wheels, accommodating the engine, etc. may be provided at the round principal member. The projections may be designed to extend from the front to the rear beyond the round principal member.

The continuous portions of the projections are preferably given an X-shape inside the round principal member, or else other diagonal braces are provided inside the principal member.

The projections are only required to extend into part of the round member and may be connected with transverse girders provided inside the round member.

The round principal member may be preferably either box-shaped or tubular cross section.

According to the invention, the projections may be led into the interior of the round member above the round member and bent off here downwardly.

According to the further invention, a tube or duct for the Cardan shaft may be provided in the longitudinal axis of the round principal member. Inside the round principal member, substantially on its underside, a preferably trough-shaped floor member may be provided.

According to the further invention, also the projections may be of either box-shaped or tubular design, preferably in such a manner as to be formed by two bent side members of U-shaped section and by an intermediate member of U-shaped horizontal projection and also U-shaped cross section.

According to the further invention, the round central principal member may be widened downwardly at the front culminating point and upwardly at the rear culminating point.

Further the invention provides that one or several joints of the members from which the round central principal member is formed may be arranged in, or close to, the lateral culminating point.

Preferably at the front and/or rear culminating points, the two U-shaped members forming the round principal member of box-shaped cross section are widened either upwards and downwards or one of them upwards and the

other downwards to allow the Cardan shaft to pass through.

When the car body panel is made from plastics, the panel is preferably provided with a projection leaning against the outer edge of the round central member, another flange resting on this member.

In the accompanying drawings the invention is shown by a number of examples, of which

Fig. 1 is a plan view of a chassis made in accordance with the invention;

Figs. 2 to 5 are sectional views of lateral frame members in connection with side panels and flooring;

Figs. 6 and 6a show two different methods of securing front and/or rear cantilevers to the central frame member.

Fig. 7 is a perspective view of the front portion of Fig. 1;

Figs. 8 and 9 are sectional views of two other forms of the central frame and car body underframes respectively;

Figs. 10 and 11 show plan views of two different slight modifications of the chassis shown in Fig. 1;

Fig. 12 is a sectional view on the line 12—12 of Fig. 11;

Figs. 13 to 15 show other forms of the device shown in Fig. 12.

Figs. 16 and 16a show two different forms of a bottom member for the central frame and its connection with a reinforcing member.

Fig. 17 shows another modification of the type shown in Fig. 1;

Fig. 18 is a sectional view on the line 18—18 of Fig. 17;

Fig. 19 is a sectional view on the line 19—19 of Fig. 17;

Fig. 20 is a sectional view of another form of the car body frame, similar to that shown in Fig. 10;

Fig. 21 is a longitudinal section through a device resembling the design shown in Fig. 8;

Fig. 22 is a perspective view of another form of frame made in accordance with the invention;

Fig. 23 is an enlarged section of the device shown in Fig. 22.

In Figs. 1 and 7, 1 designates an elliptic central member of a frame to which are connected two front cantilevers 2 and two rear cantilevers 3 and in which are provided two stiffeners 4 which form together two diagonal stays to which the inner ends of cantilevers 2 and 3 are secured. To allow the Cardan shaft to pass through, the frame member 1 is here cranked downwards at

the front and upwards at the rear. The cantilevers 2 and 3 extend beyond the frame member 1 and are cranked downwards within this portion of the frame. The members 1 to 4 are either U-shaped or box-shaped.

In Fig. 2 the elliptic member 5 is box-shaped and provided with an outwardly extending double flange 6. The outer panel 7 of the car body is secured to the flange 6, while the bottom 8 is placed on the major part of the box-shaped girder 5 or secured to it by welding, riveting, bolting, or the like.

In Fig. 3, the elliptic frame member 9 is of Z-shaped design and provided with a flange 10 to which the outer panel 11 is secured.

In Fig. 4, two Z-shaped members 12, 13 are connected to form a box which shows an upper outside double flange 14 and a lower double flange 15. The outer skin 16 is, at the bottom, secured to the double flange 14, the bottom 17 resting on the double flange 15.

In Fig. 5, an angular girder member 18 is united with a bent angular member 19 to form a box-shaped elliptic girder. The outer panel 20 which is here intended to be made from plastics shows a lower shoulder 21 and a flange 22 by which the panel rests here on the extreme edge of the box-shaped girder.

Fig. 6 shows an elliptic box frame 23, a box-shaped transverse member 24, a cantilever 25 secured to the top of members 23 and 24; Fig. 6a shows a cantilever 26 secured to the underside of members 23 and 24.

In Fig. 7, an engine trough 27 rests on the front cantilever 2.

In Fig. 8, the bottom 28 is provided with an angular shoulder 29. 30 is an angular elliptic member to which the likewise elliptic member 28, 29 may be secured. The transverse girder 31 corresponds substantially to the transverse girder 24.

In Fig. 9, two elliptical angular members 32, 33 are joined with each other to form a box, in a similar manner as shown in Fig. 4. At 34 a joint of the angular members 32 and 33 respectively is shown.

In Fig. 10, two joints are provided at 35, 36 which are located in the almost rectilinear portion of the ellipse, i. e., which is least affected. The front and rear cantilevers 36 and 37 are fastened in this embodiment to the cross stays 38 within the elliptic portion, and they may be made continuous, as indicated at 39, e. g., by being passed through below the cross stays 38. If, in this case, a continuous bottom plate is provided, a duct 40 may be provided in the bottom plate, which duct is eventually covered below, thus becoming resistant to torsion. A duct of this type may be also provided independently of the bottom.

In Fig. 11, the cantilevers 41, 42 are extending continuously from front to rear; inside the elliptic member 43 they converge to form an X, and in the center they are connected with each other by top and bottom cover plates 44, as shown in Fig. 12. The Cardan shaft 45 passes here between the girders. The longitudinally extending members 41, 42 are in this case lowered inside the elliptic member 43 such an amount as to extend underneath the cross girders 46.

Figs. 13, 14 and 15 show various profiles of front and rear cantilevers, no matter if they extend from front to rear or terminate within the elliptic member.

Fig. 16 shows a trough-shaped member 47

which corresponds substantially to member 28 shown in Fig. 8. This member is here shown in full lines as resting on and being connected to a box-sectional marginal member 48. The Figure 16a shows an angular member 49 which corresponds substantially to member 30 shown in Fig. 8 as being fastened to the member 47. The transverse girder 50 shows here a U-shaped section open on top, as contrasted with the transverse girder 31 shown in Fig. 8 and having a cross section open at the bottom.

In Fig. 17, the front cantilevers 51 consist of a common member 52 of U-shaped cross section and also U-shaped in horizontal projection, and of single channel members 53 encircling this member and the ends of which adapt themselves to the shape of the elliptic central member 54; if the member 54 is of equal U-shaped design, they may also be connected with it to form a box, as shown in Fig. 19. The rear cantilevers 55 shown in Fig. 17 are designed similarly to members 53 of the front cantilevers, while specially molded members 56 are provided between the cantilevers 55 with a view to further support the cantilevers in relation to the elliptic frame member. The front and rear cantilevers may be either of equal or different shapes.

Fig. 20 shows an elliptical girder 57 which in its center is bent downwards in the front at 58 and upwards in the rear at 59, so that the Cardan shaft 60 extends in front above the frame and in the rear underneath the frame. Accordingly the transverse girders 61 are also bent downwards in their center. Both the front and rear cantilevers 62 and 63 are here shown as continuous girders; beside the deflection of the transverse girders 61 the cantilevers 62, 63 extend below the latter. The cantilever 63 may be passed above the frame 57, and the cantilever 62 below this frame.

Fig. 21 shows a device which corresponds substantially to Fig. 8. Here, a number of transverse girders, 65, 66, 67, and 68, are provided, which may be adapted to secure the front and rear cantilevers 69, 70 and/or to carry the seats.

Figs. 22 and 23 are perspective views indicating that the elliptical central member 71 is embraced from outside by the front and rear cantilevers 72, 73, the elliptic member being devised as box-shaped and, as particularly shown in Fig. 23, consisting of two U-shaped members 74, 75 which are bent off upwards and downwards for allowing the Cardan shaft to pass through. However, for instance, only one member may be bent off, while the other may extend rectilinearly; in this case, the upward bend would be in front and the downward bend in the rear, while in front the lower member 75 would take a rectilinear course and in the rear the member 74.

It is understood that the elliptical member may also have another round shape. It is of importance that the frame, seen from the interior of the principal member, is substantially concave at all points.

I claim:

1. In a vehicle frame structure such as a combined body and chassis frame structure, comprising a substantially flat principal part being generally oval in plan view and substantially concave at all points when viewed from the center of the frame, the maximum diameter of said principal part being essentially smaller than the total length of the structure, said principal part defining the outer contour of the central section of the frame structure, rigid cantilever members

projecting at least beyond one end of said principal part in the general longitudinal direction of the frame structure and being connected to said principal part, two cantilever members which extend beyond the one end of the principal part being spaced from each other for less than the greatest transverse width of the principal part, said cantilever members being adapted for connection to road wheels of the vehicle.

2. A vehicle frame structure, as claimed in claim 1, characterized in that said cantilever members are connected to the principal part in front and in the rear for supporting the front and rear wheels and for accommodating the motor and other parts of the driving and running gear.

3. A vehicle frame structure, as claimed in claim 1, characterized in that sill members extend continuously longitudinally across and at the front and rear beyond the principal part, those portions of the sills which extend beyond the principal part forming said cantilever members.

4. A vehicle frame structure, as claimed in claim 1, characterized in that portions of the cantilever members extend only across a portion of the length of the principal part.

5. A vehicle frame structure, as claimed in claim 1, characterized in that transverse girders are provided within and extend across the principal part.

6. A vehicle frame structure, as claimed in claim 1, characterized in that the principal part comprises a marginal hollow, such as closed box-sectional, sill structure.

7. A vehicle frame structure, as claimed in claim 1, characterized in that transverse girder structures are provided within and extending across the principal part, which girder structures support the inner portions of the cantilever members extending into the confines of the principal part.

8. A vehicle frame structure, as claimed in claim 1, characterized in that the cantilever members are arranged above and extend into the confines of the principal part, and are here bent off downwardly.

9. A vehicle frame structure, as claimed in claim 1, characterized in that in the longitudinal axis of the principal part a tube or duct is produced for the Cardan shaft.

10. A vehicle frame structure, as claimed in claim 1, characterized in that also the cantilever members are of box-sectional or tubular design.

11. A vehicle frame structure, as claimed in claim 1, characterized in that the cantilever

members are formed by two bent side members of U-shaped cross section and by an intermediate member of U-shaped horizontal projection and likewise U-shaped cross section.

12. A vehicle frame structure, as claimed in claim 1, characterized in that the central principal part is bent downwardly in the front culminating point and upwardly in the rear culminating point.

13. A vehicle frame structure, as claimed in claim 1, characterized in that a joint between members forming the central principal part is arranged in the region of a lateral culminating point.

14. A vehicle frame structure according to claim 1 in which said principal part has reinforced marginal portions substantially throughout of equal width and height.

15. A vehicle frame structure as claimed in claim 1, characterized by diagonal members extending across the principal part and having the cantilever members fastened thereto.

16. A vehicle frame structure, as claimed in claim 1, characterized in that the cantilever members have their inner portions joined to bracing means extending across the principal part in a generally longitudinal direction of the vehicle, and in that the said bracing means are of X-shaped design within the confines of the principal part.

17. A vehicle frame structure, as claimed in claim 1, characterized in that the central principal part is vertically bent in at least one of the end culminating points so as to allow the arrangement of driving means.

18. In a vehicle frame structure such as a combined body and chassis frame structure, comprising a substantially flat principal part being generally oval in plan view and substantially concave at all points when viewed from the center of the frame, the maximum diameter of said principal part being essentially smaller than the total length of the structure, said principal part defining the outer contour of the central section of the frame structure, rigid cantilever means projecting at least beyond one end of said principal part in the general longitudinal direction of the frame structure and being connected to said principal part, the transverse width of said cantilever means being substantially less than the greatest transverse width of the principal part, said cantilever means being adapted for connection to parts of the driving and running gear of the vehicle, such as to the motor or to the road wheels.

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