

Feb. 15, 1938.

R. S. BEGG

2,108,191

UNDERBODY

Filed July 9, 1936

4 Sheets-Sheet 1

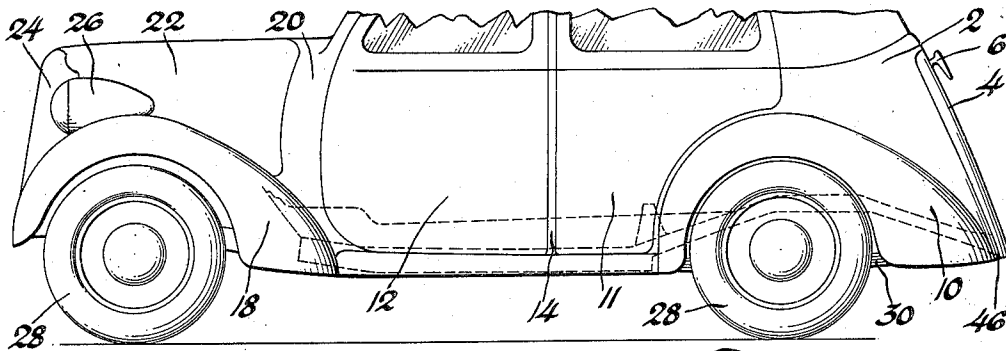


Fig. 1

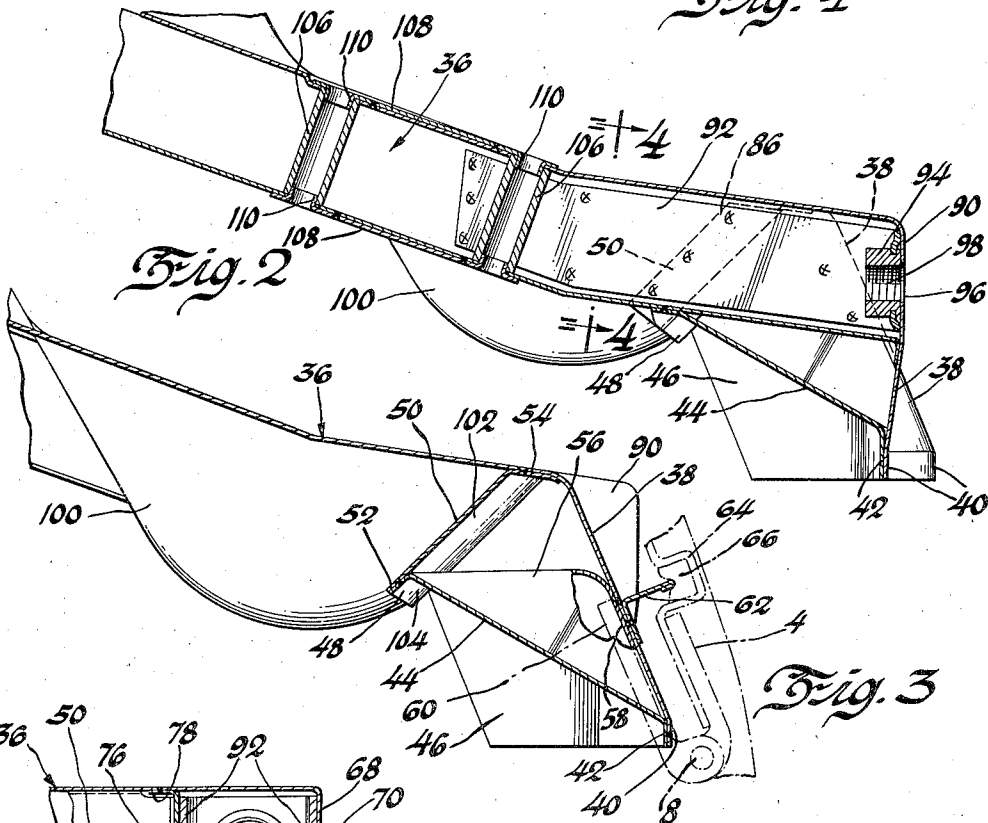


Fig. 3

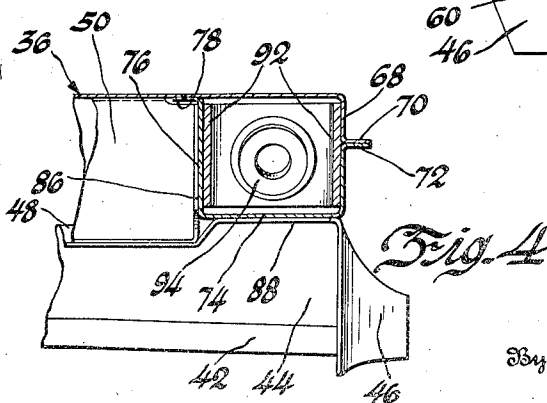


Fig. 4

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4 Sheets-Sheet 2

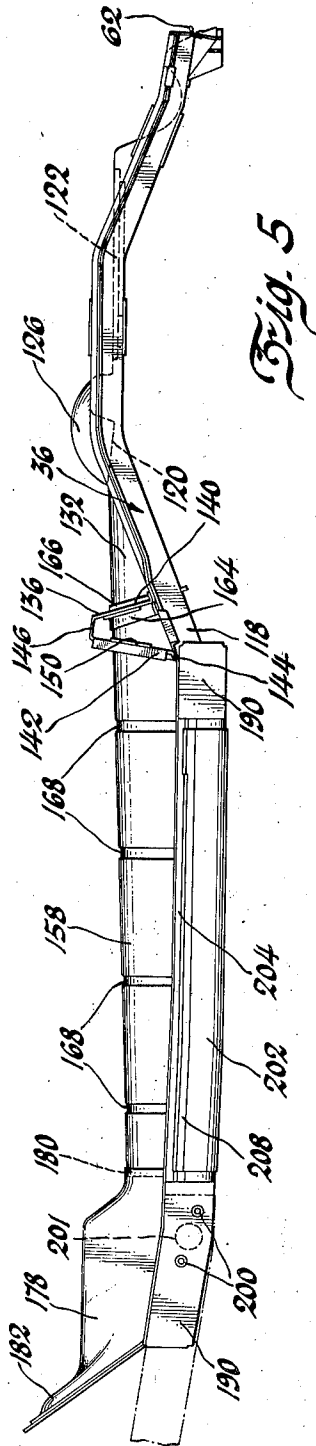


Fig. 5

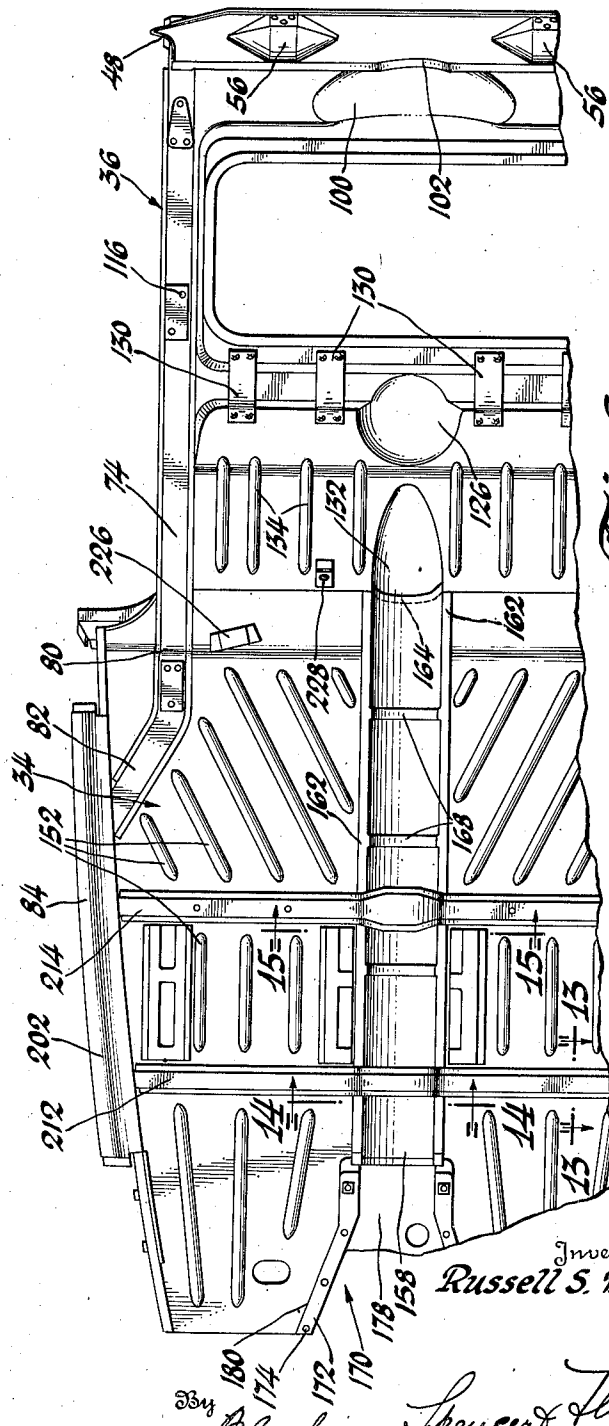


Fig. 6

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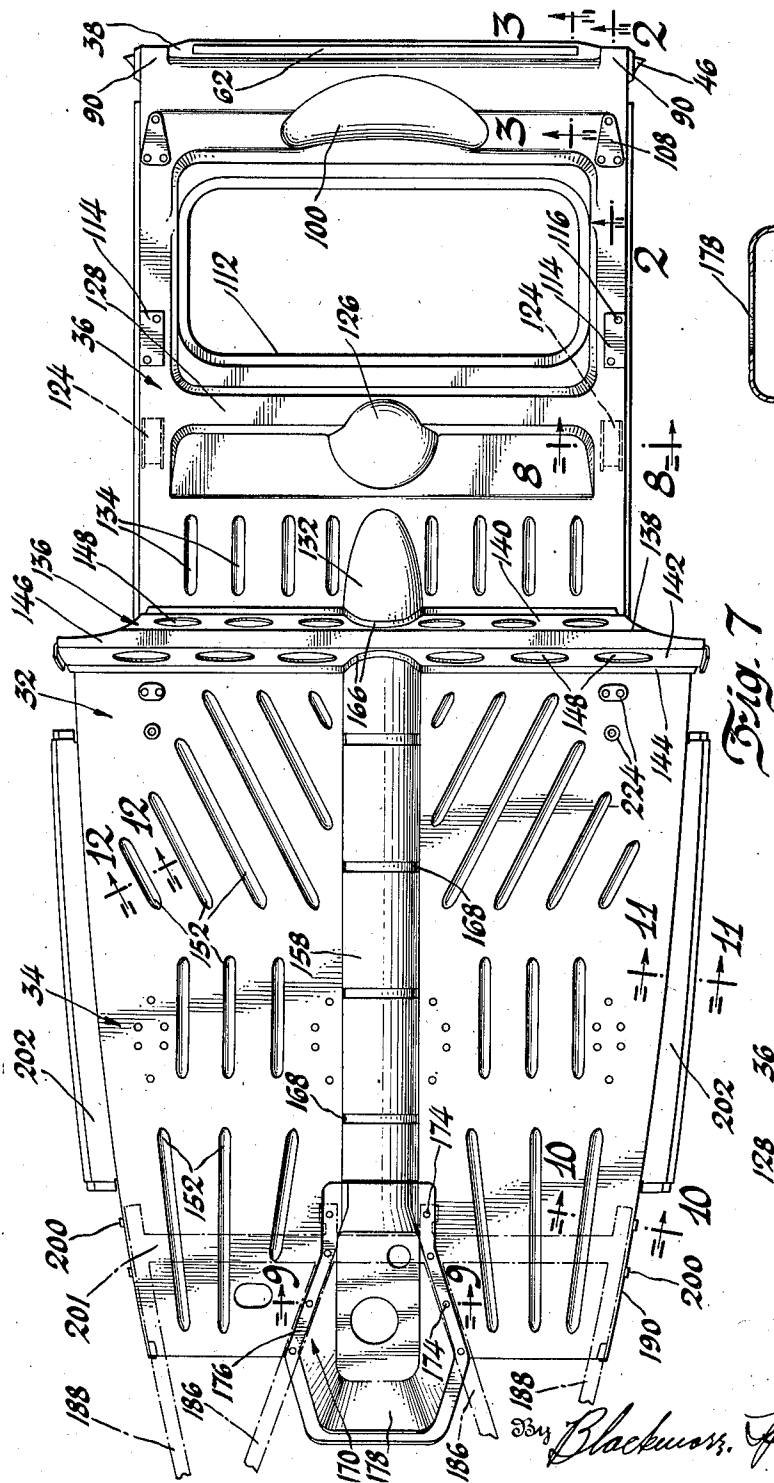
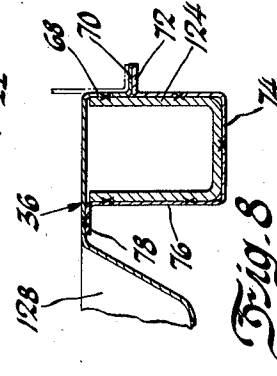
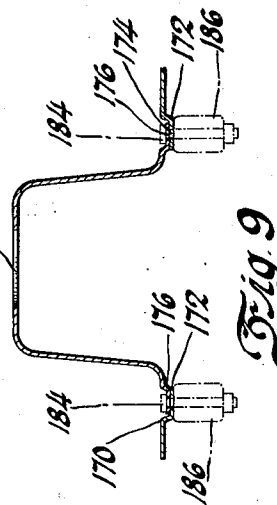
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4 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,108,191

UNDERBODY

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Application July 9, 1936, Serial No. 89,693

14 Claims. (Cl. 296—28)

This invention relates to metal automobile bodies and has particular reference to an improvement in an underbody or underpan to support the superstructure.

5 The invention relates to a body of the type in which the usual chassis is eliminated and the underpan made sufficiently strong to support the superstructure. In the present instance the superstructure is substantially the same as that shown in the copending application of Earle S. MacPherson, Ser. No. 34,781.

The novelty of the invention relates to specific details in construction of the underpan as will be later described and claimed.

15 On the drawings

Figure 1 is a side elevational view of a portion of an automotive vehicle to which the invention is applied.

20 Figures 2 and 3 are sections on the corresponding lines of Figure 7.

Figure 4 is a section on the line 4—4 of Figure 2.

Figure 5 is a side elevational view of the underpan.

25 Figure 6 is a bottom plan view thereof.

Figure 7 is a top plan view thereof.

Figures 8-12 inclusive are sections on the corresponding lines of Figure 7.

30 Figures 13, 14, and 15 are views on the corresponding lines of Figure 6.

Referring to Figure 1 of the drawings, the numeral 2 indicates an automobile body as a whole. The body has the rear door 4 having the handle 6 and hinged at its bottom as at 8 (Figure 3).

35 The rear fenders are indicated at 10, the rear doors at 11, the front doors at 12 and the intermediate post at 14. The front fenders are indicated at 18, the cowl at 20, the hood at 22, radiator grille at 24, headlamps at 26 and the wheels at 28. The front wheels are independently sprung by any suitable independent springing means while the rear wheels are mounted on the conventional leaf springs 30. The vehicle or body of the invention has no running board.

40 Referring to Figure 7 the underpan of the vehicle is indicated as a whole at 32 and comprises the forward wider part 34 and the rear narrower part 36. The part 36 is made narrower because it must be received between the rear wheels 30 of the vehicle, while the wider part extends the full width of the vehicle or beyond the usual gage of the wheels.

Referring to Figures 2-4 inclusive, the rear of the narrower portion 36 of the underpan has a 55 downturned inclined flange 38 best disclosed in

Figure 3. The downturned flange ends in a short downwardly turned flange portion 40 which mates with a flange 42 on a transverse plate 44 the ends of which are downturned in the form of flanges 46. The main portion of the plate 44 extends upwardly and forwardly and ends in the downturned flange 48. A second transverse plate 50 is welded at its lower end as at 52 to the flange 48 of the plate 44 and at its upper end it is rearwardly flanged as at 54 and is welded to the bottom of the rear portion 36. The plates 44, 50, and the flange 38 form a box-sectioned construction at the rear of the vehicle.

The transverse plate 44 intermediate its ends has two inwardly pressed portions or bulges 56 15 formed therein. The bulge is upwardly pressed until the rear side 58 thereof abuts against the rear flange 38 where the two mating faces are welded together. This structure forms recesses for the reception of the wing 60 of the hinge 8 on which the rear door 4 is swung.

Likewise welded to the mating faces 58 of the bulge 56 and the rear flange 38 is the right-angular member 62 extending the width of the door and with one wing secured to the flange 38 and the other projecting rearwardly. The door 4 has a channel 64 formed therein in which there is received a strip of soft rubber 66 which is adapted to strike against and be compressed by the member 62 when the door is in closed position. 25 This forms a weather tight construction and prevents the entrance of foreign matter into the rear compartment of the vehicle. A similar construction may be placed at the sides and top of the door.

35 The side edges of the rear narrow portion 36 have the downturned flanges 68 (Figure 4) which in turn have a short outwardly turned flange 70 which mates with the corresponding flange 72 on a channel member 74. The inner side 76 of the channel member has a short flange 78 which abuts against the underside of the underpan 36 and is welded thereto. The flanges 70 and 72 are likewise welded together and form a box section which extends from the rear extremity of the vehicle forwardly for the entire extent of the narrow portion 36 (as is best shown in Figure 6) and also extends for a portion of the way along the underside of the forward wider portion 34 as is shown at 80. The channel member 74 then is turned outwardly as shown at 82 and meets the side edge of the wider portion 34 at 84, which is also the place at which the door post 14 meets the side of the underpan.

The transverse plate 50 of Figure 3 has the 55

rearwardly turned flange 86 indicated in dotted line in Figure 2 and in full line in Figure 4. This flange is spot-welded to the side 76 of the channel member 74. The plate 44 extends the full width of the rear of the vehicle and at the edge of the underpan is welded to the underside of the channel 74 at 88. The downwardly turned flange 46 at the ends of the plate 44 are curved or arched as shown in Figures 4 and 7, the curved or arched portion conforming to the curve or arch of the rear wheel housing 10.

As will be apparent from an examination of Figures 3 and 7 the flange 38 at the rear of the underpan is given a different formation at the extreme side portions of the underpan. This is indicated by the numeral 90 in Figures 2, 3, and 7. The reason for this construction is to cause a continuation of the side box-sectioned construction to the extreme tip of the vehicle and also to form a flat surface as shown in Figure 2 to which the rear bumper may be applied. In order to strengthen the rear construction for the rear bumper, a U-shaped reinforcing element 92 is secured inside the box-sectioned construction formed by the lateral flange 68 and the channel member 74. This U-shaped reinforcing member has a socket 94 secured at the base of the U, and an opening 96 in the formation 90 gives access to the interior threaded portion 98 of the socket 94. Each side of the vehicle has a structure similar to that shown in Figures 2 and 4 so that the bumper may be attached at the two sides of the vehicle.

Adjacent the rear end of the narrower portion 36 a downward depression or pocket 100 is formed. This depression is for the purpose of receiving the lower end of the spare tire which is secured to the inside of the rear door 4. The transverse member 50 at the center of the vehicle is slightly curved or arched as indicated at 102 to cause the transverse member to conform to the shape of the depression 100. The flange 48 of the transverse member 44 is likewise curved as indicated at 104 to conform to the curvature of the pocket 100.

The mounting for the rear shackles of the rear springs 30 is shown in Figure 2. The side channel section has mating openings at its top and bottom between which tubes 106 extend. The top face of the channel is slightly depressed and receives the plate 108 which is provided with inwardly extending cylindrical portions 110 which fit in the top openings and project into the tubes 106. A similar plate 108 is applied at the bottom which has similarly provided cylinder portions 110 which extend inwardly of the tube from the bottom. These plates 108, the tubes 106 and the channel portion are rigidly welded together. The bolts to secure the shackles in place are passed through the tubes 106.

An opening 112 for the reception of the gasoline tank is provided in the rear of the narrow section 36 immediately ahead of the tire depression 100.

Fitting in depressions in the side edge of the narrow portion 36 are the rectangular plates 114 (Figure 7) having openings 116 which fit over corresponding openings in the lateral box section and to which there is applied a structure similar to the structure shown in Figure 2 for the mounting of the rear spring shackle. The structure at 114 and 116 is for the purpose of mounting the shock absorbers.

By referring to Figure 5 it will be noted that the narrower rear section 36 extends upwardly from the line of junction 118 with the wider forward

section 34. The rear part 36 extends upwardly to the point 120 and then rearwardly to the point 122 and then downwardly so that the rearmost end of the vehicle is substantially in the same plane as the forward widest part 34 of the underpan. The upward bending of the rear narrow portion 36 is to provide a kickup for the rear axle to permit the rear axle to move up and down in response to unevenness in the road and flexure of the springs. At the line 120 the box-sectioned constructions at the sides of the rear section 36 are reinforced by the channel irons 124 indicated in dotted outline in Figure 7 and in full lines in Figure 8. These U-shaped members are relatively short and are spot-welded to the adjacent sides of the box-sectioned construction. Their purpose is to strengthen the construction at the point where they are applied.

Immediately over the rear axle the rear and narrow part is provided with a pressed-out portion or bulge 126 to accommodate the differential housing. Transversely the rear section is also provided with the upwardly pressed transverse channel 128 which on its underside has welded at the sides thereof a plurality of plates 130 (Figure 6) to strengthen and reinforce the construction.

At the extreme forward end of the narrow portion 36 or immediately to the rear of the line 118 where it joins onto the forward section the rear section is formed with a tunnel shaped member 132. There are also provided a plurality of ribs 134 to strengthen the inclined portion between the lines 118 and 120.

Transversely of the underpan at the line of junction 118 the pan is provided with an inverted U-shaped reinforcing member 136 which extends the full width of the vehicle. The rearmost leg 138 of the element 136 has the rearwardly extending short flange 140 which abuts against the narrow portion 36 and is welded thereto. The forward leg 142 has the narrow flange 144 which abuts against the forward broader part 34 and is welded thereto. The web 146 of the transverse member 136 is substantially in a horizontal plane and forms a support for the front portion of the rear seat. A plurality of lightening openings 148 are provided in the member 136, each lightening opening having an inward flange as best shown at 150 in Figure 5, the purpose of the flange 150 being to strengthen the construction.

The forward wider portion 34 has formed therein a plurality of ribs 152 to strengthen the construction. On the center line of the part 34 a cutout section 154 is provided. This cutout section is relatively wide and is for the purpose of accommodating the propeller shaft 156. To strengthen the underpan at the cutout 154 and to protect the propeller shaft a tunnel 158 is provided. This tunnel is arched as is best shown in Figures 14 and 15 and has its sides 160 terminating in the lateral flanges 162 which extend under the edges of the cutout portion 154 and are spot-welded thereto to form a rigid construction. The tunnel 158 extends from the transmission at the front of the vehicle to the transverse reinforcing element 136 as is best shown in Figures 5, 6, and 7. At its rear end where it meets the transverse member 136 it telescopes into the end of the short tunnel 132 of the rear element 36 and is welded thereto at the overlapping flanges 164. Where the transverse member 136 meets the tunnels 132 and 158 it is provided with an arched portion to accommodate

the tunnels. In other words, the transverse brace or reinforcing member 136 has the tunnels 132 and 158 passing therethrough and is secured thereto by the arched sections 166 of the flanges 140 and 144.

Along the length of the tunnel 158 a plurality of inwardly pressed ribs 168 are formed to give added strength to the tunnel.

At the forward part of the wider section 34 of the underpan the cutout 154 has its sides diverging as best shown at 170 in Figures 6 and 7. The reason for the diverging part 170 is to accommodate the transmission which extends far enough rearwardly from the rear engine to be received in the underpan 32. At the diverging part 170 the edges of the underpan are offset downwardly as indicated at 172 (Figure 9) and are provided with a plurality of openings 174. On the offset flanged edge 172 there is received the flange 176 at the edge of a transmission cover 178. The cover 178 is also channel shaped as is best shown in Figure 9 and forms a continuation of the main central channel 158. The forward end of the channel 158 has the offset flange 180 which extends into the end of the transmission cover 178 and is welded thereto. The forward edge 182 is inclined and conforms to the incline of the toeboard of the vehicle. The toeboard (not shown) is of metal and has the forward edge 182 welded thereto. The transmission cover 178 is secured to the underpan by means of bolts 184 which pass through the overlapping flanges and through frame members 186 forming a part of the detachable foreframe of the vehicle. A suitable anti-squeak material (not shown) is used between the flanges 172 and 176 and between the flange 172 and the frame members 186.

The foreframe of the vehicle comprises the two inner elements 186 and the two outer elements 188 each pair 186—188 being generally of Y shape and having the wider portion of the Y secured to the underpan as best shown in Figure 7. The innermost elements 186 of the frame are secured to the diverging section 170 and the offset flanges 172 and 176 as described, while the outer elements 188 are secured to the outer edge of the underpan as will be later described.

The side edges of the front wider portion 34 have no edge flange but are unflanged throughout their length. Secured to each unflanged edge is a channel member 190. The upper flange 192 of the channel 190 is welded to the edge of the pan as indicated at 194 while the bottom flange 196 has no direct connection to the pan. The structure is best shown in Figures 10 and 11.

Referring to Figures 5, 6, 7, and 10, it will be seen that at the forward portion of the pan a bracket 198 is secured to the interior of the channel 190 by welding. This bracket has the general configuration shown in Figure 10 and there are secured in mating openings in the channel 190 and in the bracket 198 the socket 200 which is interiorly threaded and adapted to receive bolts which are threaded into the socket 200 and into the outer frame member 188. In this manner the outer frame members 188 are removably attached to the underpan. The mouth of the Y of each lateral frame pair 186—188 is joined by a tube 201 shown in Figure 5.

Under the openings of the doors 11 and 12 a more or less channel shaped shell 202 is applied. The shell 202 has the upper flange 204 spot-welded to the upper portion of the main web of the channel 190 while a bottom flange 206 is welded to the lower flange 196 of the channel 190. The

shell 202 has the offset portion or recess 208 which forms a jamb face for the overlap flange 210 of the doors 11 or 12.

Extending underneath the pan and for the full transverse width of the front wider portion 34 are two channel shaped reinforcing braces or ribs 212 and 214. Both of these ribs are downwardly arched as indicated at 216 and 218 where they meet the tunnel 158. The rearmost brace 214 is downwardly arched to a greater extent than the forward brace for the reason that the propeller shaft 156 has a greater arc of movement relative to the vehicle. The braces 212 and 214 have lateral edge flanges 220 by means of which they are spot-welded to the bottom of the underpan part 34. The ends of the braces 212 and 214 have the flanges 222 which are outwardly turned and are spot-welded to the web of the channel 190. This structure is best shown in Figure 13.

Referring to Figure 7, there is shown at 224 the place at which the forward edge of the rear spring is secured to the underpan. The structure here is substantially the same as that shown in Figure 2 for the mounting of the rear spring shackles.

In Figure 6 part 226 is to support the hand brake or emergency brake cable and part 228 is to support the oil line for the hydraulic brakes.

I claim:

1. In an automobile body, an underpan extending the length of the body, downturned edge flanges at the rear of the underpan, longitudinal channel shaped members secured to the pan edge and to the flanges and forming therewith a box-sectioned construction, door posts, said channel members extending from the rear of the pan to said posts.

2. In an automobile body, an underpan extending the length of the body, said pan having a narrow rear part and a wide front part, downturned edge flanges on the narrow rear part, longitudinal channel shaped members secured to the flanges and to the pan and forming therewith a box-sectioned construction, door posts at both sides of the body at the wider part of the underpan, said channels extending from the rear edge of the narrower section and terminating at the door posts of the wider section.

3. In an automobile body, an underpan extending substantially the full length of the body, a downturned flange at the rear edge of the pan, a transverse plate secured to the underpan and extending downwardly therefrom and spaced from the flange, a second transverse plate extending across the rear of the vehicle and secured to both the flange and the first-mentioned transverse plate and forming therewith a box-sectioned construction extending across the rear of the underpan, a depression formed in said last-named transverse plate and having one of its sides abutting the flange and secured thereto.

4. In an automobile body, an underpan extending substantially the full length of the body, a downturned flange at the rear edge of the pan, a transverse plate secured to the underpan and extending downwardly therefrom and spaced from the flange, a second transverse plate extending across the rear of the vehicle and secured to both the flange and the first-mentioned transverse plate and forming therewith a box-sectioned construction extending across the rear of the underpan, a depression formed in said last-named plate and having one of its sides abutting the flange and secured thereto, and a hinge ele-

ment secured to the abutting parts of the depression and the flange.

5. In an automobile body, an underpan extending substantially the full length of the body, a downturned flange at the rear edge of the pan, a transverse plate secured to the underpan and extending downwardly therefrom and spaced from the flange, a second transverse plate extending across the rear of the vehicle and secured to both the flange and the first-mentioned transverse plate and forming therewith a box-sectioned construction extending across the rear of the underpan, a depression formed in said last-named transverse plate and having one of its sides abutting the flange and secured thereto, and a rear door sealing member secured to the abutting parts of the depression and the flange.

6. In an automobile body, an underpan extending substantially the full length of the body, said pan having a narrow rear part and a wide front part, downturned flanges at the side edges of the rear part, channels secured to the flanges and the pan and extending forwardly to the wide part and secured thereto, said channel forming with the narrow and wide parts a box-sectioned construction extending along the sides of the underpan, said narrower part of the frame having a kickup or upturned part to accommodate the vertical movement of the rear axle, and U-shaped strengthening reinforcements in the box-sectioned construction to reinforce the same at the bends in the kickup.

7. In an automobile body, an underpan extending substantially the full length of the body, said pan having a narrow rear part and a wide front part, downturned flanges at the side edges of the rear part, channels secured to the flanges and the pan and extending forwardly to the wide part and secured thereto, said channels and front and rear parts forming a box-sectioned construction extending along the edge of the underpan, said narrower part extending upwardly and rearwardly where it joins onto the wider part, and a U-shaped transverse reinforcing member extending across the pan and having flanges at the ends of the legs of the U, one flange being secured to the narrow frame part and the other flange to the wide frame part.

8. In an automobile body, an underpan extending substantially the full length of the body, downturned edge flanges on the underpan, a channel member secured to the pan edges and to the flanges and forming therewith a box-sectioned construction, a reinforcing member inside the box-sectioned construction at the rear of the underpan, and means at the rear end of the pan secured to the box-sectioned construction and the reinforcing member on which to mount a bumper.

9. In an automobile body, an underpan extending substantially the full length of the body, flanges at the side and rear edges of the underpan, channel members secured to the sides of the underpan and to the flanges and forming therewith box-sectioned constructions, a transverse plate secured to the pan at the rear end thereof and extending between the side box-sectioned constructions, and a second transverse plate connecting the rear flange of the pan and the first-mentioned plate and forming with the rear flange and the plate a box-sectioned construction, both said plates being secured to the side box-sectioned constructions.

10. In an automobile body having side doors,

an underpan extending substantially the full length of the body, said underpan comprising a wide forward part and a narrow rear part, channels secured by one of their flanges to the edge of the wide part and extending the full length of the wide part, substantially U-shaped outer shell members, one member over each of said channels and forming therewith a box-sectioned construction, said U-shaped member being secured to the channel and extending the width of the doors only, and a door jamb face formed on said U-shaped member.

11. In an automobile body, an underpan extending substantially the full length of the vehicle, said underpan comprising a wide front part and a narrow rear part, said rear part extending upwardly from the line of junction with the wide part, a cutout part extending the full length of the middle of the said part, an arched tunnel over said cutout part, said tunnel being secured to the pan at the edges of the cutout part, the rear end of said tunnel being secured to the upwardly inclined narrow rear part, transverse reinforcing members on the underside of the pan extending the full width of the wider part said members being downwardly arched under the tunnel to accommodate a drive shaft.

12. In an automobile body, an underpan extending substantially the full length of the vehicle, said underpan comprising a wide front part and a narrow rear part, said rear part extending upwardly from the line of junction with the wide part, a cutout part extending the full length of the middle of the wide part, an arched tunnel over said cutout part, said tunnel being secured to the pan at the edges of the cutout part, the rear end of said tunnel being secured to the upwardly inclined narrow rear part, transverse reinforcing members on the underside of the pan extending the full width of the wider part, said members being downwardly arched under the tunnel to accommodate a drive shaft, and a transverse reinforcing member on the upper side of the pan at the line of junction of the wider and narrower parts.

13. In an automobile body, an underpan extending substantially the full length of the vehicle, said underpan comprising a wide front part and a narrow rear part, said rear part extending upwardly from the line of junction with the wide part, a cutout part extending the full length of the middle of the wide part, an arched tunnel over said cutout part said tunnel being secured to the pan at the edges of the cutout part, the rear end of said tunnel being secured to the upwardly inclined narrow rear part, transverse reinforcing members on the underside of the pan extending the full width of the wider part, said members being downwardly arched under the tunnel to accommodate a drive shaft, and a transverse U-shaped reinforcing member on the upper side of the pan at the line of junction of the wider and narrower parts, one leg of the U being secured to the wider part and the other leg being secured to the narrower part.

14. In an automobile body having a rear door, an underpan extending substantially the full length of the body, a downturned flange at the rear of the pan, means to reinforce the flange and to make a box-sectioned construction at the rear, and a member projecting from the flange and forming with the door a weather seal.

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