

PATENT SPECIFICATION

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- (21) Application No. 52448/74 (22) Filed 4 Dec. 1974
(31) Convention Application No. 7343710
(32) Filed 7 Dec. 1973 in
(33) France (FR)
(44) Complete Specification published 20 Oct. 1976
(51) INT CL² B62D 21/02
(52) Index at acceptance
B7D 13G



(54) MOTOR VEHICLE CHASSIS

(71) I, PAUL LEGUEU, of French nationality, of 85 Avenue de Mazy, 44380 Pornichet, France, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a motor vehicle chassis, such as a rigid chassis for a compact airborne vehicle.

Compact air-freighted motor vehicles are the subject of a particularly demanding technical specification, because they must comply with the weight conditions and dimensions imposed by the cargo aircraft which convey them. In particular the overall height of the vehicle is strictly controlled, and thus gives rise to serious difficulties because of the necessary ground clearance of the chassis, the raised location of the engine resulting from the axial position of the mechanical centre of the front axle, etc. These requirements therefore tend to result in a substantial increase in the overall height of the vehicle, which will prevent homologation of the vehicle as an airborne vehicle.

According to the present invention, there is provided a chassis for a motor vehicle, comprising two longitudinal members each carrying a front suspension mounting including a rear spring carrier, and a plurality of transverse members connecting the longitudinal members together, each longitudinal member being cranked at the position of its rear spring carrier, whereby each of the longitudinal members is divided into two parts at different levels with the part in front of said crank being higher than the part to the rear thereof, the crank in each longitudinal member being formed by an inclined transition portion thereof which connects the two said parts of the respective longitudinal member, and each of the rear spring carriers being welded into the respective transition portion.

A chassis according to the present invention will now be described by way of

example with reference to the accompanying drawings, in which:

Figure 1 is a side view of the chassis,

Figure 2 is a plan view from above of the chassis of Figure 1.

Referring to the drawings, a rigid chassis essentially comprises two parallel longitudinal members 1 which are for example of U-section and which are connected together by welded transverse members, there being four such members, at 2 and 15, in the embodiment illustrated. The transverse members 2 are provided with gussets 3 of substantially triangular shape, which are welded to the transverse members 1 and the longitudinal members 1 in order to increase the rigidity of the chassis and for example to absorb reaction forces of the longitudinal members in the longitudinal direction of the chassis.

As can be seen in Figure 1, the longitudinal members are offset or cranked at the position of the rear spring carrier 4 of the vehicle front suspension as indicated by leaf spring 5. The crank portions of the members 1 each comprise a transition portion 6 which divides the longitudinal members 1 and consequently the chassis into two parts which are disposed at different levels, a front part A of the chassis being at a higher level than the rear part B of the chassis. In the embodiment illustrated, each transition portion 6 is inclined at an angle which can be from 20 to 40° and which is preferably substantially 30°, while the rear spring carrier 4 of the front suspension 5 is bedded in the transition portion 6, thereby increasing the resistance of the longitudinal members to buckling. The longitudinal members are cut away to receive the respective spring carrier 4 which, after welding in place, forms an integral part of the longitudinal member. Each spring carrier 4 is for example of cast steel and comprises strengthening ribs 7 which are arranged in a pattern radiating from the spring mounting spindle (not referenced) and which thus contribute to forming a strong carrier member.

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5 The transition portions 6 are positioned not only in alignment with the rear spring carrier 4 of the front suspension 5 but also with the control pedals of the motor vehicle. This positioning of the portions 6 relative to the length of the longitudinal members 1 may be important, for example as regards housing the transfer box which, as will be described in greater detail hereinafter, can thus be disposed below the driver's seat.

10 The front spring carriers 8 of the front suspension 5 are also welded to the parts A of the respective longitudinal members and one or both of the carriers 8, as appropriate, comprises, in one piece, not only the suspension support bearing 9 but also a part of the steering mechanism, such as the steering box 10. The fact that the front part A of the longitudinal members 1 is raised permits the chassis to clear the front axle. However, the unitary construction of the front spring carrier with the steering box which is advantageously achieved by casting, makes it possible to lower the steering box to the maximum extent, and the steering column 11 can be arranged at a tangent to the spring carrier and a substantially flat angle so that the steering wheel can be at a position which is within the set height limit. Since the steering wheel is generally the highest point of the vehicle, the advantage which results from lowering the steering box and the steering column can be readily seen, and this feature is of substantial advance in the design of so-called airborne vehicles.

40 The front end 12 of each of the front parts A of the longitudinal members is slightly offset or cranked upwardly so as to provide the regulation 45° clearance angle, so that a winch 13 diagrammatically shown in Figure 2, and jerrican carriers 14 disposed on respective sides of the winch, have a ground clearance which complies with the standards set in respect of such vehicles.

50 It will be noted that the transverse member 15 which is disposed substantially midway of the length of the members 1 to support the transfer box (not shown), unlike the other transverse members 2, is not flat but is curved or cranked upwardly, so as to project above the upward surface 16 of the longitudinal members, as shown in Figure 1. The transverse member 15, as viewed in the longitudinal plane of the chassis, is of substantially trapezoidal shape, the small base of the trapezium being visible in Figure 2 and denoted at 17. The fact that the transverse member 15 projects above the longitudinal members 1 makes it possible to raise the transfer box, and its position is so calculated that the transfer box can be positioned directly below the

driver's seat, which provides for easy access to the transfer box, both for maintenance purposes and for possible repairs thereon.

70 The difference in level as indicated at I in Figure 1, between the two horizontal planes through the part A and the part B of the chassis provides a space for housing a fuel or water tank in the chassis.

75 Finally, the longitudinal members are provided with connecting bows or loops 18 for receiving connecting shackles or ropes for stowing or loading the vehicle, to moor it to the floor of the cargo aircraft in which it is carried.

80 The cranked chassis as described above is of substantial mechanical strength, and its shape and design permit it to impart to the vehicle of which it forms a part, the necessary compactness, while complying with the standards imposed as regards ground clearance and suitability for air transportation, to permit homologation thereof.

85 Modifications can be made in the above-described embodiment without thereby departing from the scope of the invention as defined by the appended claims. Thus, the U-section longitudinal members could be of different sectional shapes, and the longitudinal members could be completed by the addition of strengthening plate members to form a boxed section, or the members could be subjected to a surface treatment.

WHAT I CLAIM IS:—

100 1. A chassis for a motor vehicle, comprising two longitudinal members each carrying a front suspension mounting including a rear spring carrier, and a plurality of transverse members connecting the longitudinal members together, each longitudinal member being cranked at the position of its rear spring carrier, whereby each of the longitudinal members is divided into two parts at different levels with the part in front of said crank being higher than the part to the rear thereof, the crank in each longitudinal member being formed by an inclined transition portion thereof which connects the two said parts of the respective longitudinal member, and each of the rear spring carriers being welded into the respective transition portion.

110 2. A chassis according to claim 1 wherein the angle of the transition portions relative to the remainder of the longitudinal members is from 20° to 40°.

115 3. A chassis according to claim 2 wherein said angle is substantially 30°.

120 4. A chassis according to any one of the preceding claims wherein the front end portion of said front part of the longitudinal members is raised to provide an increased ground clearance at the front of the chassis.

The transition portions 6 are positioned not only in alignment with the rear spring carrier 4 of the front suspension 5 but also with the control pedals of the motor vehicle. This positioning of the portions 6 relative to the length of the longitudinal members 1 may be important, for example as regards housing the transfer box which, as will be described in greater detail hereinafter, can thus be disposed below the driver's seat.

The front spring carriers 8 of the front suspension 5 are also welded to the parts A of the respective longitudinal members and one or both of the carriers 8, as appropriate, comprises, in one piece, not only the suspension support bearing 9 but also a part of the steering mechanism, such as the steering box 10. The fact that the front part A of the longitudinal members 1 is raised permits the chassis to clear the front axle. However, the unitary construction of the front spring carrier with the steering box which is advantageously achieved by casting, makes it possible to lower the steering box to the maximum extent, and the steering column 11 can be arranged at a tangent to the spring carrier and a substantially flat angle so that the steering wheel can be at a position which is within the set height limit. Since the steering wheel is generally the highest point of the vehicle, the advantage which results from lowering the steering box and the steering column can be readily seen, and this feature is of substantial advance in the design of so-called airborne vehicles.

The front end 12 of each of the front parts A of the longitudinal members is slightly offset or cranked upwardly so as to provide the regulation 45° clearance angle, so that a winch 13 diagrammatically shown in Figure 2, and jerrican carriers 14 disposed on respective sides of the winch, have a ground clearance which complies with the standards set in respect of such vehicles.

It will be noted that the transverse member 15 which is disposed substantially midway of the length of the members 1 to support the transfer box (not shown), unlike the other transverse members 2, is not flat but is curved or cranked upwardly, so as to project above the upward surface 16 of the longitudinal members, as shown in Figure 1. The transverse member 15, as viewed in the longitudinal plane of the chassis, is of substantially trapezoidal shape, the small base of the trapezium being visible in Figure 2 and denoted at 17. The fact that the transverse member 15 projects above the longitudinal members 1 makes it possible to raise the transfer box, and its position is so calculated that the transfer box can be positioned directly below the

driver's seat, which provides for easy access to the transfer box, both for maintenance purposes and for possible repairs thereon.

The difference in level as indicated at I in Figure 1, between the two horizontal planes through the part A and the part B of the chassis provides a space for housing a fuel or water tank in the chassis.

Finally, the longitudinal members are provided with connecting bows or loops 18 for receiving connecting shackles or ropes for stowing or loading the vehicle, to moor it to the floor of the cargo aircraft in which it is carried.

The cranked chassis as described above is of substantial mechanical strength, and its shape and design permit it to impart to the vehicle of which it forms a part, the necessary compactness, while complying with the standards imposed as regards ground clearance and suitability for air transportation, to permit homologation thereof.

Modifications can be made in the above-described embodiment without thereby departing from the scope of the invention as defined by the appended claims. Thus, the U-section longitudinal members could be of different sectional shapes, and the longitudinal members could be completed by the addition of strengthening plate members to form a boxed section, or the members could be subjected to a surface treatment.

WHAT I CLAIM IS:—

1. A chassis for a motor vehicle, comprising two longitudinal members each carrying a front suspension mounting including a rear spring carrier, and a plurality of transverse members connecting the longitudinal members together, each longitudinal member being cranked at the position of its rear spring carrier, whereby each of the longitudinal members is divided into two parts at different levels with the part in front of said crank being higher than the part to the rear thereof, the crank in each longitudinal member being formed by an inclined transition portion thereof which connects the two said parts of the respective longitudinal member, and each of the rear spring carriers being welded into the respective transition portion.

2. A chassis according to claim 1 wherein the angle of the transition portions relative to the remainder of the longitudinal members is from 20° to 40°.

3. A chassis according to claim 2 wherein said angle is substantially 30°.

4. A chassis according to any one of the preceding claims wherein the front end portion of said front part of the longitudinal members is raised to provide an increased ground clearance at the front of the chassis.



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5. A chassis according to any one of the preceding claims, including a steering box, wherein a front spring carrier of the front suspension is in one piece with the steering box. 25
6. A chassis according to claim 5 wherein the front spring carrier is made in one piece with the steering box by means of casting, and is welded to the longitudinal member. 30
7. A chassis according to any one of the preceding claims wherein a said transverse member that is disposed substantially midway along the length of the chassis projects above the upper face of said lower rear part of the longitudinal members, whereby a transfer box which in the operational condition of the chassis is carried by said transverse member is disposed below the driver's position. 35
8. A chassis according to any one of the preceding claims wherein the difference in level between the two said parts of the longitudinal members provides a space for housing a water or fuel tank.
9. A chassis according to any one of the preceding claims wherein the longitudinal members carry connecting loops or bows for stowing or loading a vehicle in an aircraft.
10. A chassis for a motor vehicle, substantially as hereinbefore described with reference to the accompanying drawings.
11. A motor vehicle including a chassis according to any one of the preceding claims.

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Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1976.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

