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H. E. CURTIS

MOTOR VEHICLE CONSTRUCTION

Filed July 8, 1924

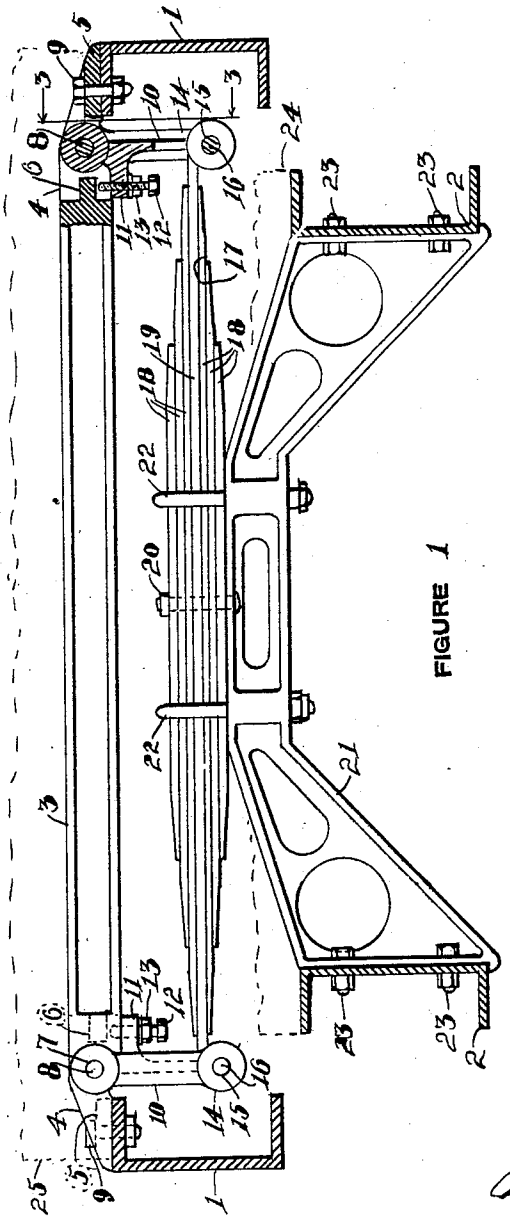


FIGURE 1

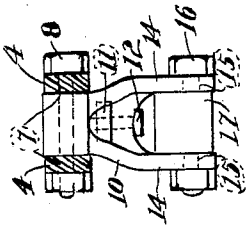


FIGURE 3

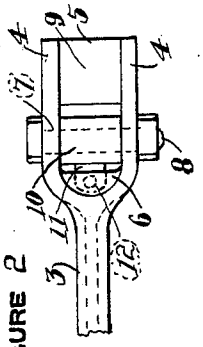


FIGURE 2

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MOTOR-VEHICLE CONSTRUCTION.

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It is one object of my invention to provide a vehicle chassis in which the body and motor are mounted upon separate but resiliently connected frames.

It is another object of the invention to provide a vehicle in which the subframe is resiliently suspended from the body frame and provided with means for permitting a limited swinging motion relative to the body frame.

Another object of the invention is to provide a structure in which means is provided for adjusting the range of swinging movement of the subframe relative to the body frame.

It is still another object of the invention to provide a structure in which the subframe and parts mounted thereon may be quickly and easily detached from the body frame and separated as a unit therefrom.

It is also an object of the present invention to provide a structure in which the vibrations induced by the action of the motor are substantially all absorbed before reaching the body frame, and one that is simple in construction, economical to manufacture, strong, durable, and highly efficient in its practical application.

Further objects and advantages will appear in the following specification and in the drawings forming a part thereof, in which,—

Figure 1 is a transverse vertical section through the body and subframes and showing the front elevation of a typical connecting unit, partly in section.

Figure 2 is a plan view of one end of the unit at its point of attachment to the body frame.

Figure 3 is a section on line 3—3 of Figure 1.

Referring more particularly to the drawing, 1 indicates the body frame and 2 the subframe.

At 3 is shown a cross beam forked at each end as at 4, the outer ends of each fork being joined by a horizontal web 5, and the base of the fork having a horizontal web 6 formed therein. The forks 4—4 are drilled at 7 to permit the insertion of a bolt 8 therethrough substantially midway between webs 5 and 6. Beam 3 is mounted on body frame 1 by means of bolts 9 engaging webs 5 and frame 1.

At 10 I show a shackle pivotally mounted on bolts 8, each shackle carrying an inwardly directed boss 11 tapped to receive a capscrew 12 carrying a lock-nut 13, this screw being so placed as to engage the under side of the adjacent web 6.

Each shackle 10 is forked as at 14 at its lower end and drilled at 15 to receive a bolt 16, the bolts 16 carrying spring 17.

The leaves 18 of spring 17 are systematically arranged on both upper and lower sides of central element 19 and secured by a bolt 20 passing through their centers.

At 21 is shown a bridge bar secured to the under side of spring 17 by yokes 22 and to the inner sides of the opposing side members of subframe 2 by bolts 23.

The engine is carried by subframe 2, its position being indicated formally by dotted lines 24. The body is mounted on frame 1 and its position is indicated in a formal manner by dotted lines 25.

Assuming the subframe to be carried by the body frame through the medium of a plurality of units constructed as heretofore described, or structures equivalent thereto, the assembly presents the following desired characteristics.

Upon the removal of bolts 9 the subframe 2 and all parts carried thereby may be separated as a unit from the body frame 1. It is necessary to disconnect or separate such parts as the drive shaft, but since such features are not essential parts of the present invention they are not illustrated herein. This quick and easy separation of the two frames is particularly valuable in truck and motor-bus construction since one operating mechanism may be removed for repairs or tuning up and another operating mechanism inserted in place thereof during such repair operations, thereby obviating the necessity of retiring the entire truck or bus from active service. This feature obviously permits material reduction of the number of body frames and parts carried thereby to the number actually required in active service, while only the subframes and associated motors and parts need be provided in excess of the number required for active service.

The swinging of the shackles 10 on bolts 8 increases the adaptability of the chassis to road conditions since the entire subframe may swing laterally a distance determined by the position of capscrews 14 relative to web stops 6. This flexibility of the sub-

frame structure obviously relieves the body frame of a large proportion of the vibrations and shocks that would be quickly transmitted to it if the shackle construction were rigid.

Furthermore, the lower ends of shackles 10 are drawn inwardly whenever the vertical movement of subframe 2 bows the spring 17 upwardly or downwardly, and the amplitude of the spring action may be governed by the adjustment of screws 14.

Finally, it is pointed out that the vibration due to operation of the engine carried by subframe 2 and the abnormal stresses and strains developed when starting the engine or operating under abnormal conditions, are almost entirely absorbed by the structure inserted between frames 1 and 2 so that the body frame and parts carried thereby are practically unaffected by said vibrations. Also the torque reactions of the engine developed in starting and stopping of the loads is completely absorbed by this structure.

It is to be understood, of course, that while I have herein shown and described one specific embodiment of the invention, changes in form, construction and method of operation may be made within the scope of the appended claims.

I claim:—

1. In a motor vehicle, a body frame, a support connecting the sides of the frame, a sub-frame adapted to carry a power plant, connecting means between the support carried by the body frame and sub-frame, means to permit lateral movement of the sub-frame and means contacting with the support to limit the lateral movement of the sub-frame with respect to the body frame.

2. In a motor vehicle, a body frame, a support connecting the sides of the frame, a sub-frame adapted to carry a power plant, depending links carried by the support, resilient means connected at its opposite ends to the links and supporting the sub-frame, said resilient means being similarly formed on opposite sides of its longitudinal axis, means to permit vertical and lateral movement of the sub-frame with respect to the other and means carried by the links and body frame to limit said movements of the sub-frame.

3. In a motor vehicle, a body frame, a sub-frame adapted to carry a power plant, means connecting the frames to permit transverse swinging movement of the sub-frame, including a spring element similarly formed on opposite sides of a horizontal plane through its center, adjustable means to permit predetermined swinging movement of the sub-frame with respect to the other, and means to permit separation of the respective frames as a unit.

4. A subframe suspension mechanism comprising a supporting bar mountable upon the body frame of a vehicle, and transversely thereof, a shackle pivotally mounted at each end of said bar to swing in a vertical plane bisecting said bar longitudinally, an inwardly directed lug carried by each shackle, a vertically adjustable capscrew inserted in each lug and adapted to engage said bar to limit the swinging movement of said shackle, a symmetrically formed leaf spring mounted upon and joining said shackles, and a subframe supported by said spring intermediate its ends.

5. In a motor vehicle, a body frame, a support connecting the sides of the frame, a sub-frame adapted to carry a power plant, means connecting the support and sub-frame to permit vertical and lateral movement of the frames, and adjustable means carried by the connecting means to limit the movement of the sub-frame with respect to the body frame.

6. In a motor vehicle, a body frame, a support connecting the sides of the frame, depending link members connected to the opposite ends of the support, spring means connecting the free ends of the links and disposed spaced from the support, a sub-frame adapted to carry a power plant supported by the spring means, and adjustable means carried by the link members to limit the vertical and lateral movements of the sub-frame with respect to the main frame.

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