July 14, 1925. **1,545,540**

C. H. WILLS

MOTOR SUPPORT

Filed Dec. 13, 1920

Fig. 1.

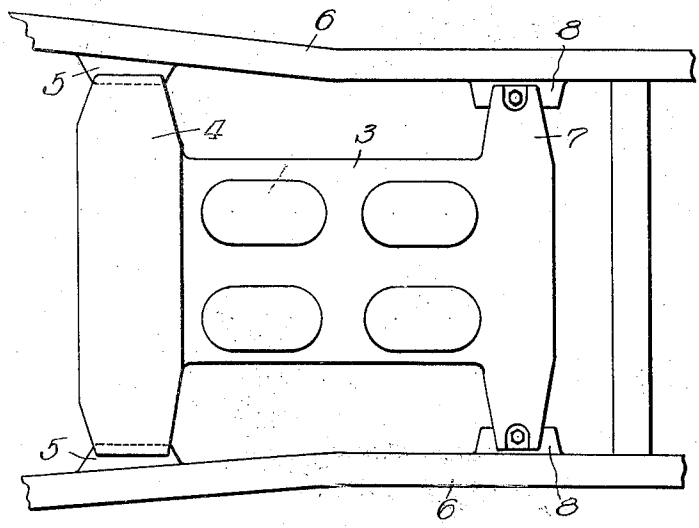
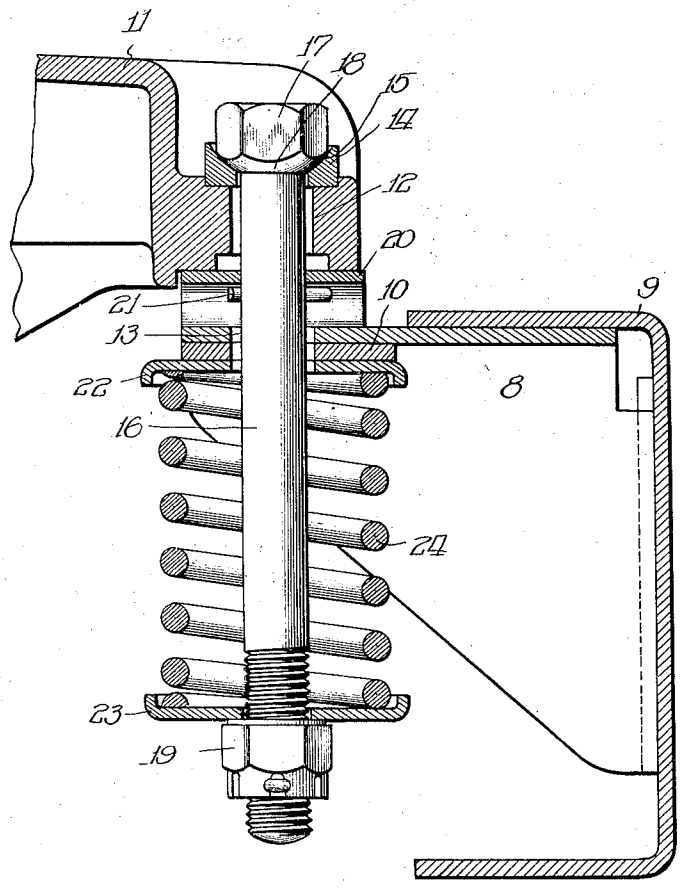


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHILDE HAROLD WILLS, OF MARYSVILLE, MICHIGAN.

MOTOR SUPPORT.

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To all whom it may concern:

Be it known that I, CHILDE HAROLD WILLS, a citizen of the United States, residing at Marysville, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Motor Supports, of which the following is a specification,

This invention relates to a new and improved resilient support, and more particularly to a cushioned support especially adapted for use in connection with the support of motors in motor vehicles.

The road vibrations and shocks are a great source of motor deterioration, and it is highly desirable that the motor be cushioned against such shocks in so far as is possible. Due to the connection between the motor and the driving means of the vehicle, and also due to the weight of the motor, it is of necessity required to be substantially immovably attached to the vehicle frame. This connection has been made either directly to the frame or to sub-frame and has generally consisted of either a four-point or three-point suspension. With the four-point suspension the motor is supported substantially at its four corners and with long heavy motors a rigid frame is required and the motor connection so stiffens the frame that the motor receives fully all shocks received by the frame. The three-point suspension was devised in the attempt to permit the frame to be more yielding and to minimize the stiffening of the frame due to the motor connection. It has been found, however, that a resilient method of attaching the motor to the frame which will permit a small amount of play will very materially reduce transmission of shocks to the motor and consequently reduce the injury to the motor due to minor road vibrations. Resilient means are provided to take up the play between the motor and the frame in such manner as to prevent any lost motion and as to eliminate rebound shocks.

It is an object of the present invention to provide means of the character described which are adapted to serve as a motor support and to cushion the connection between the motor and the vehicle frame.

It is also an object to provide a cushion support which is rugged in construction and simple in design, so as to stand up under the heavy stresses involved.

It is a further object to provide a device of this character which is composed of but few parts and which may be readily manufactured and installed at comparatively small expense.

Other and further objects will appear as the description proceeds.

Broadly my invention comprises the application of a resilient support to one end of the motor, it having been found that a completely resiliently supported motor is rendered impractical by the inertia of the heavy motor. The resilient connection is designed to cushion shocks and to prevent excessive rebound. This construction permits the frame to be less rigid and consequently to absorb a portion of the shocks.

More particularly the invention involves the application of the resilient support to the forward portion of the engine, this being the more desirable since the rear portion is connected to the driving members and hence should be as stable as possible.

I have illustrated a preferred embodiment of my invention in the accompanying drawings, in which—

Figure 1 is a somewhat diagrammatic view illustrating the relation of the engine to the frame; and

Figure 2 is a sectional detail of my cushioned motor support.

As shown in Figure 1, the motor 3 has its rear portion 4 connected to brackets 5 extending inwardly from the vehicle frame 6. The crank case front arm 7 is supported upon the frame front motor supports 8. The construction of this supporting assembly is illustrated in detail in Figure 2. The frame side rail 9 has the frame front motor support 8 secured thereto in any desirable manner. This frame front motor support 8 is provided with the reinforcement 10. The crank case upper half front arm 11 extends above the support 8 and the two members are provided with registering openings 12 and 13 respectively. The washer 14 is seated in a recess at the upper end of the opening 12 and is provided with a spherical seat 15. The bolt 16 is provided with a head 17 having the spherical lower surface 18 coacting with the seat 15. The bolt extends downwardly through the aligned openings 12 and 13, and is provided at its lower end with the castellated nut 19. The leaf spring 20 is interfitted between the members 8 and 11 and has its upwardly bowed central portion engaging the member

11, while its ends engage the member 8. A cotter pin 21 is passed through the bolt 16 and serves to hold the spring in assembled relation upon the bolt. The portion of the bolt 16 below the member 13 carries the oppositely faced dished washers 22 and 23, between which is carried the coil spring 24.

In the use of this resilient support, the spring 20 has a certain amount of permanent deformation due to the weight of the motor. The nut 19 is preferably adjusted so that the spring 24 is constantly under a predetermined compression. Shocks which are recieved by the vehicle frame 9 are cushioned by the spring 20 and largely absorbed thereby before reaching the motor arm 11. The spring 24 serves to somewhat stiffen the resistance of the spring 20 and also serves to retard and reduce the rebound of the arm 11 after compression of the spring 20 due to shock. The spherical bearing between the bolt 16 and the washer 14 upon the arm 11, taken in connection with the fact that the opening 12 is of a size sufficient to provide clearance with the bolt 16, serves to permit a limited amount of lateral play of the motor frame without binding the cushion means. This play is necessary in order to prevent a stiffening effect upon the frame due to the connection.

While I have illustrated a preferred form of resilient support, it is to be understood that my invention broadly is independent of the specific cushioning means utilized, and changes are contemplated within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. Resilient means for supporting a motor upon a vehicle frame comprising a pair of load-receiving brackets associated with the frame, a pair of load-carrying brackets associated with the motor, each motor bracket extending above a frame bracket, a leaf spring interposed between the two brackets, a spherical seat associated with the motor bracket, a bolt having a head coacting with said seat and having its shank pass downwardly through the spring and frame bracket, and resilient means associated with the lower end of the bolt and adapted to oppose separation of the brackets.

2. Resilient means for supporting a motor upon a vehicle frame comprising a pair of load-receiving brackets associated with the frame, a pair of load-carrying brackets associated with the motor, each motor bracket extending above a frame bracket, a leaf spring interposed between the two brackets, a bearing member having a spherical seat associated with the motor bracket, a bolt having a head coacting with said seat and having its shank pass downwardly through the spring and frame bracket, a cap upon the lower end of the bolt, and a coil spring interposed between the cap and the frame bracket and adapted to oppose separation of the brackets.

3. Resilient means for supporting a motor upon a vehicle frame comprising a load-receiving bracket associated with the frame, a load-carrying bracket associated with the motor, a leaf spring interposed between the two brackets, a spherical seat associated with the motor bracket, a bolt having a head coacting with said seat and having its shank pass downwardly through the spring and frame bracket, means associated with the shank below the leaf spring adapted to maintain the motor bracket, spherical seat bolt and spring in assembled relation, a cap upon the lower end of the bolt, and a coil spring interposed between the cap and the frame bracket and adapted to oppose separation of the brackets.

Signed at Marysville, Michigan, this 8th day of December, 1920.

CHILDE HAROLD WILLS.