April 24, 1928. 1,667,115

H. W. HYDE

SPRING SUSPENSION FOR VEHICLES

Filed May 28, 1923

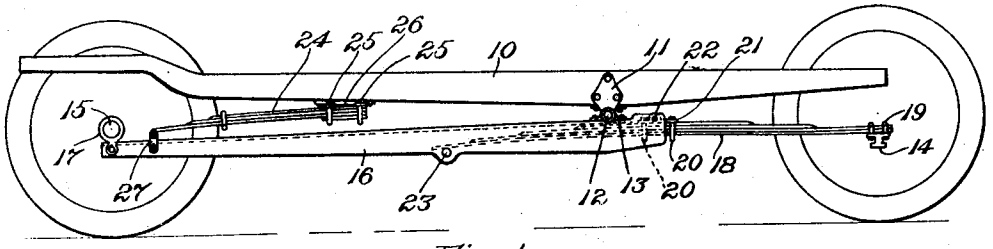


Fig. 1.

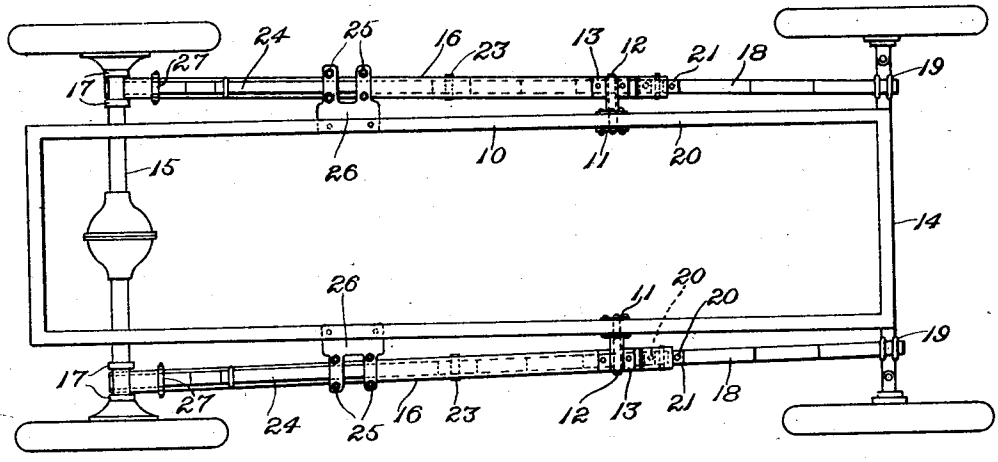


Fig. 2.

Inventor:
Henry Webb Hyde.
By Howson, Calvert, Copeland & Dike.
Attorneys.

Patented Apr. 24, 1928. 1,667,115

UNITED STATES PATENT OFFICE.

HENRY WEBB HYDE, OF NORTH COHASSET, MASSACHUSETTS, ASSIGNOR TO HYDE ENGINEERING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SPRING SUSPENSION FOR VEHICLES.

Application filed May 28, 1923. Serial No. 641,932.

This invention relates to vehicle spring suspensions of the general type shown and described in my prior application for letters Patent, filed September 29, 1921, Serial No. 504,160, patented January 27, 1925, No. 1,524,437.

As explained in said prior application, the invention disclosed therein consists primarily in providing the vehicle with longitudinal springs or spring reaches connected at their ends, either directly or indirectly, with the axles, and in supporting the body on the spring reaches intermediate the ends of the latter in such a manner as to permit said body to rock freely, with respect to and independently of the reaches, upon a horizontal, transverse axis, so that tilting or rocking of the reaches, caused by a vertical movement of either the front or rear wheels and the axle carried thereby, will not be transmitted to the body and will not tend to tip or pitch the same, said body being permitted, by rocking about its axis with respect to the reaches, to maintain its substantially horizontal position, its only movement being a slight vertical one in a substantially rectilinear direction.

In said prior application is shown a construction wherein the pivotal or rocking connection between the body and the reaches is disposed forwardly of the center of gravity of the body, the rear end of the body being partly supported by a balancing spring which engages the same at the opposite side of the center of gravity from the pivotal connection with the reaches, so that, as the reaches are rocked by an upward movement of the rear axle, opposed upward forces are applied to the body at opposite sides of the center of gravity, thereby holding the same against a corresponding rocking movement.

In such a construction as that last described, it is necessary that the balancing springs be so arranged with respect to the resilient portions of the spring reaches as not to be affected by the flexure of the latter when the front axle of the vehicle moves upwardly. In the construction shown in said prior application, the balancing springs are interposed between the body and the rear axle, being therefore beyond the resilient portions of the reaches, in the direction away from the pivotal connection of the latter with the body, so that said balancing springs are not affected by flexure of said reaches which terminate at and are secured to said axle.

The present invention has for its object to provide a form of spring reach which will enable the balancing springs to be located between the axle and the rocking connection, or at any desired point, and to be connected with the reaches, if desired, without being affected, as to their action upon the body, by any flexure of which said reaches are capable.

The foregoing and other objects of the invention, together with means whereby the same may be carried into effect, will best be understood from the following description of one form or embodiment thereof illustrated in the accompanying drawings. It will be understood, however, that the particular construction described and shown has been chosen for illustrative purposes merely, and that the invention, as defined by the claims hereunto appended, may be otherwise practised without departure from its spirit and scope.

In said drawings:

Fig. 1 is a side elevation and Fig. 2 a plan view of a spring suspension constructed in accordance with the invention.

In the construction shown, the body frame 10 is provided at each side with a bracket 11 connected by a pivot pin 12 with a bracket 13 secured to one of a pair of spring reaches connected at their ends with the front and rear axles 14 and 15, respectively, the pivot pins 12 being coaxially disposed, so as to permit a free rocking movement of said body with respect to said reaches. As in my prior application above referred to, the axis of the pivotal connection between the body and the reaches is located at or near the center of gravity of said body, being herein shown as slightly forward thereof.

Each of the reaches comprises a rigid beam 16, which is preferably of U-shape in cross section, supported at its rear end by a hanger 17 from the rear axle 15 and having secured thereto adjacent its forward end one of the brackets 13. At its forward end, beyond the bracket 13, each of the beams 16 is provided with a spring extension which, as shown, is in the form of a relatively flat, cantilever spring 18 secured at its forward end, as by U-bolts 19, to the front axle 14.

As is usual in cantilever spring constructions, said spring 18 is secured intermediate its ends, as by U-bolts 20, to a plate 21 pivotally connected at 22 to the forward end of the beam 16, the rear end of said spring resting upon a stud 23 carried by said beam and connecting the flanges of the latter. In place of the cantilever spring 18, a quarter-elliptical spring may be rigidly secured to the end of the beam 16. The cantilever type is preferable, however, as it inherently possesses a greater load carrying capacity for the same flexibility.

Interposed between each of the beams 16 and the body frame 10 is a relatively flat, quarter-elliptical spring 24 secured, as by U-bolts 25, to a bracket 26 on said body frame at the rear of the axis of the pivots 12. The springs 24 extend rearwardly from the brackets 26 and are connected at their ends by shackles 27 with the beams 16. The quarter-elliptical spring 24 is to be taken as merely illustrative of any suitable type of spring or spring device interposed between the beam 16 and the body frame 10 in the general position indicated, although such a spring is preferable as less expensive to build and easier to attach than spring devices of some other type.

It will be seen that each of the spring reaches comprises a rigid portion and a spring portion at one end only, the body being pivotally connected at one side of its center of gravity with the rigid portions of the reaches, and balancing springs being interposed between said body and said rigid reaches. When the reaches are rocked in one direction, as by an upward movement of the axle 15, upward forces will be applied to the body substantially at or quite close to the center of gravity thereof. The forces tending to cause pitching of the body are so small compared with the forces acting directly upward, that the inertia of the body maintains it in an essentially horizontal position. When the axle 14 is raised, the spring 18 is compressed, resulting in an upward force at the pivotal axis 12. Since, however, this force acts solely in a vertical direction and is applied to the frame 10 at or but a short distance away from the center of gravity, the body, by virtue of its inertia, remains substantially in its original position save for a slight upward movement in a rectilinear direction, and as the body moves upward the spring reaches turn slightly at the pivotal axis 12, so that the upward force at this point still continues in a vertical direction. The cantilever springs 18, assisted to a greater or less extent by the balancing springs 24, are sufficient to absorb the shocks delivered to either axle, and upward movement of the axle 14 does not result in flexure of the portions 16 of the reaches, which are rigid, so that no downward pull is exerted through the balancing springs 24 upon the body, notwithstanding the connection of said springs with the reaches, and said springs may therefore be located at any desired point longitudinally of the body, or wherever they may be required in order properly to balance the same.

The words "rear" and "front" and similar expressions are herein used as convenient illustrative terms, it being obvious that, although the construction shown is preferred for most purposes, the suspension might be oppositely disposed, the pivotal connection between the body and the reaches being in the rear instead of in front of the center of gravity of the body, and the other parts being correspondingly arranged. This and other modifications of the construction shown will, however, be readily apparent to those skilled in the art without discussion in detail.

Having thus described my invention, I claim:—

1. A spring suspension for vehicles including a pair of longitudinal reaches, each of said reaches comprising a rigid bar having at one end only a spring extension connected at one end to the reach and at its opposite end to the axle, the opposite end of said bar being connected to the other axle, and a connection intermediate said axles between said reaches and the vehicle body about which the latter is free to rock with respect to the former.

2. A spring suspension for vehicles including a pair of spring reaches, a connection between said reaches and the body about which the latter is free to rock with respect to the former, said connection being located at one side of the center of gravity of the body, the portions of said reaches at the side of said connection toward the center of gravity of the body being rigid throughout, and balancing springs interposed between said body and the rigid portions of said reaches respectively.

3. A spring suspension for vehicles including a pair of reaches connected at their opposite ends with the axles of the vehicle, and a connection between said reaches and the body of the vehicle about which the latter is free to rock with respect to the latter, each of said reaches having a rigid portion extending from said connection and terminating at one of the axles and having a spring portion between said connection and the other axle, and balancing springs interposed between the body and the rigid portions of said reaches at the opposite side of said connection from the spring portions of said reaches.

4. In a vehicle having a body frame and axles, a spring suspension including a pair of reaches, a connection intermediate the ends of the reaches between said reaches and the body frame about which the latter is free

to rock with respect to the former, each of said reaches including a substantially rigid beam connected at one end to one of the axles, a balancing spring for the end of the body frame adjacent said axle, and a spring connecting said beam with the other axle.

5. In a vehicle having a body frame and axles, a spring suspension including a pair of reaches, a connection intermediate the ends of the reaches between said reaches and the body frame about which the latter is free to rock with respect to the former, said connection being located at one side of the center of gravity of the body, each of said reaches including a substantially rigid beam connected at one end to one of the axles, and a spring connecting said beam with the other axle.

In testimony whereof I affix my signature.

HENRY WEBB HYDE.