W. S. PROSKEY.

RUNNING GEAR.

APPLICATION FILED OCT. 28, 1909.

1,096,947.

Patented May 19, 1914.

2 SHEETS—SHEET 1.

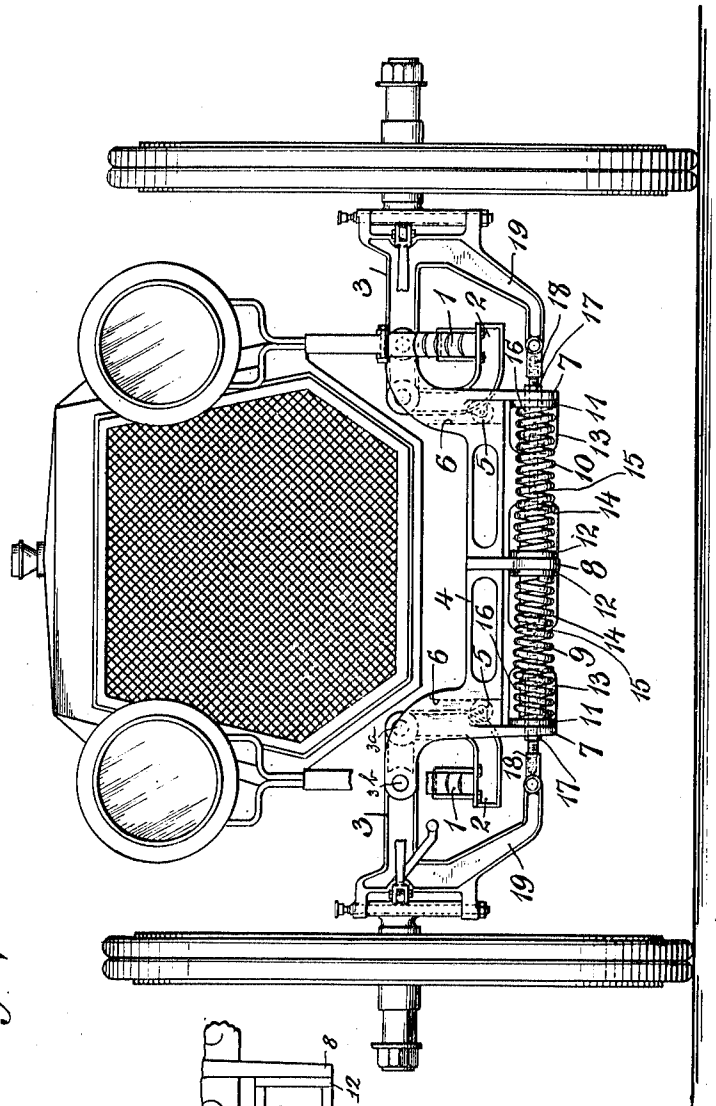


Fig. 1.

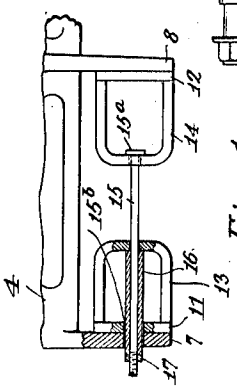


Fig. 4.

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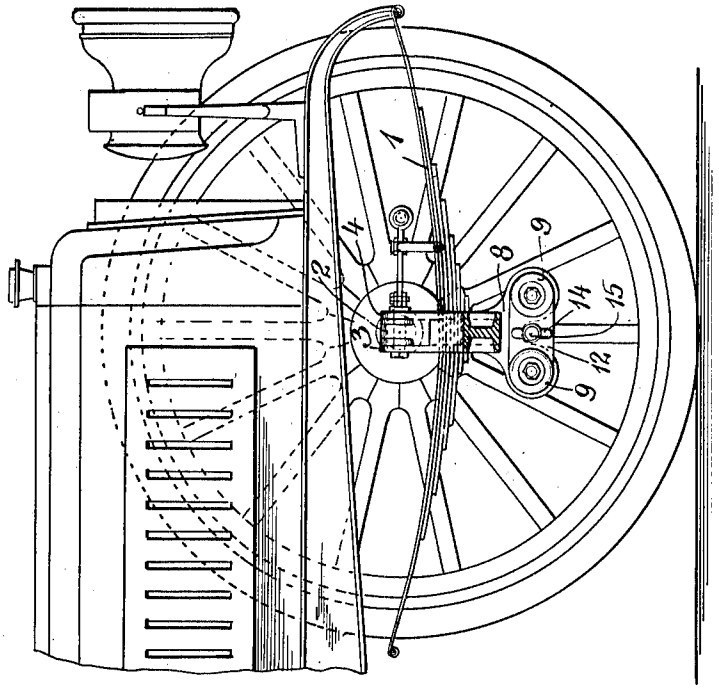
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2 SHEETS—SHEET 2.

Fig. 2,



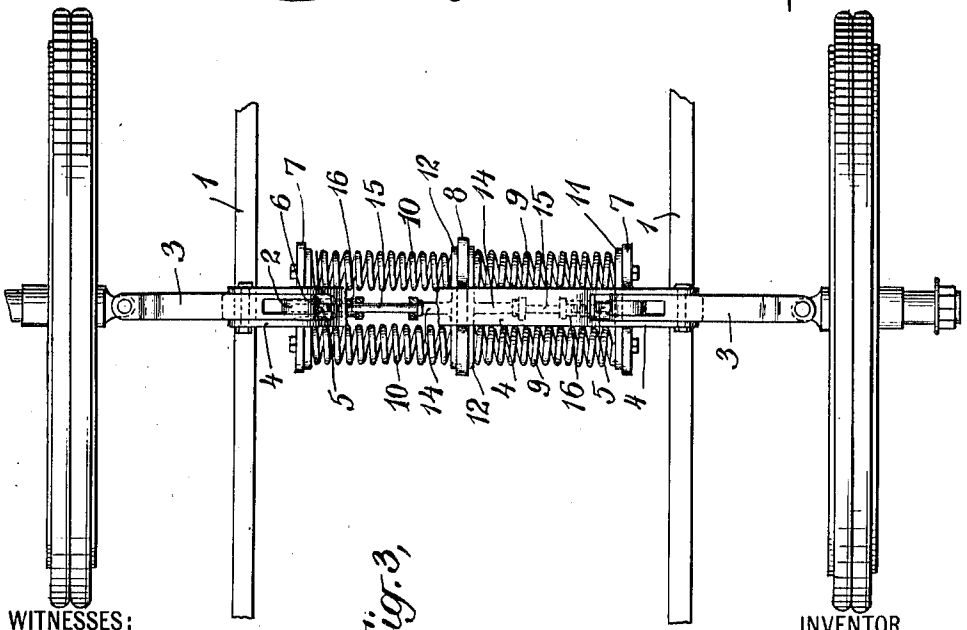


Fig. 3,

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RUNNING-GEAR.

1,096,947. Specification of Letters Patent. Patented May 19, 1914.

Application filed October 28, 1909. Serial No. 525,084.

To all whom it may concern:

Be it known that I, WINFIELD SCOTT PROSKEY, a citizen of the United States, residing at Reno, in the county of Washoe and State of Nevada, have invented certain new and useful Improvements in Running-Gear, of which the following is a full, clear, and exact description.

This invention relates to vehicle running gear, more particularly the means employed for mounting or suspending the vehicle body on the axles, and has for its chief object to provide devices for so mounting the body that the vertical movements of the wheels due to inequalities in the roadway will be compensated, or balanced, as it were, by movement of the body in the opposite direction, thereby keeping the body at a substantially constant distance above the roadway and avoiding in large measure shocks and jolts to the occupants of the vehicle.

A further object is to provide devices for the purpose mentioned, which shall be simple and effective, and capable of being constructed in the most substantial and durable manner.

To these and other ends the invention consists in the novel features of construction and combinations of elements hereinafter described, and more particularly pointed out in the appended claims.

The nature of the invention will be readily understood from a more or less detailed description of the preferred embodiment, and reference is therefore made to the annexed drawings, in which such embodiment is illustrated.

In the drawings, Figure 1 is a front view, showing the invention used with the front wheels of an automobile. Fig. 2 is a side view, partly in longitudinal section. Fig. 3 is a plan view, with the vehicle body removed. Fig. 4 is a detail sectional view of a part of the spring-mechanism, with the springs removed.

The front springs 1, on each side of the vehicle, are mounted on the outer ends of inwardly and upwardly extending suspension arms 2, which at their upper ends are pivoted to the inner ends of two short axles 3 at the points 3^a. Directly above the springs the axles are pivotally connected at the points 3^b to the outer ends of a central transverse member or distance piece 4, the suspension arms, short axles, and distance piece constituting what may be conveniently and appropriately termed a flexible or jointed axle since the parts thereof are capable of pivotal movement relative to each other. In order always to maintain the springs 1 at a fixed distance from the distance piece 4 the suspension arms are provided with anti-friction rollers 5 which bear on vertical guides or ways 6 on the said pieces.

Projecting downwardly from the center and outer ends of the distance piece are three stops or arms, 7, 8, between which are two pairs of coil springs 9, 10, bearing at their ends against abutments 11, 12, which in turn bear normally against the said stops. The abutments are provided, between their respective springs, with horizontally extending yokes 13, 14. Extending outwardly through the yokes and slidable therethrough are two tensioning rods 15, each provided with a head 15^a (see Fig. 4) on the inside of its respective inner yoke 14 so that as the rod is drawn out it draws the yoke in the same direction and so compresses the coöperating springs against the opposite outer abutment, as will be readily understood. To permit such movement of the rods each outer abutment is provided with a central aperture, 15^b, through which the respective rods pass. At their outer ends the rods are threaded and carry sleeves 16, positioned between the yokes 13 and suitable spacing or adjusting nuts 17. It will therefore be seen that if the rods are urged inwardly the sleeves 16, sliding through the stops 7 and bearing against the yokes 13, will carry the yokes 13 and the abutments 11 inwardly, thereby compressing the springs against the opposite inner abutments, the rods 15 sliding idly through the yokes 14 during the operation. The outer ends of the rods are screwed into terminal pieces 18, which are pivoted to the horizontal portions of two spring-actuating arms 19 extending downwardly from the short axle members 3. It will be observed that the lever arm between the wheel and the pivot 3^b is considerably longer than that between the pivots 3^a and 3^b. Hence, as the member 3 turns on this pivot 3^b as a fulcrum, the pivot 3^a (and consequently the vehicle body) must move a lesser distance than the wheel and in the opposite direction.

The operation will now be readily understood from the foregoing. Suppose, for example, that the wheel at the left, as viewed in Fig. 1, strikes an elevation in the road-

way. In this case the tendency is to lift the side of the whole vehicle, as would be the result with a rigid axle; but the short axle member turns slightly on its pivotal connection with the distance piece 4 as a fulcrum, drawing out the rod 15 and compressing the spring 9. At the same time the inner end of the axle member is depressed, carrying with it the arm 2 and the vehicle body through a space dependent in extent upon the strength of the springs and the position of the fulcrum with respect to the two ends of the lever-axle member. The movement of the body of the vehicle with respect to the wheel is thus the opposite, in direction, of the movement of the wheel; and it will be readily seen by those skilled in the art that by suitable proportioning of the parts the absolute movement of the body relative to the ground or roadway can be made very slight although considerable relatively to the wheel. On the other hand, if the wheel encounters a depression in the roadway the action is in effect reversed; the rod 15 is pushed in, compressing the springs against the inner abutment, and the vehicle body moves upwardly with respect to the wheel while the wheel moves down. It will therefore be seen that the movement of the body compensates or balances the movement of the wheel or wheels, as the case may be; and since the body movement can be very slight with respect to the roadway, though there may be considerable relative movement between the wheel and the body, very little of the shock and jar incident to running on an uneven road, particularly at high speed, is communicated to the body. It will also be seen that the arrangement is of such character as to enable the various parts to be constructed and connected in the strongest possible manner, so as to withstand long continued or rough use.

The apparatus can of course be used with the rear wheels as well as the front, and in other vehicles than automobiles; and it is to be understood that while the construction herein specifically described is the preferred form the invention is capable of other embodiments without departure from its proper spirit and scope as defined by the following claims.

What I claim is:

1. In a compensating suspension system for vehicles, the combination with the vehicle body and a pair of supporting wheels, of a pair of axle members on which said wheels are mounted, an intermediate distance piece pivotally connected at its ends to the axle members, body-supporting members pivoted on the axle members and movably engaging the distance piece, and springs associated with the axle members and the distance piece to resist and cushion relative motion between the two.

2. In a compensating suspension system for vehicles, the combination with the vehicle body and a supporting wheel, of an axle member on which the wheel is mounted at the outer end, a transverse member pivoted at its outer end to the axle members between the ends of the latter, a body-supporting arm pivotally carried by the inner end of the axle member and movably engaging the said transverse member, and a spring associated with the axle member and the transverse member to resist and cushion relative motion between the two.

3. In a compensating suspension system for vehicles, the combination with the vehicle body and a supporting wheel, of an axle member on which the wheel is mounted at the outer end, a transverse member pivoted at its outer end to the axle member between the ends of the latter, spring associated with the axle member and the transverse member to resist and cushion relative motion between the two, and a body-supporting arm pivotally suspended from the inner end of the axle member and extending outwardly to a point below the point of connection of the axle member with the transverse member, said arm being provided with anti-friction means engaging the transverse member to permit only vertical movement of the arm relative thereto.

4. In a compensating suspension system for vehicles, the combination with the vehicle body and a supporting wheel, of an axle member on the outer end of which the wheel is mounted, a transverse member pivoted at its outer end between the ends of the axle member, stops or arms on the transverse member, a body-supporting arm pivotally mounted on the inner end of the axle member, a coil spring between said stops, and means connecting the axle member and said spring whereby vertical movement of the wheel in either direction will compress the spring.

5. In a compensating suspension system for vehicles, the combination with the vehicle body and a supporting wheel, of an axle member on the outer end of which the wheel is mounted, a body-supporting arm pivoted to the inner end of said axle member and extending downwardly and outwardly therefrom, a transverse member pivoted at its outer end to the axle member between the ends of the latter, a spring carried by the transverse member, an arm extending from the axle member into proximity to said spring, and means connecting the last-mentioned arm with the spring whereby pivotal movement of the axle member relative to the transverse member will tension said spring.

6. In a compensating suspension system for vehicles, the combination with the vehicle body and a supporting wheel, of an

axle member on the outer end of which the wheel is mounted ,a body-supporting arm pivoted to the inner end of the axle member and extending downwardly and outwardly therefrom, a transverse member pivoted at its outer end to the axle member between the ends of the latter, stops on the transverse member, a coil spring between the stops, an arm extending from the outer end of the axle member into proximity to the spring, and devices connecting the spring and the last-mentioned arm and constructed to compress the spring at each pivotal movement of the axle member.

7. In a compensating suspension system for vehicles, in combination, an axle member, a transverse member pivoted at its outer end between the ends of the axle member, an element pivoted to the inner end of the axle member for supporting the vehicle body, stops carried by the transverse member, a coil spring between the stops, abutments interposed between the stops and the adjacent ends of the spring, an arm extending from the axle member into proximity to the spring, and a rod connecting the last mentioned arm and the said abutments whereby pivotal movement of the axle member will cause the said rod to advance one or the other of the abutments against the tension of the spring.

8. In a compensating suspension system for vehicles, the combination with the vehicle body and a pair of supporting wheels, of a pair of axle members on the outer ends of which the said wheels are mounted, an intermediate transverse member having each end pivotally connected to the adjacent axle member between the ends of the same, the vehicle body being supported by the inner ends of said axle members, and yielding means connecting the outer ends of the axle members to said transverse member, whereby movement of the axle members on their pivotal connection with the transverse member will be opposed by said yielding means.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

WINFIELD SCOTT PROSKEY.

Witnesses:

M. LAWSON DYER,

S. S. DUNHAM.