Apr. 24, 1923. 1,452,554

S. L. GARDNER

AUXILIARY TIE ROD

Filed Oct. 31, 1921

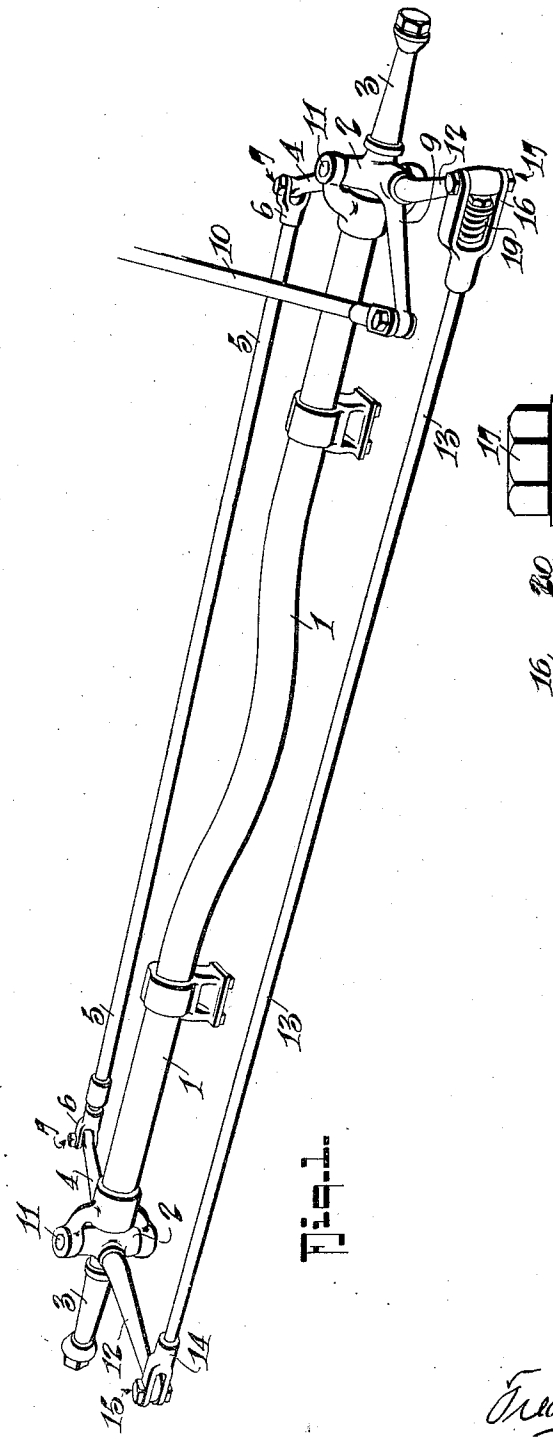


Fig. 1.

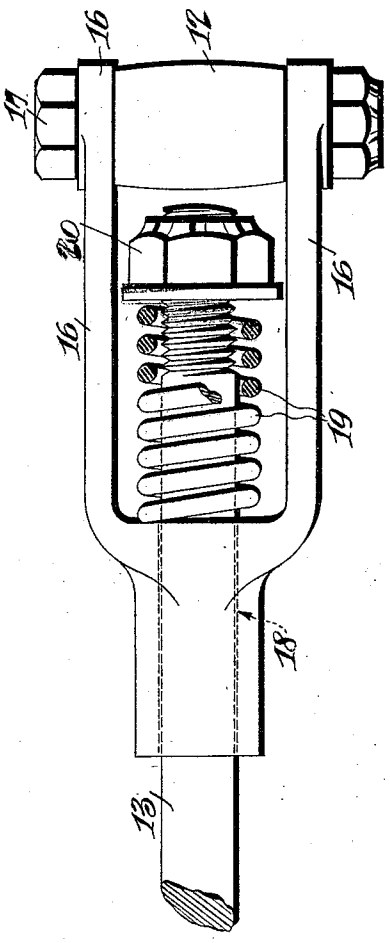


Fig. 2.

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Patented Apr. 24, 1923. 1,452,554

UNITED STATES PATENT OFFICE.

SAMUEL LYONS GARDNER, OF CEDAR RAPIDS, IOWA.

AUXILIARY TIE ROD.

Application filed October 31, 1921. Serial No. 511,759.

To all whom it may concern:

Be it known that I, SAMUEL LYONS GARDNER, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Auxiliary Tie Rods, of which the following is a specification.

The steering gear of automobiles now in general use includes a tie rod which connects the short arms of the knuckles of the front wheels together. This tie rod serves to cause both front wheels to turn in unison when one of them is turned through the medium of the steering column and its rod connected with an arm of one of the knuckles.

When the tie rod breaks, as sometimes occurs, one of the front wheels is left free and runs wild causing the front wheels to spread and often wrecking the car. It is therefore one of the objects of my invention to provide an auxiliary tie rod for connecting the knuckles of the two front wheels at that side of the axle opposite the location of the usual tie rod, whereby if the main tie rod breaks, the supplemental tie rod will function in lieu thereof to a sufficient extent to enable the car to be driven under its own power until a new main tie rod can be obtained.

It also frequently happens that wear in the bushings at the places where the tie rods are pivoted to the knuckle arms occurs to such an extent that play takes place and the front wheels wabble. This causes wear on the tires and is dangerous to the safety of the machine. It is therefore another object of my invention to provide means for taking up the slack or looseness in the joints between the main tie rod and the knuckle arms so as to prevent the wabbling of the front wheels.

In the drawings

Figure 1 is a perspective view of a front axle of the tubular type with my invention applied.

Figure 2 is an enlarged detail view of the clevis and coil spring at one end of the auxiliary tie rod.

In the drawings in which like numerals and letters of reference designate like parts in all of the Figures, 1 is the axle, 2 the steering knuckle which contains the stub shaft 3 for the front wheels and is provided with the usual arm 4 that in most cases extends rearwardly from the axle.

The arms 4 of the steering knuckles 2 at the ends of the axle 1 are connected by the usual tie rod 5 which consists of a rigid rod with clevises 6 at its ends that pivot at 7 to the arms 4, one of the clevises being adjustably carried by the rod 5.

One of the knuckles 2 is also provided with an arm 9 to which the connecting rod 10 from the steering gear is pivoted in the usual manner so that as the rod 10 is moved longitudinally in one direction or the other, the knuckles 2 will be turned on their pivotal axes 11 accordingly.

All of the foregoing parts are of the usual construction and, per se, constitute no part of my invention.

My inventinn consists in providing the knuckles 2 with auxiliary arms 12 that project from the knuckles in a direction opposite to that of the arms 4 (forwardly in the present instance) and these arms 12 are connected by an auxiliary tie rod 13 to one end of which is fixed a clevis 14 which is pivoted at 15 to one of the arms 12, a similar clevis 16 being pivoted at 17 to the arm 12 of the other steering knuckle and being apertured at 18 to permit the tie rod 13 to pass through with a sliding fit.

The tie rod 13 also carries a coil spring 19 which is secured in place by adjusting nuts so that the rod 13 can have a limited longitudinal movement in the aperture 18.

The spring 19 continuously tends to draw the pivotal points 15 and 17 toward one another and thereby takes up any slack or wear in the joints 6—7 and prevents wabbling of the wheels.

The coil spring 19 also functions to permit the points 15 and 17 to separate farther or come closer together as required during the turning movements of the vehicle.

In practice, with the construction shown, where the arms 12 diverge and the arms 4 converge, I find that unless the spring 19 is employed, there will be a tendency to bind when the wheels are turned in steering.

From the foregoing it will be seen that I have provided a simple and effective device for avoiding accidents due to breaking tie rods and also provided for taking up wear to prevent wabbling of the wheels, thus adding to the safety and comfort of the occupants of the car.

From the foregoing description taken in connection with the accompanying drawing, it is thought the complete construction, operation and advantages of the invention will

be clear to those skilled in the art and I wish it understood that while I have shown a preferred embodiment of the invention nevertheless it will be quite obvious that slight modifications of the details of construction may be made to adapt the invention to different types of cars and such may be done without departing from the spirit of the invention and the scope of the appended claims.

What I claim is:

In a device of the character described, the combination with the axle, the steering knuckles, the converging knuckle arms and the tie rod inextensibly pivotally connected to said arms; of auxiliary diverging knuckle arms on the side of the axle opposite that on which the converging arms lie, and an auxiliary tie rod having a spring clevis connection to one auxiliary arm and an inextensible pivot connection with the other of said auxiliary arms, all being arranged whereby to take up slack and wear in the bearings of said rods and arms and to allow the pivotal points of the auxiliary arms and rods to separate and move together as the knuckles are turned one way or another, the pivotal points of connection between the respective tie rods and their respective arms of a knuckle lying in a straight line passing through the pivotal axis of the knuckle.

SAMUEL LYONS GARDNER