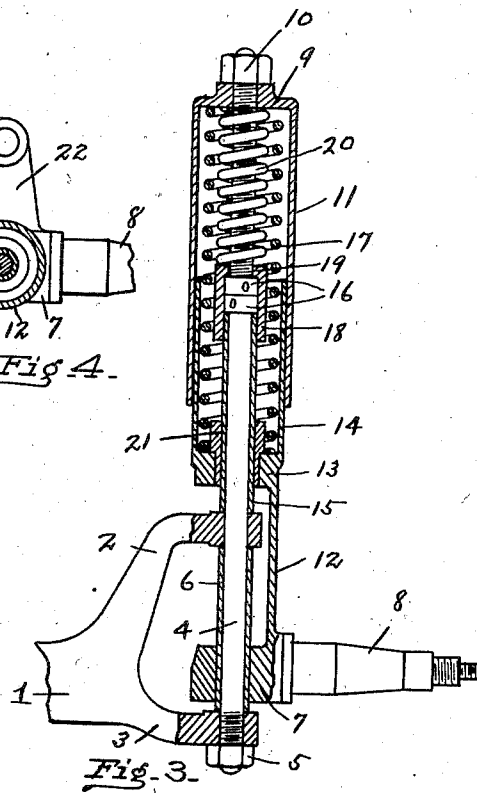
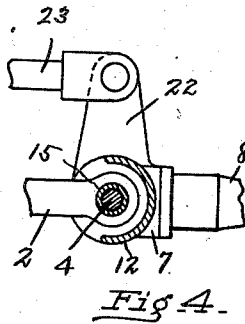
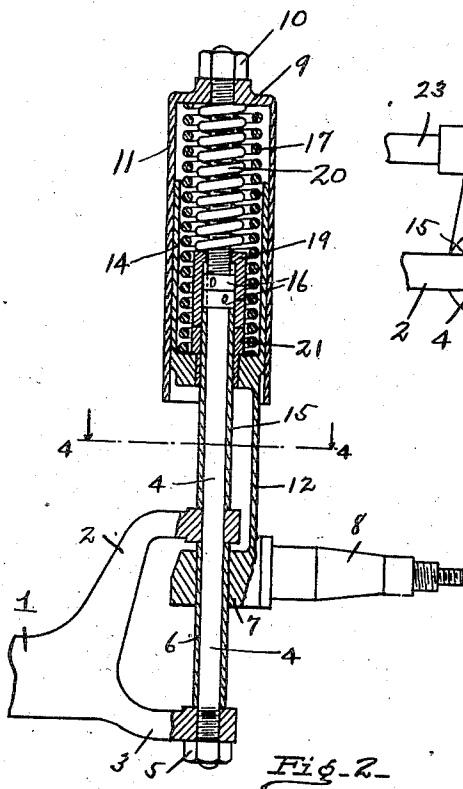
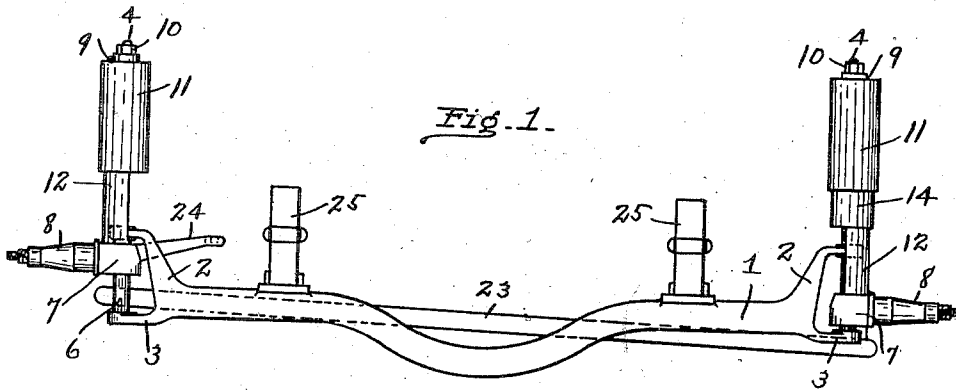


H. R. HARRISON.
 AUXILIARY TENSION DEVICE FOR SHOCK ABSORBERS.
 APPLICATION FILED JULY 5, 1912.

1,051,403.

Patented Jan. 28, 1913.



WITNESSES:
J. H. Perrault
M. E. Broesamb

INVENTOR
 HOWARD R. HARRISON.
 BY
E. S. Wheeler
 ATTORNEY

UNITED STATES PATENT OFFICE.

HOWARD R. HARRISON, OF DETROIT, MICHIGAN.

AUXILIARY TENSION DEVICE FOR SHOCK-ABSORBERS.

1,051,403.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed July 5, 1912. Serial No. 707,660.

To all whom it may concern:

Be it known that I, HOWARD R. HARRISON, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Auxiliary Tension Devices for Shock-Absorbers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to an auxiliary tension device for shock absorbers especially designed for use on motor vehicles but adaptable for other purposes, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide in connection with a device for absorbing the shock imparted to the wheels, means for obviating the setting of and a consequent loss of resiliency to the main spring or tension member by excessive compression thereof due to unusual shocks.

The above object is attained by the structure illustrated in the accompanying drawings, in which:—

Figure 1 is an elevation of the front axle of a vehicle showing generally the application of my invention. Fig. 2 is a fragmentary view partly in section, illustrating the position of parts when the auxiliary spring is brought into operation, as when the wheel encounters an unusual obstruction. Fig. 3 is a similar view showing the position of parts when the wheel drops into a depression. Fig. 4 is a horizontal section, as on line 4—4 of Fig. 2.

Referring to the drawings by the characters of reference marked thereon, 1 designates the front axle of a vehicle having at its ends the usual knuckle jaws 2 and 3, respectively. Passing through the upper jaw member 2 at each end of the axle is a vertically disposed bolt 4, whose end screws into the lower jaw member 3 and is locked by the nut 5. Embracing the bolt 4 between said jaw members is a sleeve 6. Mounted to slide vertically upon the sleeve 6 between the jaws is a fitting or spindle member 7, carrying a laterally projecting spindle 8

adapted to receive the front wheel, not shown. The bolt 4 extends some distance above the jaw 2 and is threaded at its upper end to receive a cap 9 which is screwed thereon and confined by the nut 10. From the cap 9 depends a cylindrical shell 11.

Projecting upwardly from the spindle member 7 is a semi-circular wall 12 which embraces the bolt 4 and the end of the upper jaw 2. At the upper end of the semi-circular wall 12 is a collar 13, and rising from said collar is a cylindrical shell 14 of a diameter to telescope within the cylindrical shell 11, as shown, said parts being arranged to slide one over the other. Embracing a portion of the bolt 4 extending above the upper jaw 2 is a sleeve 15 which is confined by the nuts 16 threaded on said bolt and screwed against the upper end of said sleeve. Surrounding the bolt 4 within the cylindrical shells 11 and 14, which serve as an inclosing telescopic case therefor, is the main compressible spring 17, the upper end of said spring being engaged by the cap 9 which serves as an abutment therefor, and the lower end of said spring being engaged by the collar 13 which is slidable upon said bolt against the tension of said spring.

Fitted to slide upon the bolt 4 centrally thereof is a sleeve 18 whose upper end is flanged at 19 to engage the uppermost of the nuts 16 and to support said sleeve from further descent upon said bolt. Confined between the upper end of the sleeve 18 and the cap 9 is a secondary or auxiliary spring 20 which lies within the main spring 17. Carried by the collar 13 and embracing the sleeve 15 of the bolt 4 is a ring 21 which forms an annular shoulder and which is movable vertically upon the sleeve 15 of the bolt 4 with the collar 13, said shoulder being adapted by an extreme upward movement of the collar 13 to engage the lower end of the sleeve 18 and move said sleeve upwardly against the action of the secondary or auxiliary spring 20.

It has been found, that, in shock absorbers of this character when a single spring only is employed, such as the spring 17, said spring will become set under extreme compression due to unusual shocks and lose a portion of its resiliency. It is for the purpose of preventing the setting of the main spring and the consequent loss of resiliency therein, that the secondary spring is employed.

The spindle members carrying the wheel spindles being free to move vertically upon the bolt 4 between the jaws of the knuckle members at the ends of the axle, allow the wheels to rise when riding over an obstruction or to drop into a depression whereby a small proportion only of said movement is imparted to the axle. Fig. 1 at the left illustrates the position when the wheel is passing over an obstruction, and said figure at the right illustrates the position when the wheel is dropping into a depression in the roadway. The parts illustrate the extreme of these two movements, yet the axle, as will be seen, remains substantially in a horizontal plane whereby the shock due to the wheels encountering any inequalities in the road is absorbed in the springs and the axle is mainly relieved therefrom. Where an unusual obstruction is encountered the collar 13 will move upwardly upon the bolt 4 so as to cause the shoulder 11 to engage the lower end of the sleeve 18 and move said sleeve upwardly against the action of the auxiliary spring 20. The auxiliary spring thus being brought into operation relieves the main spring 17 and prevents an extreme compression thereof, at the same time relieving the axle from the shock which would otherwise result from a complete collapse of the main spring.

By screwing downwardly the cap 9, any desired tension may be placed upon the springs.

Each of the spindle members 7 is provided with a projecting arm 22 to which the ends of the connecting rod 23 are connected, respectively. An arm 24 (see Fig. 1) extends from one of the spindle members for a connection of the steering rod, as will be well understood. The body springs are shown at 25 in Fig. 1.

The opening in the semi-circular wall 12 is sufficient to allow the necessary swinging movement of the spindle member without causing the edges of said wall to encounter the upper jaw 2 of the knuckle.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. An auxiliary tension device for shock absorbers comprising a vertical support adapted for attachment to the end of an axle, a member slidable upon said support having a projecting wheel spindle, a collar slidable upon said support carried by the spindle member, an abutment at the upper end of said support, a main spring confined between said collar and said abutment, a member movable on said support interme-

diating said collar and said abutment, and an auxiliary spring confined between said abutment and said intermediate movable member.

2. An auxiliary tension device for shock absorbers comprising a vertical support adapted for attachment to the end of an axle, a member slidable upon said support having a projecting wheel spindle, a collar slidable upon said support carried by said spindle member, an abutment at the upper end of said support, a main spring confined between said collar and said abutment, a sleeve movable upon said support intermediate said collar and said abutment, and an auxiliary spring confined between said abutment and said movable sleeve, the lower end of said sleeve extending into the path of travel of said collar.

3. An auxiliary tension device for shock absorbers comprising the jaws of an axle end, a vertical support passing through said jaws, a member slidable upon said support between said jaws and having a projecting wheel spindle, a collar slidable upon said support above the axle and carried by said spindle member, an abutment at the upper end of said support, a main spring confined between said collar and said abutment, a sleeve slidable upon said support intermediate said abutment and said collar, the lower end of said sleeve adapted to be engaged by said collar as it moves upwardly, and an auxiliary spring confined between said abutment and said sleeve.

4. An auxiliary tension device for shock absorbers comprising a vertical support adapted for attachment to the end of an axle, a member slidable upon said support having a projecting wheel spindle, a collar slidable upon said support carried by the spindle member, an abutment at the upper end of said support, a main spring embracing said support and confined between said collar and said abutment, a sleeve vertically movable upon said support intermediate said abutment and said collar, the lower end of said sleeve extending into the path of travel of said collar as it moves upwardly, means for limiting the movement of said sleeve in one direction, and an auxiliary spring embracing said support within the main spring and confined between said abutment and said sleeve.

In testimony whereof, I sign this specification in the presence of two witnesses.

HOWARD R. HARRISON.

Witnesses:

E. S. WHEELER,
M. E. BROESAMLE.