W. E. EASTMAN.

VEHICLE SPRING.

APPLICATION FILED DEC. 16, 1909.

1,002,830. Patented Sept. 12, 1911.

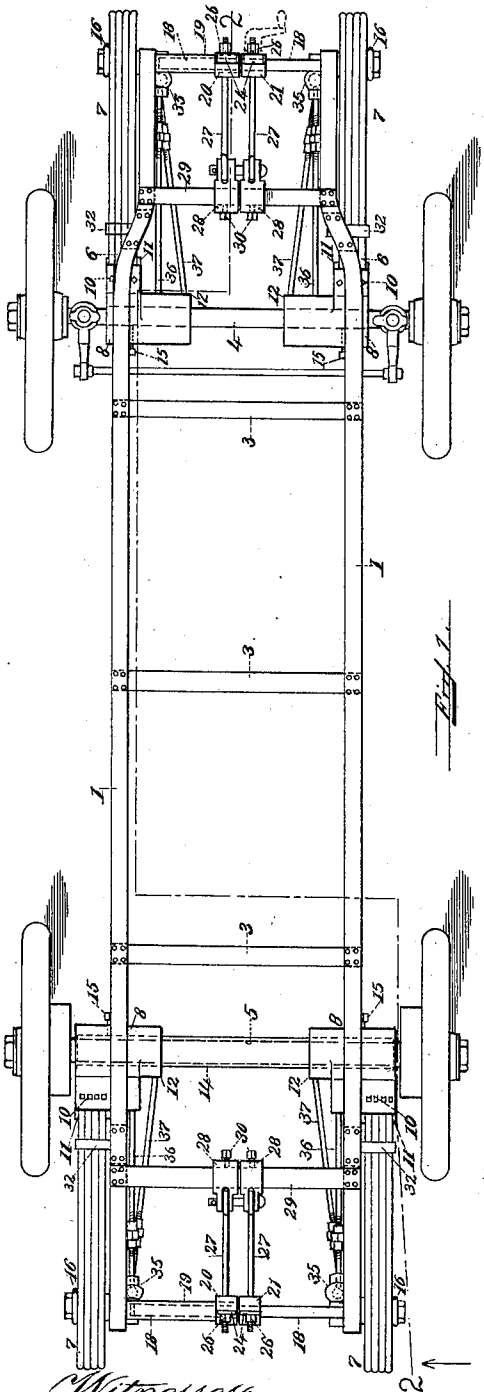

Fig. 1.

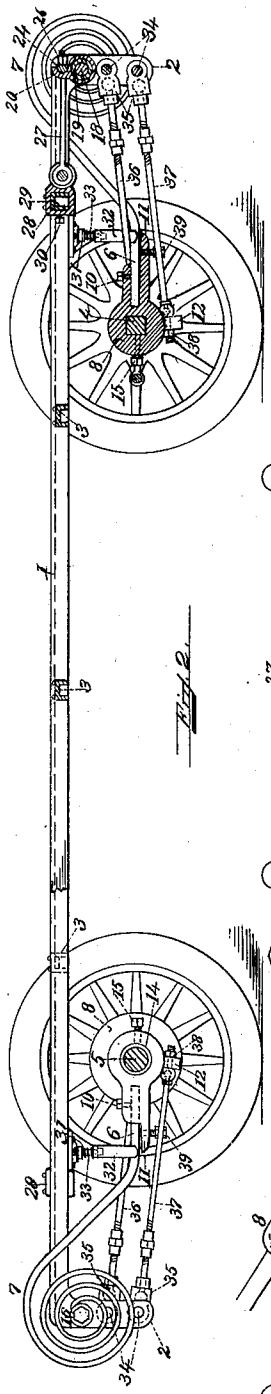

Fig. 2.

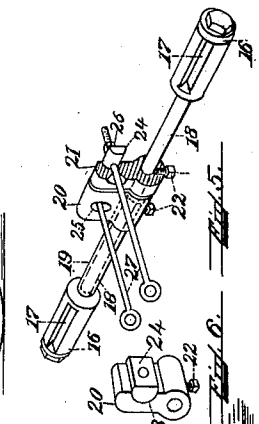

Fig. 5.

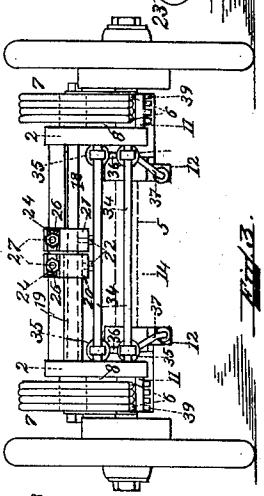

Fig. 3.

Fig. 6.

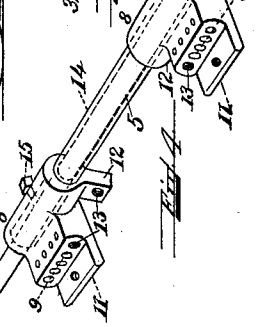

Fig. 4.

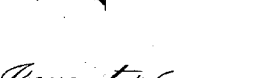

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM EVERARD EASTMAN, OF BOSTON, MASSACHUSETTS.

VEHICLE-SPRING.

1,002,830. Specification of Letters Patent. **Patented Sept. 12, 1911.**

Application filed December 16, 1909. Serial No. 533,459.

To all whom it may concern:

Be it known that I, WILLIAM E. EASTMAN, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Vehicle Springs, of which the following is a specification.

My invention relates to improvements in vehicle construction and springs, and it appertains particularly to the class of elastic supports that maintain the carriage body in position above the axles.

The objects of my improvement, are, first, to secure means to restore the tensive strength of the springs after their partial compression; second, to provide a carriage body supporting base equivalent to an extended wheel-base without changing the position of the axles; third, to obviate the transverse movement and permit the vertical rise of said axles with minimum strain and friction to the radial rods and springs; fourth, to lessen the motion of the carriage body in a vertical direction; fifth, to secure a uniform tension of the springs by increasing the leverage thereof; sixth, to insure when the axles rise a thrust diagonally to the vehicle body; seventh, the provision of an emergency device and in other essential elements hereinafter described.

I attain these objects by the mechanism illustrated in the accompanying drawing forming a part of this specification, in which:

Figure 1, is a plan of a vehicle understructure sufficient to exhibit my invention. Fig. 2, combines a side elevation, and a longitudinal section on broken line 2—2, of Fig. 1. Fig. 3, denotes a rear elevation of the same. Fig. 4, is a detail in perspective of the rear axle and its equipment supporting the springs and radial rods. Fig. 5, similarly illustrates the telescopic rods and the assemblage of devices collectively comprising the springs anchorage and tension restoring devices. Fig. 6, is a front perspective of one of the said tension restoring members, and Fig. 7, a perspective of the emergency device.

Corresponding numerals of reference designate similar features in the several views, referring to which—

1, indicates the longitudinal channel frame, reflexed at the ends to form the dependent portions or hangers 2 for the purpose presently disclosed. 3, represents the tie-plates uniting the frame, while 4 and 5 denote the front and rear axles respectively, with the anchorages for the curved spring extensions shown at 6, there being a plurality of units or compressible members aggregating a spring, the aggrouped elements therefor comprising resilient multipartite supports 7 upholding the frame with its superposed carriage body. Said anchorages also serve for the attachment of the inward ends of the duplex radial rods hereinafter described. These anchorages comprise the integral supports 8, upholding and retaining the individual curved extensions 6 (Fig. 2) forming parts of the springs, and which are forced into the receptacles 9 (Fig. 4) and therein secured by the tap-bolts 10, the protruding section 11 forming additional bearings for the adjustment of said extensions 6. Said anchorages also form the diagonal and downwardly projecting lugs 12 which serve as anchorages in connection with the receptacles 13 seating the inward end fastenings of the duplex radial rods.

The rear anchorages 8, are united by, and supported over the sleeves 14 surrounding the revoluble rear axle 5, and secured in the desired position against said sleeves by the bolts 15. In the front axle 4, these anchorages are similarly secured thereagainst, or, if a tubular axle, then with the addition of a sleeve 14, and in the manner described. The terminals of the extensions 6 form the spirals of the springs as at 7, and are seated in the chairs 16 (Fig. 5) the longitudinal reentering angular slots 17 confining them firmly, yet independently, and in a removable manner should occasion require their change. Said chairs control the spring ad-

justment and are independently revoluble through the medium of the rod 18 and the telescopic bearing 19 enveloping said rod, a rock-lever 20 actuates the latter bearing, and a similar lever 21 oscillates the rod 18, each lever being confined to its co-acting bearing by the bolts 22, the organized elements being supported in the reflexed ends 2 of the frame. Said levers near their upper ends have semi-circular transverse depressions 23 (Fig. 6) receiving the correspondingly shaped bearings 24, and the convergent perforations as at 25 (Fig. 5) to accommodate the oscillatory movement of the said levers by the nuts 26, over the screw threaded ends of the take-up rods 27 during the recuperation manually of the springs. The opposite ends of said rods are pivotally attached to brackets 28 (Fig. 1) secured to the cross-bars 29 by the bolts 30. The emergency frame sustaining devices, comprise the standard 31 (Fig. 2) secured to the under side of the frame 1, and provided with forked members 32 sliding under vertical pressure over said standards, these devices are positioned so as to encompass transversely the curved spring extensions 6 as observed in Fig. 2 should the carriage frame be depressed below a normal limit of spring resistance through breakage or otherwise, the spring buffer 33 will greatly diminish any collapse should such occur.

The construction of the duplex radial rods is as follows. Secured to the end portions 2, of the frame 1, are the tie-rods 34 to which are attached the links 35 holding the outward ends of said radial rods 36 and 37 in a pivotal manner, the inward ends of the rods penetrating the receptacles 13 (Fig. 4) in the lugs 12 of the anchorages 8 and secured therein and held by the nuts 38 (Fig. 2) the rods 37 (Fig. 1) being divergently positioned in relation to their fellow members 36, for the purpose of restricting certain movements of the carriage axles and sleeve, or sleeves.

Fig. 2 indicates the adjusting bolts retaining the curved extensions 6 of the spirals in a manner that the leverage of the aggroupment may be uniformly secured and through the diagonal thrust greatly diminish the vibrations of the carriage body.

In the practical operation of my improved invention it is desirable to augment the tension of the spirals by recoilment in order to increase their elasticity to sustain a predetermined load with comparatively their original resiliency. This I accomplish by manually actuating the take-up rods 27 by the application of a wrench as in Fig. 1, keying up to the desired point depicted on a scale as defined by my "vehicle spring" patent application No. 475,500, filed February 1st, 1909, applying this procedure to the forward and rearward rods 27 consecutively, until each element forming the elastic supports responds to the desired tension.

Obviously there may be other modifications structurally departing from the manner illustrated, such as an integral construction of the spring anchorages and sleeves, and in other minor essentials, therefore I desire not to be held to the strict interpretation herein disclosed, but may use such equivalents therefor as will come within the fair scope and spirit of my invention, which, having thus disclosed, I desire to secure by Letters Patent of the United States, and

I claim—

1. In combination the spiral springs provided with extensions, means to attach and support said extensions to the vehicle axle sleeves, the said sleeves, the duplex radial rods secured to the sleeves, pivotal elements to sustain said rods, a series of rock levers having telescopic bearings and means supported thereon to renew independently the tension of said springs after the partial relapse of their sustaining power.

2. In multipartite elements composing springs for a carriage frame the combination with telescopic bearings sustained in said frame of a series of rock levers provided with transverse semi-circular depressions near their upper ends and having convergent perforations connecting therewith, bearings positioned in said depressions in a manner to permit the oscillation of said levers and the rod connections to restore the tension of the springs.

3. In an elastically supported frame for vehicles a plurality of body supporting elements, a series of radial rods divergently positioned relatively, a series of chairs having reentering angular receptacles, telescopic means for their independent support transversely in said frame, a plurality of rock levers coacting with said chairs and means for their attachment to the frame in a manner that the said chairs may be individually oscillated to increase the tension of said spirals.

4. In an elastically supported frame for vehicles provided with integral hangers, telescoping rods sustained by said hangers, a rock lever attached to each rod and having a differential motion, multiple take-up rods pivotally connected to said frame and communicating with said rock levers, a plurality of yielding elements collectively forming springs and means for the oscillatory anchorage of the rock levers in a manner

to secure independent semi-rotatable action of said telescoping elements to recuperate the exhausted tension of said springs.

5. In a resilient supported vehicle frame the combination with the curved spring extensions of an emergency device comprising a forked member encompassing said extensions, a standard attached to the vehicle frame and slidingly secured in said forked member and a buffer surrounding the standard to cushion any occurring collapse of the elements supporting the carriage body.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM EVERARD EASTMAN.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."