(No Model.) 2 Sheets—Sheet 1.

E. L. NORFOLK.

VEHICLE SPRING.

No. 393,171. Patented Nov. 20, 1888.

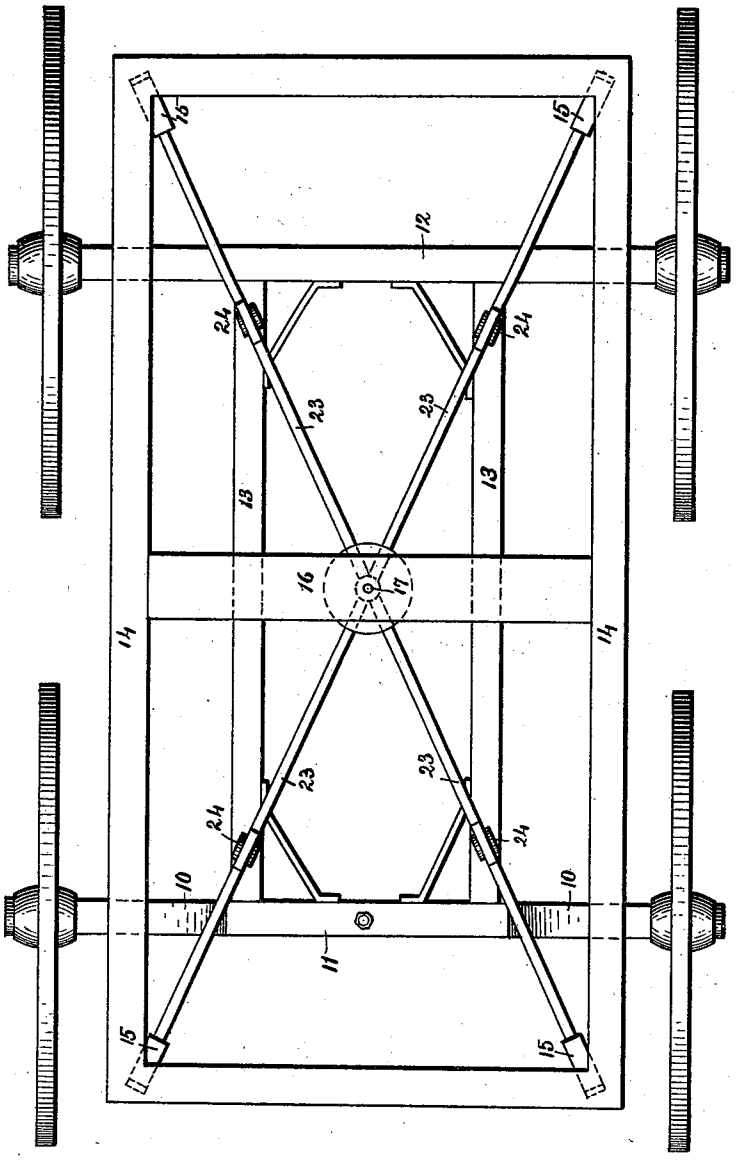


FIG. I.

ATTEST.
J. Henry Kaiser
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INVENTOR.
Edward L. Norfolk,
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(No Model.) 2 Sheets—Sheet 2.

E. L. NORFOLK.

VEHICLE SPRING.

No. 393,171. Patented Nov. 20, 1888.

FIG. 2.

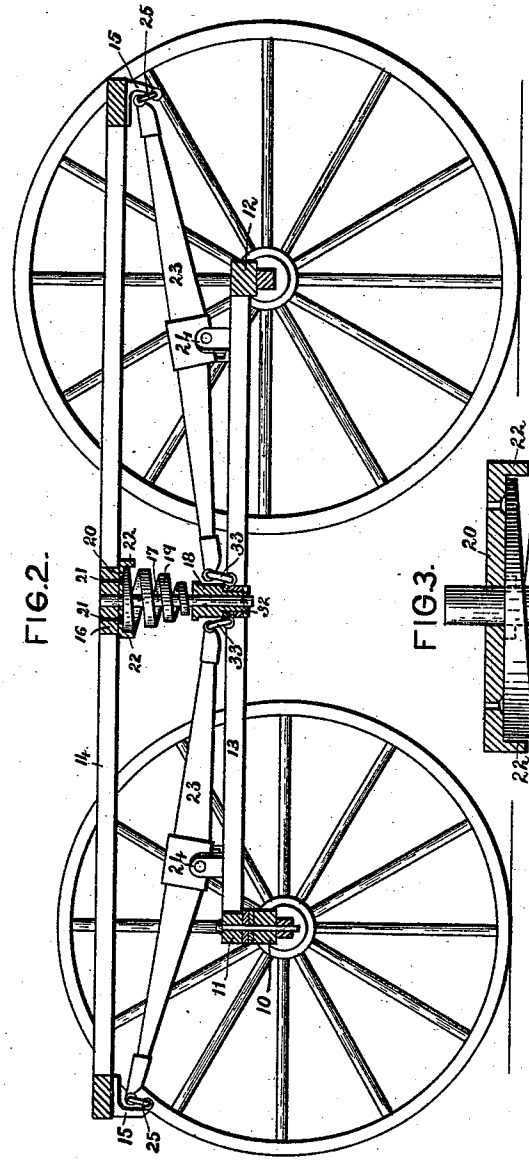


FIG. 4.

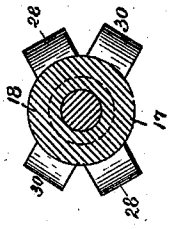
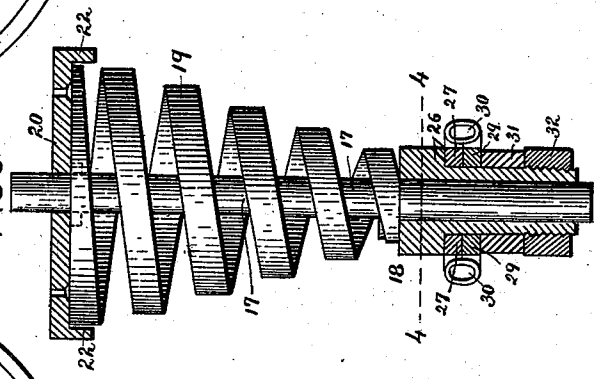


FIG. 3.



ATTEST.

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UNITED STATES PATENT OFFICE.

EDWARD L. NORFOLK, OF KINGSTON, ASSIGNOR TO HIMSELF, AND OLIVER L. GIDDINGS, OF EXETER, NEW HAMPSHIRE.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 393,171, dated November 20, 1888.

Application filed July 21, 1888. Serial No. 280,598. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. NORFOLK, a citizen of the United States, residing at Kingston, in the county of Rockingham and State of New Hampshire, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification.

The object of this invention is to provide a vehicle-spring which is very simple and economical in construction, and on which the vehicle-body will maintain a steady and easy carriage, whether under light or heavy loads, the weight upon the spring being distributed so as to prevent tilting or swaying.

Figure 1 is a plan view of the running-gear of a vehicle provided with this improvement, including the sills of the vehicle-body. Fig. 2 is a central longitudinal vertical section thereof. Fig. 3 is an enlarged view of the spring proper and the parts immediately connected therewith. Fig. 4 is a section on line 4 4 of Fig. 3.

Similar numerals of reference indicate corresponding parts in the different figures.

The running-gear comprises a front axle, 10, a bolster, 11, connected thereto by an ordinary king-bolt, a hind axle, 12, and reaches 13, connecting the hind axle with the bolster in the usual manner, the reaches being preferably parallel with each other. The ordinary sills, 14, of the vehicle-body are provided at the four corners with downwardly-projecting hangers 15, and a central transverse sill, 16, extends between the side sills. A vertical dependent spindle, 17, extends downward from the transverse sill 16, and a sliding sleeve, 18, is disposed on said spindle. A conical spiral spring, 19, is also disposed on said spindle between the sliding sleeve and the sill or vehicle-body. This spring is of sufficient strength and action to receive the weight of the load and adjust itself to varying loads.

The spindle 17 is provided with a fixed disk, 20, which is preferably integral with the spindle. This disk serves as an attaching-plate for fastening the spindle in position, bolts or screws 21 being passed through the disk and through the sill 16, whereby the spindle is braced against lateral play. The disk also serves as a bearing for the upper end of the spring, and is preferably provided with a downwardly-projecting flange, 22, at its outer edge, which flange surrounds the upper end of the spring and holds the latter in place.

Four levers, 23, are pivoted in brackets 24 attached to the reaches near their ends. These levers are disposed diagonally of the vehicle-body, their outer ends being underneath the corners thereof and their inner ends underneath the center and adjacent to the sliding sleeve of the central spindle. The outer ends of the levers are connected with the hangers 15 by means of links 25, and their inner ends are connected with the sliding sleeve 18 in any suitable manner.

The sleeve 18 has a shoulder, 26, near its upper end and an external screw-thread at its lower end. A ring, 27, provided at diametrically-opposite points with eyes 28 is slipped over the reduced portion of the sleeve against the shoulder thereof, and a ring, 29, provided with eyes 30, at diametrically-opposite points, is also slipped over the reduced portion of the sleeve up against the ring 27. A washer, 31, is placed on the sleeve below the rings, and a nut, 32, on the sleeve below the washer serves to hold the washer and rings in position on the sleeve. Links 33 connect the inner ends of the levers 23 with the eyes of the rings. The rings 27 and 29 are loose on the sleeve, so as to turn or swivel to bring their eyes into position to meet the links.

In the use of this improved vehicle-spring the weight of the load, acting through the hangers and links 25, pulls down the outer ends of the levers 23 and presses up their inner ends, whereby the sliding sleeve 18 is forced upward on the spindle 17 against the tension of the central spring, which latter is compressed and stiffened as the weight is increased.

I claim as my invention—

1. The combination of a vehicle-body provided with a central vertical dependent spindle, a sliding sleeve on said spindle, a spring interposed between said sleeve and body, hangers at the four corners of said body, and diagonal levers fulcrumed in bearings connected with the reaches, the outer ends of said levers being connected with said hangers and their inner ends with said sleeves.

2. The combination of a vehicle-body provided with a central vertical dependent spindle, a sliding sleeve on said spindle, a spring interposed between said sleeve and body, hangers at the four corners of said body, the vehicle-gear provided with fixed bearings, diagonal levers fulcrumed in said bearings, links connecting the outer ends of said levers with said hangers, and links connecting the inner ends of said levers with said sleeve.

3. The combination of a vehicle-body provided with a central vertical dependent spindle, a sliding sleeve on said spindle provided with a shoulder or stop, swiveling-rings on said sleeve provided with eyes, a spring interposed between said sleeve and body, hangers at the four corners of said body, the vehicle-gear provided with fixed bearings, diagonal levers fulcrumed in said bearings, links connecting the outer ends of said levers with said hangers, and links connecting the inner ends of said levers with said eyes.

4. The combination of a vehicle-body provided with a central vertical dependent spindle having an attaching-disk provided with a flange at its outer edge, a sliding sleeve on said spindle, a spring interposed between said sleeve and body and surrounded by said flange, hangers at the four corners of said body, the vehicle-gear provided with bearings, and diagonal levers fulcrumed in said bearings, the outer ends of said levers being connected with said hangers and their inner ends with said sleeve.

EDWARD L. NORFOLK.

Witnesses:
GEORGE W. LEAVITT,
WM. H. BELKNAP.