

No. 687,872.

Patented Dec. 3, 1901.

H. P. COX.
VEHICLE SPRING.

Application filed Apr. 27, 1901.

(No Model.)

Fig. 1.

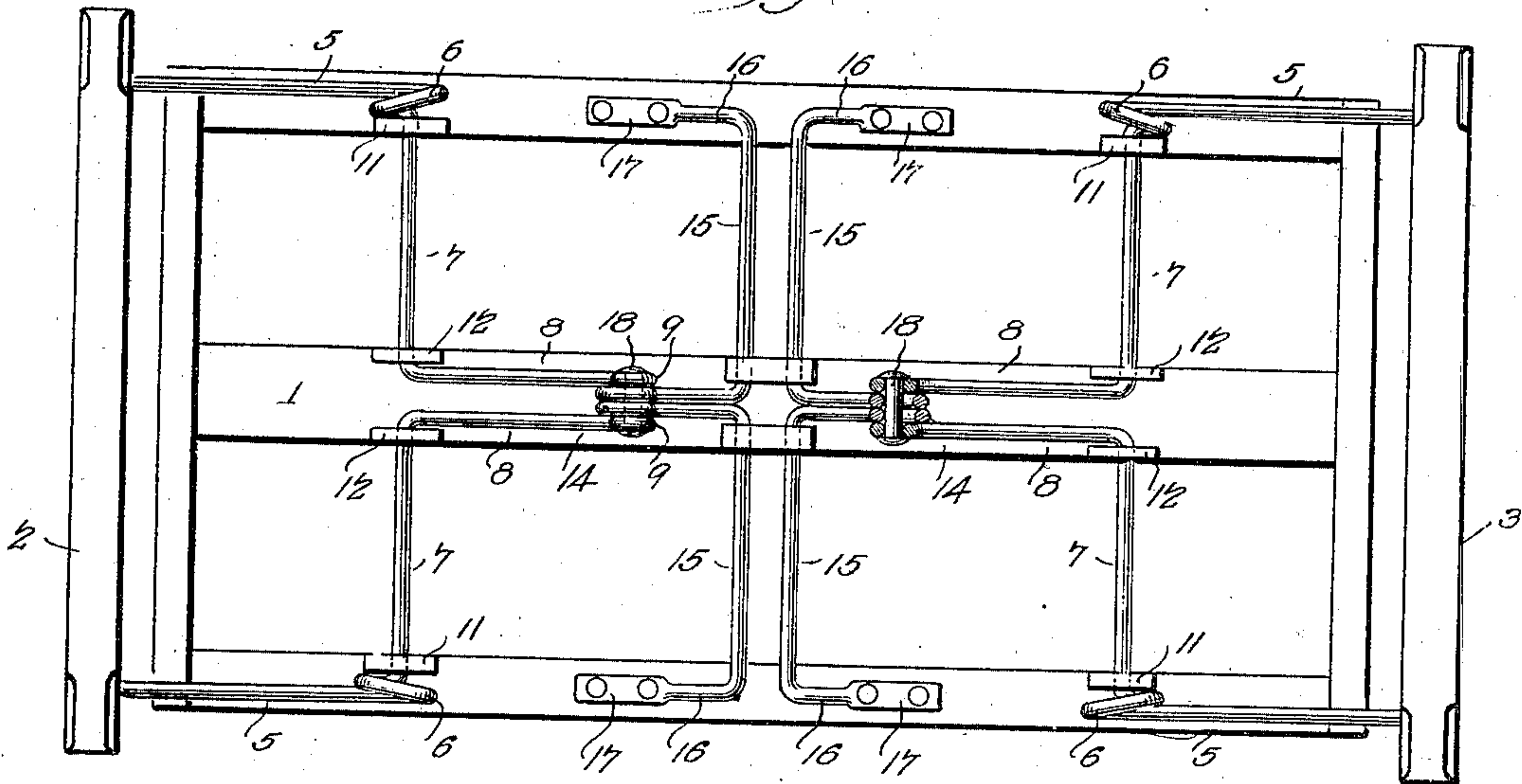


Fig. 2.

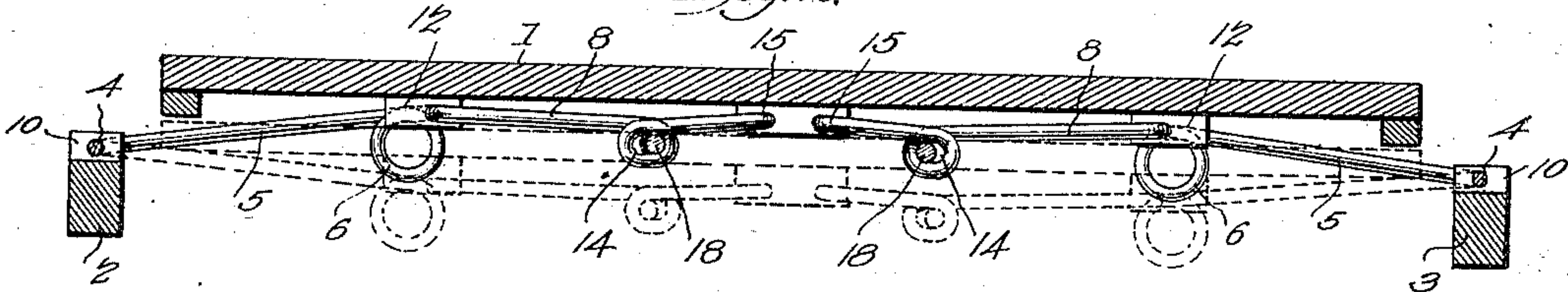


Fig. 3.

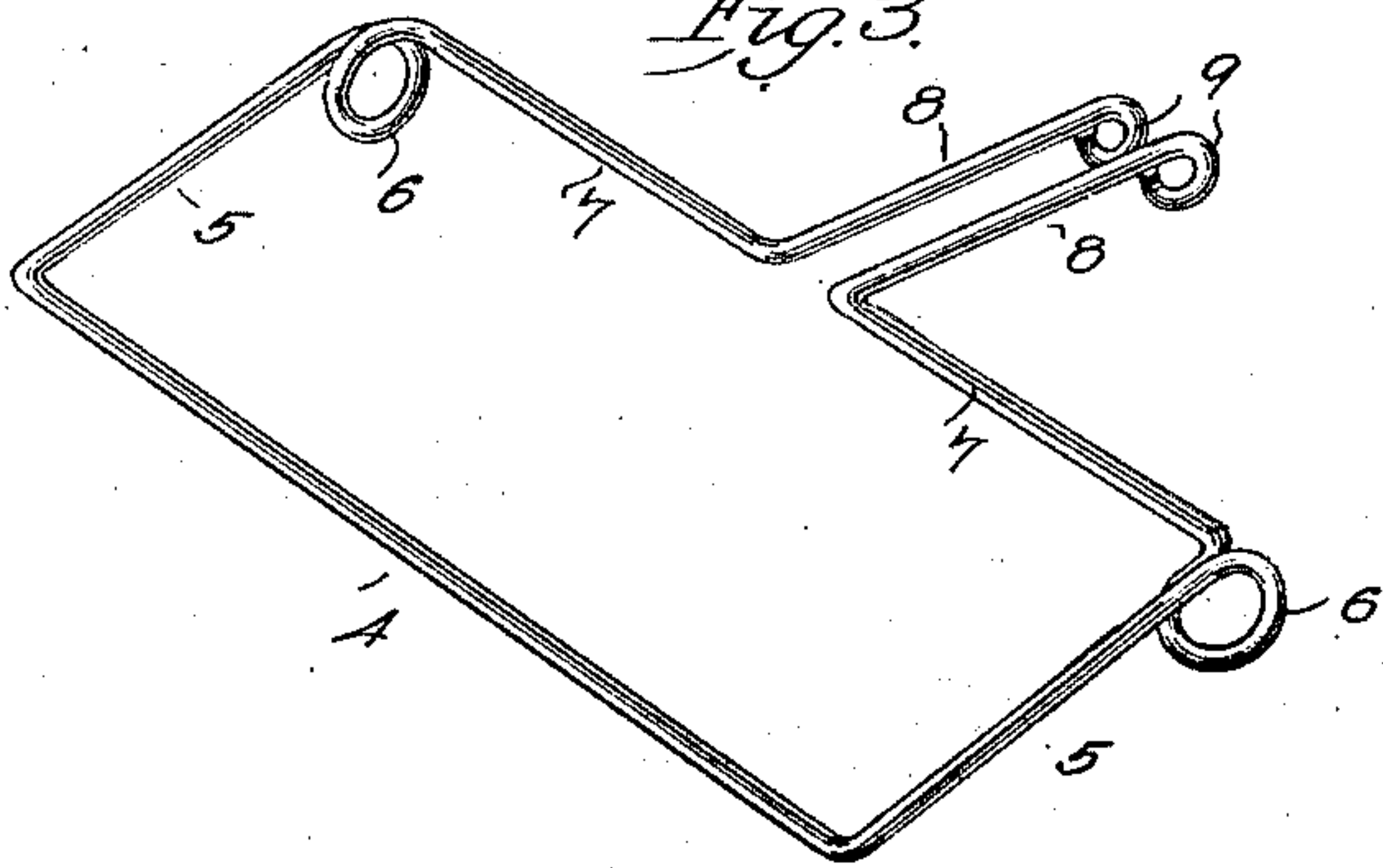
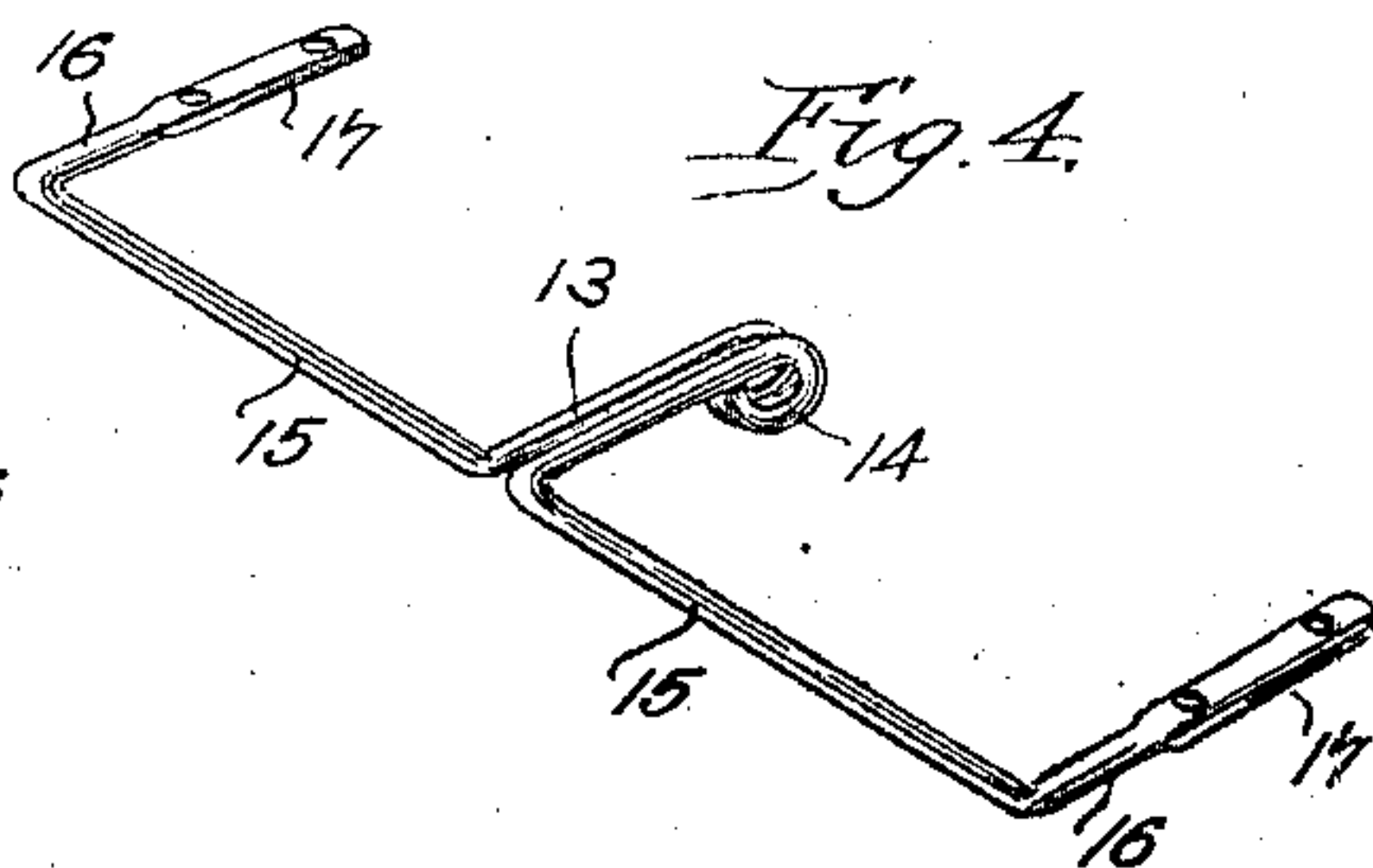


Fig. 4.



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UNITED STATES PATENT OFFICE.

HEZEKIAH PRESTON COX, OF MARIETTA, OHIO.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 687,872, dated December 3, 1901.

Application filed April 27, 1901. Serial No. 57,824. (No model.)

To all whom it may concern:

Be it known that I, HEZEKIAH PRESTON COX, a citizen of the United States, residing at Marietta, in the county of Washington and State of Ohio, have invented a new and useful Vehicle-Spring, of which the following is a specification.

This invention relates to vehicle-springs, and has for its object to provide certain new and useful improvements whereby the body of a vehicle is maintained level wherever the load may be placed thereon and a light load is as effectively cushioned as a heavy load. It is furthermore designed to arrange the device so that it may be applied to any ordinary wagon without altering the same and also to relieve strain from the axles when the wagon is heavily loaded.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a bottom plan view of the present spring applied to a vehicle-body. Fig. 2 is a longitudinal sectional view thereof in its normal position. Fig. 3 is a detail perspective view of one of the terminal spring members. Fig. 4 is a detail perspective view of one of the intermediate spring members.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

Referring to the drawings, 1 designates the bottom of an ordinary vehicle-body, which is supported upon the front and rear axles 2 and 3, respectively, by means of the present form of spring. These parts are common and well known, and as they form no part of the invention their form may be varied at will.

In carrying out the invention there is provided a pair of duplicate terminal spring members mounted upon the respective axles, one of such members being shown in Fig. 3 of the drawings. Each of these members is

formed from a single spring rod or bar, the intermediate portion of which is straight, as at 4, and at the opposite terminals thereof the opposite spring-arms 5 extend forwardly in the same direction at substantially right angles to the rock-bar portion 4. Adjacent to the outer end of each arm the same is bent into a vertically-disposed spring-coil 6, and from the coil the rod is bent laterally inward, as at 7, and then bent outwardly into a link member 8, substantially parallel with the spring-arm and terminating in an eye 9, the opposite links being separated by a suitable space for the reception of the link of the adjacent intermediate spring member, as will be hereinafter explained. Each axle is provided with one of these terminal spring members, the rock-bar portion 4 thereof being disposed longitudinally across the top of the axle and mounted or journaled in suitable bearings 10, so as to swing vertically thereon as a pivotal center, the main portion of the member being projected inwardly from the axle and beneath the adjacent end of the vehicle-bottom. The cross-bars 7 lie transversely beneath the body and have their outer ends connected to the bottom thereof by means of the respective hangers 11, and their inner end portions journaled in the respective hangers 12 upon the bottom of the vehicle. As best indicated in Fig. 2 of the drawings, it will be seen that the link 8 inclines downwardly and outwardly in opposition to the side arms 5, so that these parts lie out of contact with the vehicle-bottom.

Between the opposite terminal spring members are a pair of duplicate intermediate spring members, one of which has been shown in detail in Fig. 4 of the drawings. Each of these intermediate members is formed from a single spring rod or bar, which is bent intermediate of its ends into a link 13, the rod portions lying close together, with the bent end of the link formed into a longitudinally-elongated loop or eye 14, forming a slotted terminal. The opposite end portions of the rod are bent laterally outward in opposite directions into the cross-bars 15, which have their outer ends bent back in the direction of and substantially parallel with the link and forming arms 16, the outer terminals of which are flattened and perforated to form attaching-

brackets 17 for application to the under side of the vehicle-bottom, as shown in Fig. 1. Each intermediate spring member has its terminal brackets secured to the bottom of the vehicle, with its intermediate link projected outwardly and lying between the link members of the adjacent terminal spring member, the link 13 being inclined downwardly and outwardly, so that its slotted terminal may normally lie in alinement between the corresponding eyes or slotted terminals of the link members 8. A suitable pin 18 is passed through the aligned slotted portions or eyes and normally lies at the inner terminal of the slot in the intermediate link.

When a comparatively light weight is placed upon the vehicle, the body thereof will move downwardly by reason of the terminal spring members swinging downwardly upon their pivotal connections with the respective axles, whereby the pins 18 will travel in arcs struck from the respective rock-bars 4 as centers, thus drawing the pins outwardly through the slots of the intermediate links, the friction between the pins and the intermediate links retarding the downward swing of the terminal members and placing a torsional strain upon the intermediate spring members, thus giving elasticity to the vehicle-body when supporting a light load. When the pins have traveled to the outer ends of the slots in the intermediate links, the respective pairs of terminal and intermediate spring members become interlocked against independent movement and the strain is thrown upon the spring-coils of both terminal members for the support of a heavier load. Under the strain of a heavy load the spring-coils are contracted, thereby giving increased length to the terminal spring members and automatically compensating for the increased distance between the opposite rock-bars, and thus relieving strain from the axles.

From the foregoing description it is apparent that the intermediate spring members are brought into action under the weight of a light load, while the outer terminal members are unaffected thereby and are only brought into action under a heavy load. This feature is highly important with the present invention, as the springs are especially designed for application to vehicles for transporting nitroglycerin in mining districts, wherein the original load is heavy and is supported by the terminal spring members. After the load has been gradually diminished by unloading the torpedoes along the route of the vehicle the strong terminal spring members will become unaffected by the comparatively light remaining load, which ordinarily is a dangerous condition; but the light load affects the intermediate spring members and is effectually cushioned thereby and danger of explosions is thereby obviated.

What is claimed is—

1. The combination with a vehicle-body, and the running-gear thereof, of opposite ter-

minal spring members having their outer ends pivotally mounted upon the running-gear, and their inner end portions secured to the body, and provided with inwardly and downwardly inclined links, and a pair of intermediate spring members secured to the intermediate portion of the body, and having outwardly and downwardly inclined links, there being a slidable connection between the link of each intermediate member and the link of the adjacent terminal member.

2. A vehicle-spring, composed of opposite terminal spring members, having outer pivotal supports, and intermediate vehicle-body connections, and an intermediate spring member, having an intermediate body connection, and opposite terminal connections with the inner ends of the pivotal spring members, said connections being slidable and constructed to interlock all of the spring members and bring the terminal members into action only after the intermediate member has become active.

3. The combination with a vehicle-body, and the running-gear thereof, of opposite terminal spring members supported upon the respective axles and lying beneath the body, and one or more other spring members connected to the body and the respective terminal members, said other spring members being constructed to be active under the weight of a light load only, and the terminal members being constructed to be active under a heavy load only and after the said other springs have become active.

4. A vehicle-spring, composed of opposite terminal members, having outer terminal pivotal supports, intermediate vehicle connections, and inner downwardly and outwardly inclined terminal portions, said members being constructed to be active under a heavy load only, and an intermediate spring member, having an intermediate vehicle connection, and opposite outwardly and downwardly inclined terminal portions, there being slidable connections between the opposite terminals of the intermediate member and the inner terminals of the respective terminal members, said connections being at their inner limits upon the intermediate member in the normal position of the entire spring, and at their outer limits when the terminal spring members are active.

5. A vehicle-spring, composed of opposite terminal spring members, having outer terminal pivotal supports, intermediate spring-coiled portions, and outwardly and downwardly inclined terminal portions, intermediate vehicle connections for each member, and an intermediate spring member, having an intermediate vehicle connection, and opposite downwardly and outwardly inclined link portions, there being slidable connections between the respective links and the inner terminals of the respective outer spring members, said slidable connections being at their inner limits upon the intermediate member

in the normal condition of the entire spring, and at their outer limits when the outer spring members are active.

6. A vehicle-spring, composed of opposite outer terminal spring members, each of which has an outer terminal pivotal support, an intermediate coiled-spring portion, and opposite outwardly and downwardly inclined terminal portions, and an intermediate spring member, having opposite outwardly and downwardly inclined link portions, there being a pin-and-slot slidable connection between the outer terminal of each link and the inner end of the adjacent terminal spring member, said connection being at its inner limit upon the intermediate member in the normal condition of the entire spring, and at its outer limit under the strained condition of the spring and when the terminal members are active.

7. In a vehicle-spring, the combination of opposite terminal spring members, each member comprising opposite side arms, having outer terminal pivotal supports, intermediate spring-coil portions, and inner terminal eyes, the opposite end portions of the arms being inclined outwardly and downwardly from the spring-coils, and an intermediate spring member, having opposite downwardly and outwardly inclined link portions, provided with terminal eyes that are normally aligned with the eyes of the respective outer terminal spring members, and pins passing through the aligned eyes, the eyes of one member being elongated to form a slidable connection between the members, the pins being at their inner limits upon the intermediate member in the normal condition of the entire spring, and at their outer limits under the strained condition of the spring.

8. In a vehicle-spring, the combination of opposite outer terminal spring members, each of which comprises a rock-bar, having journal-bearings, opposite lateral arms extending in the same direction, and provided with outer terminal spring-coils, and inwardly-directed cross-bars extending from the respective spring-coils, the inner terminals of the cross-bars having outwardly and downwardly in-

clined link members provided with outer terminal eyes, and a pair of intermediate spring members, each of which comprises an outwardly and downwardly inclined link having an outer terminal elongated eye lying between the terminal eyes of the adjacent terminal spring member, the opposite end of the link having opposite lateral cross-bars, provided with terminal attaching means, there being pin connections between the aligned eyes to form slidable connections between the outer and intermediate spring members, the pins being at their inner limits upon the intermediate members in the normal condition of the spring, and at their outer limits in the strained condition of the spring.

9. The combination with a vehicle-body, and the front and rear axles of the running-gear thereof, of opposite terminal spring members, each comprising a rock-shaft mounted upon the adjacent axle, and having terminal crank-arms extending inwardly of the vehicle-body, each arm having a terminal spring-coiled portion, a lateral inwardly-directed cross-bar extending from the spring-coil, and a downwardly and outwardly inclined link extending from the cross-bar, and provided with an outer terminal eye, the arm being connected to the vehicle-body, and a pair of intermediate spring members each of which comprises a cross-bar, having opposite terminal connections with the vehicle, and an intermediate outwardly and downwardly inclined link, provided with an outer terminal elongated eye lying between the eyes of the adjacent terminal spring member, there being pins projected through the aligned eyes, each pin being at its inner limit upon the intermediate member in the normal condition of the spring, and at its outer limit in the strained condition of the entire spring.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

H. PRESTON COX.

Witnesses:

JAS. WILLIAMSON,
JAS. W. SCOTT.