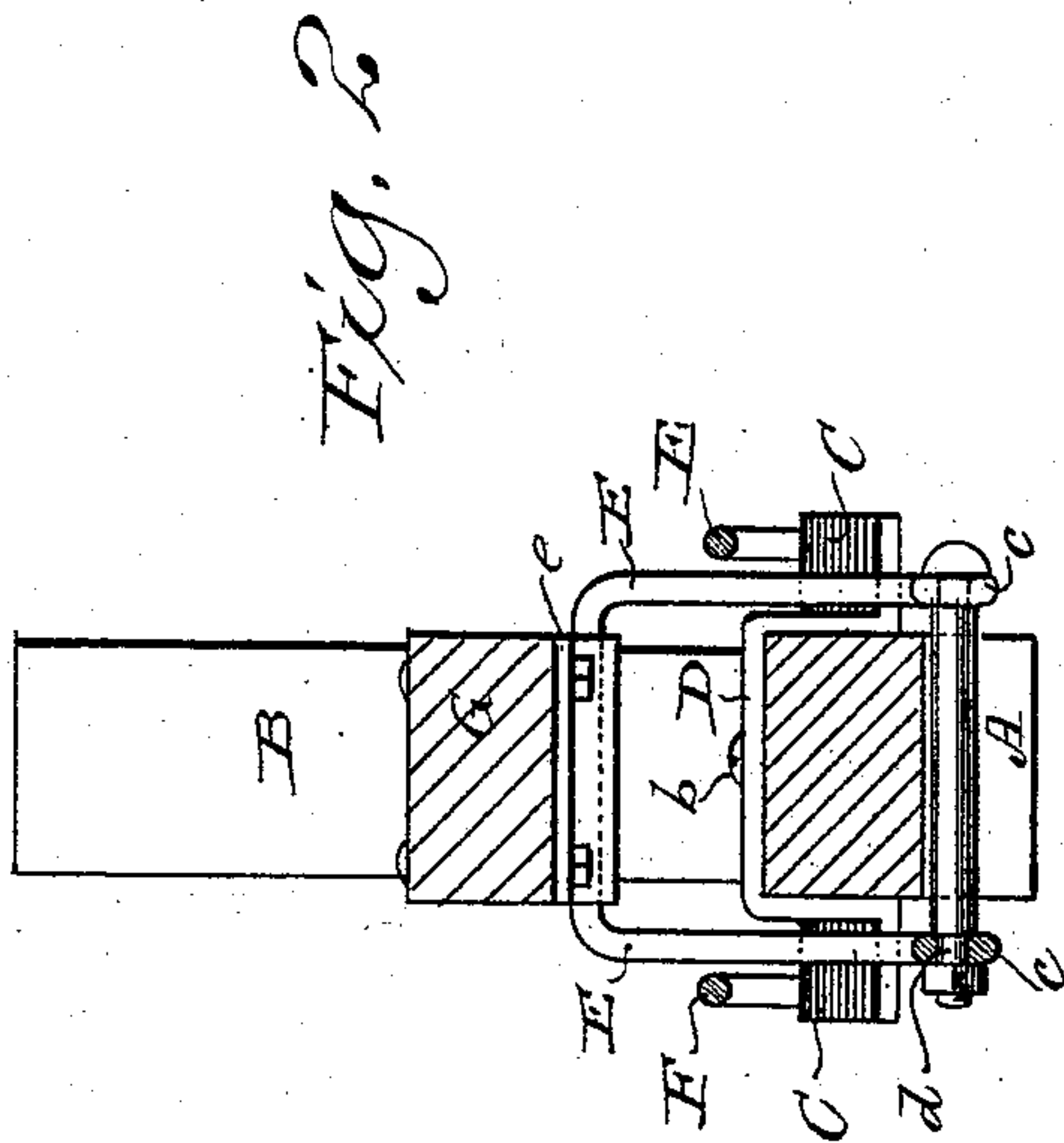
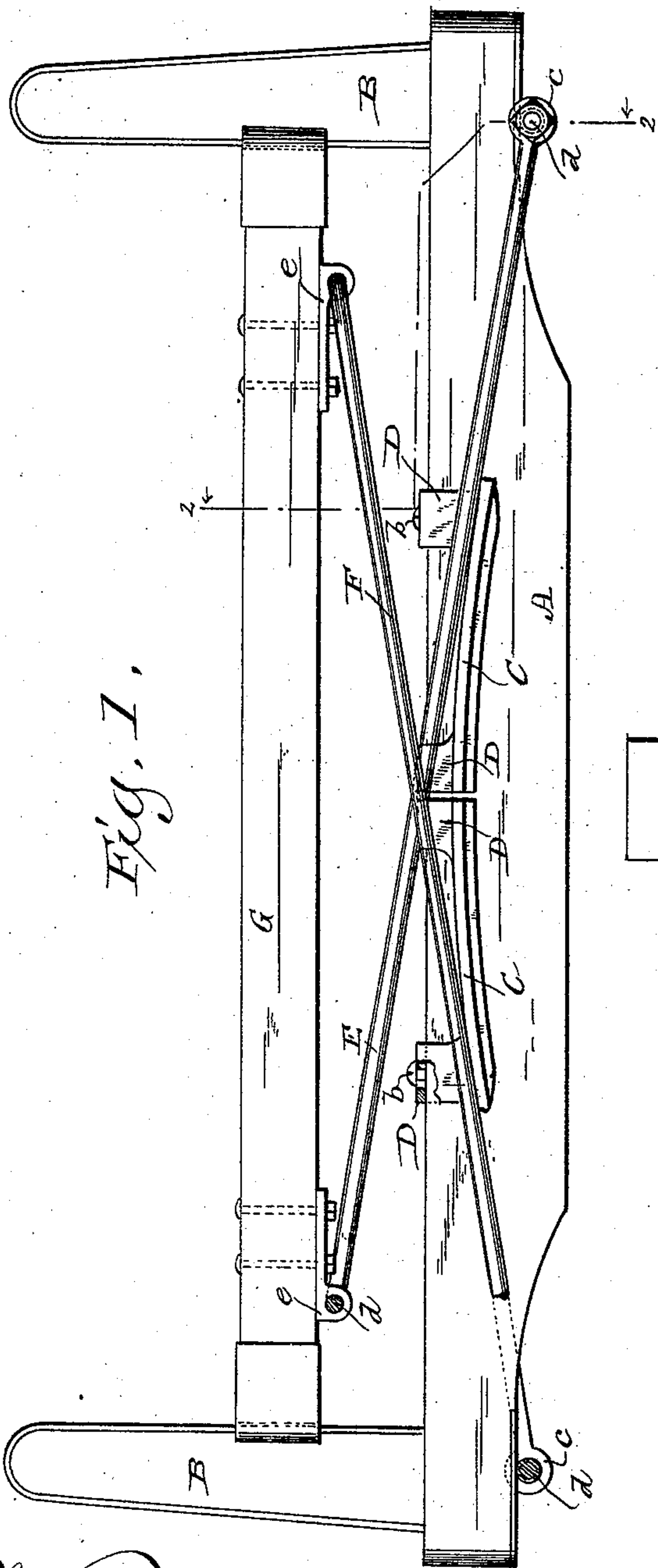


(No Model.)

R. T. LOMBARD.
VEHICLE SPRING.

No. 540,450.

Patented June 4, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT T. LOMBARD, OF RACINE, WISCONSIN.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 540,450, dated June 4, 1895.

Application filed July 12, 1892. Renewed November 7, 1894. Serial No. 528,164. (No model.)

To all whom it may concern:

Be it known that I, ROBERT T. LOMBARD, a citizen of the United States, and a resident of Racine, in the county of Racine, and in the State of Wisconsin, have invented certain new and useful Improvements in Vehicle-Springs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a vehicle spring having a variable fulcrum, as well as one which when employed in connection with a bolster will work from below the upper face of the same, whereby the spring will have a yielding resistance up to the time the bar or body supported thereon comes down into approximate contact with said bolster.

My invention therefore consists in certain peculiarities of construction and combination of parts to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a side elevation of a vehicle-spring constructed according to my invention, and Fig. 2 a transverse section taken on line 2 2 of the preceding figure.

Referring by letter to the drawings, A represents a bolster provided with the usual standards B, and supported on the bolster is a saddle comprising two arc-shaped bearing plates C united by cross-pieces D, and as a matter of preference this saddle may be fastened to said bolster by screws *b* extended through the cross-pieces, although it is not absolutely essential that any fastening means be employed.

As shown in Fig. 1, the saddle may be made in sections separated one from the other any desirable distance to thus vary the radius of the circle of which the bearing-plates C form an arc.

Supported on each of the bearing-plates C are spring-leaves or rods E, F, that cross each other on the line of center from which said bearing plates are struck, the lower ends of each pair of spring-rods being carried below the bolster and terminated in the form of eyes *c* for a connecting bolt *d*, while the upper ends of said rods are arranged in eye-plates *e* on the under side of a bar G, the latter serv-

ing as a rest for a vehicle-body. In some instances it may be preferable to have each pair of the spring-rods made from a continuous piece bent to have a horizontal portion thereof engage one of the eye-plates on the bar G, and this form is the one illustrated by the present drawings.

It is immaterial that the lower ends of the spring-rods be connected under the bolster as shown, but it is one of the essential features of my invention that said ends of the spring-rods be arranged to rest beneath the upper face of said bolster, whether connected or otherwise, and to the attainment of this result it is possible to vary the exact construction herein shown without departure from the spirit of my invention.

While I have shown the arc-shaped bearing-plates C, I do not wish to be understood as confining myself thereto, as a series of pins arranged on an arc of a circle would serve the same purpose, and in some instances the saddle above described would not be absolutely necessary, although it is essential in all instances that each spring shall have its bearings or fulcrum on the arc of a circle.

In any form of my invention each spring normally touches on the lowest point of the arc-shaped bearing surface, this point being the initial fulcrum and said spring then having its least resistance. Now, as load comes upon the spring, the latter will come more and more upon its arc-shaped bearing, whereby the fulcrum will be gradually shifted and said spring stiffened to offer an increase of resistance in proportion to said load. It is also to be observed that when a spring-rod has reached the highest point of the arc-shaped bearing there will still be a certain amount of resistance remaining in the rod itself, and in case of the application of my invention as a bolster-spring there is nothing to oppose the taking up of this remaining resistance until the body or bar G comes into contact with the opposing bolster, and consequently my spring is still in play at the time when bolster-springs or ordinary construction have reached their limit of resistance.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A vehicle-spring comprising an arc-shaped bearing that rests upon a bolster, crossed spring-leaves or rods normally touching the extremities of the bearing but having
5 their lower ends below the upper face of the bolster, and a bar connected to the upper ends of said spring-leaves or bars, substantially as set forth.
2. A vehicle spring comprising a non-yield-
10 ing arc-shaped bearing, and crossed spring-leaves or rods in variable contact therewith, substantially as set forth.
3. A vehicle-spring comprising a bolster-saddle consisting of two arc-shaped plates
15 united by cross-pieces, crossed spring-leaves or rods in contact with the arc-plates and designed to have their lower ends rest below the upper face of a bolster, and a bar connected to the upper ends of said spring leaves or rods,
20 substantially as set forth.
4. A vehicle spring comprising a bolster saddle in two sections each of which consists of two arc-shaped plates united by cross-pieces, crossed spring-leaves or rods in contact
25 with the arc-plates and designed to have their lower ends rest below the upper face of a bolster, and a bar connected to the upper ends

of said spring-leaves or rods, substantially as set forth.

5. A vehicle-spring, comprising a bolster
30 and a bar above the same, in combination with crossed spring-leaves or rods, whose upper ends are pivotally secured to said bar, and whose lower ends rest below the upper face of said bolster, and fulcrums for said spring-
35 leaves or rods arranged lengthwise of the same.

6. A vehicle spring, comprising a bolster and a bar above the same, in combination with
40 two pairs of crossed spring-leaves or rods, whose upper ends are pivotally secured to said bar, one pair of said crossed spring-leaves or rods being on one side of said bolster, and the other pair on the other side of the same, and
45 fulcrums for said spring-leaves or rods arranged lengthwise of the same.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ROBERT T. LOMBARD.

Witnesses:

H. G. UNDERWOOD,
JOHN E. WILES.