(Model.)

W. B. RICHMOND.

Vehicle-Spring.

No. 226,882. Patented April 27, 1880.

Fig 1

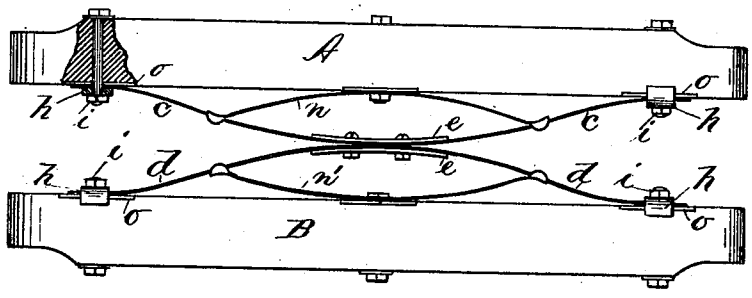
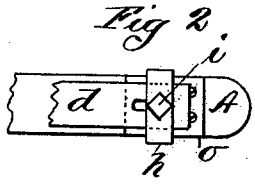


Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM B. RICHMOND, OF SPRINGFIELD, MASSACHUSETTS.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 226,882, dated April 27, 1880.

Application filed March 11, 1880. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM B. RICHMOND, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Vehicle-Springs, of which the following is a specification.

My invention relates to the construction of springs for light carriages; and the object of my invention is to provide an improved spring for said use, which will possess great elasticity and lightness, and not be subject to danger of breaking by rebounding.

I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my spring, showing its manner of attachment to the running part and to the body of the vehicle. Fig. 2 is a plan view of the end of one of the long spring-leaves and of the end of one of the bars to which it is bolted.

A is a bar under the body of a vehicle, and B is the usual bar located immediately over the carriage-axle. *c d* are long metallic strips bolted together centrally, side to side, between two supporting-strips, *e e*, and each of them is bent to the semi-elliptic form shown, having their ends straightened to cause them to bear flatly against the faces of bars A and B at the point thereon where they are secured thereto. The said strips *c* and *d*, when so bent and bolted together, constitute a double semi-elliptic spring, formed by bolting their convex sides centrally together, leaving their free ends to diverge gradually from each other from their centers to each end. The ends of said strips *c* and *d* are provided each with an oblong bolt-hole, as shown in Fig. 2.

The spring thus formed from the strips *c* and *d* is applied between the bars A and B in the manner shown in Fig. 1, said bars being pierced for the bolts *i*, which pass through said bars, through bearing-plates *o*, secured to the face of the bars, through the oblong bolt-holes in the ends of strips *c* and *d*, and through the spring-clips *h*, which lie outside of the ends of said strips, having their ends bent upward and downward against the outside of bars A and B, as shown.

It will be seen that the action of the spring formed by the said strips *c* and *d*, constructed and applied as described, when a weight is applied to move bars A and B toward each other, will be to cause the ends of said strips to slide on the plates *o*, guided by bolts *i* and the clips *h*, allowing of an easy vertical and rocking motion to bar A, supposing bar B to be fixed to a carriage-axle.

It is desirable that springs of this class should combine lightness, elasticity, and strength; and in order that the spring just described may be so re-enforced as to give it a proportionate resistance to an increasing load without materially adding to the weight of the combined construction or detracting from its desired elasticity, I interpose between the central portions of the strips *c d* and the bars A B the spring-strips *n n'*, of a curved form, as shown, bolted through their centers to bars A B, as shown, their ends having a bearing on strips *c* and *d*, between their centers and their ends, in such a way that the depression of bar A causes a simultaneous compression of the four spring-strips *c d n n'*, allowing an easy vertical motion, not subject to a disagreeable rebound, and an easy lateral rocking motion, not common to ordinary elliptic springs.

Springs constructed as above set forth possess a great degree of strength compared to their weight, and their motion is easy.

What I claim as my invention is—

The combination, with the bars A and B, of the spring-strips *c* and *d*, bolted centrally together, as shown, and to bars A and B by a sliding connection, and the spring-strips *n n'*, bolted centrally to bars A and B, and adapted to bear between the centers and the ends of the strips *c* and *d*, substantially as and for the purpose set forth.

WILLIAM B. RICHMOND.

Witnesses:
WM. H. CHAPIN,
C. S. PARKHURST.