RICHARD DUDLEY.

Improvement in Springs for Vehicles.

No. 125,796. Patented April 16, 1872.

Fig. 1.

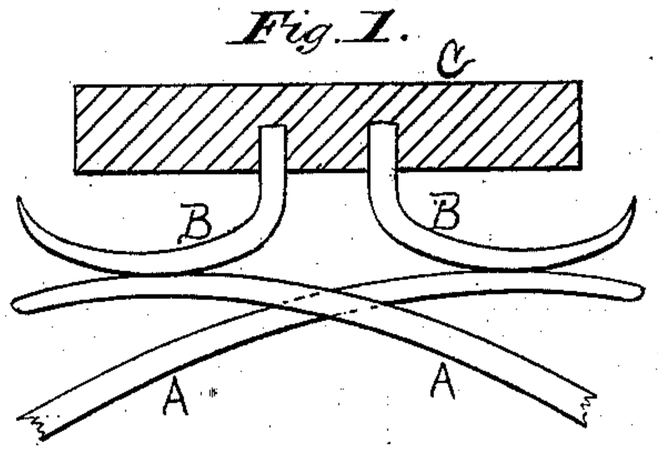


Fig. 2.

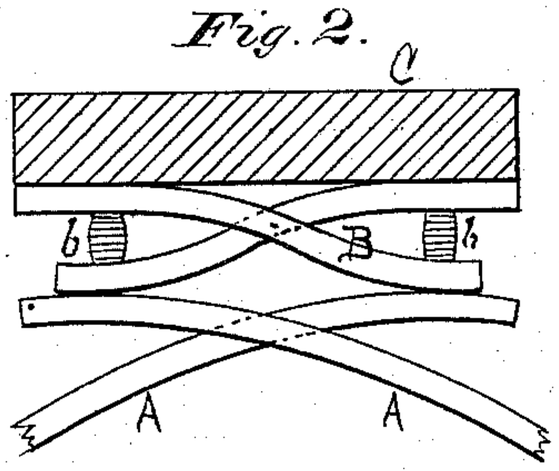


Fig. 3.

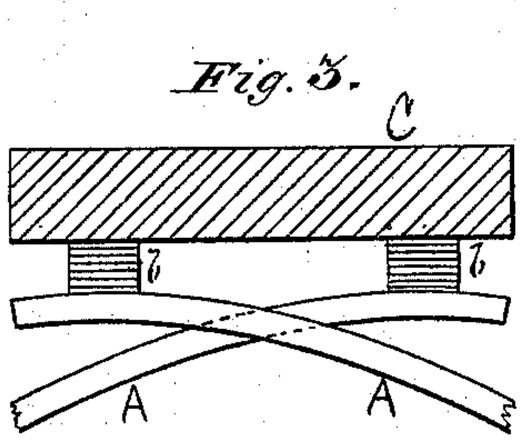
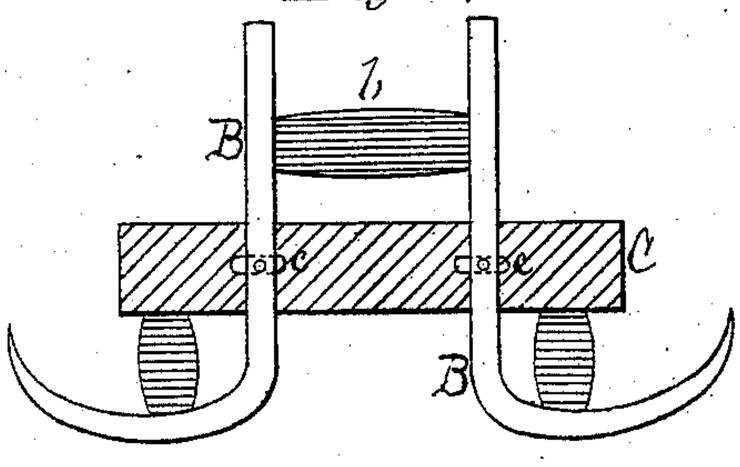


Fig. 4.



Witnesses:
Edwin James.
K. V. Gordon.

Inventor:
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UNITED STATES PATENT OFFICE.

RICHARD DUDLEY, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN SPRINGS FOR VEHICLES.

Specification forming part of Letters Patent No. 125,796, dated April 16, 1872.

To all whom it may concern:

Be it known that I, RICHARD DUDLEY, of the city and county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Springs for Vehicles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is an end view, the arms being rigidly secured to the bolster-plate. Fig. 2 is an end view, the arms being pivoted to the bolster-plate, and a block of rubber being inserted between one end of the pivoted arm and the other end of the other pivoted arm. Fig. 3 is an end view, the rubber being attached to the lateral lever-arms, and working directly on the bolster-plate. Fig. 4 is an end view, the shanks of the arms extending through the bolster-plate, and having a rubber block inserted between their extensions.

My present invention relates to the frictionless action of torsion-springs, and is a modification and improvement in the patent issued to B. Hershey April 25, 1871, No. 114,136, which, as assignee, I now own. The invention embraced in the patent referred to, practical experience has demonstrated attains fully the result claimed—that is, it is a frictionless spring in operation, and which is due entirely to the fact that the lateral lever-arms, meeting at their outer surfaces as pressure is applied, the two series of springs yielding or receding together, the lever-arms of one series do not travel over the surface of the other, and, consequently, there is no friction, no matter how great the torsional action exerted may be. The only objection to this spring is found in the fact that its operation requires two sets of springs, one being arranged on each of the bolster or other bearing-plate, and which sometimes renders the springing of a vehicle unnecessarily expensive. To remedy this defect is the object of my present invention; and it consists in dispensing with one set of these springs, and substituting therefor spring-arms of the same or about the same tension as the lateral lever-arms of the springs, and nearly of the same dimensions and form. These may be rigidly secured to the bolster, the degree of tension depending on the elasticity of the steel; or they may be pivoted to the bolster, having rubber or other elastic blocks inserted between the same and the arms; in which case the tension that secures the proper yielding of the arms depends entirely on the rubber, as there need not necessarily be any elasticity in the metal arms when thus secured in connection with the rubber blocks, as these alone will secure the yielding or receding of the arms in the desired manner; or, if desired, these arms may be formed with long shanks, which are pivoted in oblong slots cut through the bolster, the head of the shanks projecting sufficiently far through to permit of rubber or other elastic blocks to be inserted and held, and which will afford the necessary yielding of the arms as pressed by the lateral lever-arms of the springs. Another form of attachment, and which will accomplish the same result, is attained by attaching the rubber or other elastic blocks directly to the lateral arms of the spring.

The construction and operation of my invention are as follows: A A are the lateral lever-arms of torsion-springs used or employed in springing any class of vehicle, such as a wagon, carriage, car, &c. The springs are composed of any suitable material, and are arranged on their respective bolsters or other bed-piece or support in the usual manner. In the drawing no portion of the spring is shown but the lateral lever-arms A A, or those arms which twist or wrench the long shank of the spring, so as to cause it to develop its torsional action, as my present improvement is not in the spring *per se*, but in the arms B B, in connection with which the lateral lever-arms A A work, and which renders the springs frictionless in operation. These arms B B may be secured rigidly to the bolster C, as shown in Fig. 1, in which case they must be spring-rods, so as to yield and recede exactly in the same degree or ratio as do the lateral lever-arms B B when pressure is applied to the spring, so that with one set of springs I am enabled to secure the same result or effect as in B. Hershey's patent before referred to, which requires two sets of springs, as the lateral lever-arms A A and the arms B B act in connection with each other precisely as the two sets of lever-arms do in the patent named; or instead of the arms B B being spring-arms and se-

cured to the bolster C, as stated, they may be pivoted, as shown in Fig. 2, and blocks of rubber or other elastic material *b b* may be inserted, the rubber yielding under pressure of the lateral lever-arms A A, and acting as described. Again, the same result precisely is attained by cutting through the bolster or other bed-piece C two slots, *c c*, and forming the arms with long shanks projecting through the slots and being pivoted therein, as shown at Fig. 4, the rubber block *b* being inserted between the protruding shanks. In Fig. 3 another modification is shown in which the arms B B are dispensed with, and blocks of rubber or other elastic material, *b b*, alone are used, and which are attached directly to the lateral lever-arms A A.

It will be seen in all the devices illustrated on the drawing the principle of the Hershey patent of April 25, 1871, is maintained and rigidly adhered to. The object of this improvement is to secure the advantages with one set, which, in the patent referred to, cannot be accomplished without two sets of springs. Instead of the rubber blocks *b b*, of course, coil or other springs might be substituted.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In combination with the lateral lever-arms A A of a torsion-spring, the stationary spring-arms B B, the same being combined and arranged so as to operate substantially as described.

2. In combination with the lateral lever-arms A A of a torsion-spring, the pivoted arms B B and rubber blocks *b b*, the whole being arranged so as to operate substantially as described.

3. In combination with the lateral lever-arms A A of a torsion-spring, the rubber blocks *b b*, arranged as shown in Fig. 3, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD DUDLEY.

Witnesses:

EDWIN JAMES,

JOS. T. K. PLANT.