R. DUDLEY.

Improvement in Springs for Vehicles.

No. 130,491. Patented Aug 13, 1872.

Fig. 2.

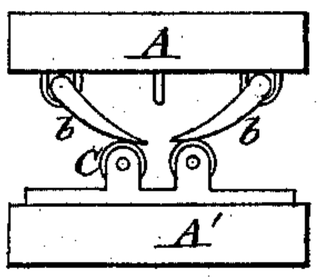


Fig. 1.

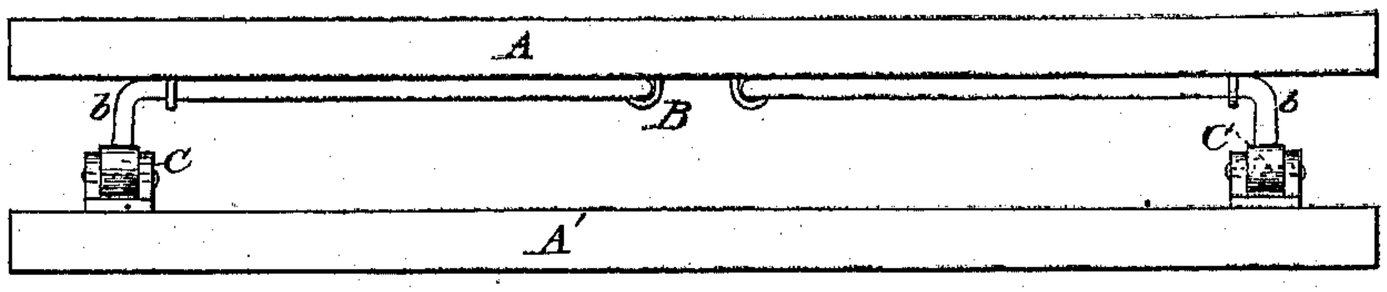
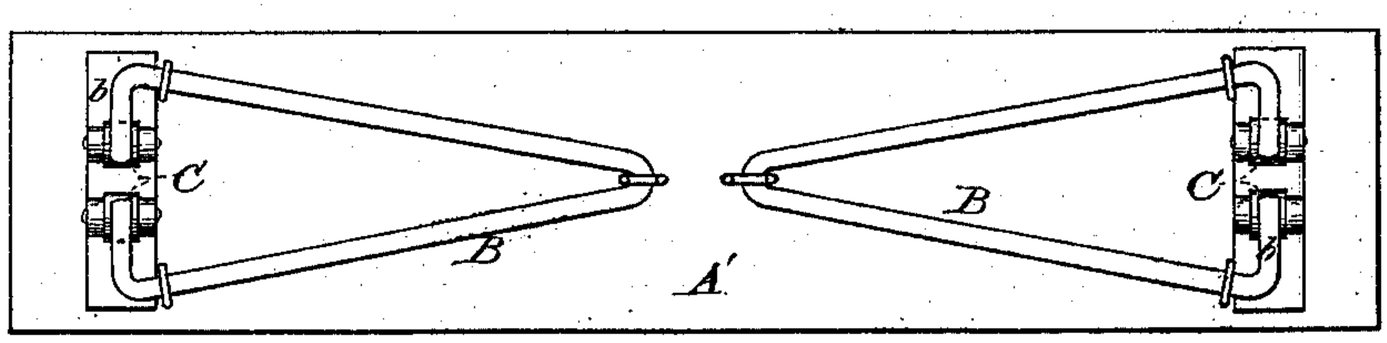


Fig. 3.



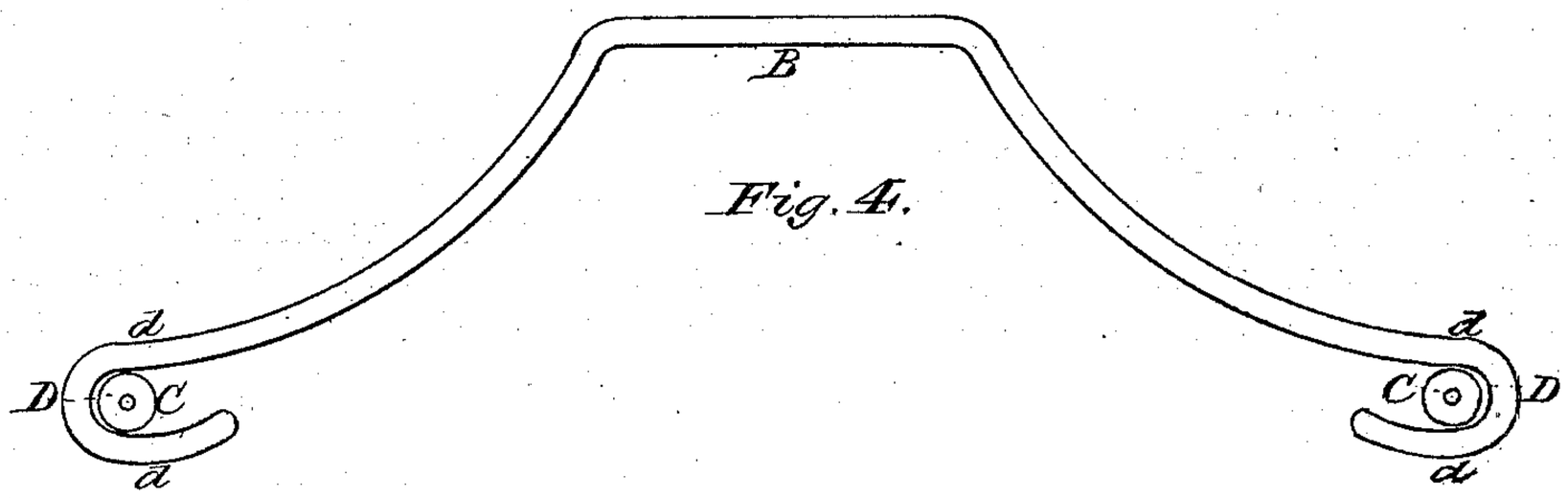


Fig. 4.

Fig. 5.

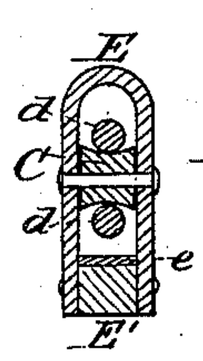


Fig. 6.

Witnesses:
Edwin James.
K. V. Gordon

Inventor:
Richard Dudley.
per J. E. F. Holmead
Attorney.

UNITED STATES PATENT OFFICE.

RICHARD DUDLEY, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN SPRINGS FOR VEHICLES.

Specification forming part of Letters Patent No. **130,491**, dated August 13, 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 a part of this specification, in which—

Figure 1 is a side view. Fig. 2 is an end view of Fig. 1. Fig. 3 is a plan view of Fig. 1. Fig. 4 is a side view of a modification. Fig. 5 is a top-plan view of Fig. 4. Fig. 6 is a sectional view through the center of the roller as arranged in Fig. 4.

My present improvement in torsion-springs for all characters of vehicles, such as wagons, carriages, cars, &c., relates entirely to the anti-friction bearings on which the lever-arms rest and work, and through which the torsional action of the spring is exerted when power is applied or the spring is called upon to resist pressure. My invention, as I have said, is designed to render the spring frictionless in operation; and consists in substituting a roller for the anti-friction sliding plate or the rocking plate described and claimed in the patent of February 28, 1871, issued to myself and B. Hershey, or for the combination of lateral lever-arms described and claimed in B. Hershey's patent of April 25, 1871. The roller is journaled or secured in a socket-bearing on the bolster or other bearing, and of course must be secured at such relative position thereon as always to be in contact with the lateral lever-arm of the spring, so that when the spring is called to resist pressure and the lever-arms so twist and wrench the long arm as to cause it to develop its torsional power, the lever-arm, resting and acting on the roller simply, partially revolves the same, and which movement avoids in its action all friction, the roller acting in connection with the lever-arm precisely on the same principle as the rocker-plate embraced in and covered by the patent issued to myself and B. Hershey February 28, 1871, and hereinbefore referred to.

The construction and operation of my invention are as follows:

A is the upper and A′ is the lower bearing-surface of the spring or bolster plate. On the upper of these plates are secured torsion-springs B B. These springs may be of the V-shape, as shown in Fig. 3, or of any other desired form, and are made of steel rods, tubes, or any other suitable material that can be wrenched or twisted so as to secure the desired torsional action. These spring-rods may be formed with lateral lever-arms *b b*, or the arms may be independent and secured by an ordinary wrench attachment; but it is deemed preferable to form them as part of the spring-rod, the arms *b b* being turned off at right angles from the main shank of the spring, and either in or out, as preferred, and at the usual degree of inclination. These springs may be arranged and attached in any desired manner. C C are rollers, and are journaled in suitable axle or socket bearings. These rollers, of course, are secured on the plate or bolster directly opposite to the one on which are secured and arranged the torsion-springs B B. These rollers are relatively so arranged that the lateral lever-arms *b b* shall rest and act thereon exactly as they do on the rocker-plates embraced and claimed in patent No. 112,229, before referred to; and, if desired, the lever-arms may be formed with a concaved face, as shown in B. Hershey's patent of June 20, 1871, No. 116,186, and which permits of their acting in connection with the rollers in a manner similar to that described and claimed in the patent last referred to. These rollers C C may be of any desired dimensions and formed of any suitable material, and so arranged that as the lever-arms are depressed to twist and wrench the rod to cause it to develop its torsional action the roller revolves, and as the arm does not travel on the same, of course there will be no friction.

In Figs. 4, 5, and 6 are shown a modificatiod of the torsion-spring acting in connection with anti-friction rollers, and illustrates a device that is admirably adapted for wagon-seats, children's carriages, and also for springing light vehicles. The form of this spring is generally such as is shown at B, Fig. 4, and, instead of having lever-arms turned off as shown at *b b*, they are provided with looped or hooked ends D D, which encircle the roller C, one arm, *d*, of the hook acting above and the other below the roller.

When used as a spring-support for a wagon-

seat a metal stirrup, E, may be advantageously employed to retain the roller C and the arms *d d* of the loop. The form of this stirrup is distinctly shown in Fig. 6, its cross-bar *e* resting on a strip, E′, and which, lying and being secured on the sides of the box, affords a safe and convenient means of attachment, and one which insures the direct and proper action of the spring. This roller C may also be used in connection with the sliding plate and cup described in Letters Patent of the United States No. 112,037, which, as well as all other patents hereinbefore referred to, I, as assignee, am the entire owner.

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

1. The rollers C C, arranged, in connection with torsion-springs B B, in such manner as to render the springs frictionless in operation, substantially as described.

2. The torsion-springs B B, having hooked ends D D, in combination with rollers C C, 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.