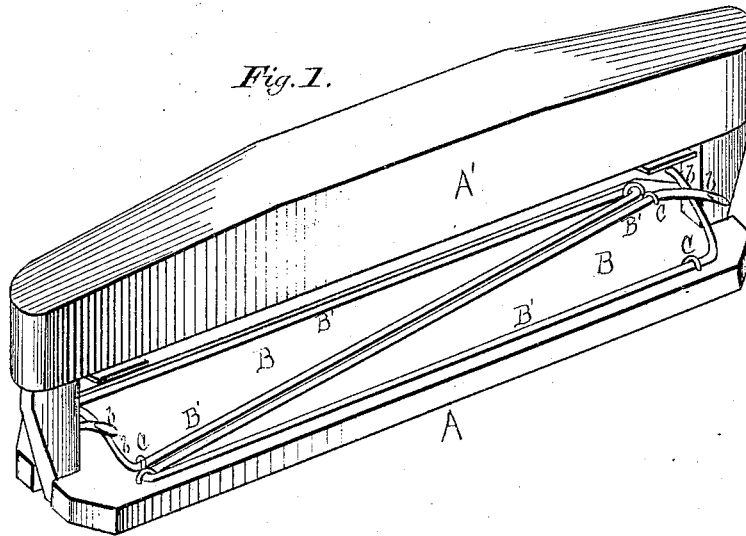


B. HERSHEY.  
TORSION SPRING FOR CARS.

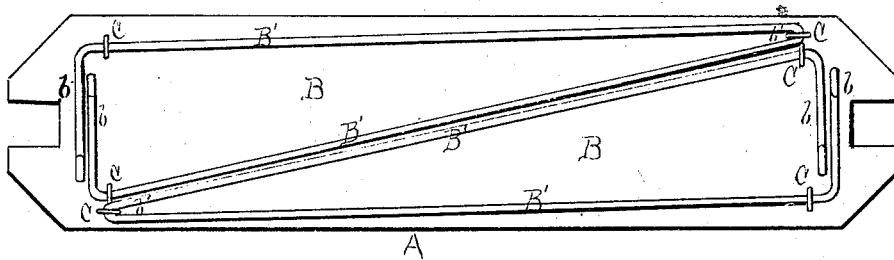
No. 113,166.

Patented Mar. 28, 1871.

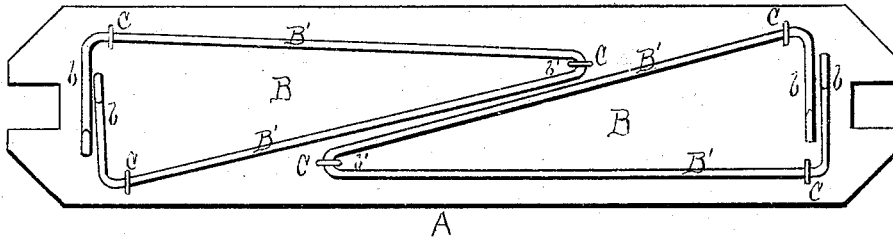
*Fig. 1.*



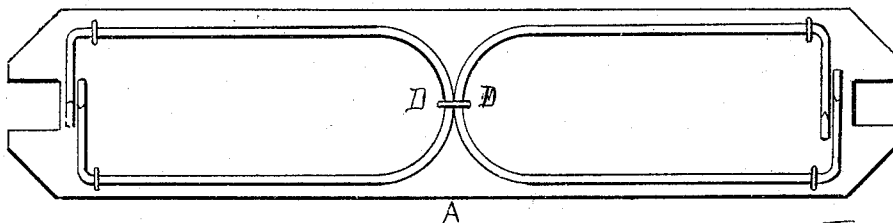
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses:

Edwin James.

Horace Brown

*Inventor.*

Benjamin Hershey.

per J. S. J. Holmead

Attorney.

# UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY, OF ERIE, PENNSYLVANIA.

## IMPROVEMENT IN TORSION-SPRINGS FOR CARS.

Specification forming part of Letters Patent No. **113,166**, dated March 28, 1871.

### *To all whom it may concern:*

Be it known that I, BENJAMIN HERSHEY, of the town and county of Erie, in the State of Pennsylvania, have invented certain new and useful Improvements in Torsion-Springs for Railroad-Cars and other Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a perspective view of my improved torsion-spring as applied to the bolster-plate of railroad-cars or other equivalent support. Figs. 2 and 3 are plan views of a bolster-plate or equivalent support or plate with my improved springs secured and arranged thereon. Fig. 4 is a plan view of a bolster-plate with the ordinary U-shaped spring secured and arranged thereon. This figure is given simply for the purposes of illustration and comparison.

The object of my invention is to furnish for railroad-cars and other vehicles a torsion-spring so constructed as to afford the utmost degree of twist to the rod which forms the spring that is possibly attainable within the prescribed dimensions of the ordinary bolster-plate or other equivalent spring-base or support.

This great desideratum practical experience has fully attested cannot be secured in springs which are composed of straight rods arranged horizontally across the bolster-plate and running parallel with each other, as by this means it is impossible to obtain for the torsional action of the rod even a length equal to that of the bolster-plate. Nor is it attainable with the U-shaped spring embraced in and covered by Letters Patent of the United States No. 53,376, issued March 20, 1866, to W. J. F. Liddell and John P. Onderdonk as the assignees of the said Liddell; for in their arrangement, in consequence of the fact that the arms or prongs which compose the spring throughout nearly their entire length are parallel to each other, it is impossible, notwithstanding its curved form, to obtain for or use in the construction of a spring a rod of a length scarcely at all, if any, greater than is that of the bolster-plate for which the springs are designed. These springs, owing to the broad curve which forms their head, as the width of

the bolster-plate will not allow of their being secured so as to lie even for a short time side by side, must be secured at the center of the plate, and therefore each spring can only be a little more than twice the half length of the bolster-plate.

All these difficulties are remedied in my invention, which simply consists in giving to the spring, in contradistinction to the U-shaped as well as to the straight, a V-shaped or angular form, or so constructing the springs that their arms or prongs do not run parallel to each, but, on the contrary, constantly converging from their free or open end, shall meet at a positive sharp or acute angle. This V-shaped or angular form permits the springs to lie alongside of each other on the bolster-plate.

Thus I can use in each spring, should the same be desirable, a rod twice the length of the bolster-plate.

The great advantage of this form in springs of this class, and their arrangement on the bolster-plate, will readily suggest themselves in view of the incontrovertible fact that the degree of the elasticity of the spring, and, consequently, its torsional power, depends entirely on the length of the rod used in its manufacture.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

A is the lower, and A' the upper, bolster-plate or follower. B B are the springs, which are constructed of suitably-tempered steel, and are of a V-shaped or angular form. The free ends of their prongs or arms B' B' are turned in so as to form lateral arms *b b*.

While these springs B B are always of an angular or what is recognized as a V-shaped form, they are not invariably constructed of the same exact general outline, as this necessarily depends on the size of the bed-plate and the amount of torsional action desired, and, as a consequence, the length of rod required; for instance, in Fig. 2, where the springs B B are each composed of a rod which is nearly, if not quite, twice the length of the plate A, the arms B' B' do not run at the same angle as in Fig. 3, where each rod is only one a half time the length; yet in each case the arms so converge as to form at their point of union a posi-

tive angle,  $b'$ , which permits of the heads of the springs passing each other, and of their being arranged side by side, as shown.

C C are staples or other equivalent fixed bearings, by means of which the springs are secured to the plate A.

In Fig. 4, at D D, are shown the double U-shaped springs embraced in and covered by the Liddell patent hereinbefore referred to.

By reference to Figs. 2, 3, and 4, and a comparison of the springs, secured as they are in each instance on bolster-plates of precisely the same dimensions, the advantage of the V or angular shaped springs B B over the U as to length of rod secured for the torsional action of the spring will readily be seen.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent of the United States, is—

A V or angular shaped torsion-spring for railroad-cars and other vehicles, substantially as described.

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

BENJAMIN HERSHEY.

Witnesses:

WM. LUTJE,

JAKOB ANTHONY.