

B. HERSHEY.

Torsion Spring for R. R. Cars & other Vehicles

114136

PATENTED APR 25 1871

Fig. 1.

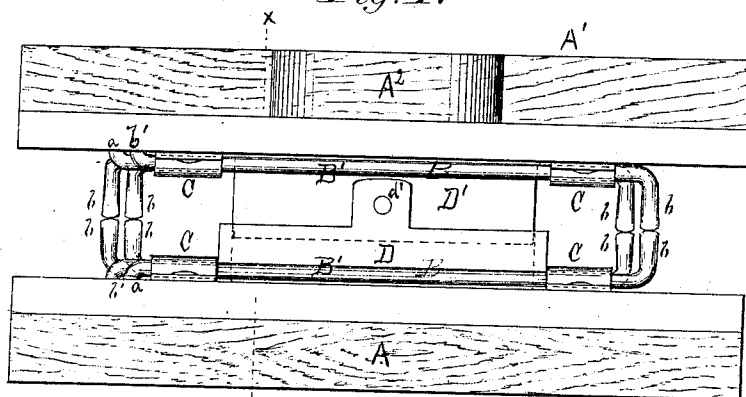


Fig. 2.

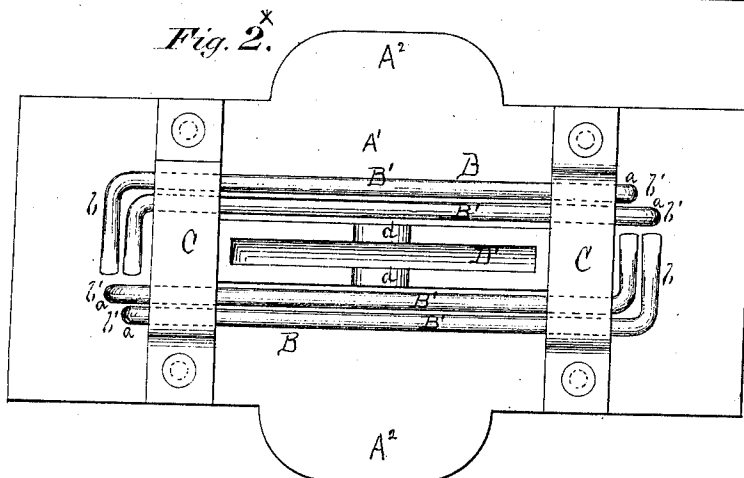
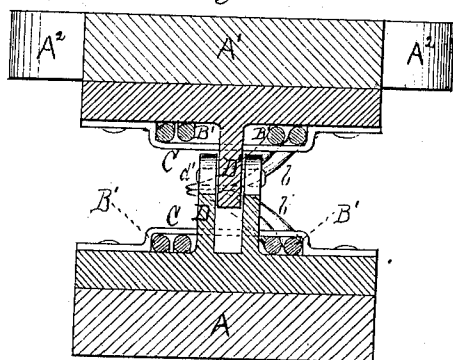


Fig. 3.



Witnesses:

Edwin James
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Inventor:

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per J. P. Holmeads
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United States Patent Office.

BENJAMIN HERSHEY, OF ERIE, PENNSYLVANIA, ASSIGNOR TO HIMSELF,
E. GEER, RICHARD DUDLEY, AND R. F. GAGGIN, OF SAME PLACE.

Letters Patent No. 114,136, dated April 25, 1871.

IMPROVEMENT IN TORSION-SPRINGS FOR RAILWAY CARS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, BENJAMIN HERSHEY, of the town and county of Erie and 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 the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a front view.

Figure 2 is a plan view of the lower bolster-plate, showing distinctly the arrangement of the springs.

Figure 3 is a vertical sectional view on the line *x* *x*, fig. 1.

The object of my invention is to arrange a series of torsion-spring rods on the bolster-plates of railroad cars, or on like supports spring bed-plates in other vehicles or devices, so as to secure the greatest degree of power that is possibly attainable, and at the same time furnish a spring that shall be frictionless in use and operation.

The nature of my invention consists in securing the torsional spring rods on the upper and lower bolster-plates in such manner that when the plates are placed in their proper relative position—that is, the one above the other—the outer surface of the lateral lever-arms of one series of spring-rods shall meet or be in contact with those of the other or opposite series. This not only causes the pressure of the weight that the springs are required to sustain to be divided between the opposite series of rods, but also to be so equalized thereon as to cause their lateral lever-arms to yield or recede in exactly the same proportionate ratio or degree.

The great advantage of this arrangement is found in this fact: that as the lateral lever-arms yield or recede together, one series never moving or traveling transversely on the other, the spring is frictionless in operation.

My invention also consists in so securing the spring rods, one within the other, that owing to their compact arrangement they can be duplicated, triplicated, or so multiplied as to cover the entire bolster-plate. This arrangement, by economizing and utilizing the entire face of the plate, as it does, permits springs of immense power to be arranged and successfully operated in a most limited space.

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 upper, and

*A*¹ the lower bolster-plate of a railroad car or equivalent supports in other vehicles.

B B are the spring rods, which consist of a long

arm or shank, *B'*, terminating at one end in a lateral or turned-in lever-arm, *b*, and in a right-angled shoulder, *b'*, at the other. These rods *B B* are to be constructed of steel properly tempered to permit of the necessary twisting or wrenching of the rod to secure its proper torsional action.

These springs rods *B B* are attached to the bolster-plates *A* and *A*¹ by bearing-plates *O C* in such manner that while the utmost freedom of a torsional movement is secured or allowed all other forms of movement is securely guarded against.

The shoulders *b' b'* being secured in sockets *a a* on the plates serve, as it were, as vertical pivot-wrists for the rods to twist or turn on. The arrangement of the spring rods *B B* is clearly shown in fig. 2, where they are arranged in sets as they are designed to be when in practical use, the rods lying side by side and one within the other, the lateral lever-arms *b b* of one set or series being at one end of the bolster-plate while the lateral arms of the other are at the opposite end.

Owing to this compact form of arrangement it will be seen how readily the number of rods can be increased and the power of the spring multiplied; for, although in the drawing the rods are only shown as duplicated, I desire it distinctly understood that instead of only two rods being arranged in a set, three, four, or more may be used, the only restriction being the dimensions of the plate or bed on which they are to be secured.

D is a socket or flanged recessed bearing-plate, and is arranged horizontally along the center of the bolster-plate.

D' is a rectangular plate, and is secured to the bolster-plate *A*¹ at such position thereon that when the bolster-plates are brought together the plate *D'* shall enter and work in the recess of the plate *D*.

The plates *D* and *D'* are connected by means of a slot, *d*, cut through the plate *D'*, and a bolt, *d'*, as clearly shown in fig. 3. The relative dimensions of the plate *D'* and the recess in the plate *D*, and also of the slot *d* and bolt *d'*, are to be such as not only to allow to the plate *D'* a positive vertical play, but also a slight rocking movement, the former being indispensable in the operation of the spring and the latter most desirable, especially when the weight to be sustained is not equally or uniformly distributed over the bolster-plate or spring.

*A*² *A*² are ears attached to the plate *A*¹, and by means of which the spring is bolted or otherwise secured to the axle or other support.

From the foregoing full and detailed description of the construction of my improved torsion-spring its operation will be readily understood.

The spring rods *B B*, formed, as stated, of suitably-

tempered steel, are secured and arranged on each bolster-plate in the manner shown in fig. 2. The plates A A' are then secured together by letting the plate D' fall in the recess or socket of the plate D, and by passing the bolt *d* through the slot *d*. The spring is now in a compact box form and in condition to be secured on the axle.

It will be seen by reference to figs. 1 and 3, and in which the spring is represented as it is in its normal condition, that only the outer faces of the lateral lever-arms *b b* meet or are in-contact.

Now, when pressure or weight is applied to the spring it effects in like manner both the spring rods of the upper and lower plate, and while this, of course, brings the rear ends of the arms *b b* closer or nearer together, but owing to the fact that they yield or recede toward their respective plates, in the same manner and degree their movements are effected without creating any friction, as the only result of pressure on the spring is to bring more of the surface of these arms *b b* in contact, and not to cause them to travel transversely one on the other.

These arms *b b*, acting as revolving levers, twist or wrench the long arms B' B', and through which tor-

sional action the desired elasticity is secured, the rods, so soon as the pressure is removed, untwisting themselves and returning to their original position.

Having thus fully described my invention,

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

1. The plates A and A', having torsional spring rods arranged thereon in such relative position that their lateral arms *b b* shall operate in connection with each other, substantially as described.

2. The torsion-springs B B, when arranged in sets parallel to each other, and extending the whole length of the bolster-plate, the lateral arms of each set meeting or being in contact, substantially as described.

3. The plates A and A', torsional spring rods B B, plate D', and flanged recessed bearing-plate D, when the same are combined and arranged so as to operate substantially as described.

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

Witnesses: BENJAMIN HERSHEY.

WM. LUTJE.

JACOB ANTHONY.