DUDLEY & HERSHEY.

RAILWAY CAR SPRING.

No. 112,229. Patented Feb. 28, 1871.

Fig. 1.

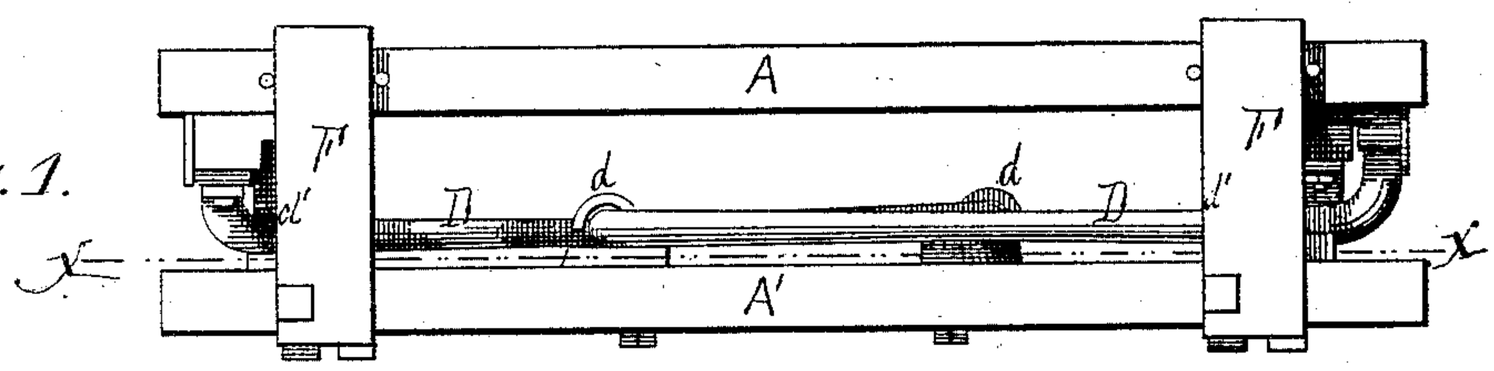
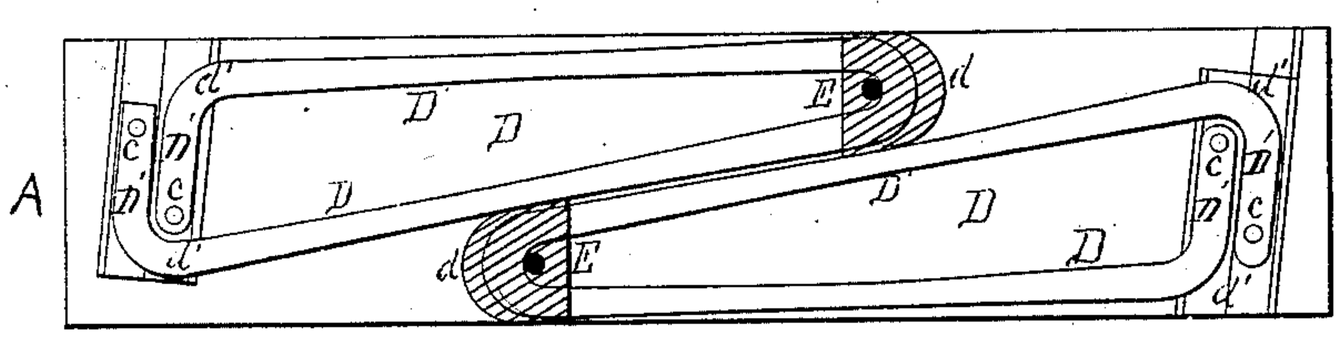


Fig. 2.



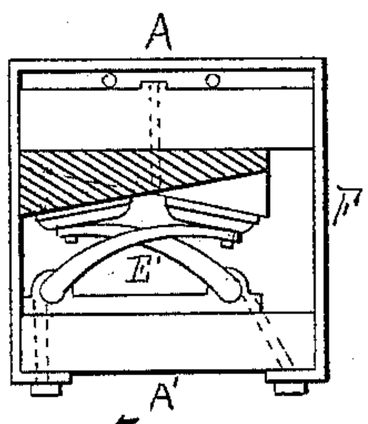


Fig. 3.

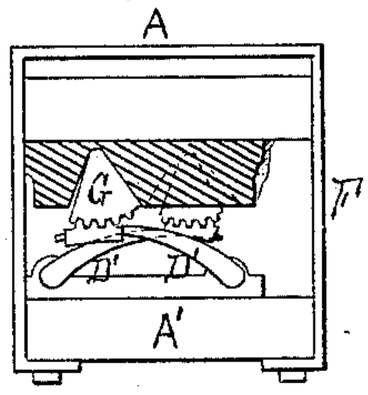


Fig. 4.

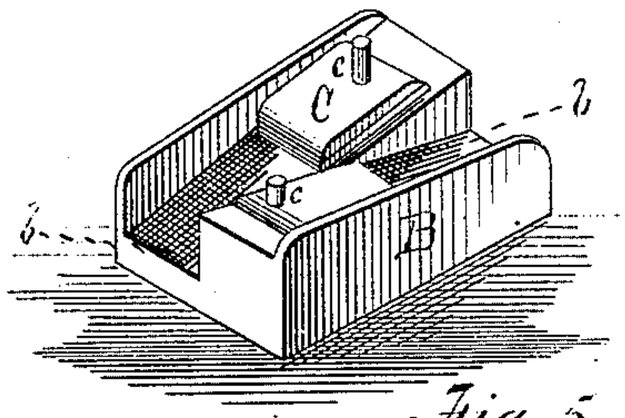


Fig. 5.

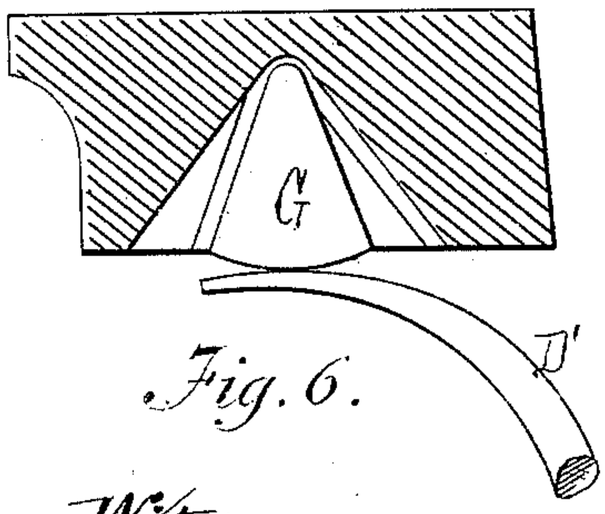


Fig. 6.

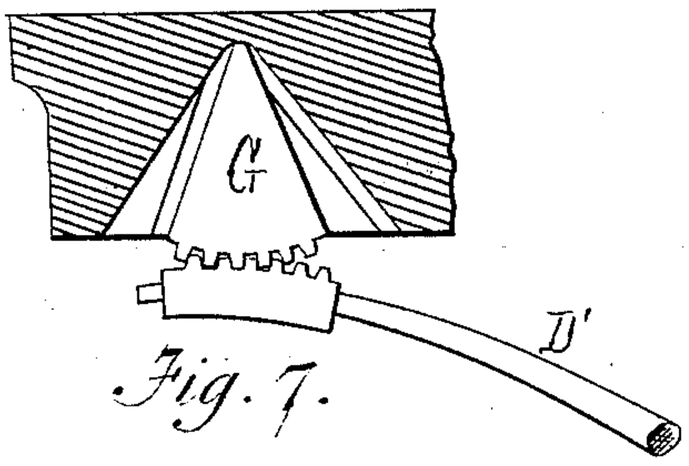


Fig. 7.

Witnesses;
Edwin James
Horace Brown

Inventor;
Richard Dudley & Benj Hershey.
per J. F. B. Holmead
Attorney

UNITED STATES PATENT OFFICE.

RICHARD DUDLEY AND BENJAMIN HERSHEY, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN RAILWAY-CAR SPRINGS.

Specification forming part of Letters Patent No. **112,229**, dated February 28, 1871.

To all whom it may concern:

Be it known that we, RICHARD DUDLEY and BENJAMIN HERSHEY, both of Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Springs for Cars and for other purposes; and we 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 side view of the bolster-plates with the springs attached. Fig. 2 is an inverted sectional view at the line *x x*, Fig. 1. Fig. 3 is an end view, showing the lateral arms of the springs attached to the friction-slides. Fig. 4 is the same, a rocking plate being substituted for the slide. Fig. 5 is a detached view of the friction bed-plate and slide. Figs. 6 and 7 are detached views of the rocker and lateral arm of the spring, in the one ratchet-teeth being used, while in the other they are dispensed with.

This invention relates to an improvement in the torsion-spring, as well as in the method of applying the same to railroad-cars and other vehicles.

By our improvement the spring is not only greatly strengthened and the degree of its elasticity much increased, but is so connected with the bolster-plates as to operate with, comparatively speaking, little friction.

It is well known that in springs of this class and form—that is, the torsion—having a curved end or head, and which is invariably secured at this point in a stationary bearing, that the twisting of the rod, through which alone the power of the spring is exercised, necessarily causes immense strain on the spring at its curved or angular section. To enable the spring to sustain this strain it has heretofore been the practice, especially when the spring was designed for railroad-cars, to manufacture it large and exceedingly heavy. This has been found to be most objectionable, as it not only rendered the springing of a car very expensive, but also burdened it with an unnecessary weight.

To remedy this defect is one of the chief objects of our invention, and is accomplished by so upsetting the spring that it shall be **V**-shaped in form and much larger or greater in diameter at the angle of the **V**, and also at the angles where the short or lateral arms are bent inward, than at any other portion of their entire surface. Thus the spring is strengthened exactly at such points as are required to support or resist the greatest strain, and which by our improvement is readily accomplished without rendering the spring unduly heavy.

Another great advantage of the **V**-shaped form of the spring is found in the fact that we are not compelled to secure them at the center of the bolster-plate, as are the **U**-shaped, since their tapering or angular heads enable the springs for a considerable distance on the bolster-plate to lie side by side. This permits the lengthening of the main arms or shanks of the spring, and as the degree of elasticity depends entirely on the length of these arms this advantage will readily be appreciated.

Our invention also consists in securing the lateral or inward-bent short arms of the spring on friction-plates, or so resting them on rocker-plates, either with or without a ratchet-rack, that a free movement or play may be secured to them with much less friction than when they rest and travel on stationary plates or bearings, as has heretofore invariably been the practice.

Another valuable feature of our invention consists in the manner we attach the springs to the lower bolster-plate, and also in securing for their free or open ends an intermediate bearing between the upper and lower plates.

Prior to our invention the springs have invariably been attached on the face of one bolster-plate, its free ends being in direct contact with the other. We secure the springs, not to the bolster-plate, but on suitable bearings which are attached thereto, and which retain the springs at a considerable distance therefrom. This causes the rod to act as a center around which the short arms revolve, and which, in connection with the inclination of the friction-plates and their inclined bed, causes the spring to operate most effectively, and at the same time not require the plates to which its free ends are attached to travel more than half the distance which has for-

merly been necessary for the successful working of the spring. This saves an immense amount of friction, and is consequently a most important advantage.

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

A is the upper bolster-plate of an ordinary car-truck or other vehicle. On this plate A and at its extreme ends are secured bed-plates B B. These friction bed-plates are recessed, as shown in Fig. 3, so as to leave two inclined tracks or grooves, *b b*, for the friction-plates C C to work or travel in. These plates C C are rectangular in form, and are provided with wrist or bearing pins *c c*, by means of which they are connected with or secured to the lateral arms D′ D′ of the springs D D.

D D are torsion-springs, constructed of suitably-tempered steel, and are V-shaped in form. These springs are upset in such manner as to leave them much heavier and of greater diameter at *d* and *d′ d′* than at any other portion or portions of their entire surface, as clearly shown in Fig. 1. Thus it will be seen that the springs are strengthened or braced by an increased weight of metal exactly at such points, and only at such, as are called upon to resist the immense strain of the twisting of the wire in the torsional action of the spring. Owing to the V-shaped form of the spring, they are not compelled to be attached in their stationary bearings on a line at the center of the bolster-plate, as are the U-shaped springs of this character, since their angular or tapering form permits of their being run alongside of each other for a considerable distance. This enables the forked arms of the springs to be made nearly two-thirds the length of the bolster instead of one-half, which last is the greatest length ever allowed to the U-shaped spring. Now the elasticity of the spring is increased or diminished exactly in the very proportion that these arms are lengthened or shortened. In view of this fact the advantages of the V-shaped spring arranged as we have them will readily be seen.

D′ D′ are two lateral or inwardly-bent arms, which cross one another and are inclined toward the upper bolster-plate. By means of eyes at their extreme ends, which fit over the wrist-pins *c c* of the friction-plates C C, these plates and springs are connected together.

The springs D D are not attached directly to the under bolster-plate, A′, but are secured in suitable bearings E E′ at the center and extreme end thereof, the former of which is shown detached and resting in the angles of the spring, Fig. 1, and the latter in Fig. 2. In consequence of this method of connection the long arms of the spring act as center rods for the short arms, D′ D′, to revolve on, and in connection with the inclined beds B B enable the spring to act most effectively, with but a limited travel or movement of the slides C C. F are guide brace-bands, which connect the bolster-plates A and A′.

Instead of the inclined bed-plate B and slide C, a rocking plate, G, may be used, either with a circular ratchet-rack, as shown in Figs. 4 and 5, or a plain curved face, as shown in Fig. 6.

When the plates are provided with ratchet-racks the lateral arms D′ D′ of the springs should be provided with ratchet-sleeves, as also shown in Figs. 4 and 5.

Instead of the spring D D being formed of one continuous wire upset in a V-shaped form, it may consist of two independent rods secured at such an angle as to preserve or retain the V-shaped outline.

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

1. The V-shaped springs D D, when they are upset at the angles *d d′ d′*, substantially as described, as and for the purpose specified.

2. The combination of the V-shaped springs D D, having lateral arms D′ D′, friction bed plate B, and slide C or rocking plate G, substantially as described.

RICHARD DUDLEY.
BENJ. HERSHEY.

Witnesses:
J. W. WETMORE,
J. W. DOUGLASS.