

R. DUDLEY.
Torsion-Springs.

No. 158,477.

Patented Jan. 5, 1875.

FIG. I.

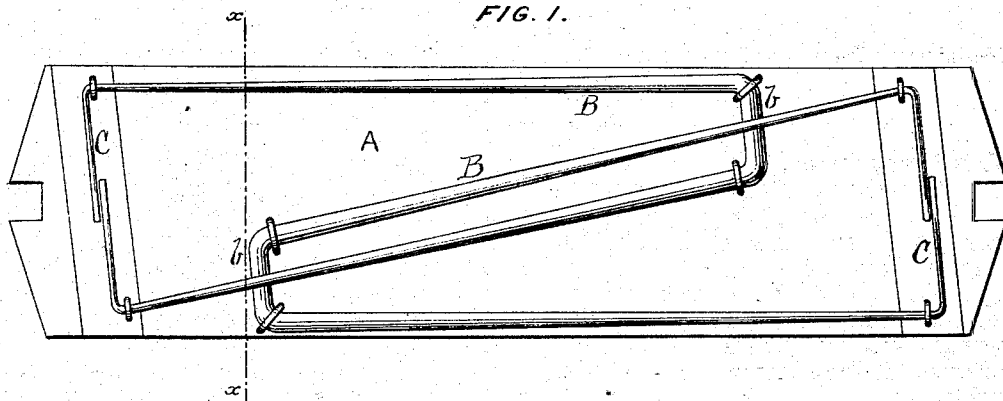


FIG. II.

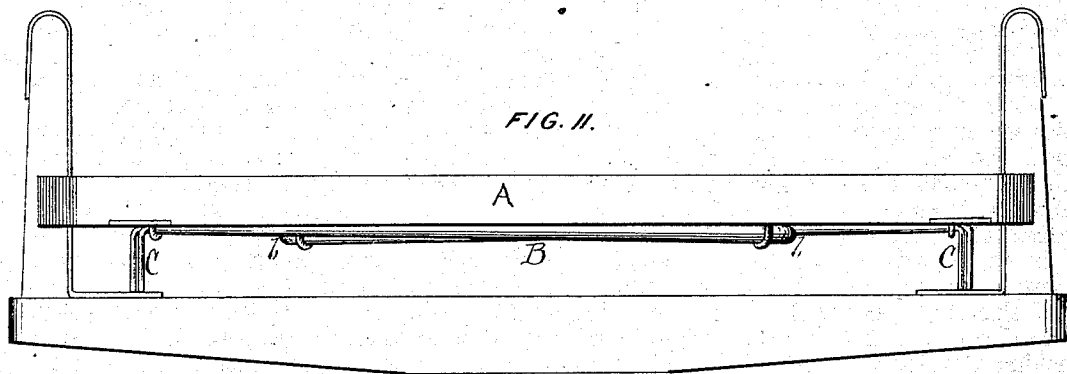
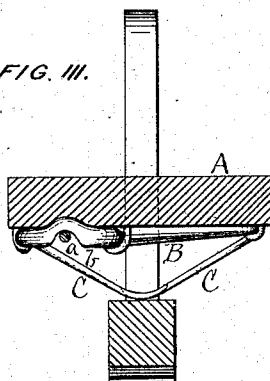


FIG. III.



WITNESSES:

Edwin James.
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per J. E. F. Holmeads
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UNITED STATES PATENT OFFICE.

RICHARD DUDLEY, OF ERIE, PENNSYLVANIA.

IMPROVEMENT IN TORSION-SPRINGS.

Specification forming part of Letters Patent No. **158,477**, dated January 5, 1875; application filed December 10, 1874.

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 Improvements in Torsion-Springs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a bottom-plan view. Fig. 2 is a side view. Fig. 3 is a sectional view on the line *xx*, Fig. 1.

The nature of my invention consists in bending into a curved form the section of the rod which forms, as it were, the head of the spring, slightly depressing the same, so as to allow of the free passage of one of the component arms of the opposite spring over or under the same, whereby the steel or other elastic rods which form the springs can be so arranged as to secure the greatest degree of torsional action possibly attainable.

It is well known to all who are familiar with torsion-springs that their tension or degree of elasticity measurably depends on the length of the rod through the twisting or wrenching of which the torsional action of the spring is exerted.

My present improvement consists, in the first place, in an exceedingly-simple expedient, whereby the steel or other elastic rods which form the springs can be so arranged as to secure to the torsional arms of the springs the greatest possible length of rod which can be arranged or utilized within the prescribed limits of a bolster or bed-plate. My invention also consists in giving to the rods which compose the component arms of the springs such a tapering form as to secure the greatest weight, and, consequently, strength, of metal at the sections of the springs where the greatest resistance is required.

The construction and operation of my invention are as follows: A is the bolster or bed-plate, to which the torsion-springs are attached. If the springs are designed to be used for a wagon-seat, A would represent the same. B B are the torsion-springs, and

are so formed and arranged that the greatest length of rod for torsional action is acquired. To allow these spring-rods to pass each other without interfering with their torsional action, a groove is formed, as it were, in their curved heads *b b* by depressing the rods at that section, as clearly shown at *a*, Fig. 3.

If desired, the spring-rods may pass under the heads *b b* instead of over the same, as shown in the drawing.

The rods B B are tapered in form, so that the greatest diameter is provided where the greatest strain is required, as clearly shown in the drawing. C C are the lateral lever-arms, and are formed and operated in the usual manner. These arms may be turned in, as shown in the drawing; or, if desired, may be turned out.

When this form of torsion-spring is used for wagon-seats the usual link motion, as covered by my former patents, is employed.

I do not claim to be the first who conceived the idea of so forming the torsion-springs as to allow of the same passing each other on a bolster or other bearing, so as to secure the greatest length of rods for torsional action within the prescribed limits of the bolster or bed-plate to which the springs are secured, for I am aware to accomplish this result was the chief design of the V-shaped spring patented to B. Hershey, March 28, 1871, No. 113,166, but in this spring, and all others of this class, the object of whose design is to increase the length of the torsional arms, their advantages result entirely from the V shape, loop, or other peculiar and distinctive form in which they are manufactured; and their advantages can only be attained in connection with said form. But my improvement, in this connection, is applicable to all springs, as the head of any spring can be curved in such manner as I contemplate doing, so as to let the torsional arm of one spring pass under or over the head of the opposite spring. Another great advantage of the curve which I give to the head of the spring is the increased strength which ever results from the arch formation; and, besides, it avoids the strain due to the opposite wrenching of the torsional arms at a given point, and which in all other torsional springs

has to be resisted at a given point at or near the center of the head.

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

1. The torsion-spring B, formed with a curve at its head *b*, said head being so bent as to allow the long arm of the opposite spring to pass over or under the same, substantially as described.

2. A torsion-spring, B, having the long arm

B of a tapering form, substantially as and for the purpose specified.

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

RICHARD DUDLEY.

Witnesses:

J. H. BUYS,

E. DIEFENDORF.