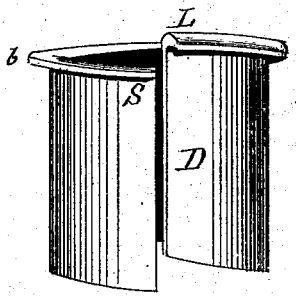
J. LELAND.

Car Spring.

No. 111,127. Patented Jan. 24, 1871.

Fig I



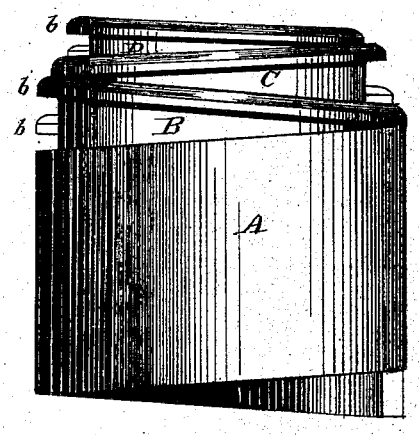


Fig II

Inventor

James Leland

by his attorneys

Gardiner & Hyde

Witnesses

E. Dudley Chapin.

H. C. Chapin

United States Patent Office.

JAMES LELAND, OF SPRINGFIELD, MASSACHUSETTS.

Letters Patent No. 111,127, dated January 24 1871.

IMPROVEMENT IN CAR-SPRINGS.

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

I, JAMES LELAND, of Springfield, Hampden county, Commonwealth of Massachusetts, have invented a new Improved Spring for Cars, of which the following is a specification.

Nature and Objects of the Invention.

My invention consists in forming a car-spring of two or more peculiarly-constructed hollow cylinders of steel, arranged one within the other, so that a weight bearing upon one overcomes its resistance before encountering the elasticity of the next, and this graduation is effected by decreasing the strength of the springs upward.

The object of my invention is to form a car-spring that occupies little space, and that can be made at will to yield and return any distance, or be made so strong in the first place that no weight that will be brought to bear can take up all its spring.

General Description.

The peculiar construction of each spring is as follows:

A hollow steel cylinder is slit in one of its sides, as shown in Figure I. It is then warped or bent so that one corner at the slit falls below the other.

This warping is done when the shell is heated, so that when cool it would return to its first shape if pressed down until its top edges were in a plane.

Each cylinder-spring is provided with a flange, *b*, excepting the lowest, which, not being required to catch upon any other, but only to hold the others, has none.

Figure II shows the manner of arranging the springs within each other, the slit in the spring B being opposite a point on the spring A, directly opposite its own slit, and so on, as many springs as may be used. This is shown in Fig. II, where it will be seen that, while the flange of a lower corner of a spring rests on the spring beneath, the flange of the upper corner of the same spring supports the spring above, and it will be evident that the spring D will have its corner L depressed under a weight flush with its other corner S before the weight will commence to bear down the corner of the spring C. This would be the case were they all of the same thickness; but I graduate the thickness of each spring, so that an easy motion is obtained for passenger-cars, while a spring is obtained to meet all the requirements of a freight-car, or of a tender, where a powerful spring with little play is needed, so that little motion is given to the water within the tender, and, at the same time, sufficient to prevent any bumping.

The slits in the sides of the spring-cylinders are made wide enough to enable the spring to be slightly compressed when inserted within another, so that the lateral spring in each piece holds it in place and prevents its position from being relatively changed.

In applying my spring it may be placed in a box on the axle, or simply over a stud attached to the car-axle box.

In the volute spring the weight comes mostly upon the center, and a comparatively small portion of the spring upon each side of the center, where it generally breaks.

In the elliptic the strain is always on the weakest portion of the spring, and the spring now in use, consisting of a succession of spiral springs within each other, can be made in a small space, of only a limited strength, and when they bump from overweight the fiber of the steel is destroyed.

But in my spring, by regulating the thickness of the cylinders, their height and the degree of deflection of the corners of each one from the plane their flanges were in originally, a graduated spring is made that meets every requirement.

Claim.

What I claim as my invention is—

A car-spring, constructed of the slit cylinders A B C D, &c., having the flanges *b*, and arranged in the manner and for the purpose shown and described.

JAMES LELAND.

Witnesses:

L. A. TIFFT,

R. F. HYDE.