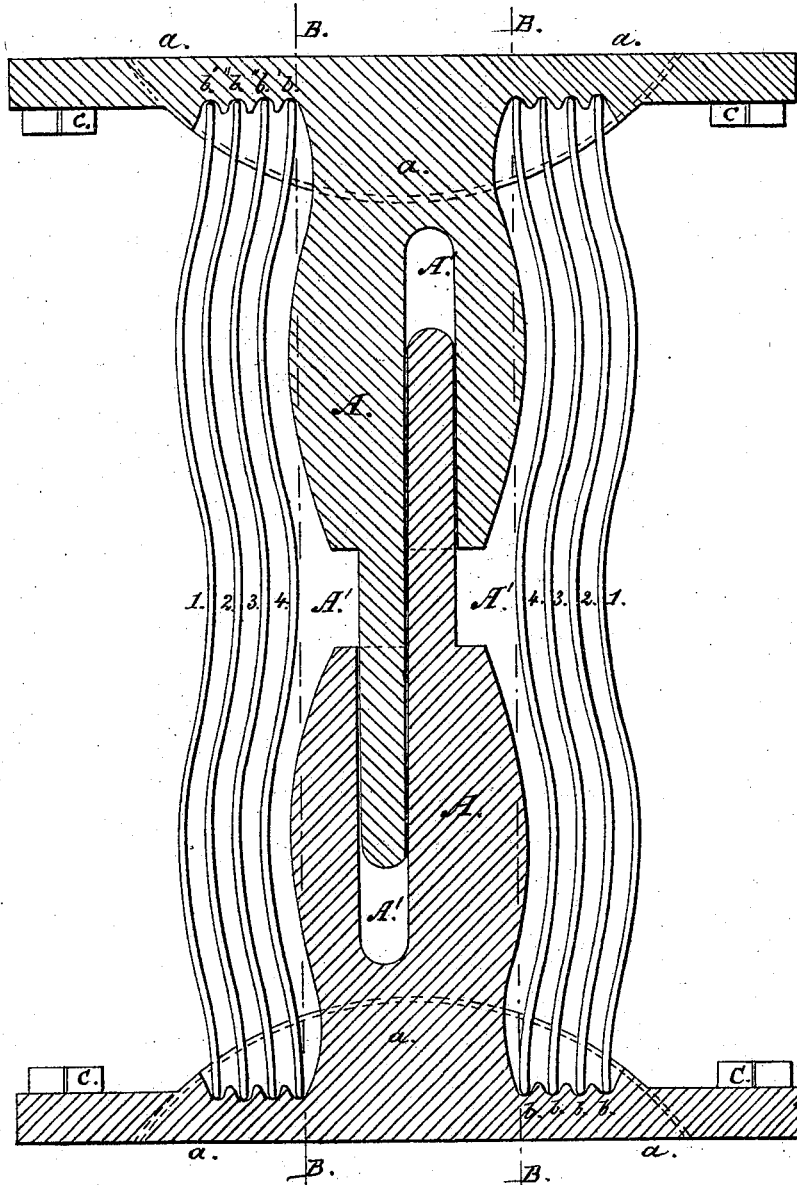


A. T. WATSON.

Car Spring.

No. 54,234.

Patented Apr. 24, 1866.



Witnesses:

Wm. F. Webb
Samuel L. Thorne

Inventor.

Alex. T. Watson

UNITED STATES PATENT OFFICE.

ALEXANDER T. WATSON, OF NEW YORK, N. Y.

IMPROVED RAILROAD-CAR SPRING.

Specification forming part of Letters Patent No. 54,234, dated April 24, 1866.

To all whom it may concern:

Be it known that I, ALEX. T. WATSON, of the city of New York, county and State of New York, have invented certain new and useful Improvements in Springs, which are particularly adapted to use as railroad-car springs, but may be applied to other purposes; and I do hereby declare that the following is a full and exact description of my said invention and improvements, reference being had to the drawing accompanying and making part of this specification.

The drawing represents the spring in side elevation, and it also represents any vertical section of the spring parallel to that shown in the drawing.

The nature of my invention consists in the use of steel plates or leaves curved in sections of an equal radius, the middle curve tending inward, the curves on each side of the middle one outward, and the ends a short section of a like curve, cut off where a straight line from the ends so cut off will fall within the middle curve, as seen by the red line B B, thus forming a series of curves, the action of which will hereinafter be explained, and in arranging and combining the same in frames in such a manner that the plates or leaves shall stand vertically or at right angles to the ends of the frames, and in corresponding pairs facing each other on opposite sides, so that the pressure or weight will act in a vertical straight line upon the ends of the steel plates or leaves, and the elastic action will, owing to the peculiar form of the curves and their position on opposite sides, be opposite or apart each pair from each other.

The spring consists of two parts—the frame or setting and the steel plates or leaves. The frame is shown in the drawing at A A, and is in two parts, the two parts being alike. The frames are constructed so as to interlock and form a mortise or sliding joint and a space between the two parts when the leaves or plates are in position, as shown at A' A', sufficient for the play or elastic action of the spring. The two parts of the frame are iron castings, each part cast in one piece. On the inner surfaces of the frame-pieces are grooved recesses *b b b b*, of sufficient depth to receive the ends of the plates or leaves and retain them in their places. Between and separating these frame-pieces are arranged the steel plates or leaves

1 2 3 4 in the grooved recesses *b b b b*. These plates or leaves are of the width of the frames—usually, for body-springs for railroad-cars, about three and a half inches. The plates receive their shape by being pressed in molds adapted to the purpose. To prevent the plates from lateral displacement, a flange-plate, *a a a*, is cast upon the frame on either side.

In the spring, as represented in the drawing and as now described, all the steel plates or leaves are exactly of the same length and thickness, and alike in the form of the curves. They may, however, be made of descending lengths—viz., the first pair (next the frame) the longest, and each succeeding pair a fraction shorter, so as to act as a compensating spring. Thus each pair will come into play according to the weight imposed.

When the spring is to be used for a passenger-car body-spring I use the leaves or plates about three thirty-seconds of one inch in thickness; when used for freight-cars, about from one-eighth to three-sixteenths of one inch in thickness. When applied to railroad-cars as body-springs, one part of the frame, which may in such case be called the “upper frame-piece,” is fastened to the underside of the bolster of the car by screw-bolts C C, and the under frame-piece is fastened to the stirrup directly under, so that the two parts of the frame act upon the springs between them in a vertical line. It will be seen from this arrangement and the shape or form of the curves of the plates or leaves and their bearings that the line of pressure will necessarily fall within the middle curves, and the elastic action of each pair of plates or leaves will invariably be outward—that is to say, in a direction opposite to each other—the leaves or plates, when under pressure, tending to straighten toward the middle in an outward direction, and this produces the apparently paradoxical effect of lengthening the spring or raising the load as the first action of the spring.

In the drawing the height of the spring (a body-spring) is about eleven inches when at rest. The play of the spring will be about one inch. For a body-spring for a railroad-car I consider the four pairs of plates or leaves, as shown in the drawing, to be the proper number; but it is not my intention to confine myself to a precise or fixed number of leaves or plates, or thickness or width, as these may be varied as

circumstances may require; nor do I limit the application and use of my springs to railroad-car purposes, as I consider them adapted to almost any purpose where a spring may be required.

I do not claim the frame or castings in which the leaves or plates of the springs are set, the same having been substantially described in Letters Patent of the United States granted to me under date of March 20, 1860; but,

Having thus described my invention and the manner of constructing the same, what I claim therein, and desire to secure by Letters Patent, is—

1. The peculiar construction and adaptation of the sockets or grooved recesses *b b*, in which the extremities of the plates or leaves are set,

together with the flange or side guards, *a a*, by which the free action of the ends of the plates is permitted, and they are at the same time held in their proper positions, substantially as described.

2. The plates or leaves constructed substantially as described, and the cutting or fixing the extreme or end curves at such a point, and so combining and arranging the curves with each other that when under pressure the elastic action of the plates is outward, and the curves of the plates, except at the ends, are caused to straighten, whereby the liability to fracture or collapse is greatly diminished.

ALEX. T. WATSON.

Witnesses:

SAMUEL G. THORN,

WM. FITCH.