S. YERKES, Jr.

Improvement in Railway-Car Springs.

No. 114,741. Patented May 9, 1871.

Fig. 1.

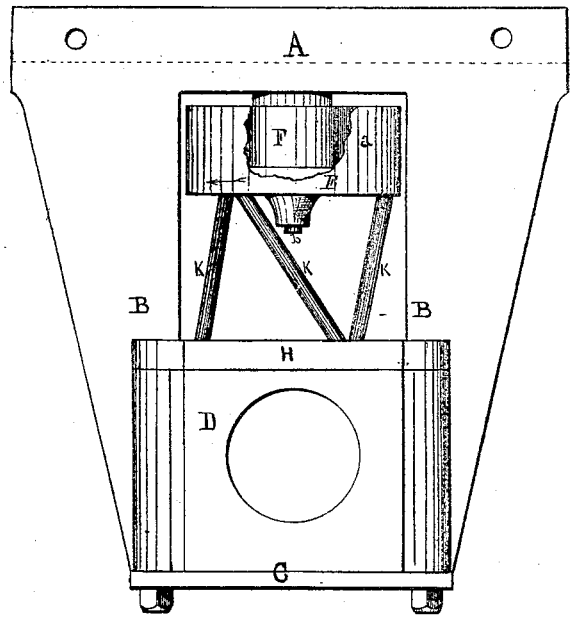


Fig. 2.

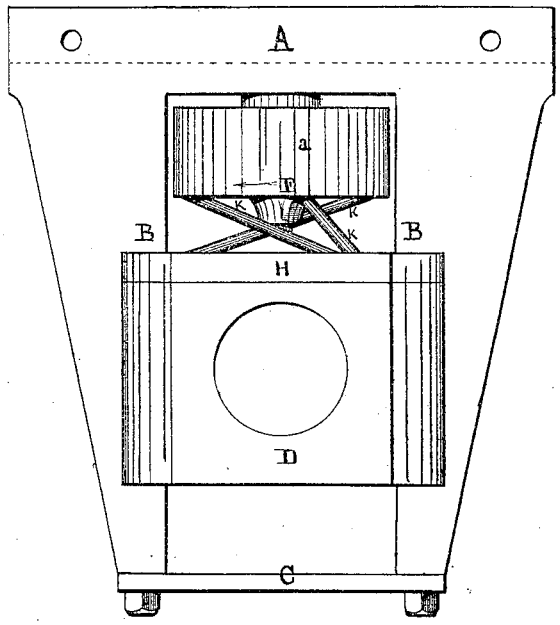


Fig. 3.

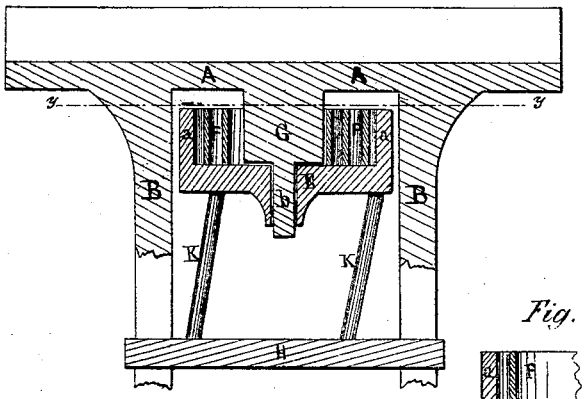


Fig. 4.

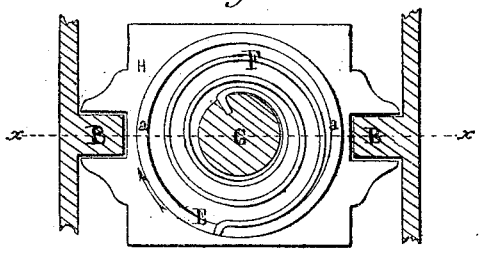


Fig. 6.

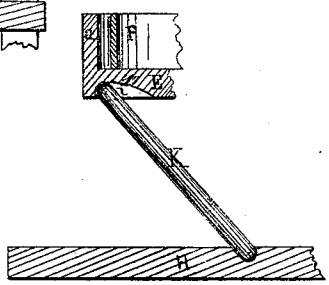
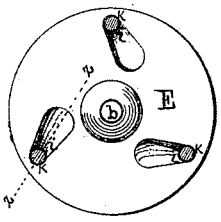


Fig. 5.



WITNESSES

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SILAS YERKES, JR., OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 114,741, dated May 9, 1871.

IMPROVEMENT IN RAILWAY-CAR SPRINGS.

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

I, SILAS YERKES, Jr., of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improved Spring for Railroad Cars and for other purposes, of which the following is a specification.

Nature and Objects of my Invention.

My invention relates to the coiling or uncoiling of a spiral spring by means of pressure applied in a direction coincident with the axis of said spring; the object of my said invention being to utilize the resilient power exerted by a coiled strip of properly-tempered metal in the act of winding or unwinding its free end about a central axis.

Description of the Accompanying Drawing.

Figure 1 is an elevation of my improved spring combined with the axle-box of a railroad car and relieved from pressure, a portion of the flange of the revolving plate being broken away to disclose the spiral coil;

Figure 2 is a similar view of the spring fully compressed;

Figure 3 is a central vertical section of the spring in a plane parallel to the end-face of the axle-box, said section being taken in the line *x x* of fig. 4;

Figure 4 is a transverse section in line *y y* of fig. 3, illustrating the position and arrangement of the spiral coil;

Figure 5 is a bottom or inverted view of the revolving plate carrying the spiral coil; and

Figure 6, a longitudinal section through one of the rods or levers in the line *z z* of fig. 5.

General Description.

A, fig. 3, is the upper bar or plate of the frame or casing of my improved spring;

B B, its side bars or plates, secured to and projecting from said upper bar A; and

C, figs. 1 and 2, a lower cross-bar uniting the lower ends of the side bars to complete the frame. This lower bar may be confined by bolts and nuts so as to be detachable at will.

Where my spring is employed for railroad cars its frame A B C may be constructed to serve as a hanger of the ordinary form in which to secure and confine the journal-box D at either end of the car-axles, and figs. 1 and 2 of the drawing illustrate my device thus applied.

E is the revolving plate carrying the elastic coil F, figs. 1, 3, and 4, of my improved spring. This plate is, by preference, made circular in form, and provided with a flange, *a*, projecting upwardly from its rim to inclose the spiral coil F, as shown in the drawing.

This spiral spring F is coiled about a cylinder, G, (see fig. 3,) projecting centrally from the under side of the upper bar A, and to which the inner end of the coil is secured.

The plate E bears against the face of the lower end of said cylinder (see fig. 3) and revolves against the same upon a pin, *b*, projecting centrally from said lower face as its axis, its flange *a* completely encircling the coiled spring F, as shown in fig. 3.

The inner end of this coil is secured to the central fixed cylinder G, as shown in fig. 4, and its outer end is secured to the flanged rim *a* of the revolving plate E, so that a revolution of the plate in the direction of the arrow in figs. 1, 2, and 4 will serve to wind up and tighten the coil, while an opposite movement would operate to unwind it.

Instead of having the central attachment of the coil fixed and its outer end movable as just described, the revolving plate E may be provided with an upwardly-projecting sleeve secured thereto to encircle the cylindrical projection or pin G, and an annular flange be fixed to the upper bar or plate A of the frame, so as to project down toward the face of the plate E, near its periphery, within its flange *a*, if said flange *a* be not in such case wholly dispensed with.

In this case the inner end of the coiled spring F, being secured to the central sleeve or collar projecting from the revolving plate E, will move with said plate, while its outer end, secured to the annular flange projecting from the fixed bar or plate A, will remain stationary, thus reversing the arrangement thereof, illustrated in the drawing, and transmitting the power or pressure moving the plate E to the center of the coil instead of to its circumference.

H is a plate placed parallel to the revolving plate E, beneath the same, and arranged to move freely to and from said plate, between the side bars B B of the frame, which may be made to serve as ways therefore, as is illustrated in the drawing. (See fig. 4.)

K K K are rods or levers interposed between the sliding plate H and the revolving plate E, the ends of each rod resting in sockets *i* formed in the faces of the plates H and E, respectively.

These sockets are enlarged, with a gradual upward slope, in the direction of the inclination of the levers, (see fig. 6,) to permit an extreme inclination of said levers when the spring is compressed, as shown in fig. 2, and as is hereinafter more fully explained.

These rods K K are placed at equal distances apart, and are inclined with a common angle of inclination, each, in a plane tangential to a common circle, described about the axis of the plate as its center, so that the upper and lower ends of each and all are at equal distances from an axial line coincident with the pivotal axis of the revolving plate E.

If, now, the sliding plate H and rotary plate E be caused to approach each other, the inclination of the

rods K K will be thereby necessarily increased in proportion to the movement, and their ends will be thereby made to bear and thrust against the plates E and H with equal force in one common direction, each upon a tangent to the circle embracing their sockets. As the plate E turns freely upon its pivot in the direction of the thrust it will transmit the force of the thrust of the levers to the elastic coil F, and thus bring into active operation its resilient power in resistance thereto.

By interposing my improved spring, thus constructed, between the axle-box D of a car-axle and its truck, within a suitable hanger, A B C, as described, the weight of the car over said axle, by forcing the plates E and H toward each other, will bring the same to bear directly upon the coiled spring F, through the operation of the levers K K K, operating against the yielding plate E, as described.

It is evident that my improved spring may be inclosed within a telescopic casing, the revolving plate E carrying the coiled spring F being placed upon a pivot secured to the inner end of one division of the casing, and the levers K K placed to bear against the opposite end of the remaining division thereof.

Although I prefer to interpose at least three inclined levers between the plates E and H, in order to obtain an evenly-balanced pressure against the plate E, yet two or even one lever may serve to operate the spring, substantially in the manner herein described.

Instead of operating my improved spring by compression to produce an approximation of the plates E and H, as hereinbefore described, it may be made to subserve a useful purpose if made to operate by extension, or rather by a separation of the plates E and H.

To adapt it to this end the levers K K of my improved spring are pivoted, hinged, or jointed in any suitable manner to the plates E and H, and the plates are so approximated when the spring is at rest as that the levers or links shall then be set at a very great inclination, substantially in the position illustrated in fig. 2 of the drawing, so that a tension upon the plates E or H, to draw them apart, shall operate to produce a revolution of the plate E, and a consequent tension of the spiral coil F therewith, as has herein been fully set forth.

Claim.

I claim as my invention—

A centrally-pivoted revolving plate or bearing carrying a coiled or spiral spring, secured at one end thereto, and at the other to any suitable fixed point apart therefrom, in combination with a plate or bearing moving freely in a right line coincident with the axis of said revolving plate, and with levers or links interposed between the two, each in an inclined position in a plane tangential to an arc having said axis as its center, the whole arranged and operating substantially as herein set forth.

As witness my hand this 17th day of March, 1871.

SILAS YERKES, JR.

Witnesses:

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EWELL A. DICK.