

EDWARD CLIFF.

Improvement in Springs for Railway-Cars.

No. 114,645.

Patented May 9, 1871.

Fig. 1.

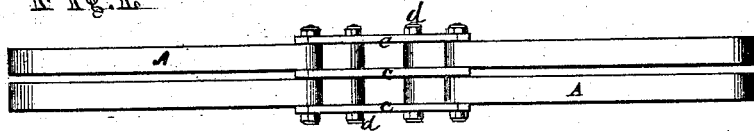
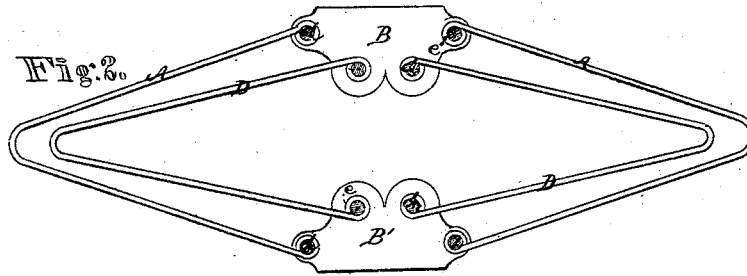


Fig. 2.



Witnesses  
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# United States Patent Office.

EDWARD CLIFF, OF OSWEGO, NEW YORK.

Letters Patent No. 114,645, dated May 9, 1871.

## IMPROVEMENT IN SPRINGS FOR RAILWAY CARS.

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

### *To all whom it may concern:*

Be it known that I, EDWARD CLIFF, of Oswego, in the county of Oswego and State of New York, have invented a new and valuable Improvement in Springs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a top view of my spring, Figure 2 is a central vertical longitudinal section of the same.

My invention has relation to an improvement in elliptic springs for railroad cars, locomotives, carriages, &c.; and

It consists in the construction and novel arrangement of the sectional spring, and the manner of connecting the same, whereby they are adapted to be readily removed when repairing is necessary, or when it is desirable to alter the power of the entire spring.

The letters A A of the drawing designate the outer series of semi-elliptic or >-shaped springs. These are placed horizontally opposite to each other, as shown in the drawing, and are connected by suitable couplings. One or more of these sectional >-shaped springs may be used on each side, the number employed being governed by their strength and the weight under which they are to operate.

B represents the coupling which connects the upper arms of the springs together.

Directly below it is the coupling B', similar in form and construction, and serving to connect the lower arms of the springs.

These couplings are thus constructed:

Parallel vertical plates *c c* extend across between the arms. These plates are perforated for the passage of the bolts *d d*, which pass also through the eyes *e e*, formed in the ends of the springs A A, by turning or curling them, the said ends being placed between the plates before the insertion of the bolts.

D D represent a second or inner series of >-shaped springs, attached on each side to the plates *c c*, by bolts in a similar manner to that in which the springs A A are secured.

These inner springs D D are parallel with the outer springs A A, and they are usually of the same length, the bolts by which their ends are secured to the plates *c c* being placed nearer together.

Should it be required, a third series of springs may be introduced between the springs A and D.

These springs are easily manufactured. When one of the sectional springs is broken its place can be supplied in a few minutes by a new one. The power of a spring constructed in this manner may be readily regulated to suit the load by adding or subtracting the sectional springs.

### *Claim.*

The parallel >-shaped sectional springs A D made of equal length, in combination with the vertical coupling-plates *c c* and the bolts *d d*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

EDWARD CLIFF.

Witnesses:

FRANK HURLIE,  
GEORGE G. CRAGG.