

G. DOUGLASS.  
SPRING.

No. 18,961.

Patented Dec. 29, 1857.

Fig. 1.

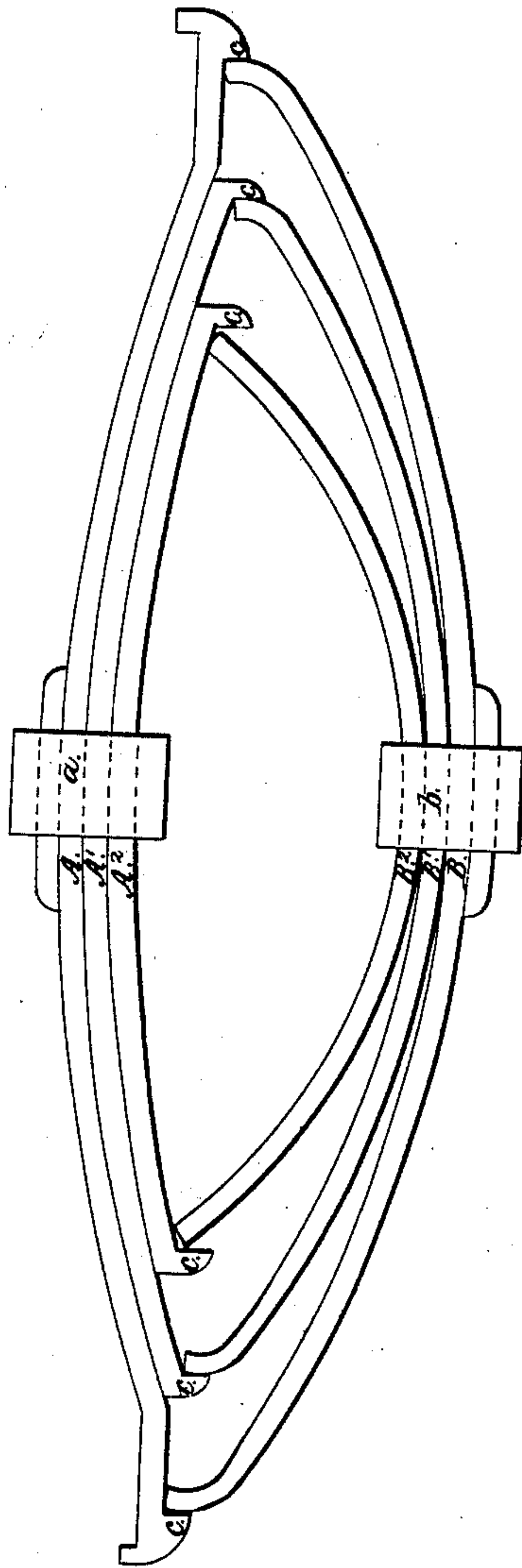
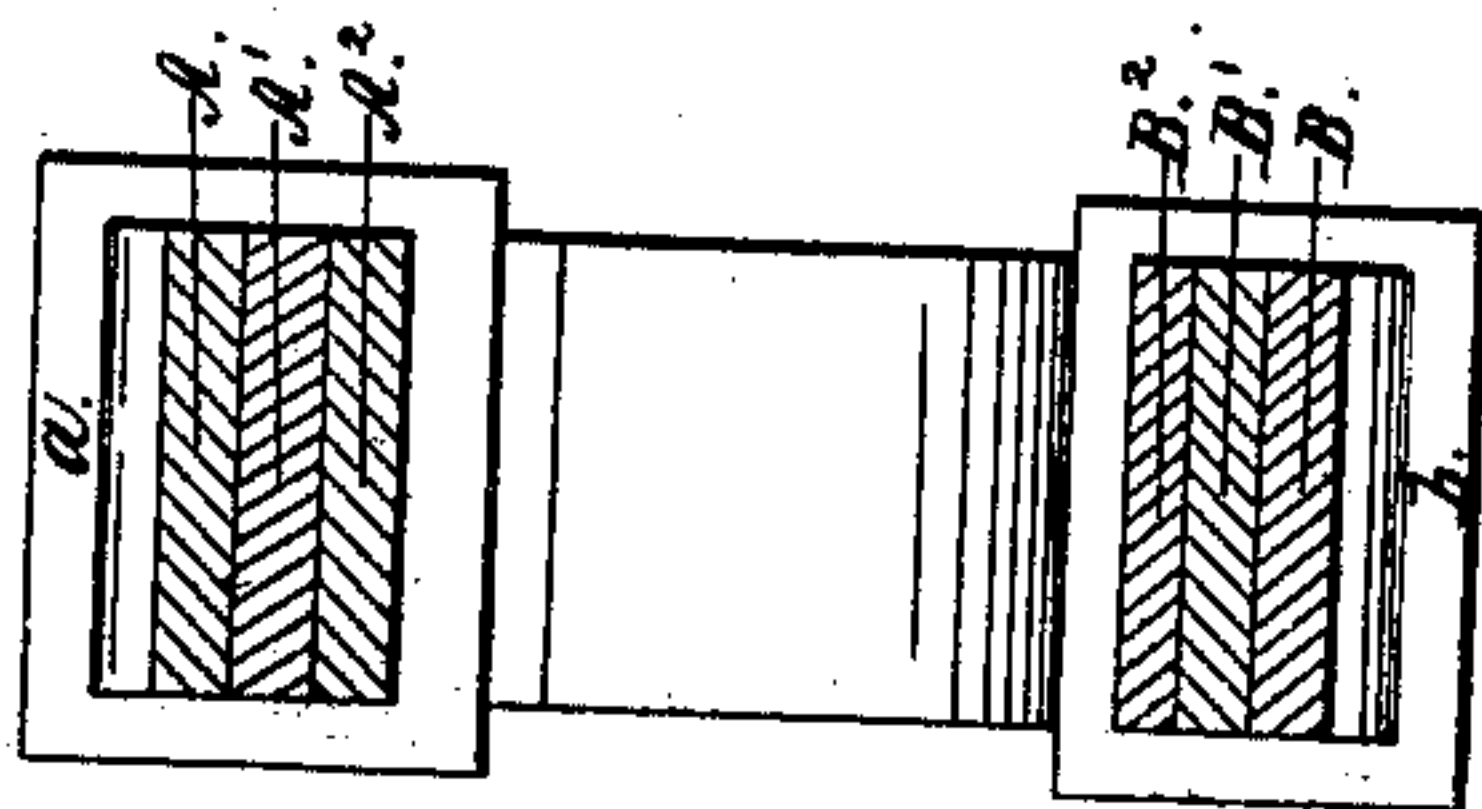


Fig. 2.



# UNITED STATES PATENT OFFICE.

GEORGE DOUGLASS, OF SCRANTON, PENNSYLVANIA.

## RAILROAD-CAR OR CARRIAGE SPRING.

Specification forming part of Letters Patent No. 18,961, dated December 29, 1857; Reissued April 28, 1863, No. 1,461.

*To all whom it may concern:*

Be it known that I, GEORGE DOUGLASS, of Scranton, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Springs for Railroad-Cars, Locomotives, and other Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of a locomotive spring constructed according to my invention. Fig. 2 is a transverse section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

My improvement consists of a new article of manufacture, viz., a carriage spring, made substantially as hereinafter set forth.

The particular example of my invention that is represented in the accompanying drawings is made with three leaves or plates in each half of the spring, but any other number of plates may be used. The plates A, A', A<sup>2</sup>, of the upper half are made with less set than the corresponding plates B, B', B<sup>2</sup>, of the lower half. The upper plates A, A', A<sup>2</sup>, are made with lips c, c, at their ends to lap over the ends of the lower plates B, B', B<sup>2</sup>, as shown in Fig. 1, and the latter being sprung into their places between the lips c, c, are confined tightly by their natural tendency to straighten themselves. The three upper plates A, A', A<sup>2</sup>, lie close together along their whole length, but the inner ones diminish in length, the middle one being shorter than the outer one and the inner one being shorter than the middle one. The three lower plates B, B', B<sup>2</sup>, only touch one another at the center of their length, the middle one having more set than the outer one and the inner one more than the middle one.

a, is a clip to confine the upper plates A, A', A<sup>2</sup>, together and b, is a similar clip to confine the lower ones. These clips are substantially like what are used in common elliptic springs.

The spring is intended to be supported at

the center of the lower half and to receive the weight at or near the ends of the upper half. The tendency of the weight applied in this way is to cause the plates B, B', B<sup>2</sup>, of the lower half of the spring to be straightened or unbent and this tendency exerts a tension in a nearly longitudinal direction on the plates A, A', A<sup>2</sup>, of the upper half of the spring, so that while the lower plates yield considerably in the direction of the pressure or in the direction of lines parallel therewith the upper plates, though sufficiently elastic, yield very slightly, but serve to give great strength to the lower plates. Every upper plate and its corresponding lower plate combine to constitute a separate spring. Springs constructed on this plan have been proved by experiment to be capable of sustaining a far greater pressure in proportion to their weight than the common elliptic spring while they possess at least an equal degree of elasticity.

It is obvious that the position of the spring as shown in Fig. 1, may be inverted or changed in any way to suit circumstances, but it must be observed that the weight or support is to be always applied at the center of that half of the spring which has the greatest set and is confined lengthwise, and the support or weight near the ends of that half which has the least set and by which the other half is confined lengthwise.

I do not claim, broadly, the causing of one leaf of a spring to overlap another. An example of this is seen in the device of S. S. Barry, rejected 1852, in which the ends of the upper spring overlap those of the under spring, the two ends fitting together on the tongue and groove plan. The employment of the tongue and groove avoids the necessity of eyes and bolts to connect the ends of the springs; in other respects, the above plan resembles the common elliptic spring, the weight being applied in the middle of the upper and lower leaves. My improvement is quite different, as the upper leaves serve chiefly as horizontal chords to prevent the too wide opening of the lower leaves. The strain upon the upper leaves is chiefly in a horizontal direction. Nor do I claim the



broad idea of suspending the load upon the ends of elliptical springs. But to the best of my knowledge, it is a new feature in elliptical carriage springs so to arrange them as  
5 that one set of the leaves shall serve as horizontally elastic chords, to prevent the undue opening of the other set of leaves.

Having thus described my invention, I

claim and desire to secure by Letters Patent, as a new article of manufacture,—  
A carriage spring made substantially as  
herein set forth. 10

GEORGE DOUGLASS.

Witnesses:

C. W. FALKENBURY,  
EDWARD MILLER.

[FIRST PRINTED 1911.]