

W. P. HANSELL.  
Car-Springs.

No. 154,478.

Patented Aug. 25, 1874.

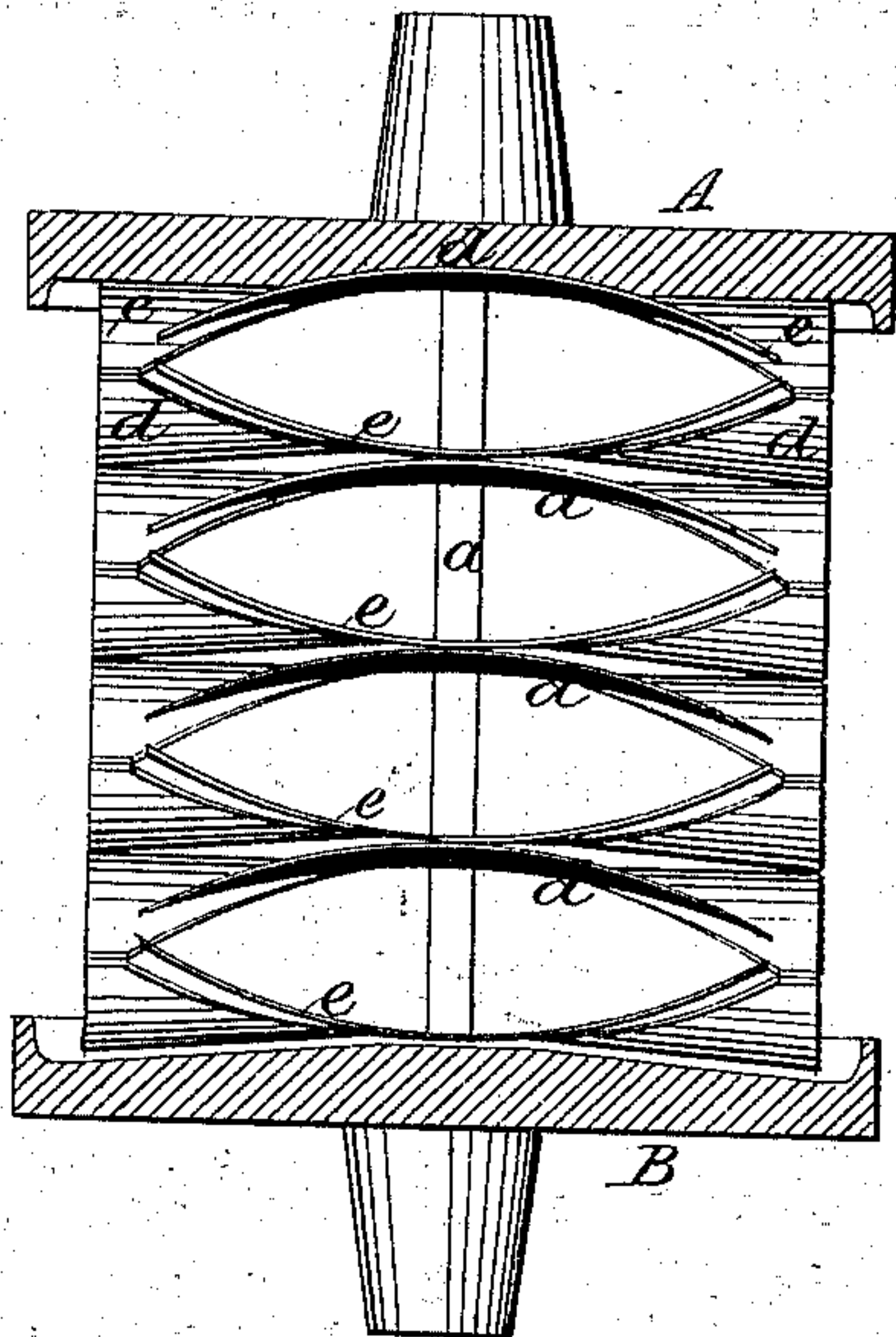


FIG II

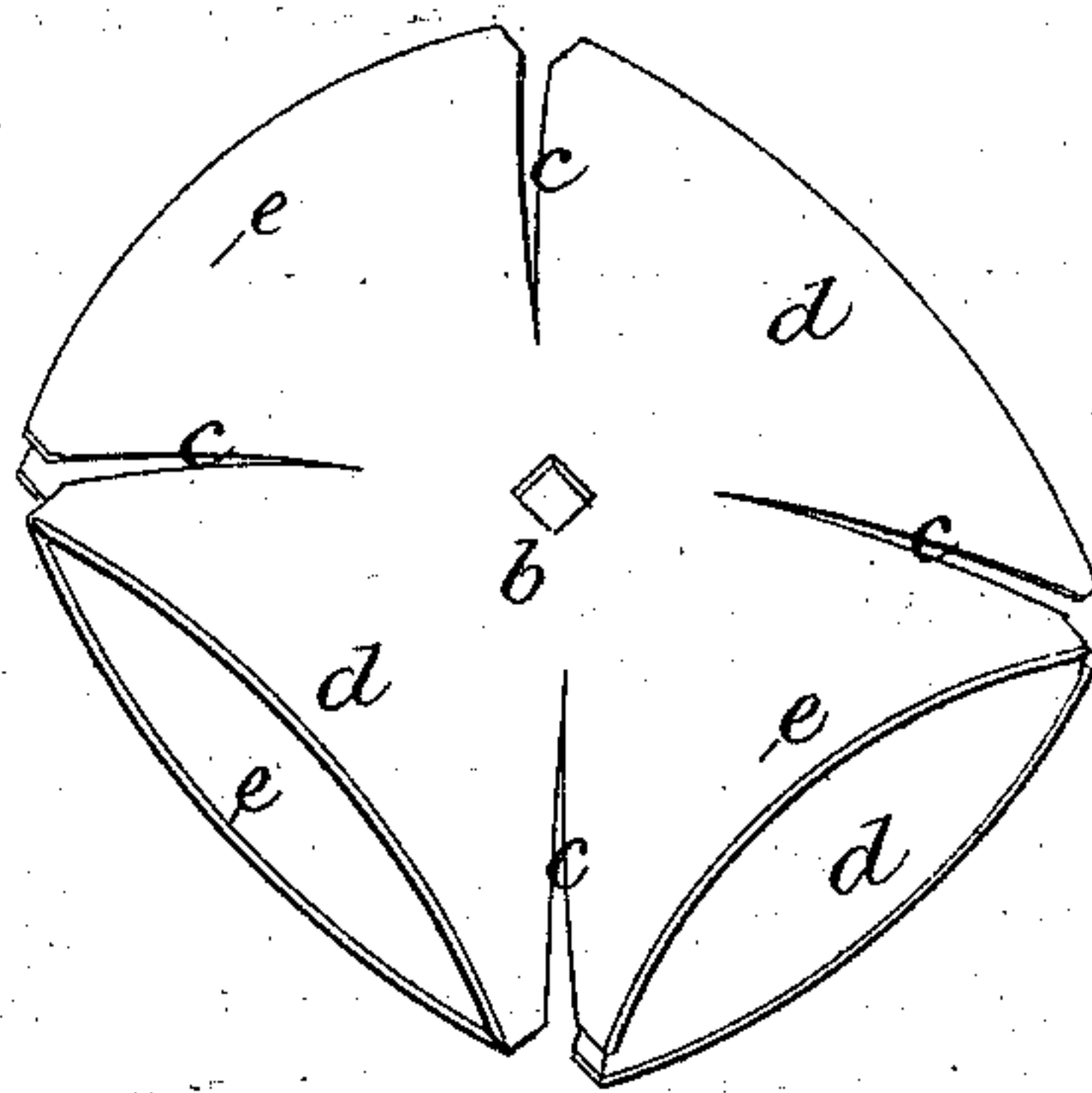


FIG III

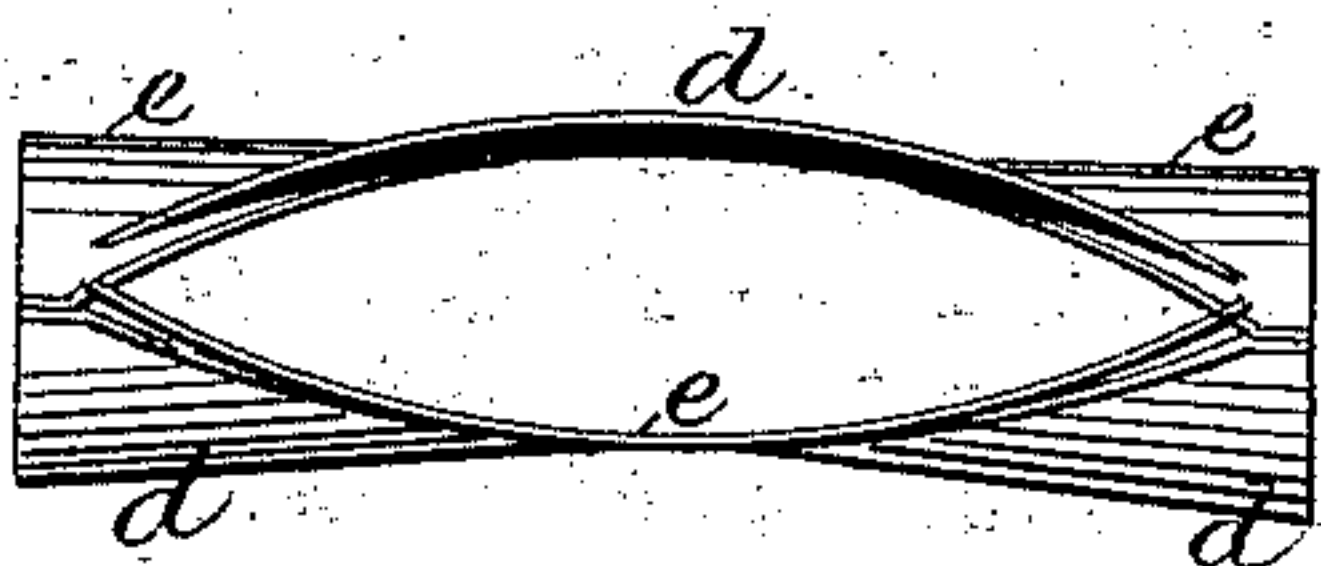


FIG IV

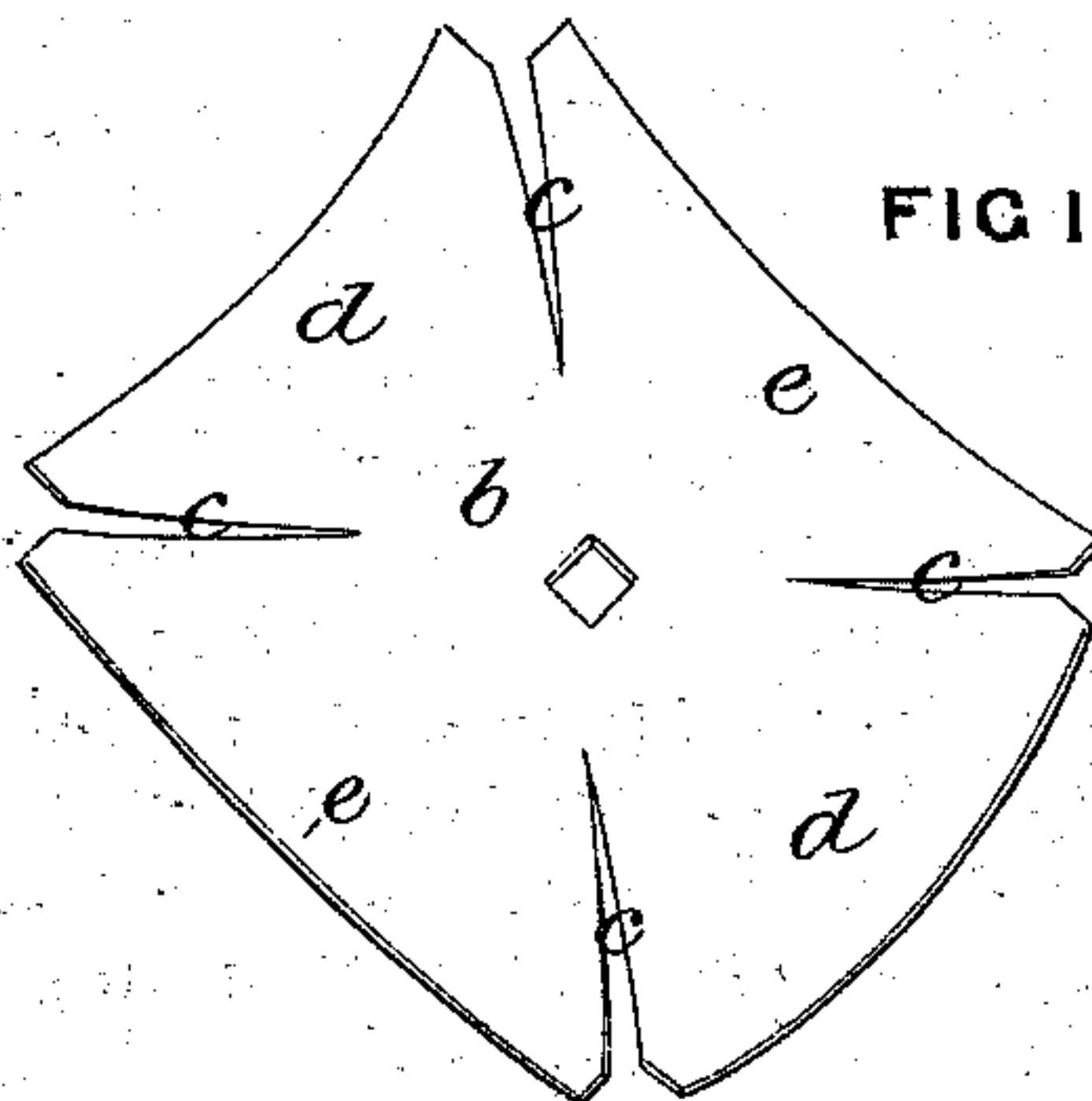


FIG VI

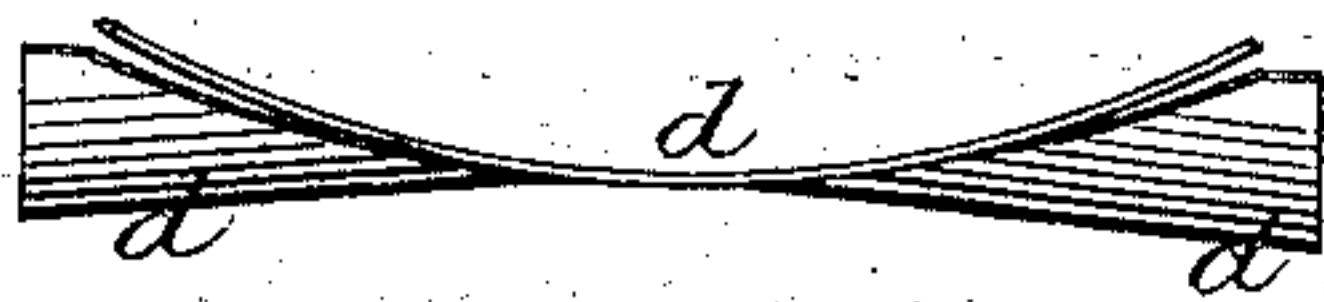
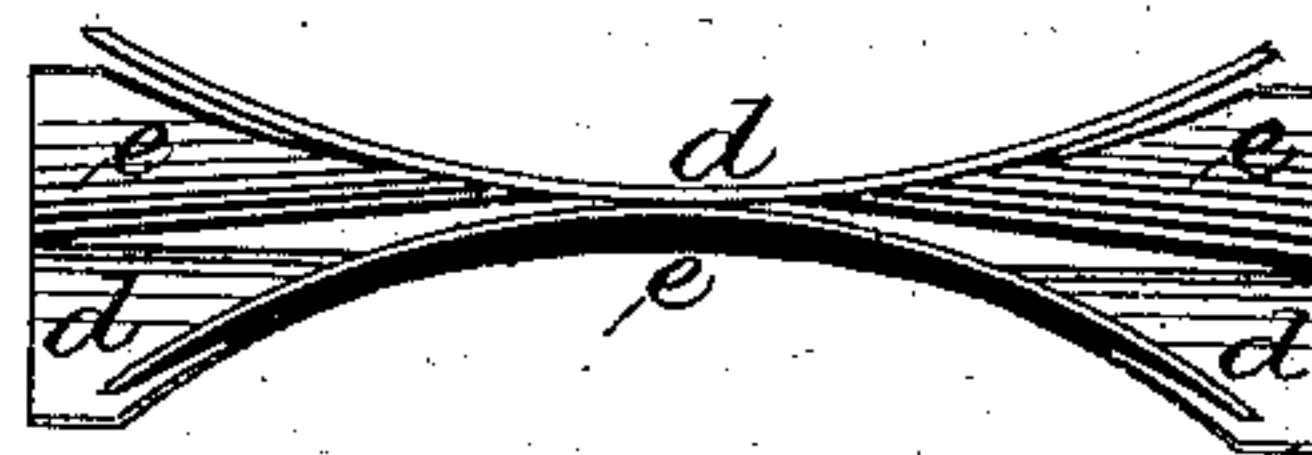


FIG V



WITNESSES

*John C. Laing*  
*St. Rutherford*

INVENTOR

*Walter P. Hansell*  
by *Johnson and Johnson*  
his Attys



# UNITED STATES PATENT OFFICE.

WALTER P. HANSELL, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO GEORGE W. MORRIS, OF SAME PLACE.

## IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. 154,478, dated August 25, 1874; application filed July 3, 1874.

*To all whom it may concern:*

Be it known that I, WALTER P. HANSELL, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Car Springs; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My present invention is an improvement upon a patent granted to me March 17, 1874, which embraces an elliptical or bow spring with four or more bearing-points in pairs, with two opposite such bearing-points of less pitch or curve than the others, the object being to obtain a double spring of each leaf, to increase its capacity and strength, while obtaining a short spring. The particular features of the invention under this patent consist of a spring formed of a pair of steel plates of any shape, split or cut at their edges toward the center, in a manner to form a series of semi-elliptical springs between each split, and grouped together in pairs of different pitch, one high and one low, the surface between the splits forming separate and distinct semi-ellipses, and their unequal pitch obtained by being raised in the middle, so as to give each opposite curved surface of the same plate the same pitch, and to produce one or more pairs of such surfaces higher than the others by sloping them toward the center, so that their bowed edges will be above the plane of the surfaces between the other splits, and in this way give to each plate its group of unequal-pitched semi-ellipses independent of each other, to allow them to be brought into action in pairs under an increased weight. The object and purpose of such construction are to obtain a spring that will be effective in the event any one of the separate semi-ellipses should become broken; to relieve the center of the plate of strain and transfer it to the points of the semi-ellipses; to hold each pair of plates with their bearing-points in place by the unequal pitch of the semi-ellipses, which brings their points so as to in-

terlock; and to lock each pair of springs in place with the others by the matching of their backs, so that a high and low side of each split part will rest upon each other, and thereby form stops to prevent them turning.

In the accompanying drawings, Figure 1 represents an elevation of a spring embracing my invention. Fig. 2 represents a view, in perspective, of a pair of split plates which compose the spring; Fig. 3, an edge view of the same; Fig. 4, a view, in perspective, of one of the split spring-plates; and Fig. 5, a view of two of the plates placed back to back.

The springs are arranged in pairs upon a center rod, *a*, between the usual top and bottom plates *A B*, secured to the bolsters of the cars. These springs are of peculiar construction, consisting of steel plates *b*, split at their edges toward the center at *c*, in a manner to form semi-elliptical springs *d d* and *e e* of unequal pitch, in which the surfaces between the splits *c* form separate semi-ellipses by being raised in the middle, so as to bring each opposite curved surface *d d* on the same pitch, and each pair of such surfaces raised higher than the others, *e e*, by inclining them toward the center and above a horizontal line of the less-pitched surfaces, as shown in Fig. 3. The peculiarity of this construction causes each of the groups of semi-ellipses to yield in the line of its edge, and not toward the center of the plate, so that, notwithstanding each semi-ellipse is a part of the same plate, yet they become separate and independent springs when acting together. These semi-ellipses are paired with high and low pitches—that is, a high and low pitched bow bear together, the latter, *ee*, being below the line of the former, *dd*; and this unequal pitch is made by inclining an equal number of the separate semi-ellipses toward the center above an equal number of straight backs.

By this arrangement only one set of semi-ellipses will be constantly in action, and the other set when the weight is increased, and this space between the points of the semi-ellipses is produced by their different pitch; and when they are put together with the points of a high and low semi-ellipse bearing upon each other, it will bring the other non-acting points in position across the bearing



ones, and thereby form stops to prevent the plates from turning on each other, so that the very positions of the acting and non-acting points serve to keep them in place. So, also, do the unequal pitches of the semi-ellipses serve to keep each pair of springs in place with the others by the high back of one semi-ellipse matching with the low back of the other to bring them flush together, and, acting like shoulders, hold each other from turning, as shown in Fig. 5. The angular form of the center rod also serves to hold the springs in place.

The top and bottom plates are held in place by flanges formed upon the bolster-plates.

The plate may be split and the set of the semi-ellipses made in any suitable way that it will produce the spring described; and any number of plates may be used to form the spring, and any number of these springs arranged together, as may be found desirable.

I claim—

1. A group of semi-elliptical springs in the same plate, split toward its center, and the surfaces between the splits bowed to render their acting points independent of each other, as set forth.

2. A spring-plate having a group of semi-

elliptical springs of different pitch formed between splits therein, in the manner shown and described.

3. Spring-plates having groups of semi-elliptical springs of different pitch, with the semi-ellipses having the greatest pitch matching with those of less pitch in the combined pair of plates, as and for the purpose described.

4. Spring-plates having groups of semi-elliptical springs formed between splits combined and matched, with their acting points crossing those of the non-acting points to hold them in place, as set forth.

5. Spring-plates having groups of semi-elliptical springs of different pitch, with the back of the semi-ellipse having the greatest pitch matched with those of the other plate having the least pitch, whereby the springs are locked in place with each other, all combined as set forth.

In testimony that I claim the foregoing as my own I have affixed my signature in presence of two witnesses.

WALTER P. HANSELL.

Witnesses:

WM. J. LOGAN,

BIDDLE R. HANSELL.