

(No Model.)

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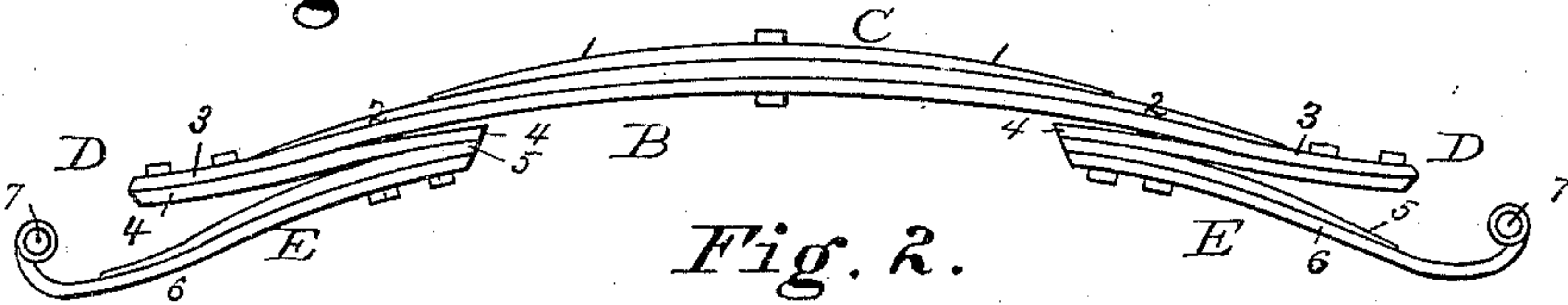
C. A. BEHLEN.

VEHICLE SPRING.

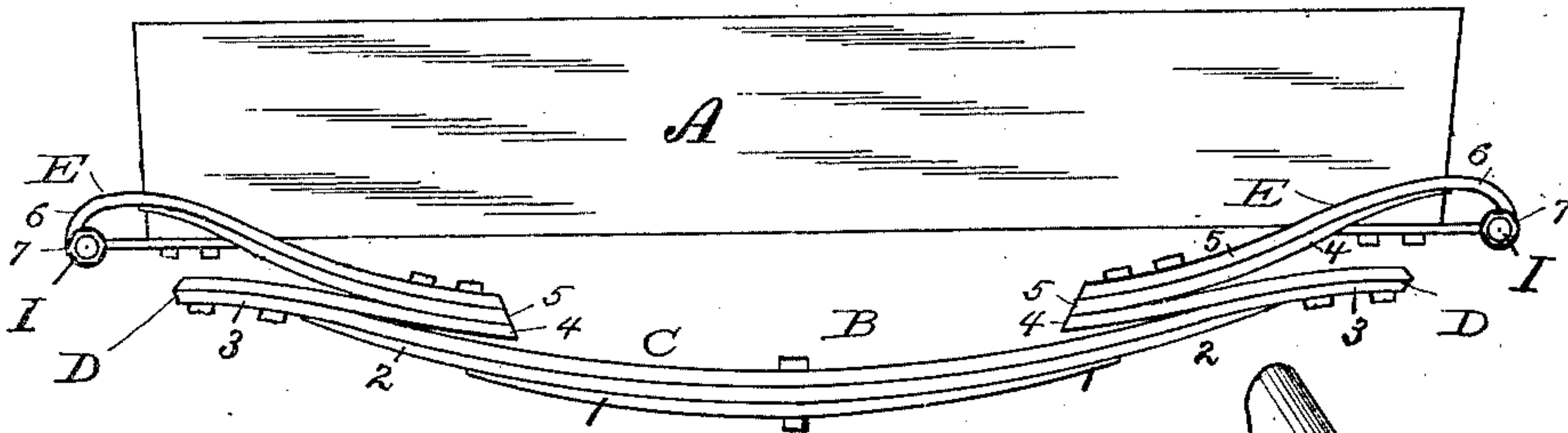
No. 333,588.

Patented Jan. 5, 1886.

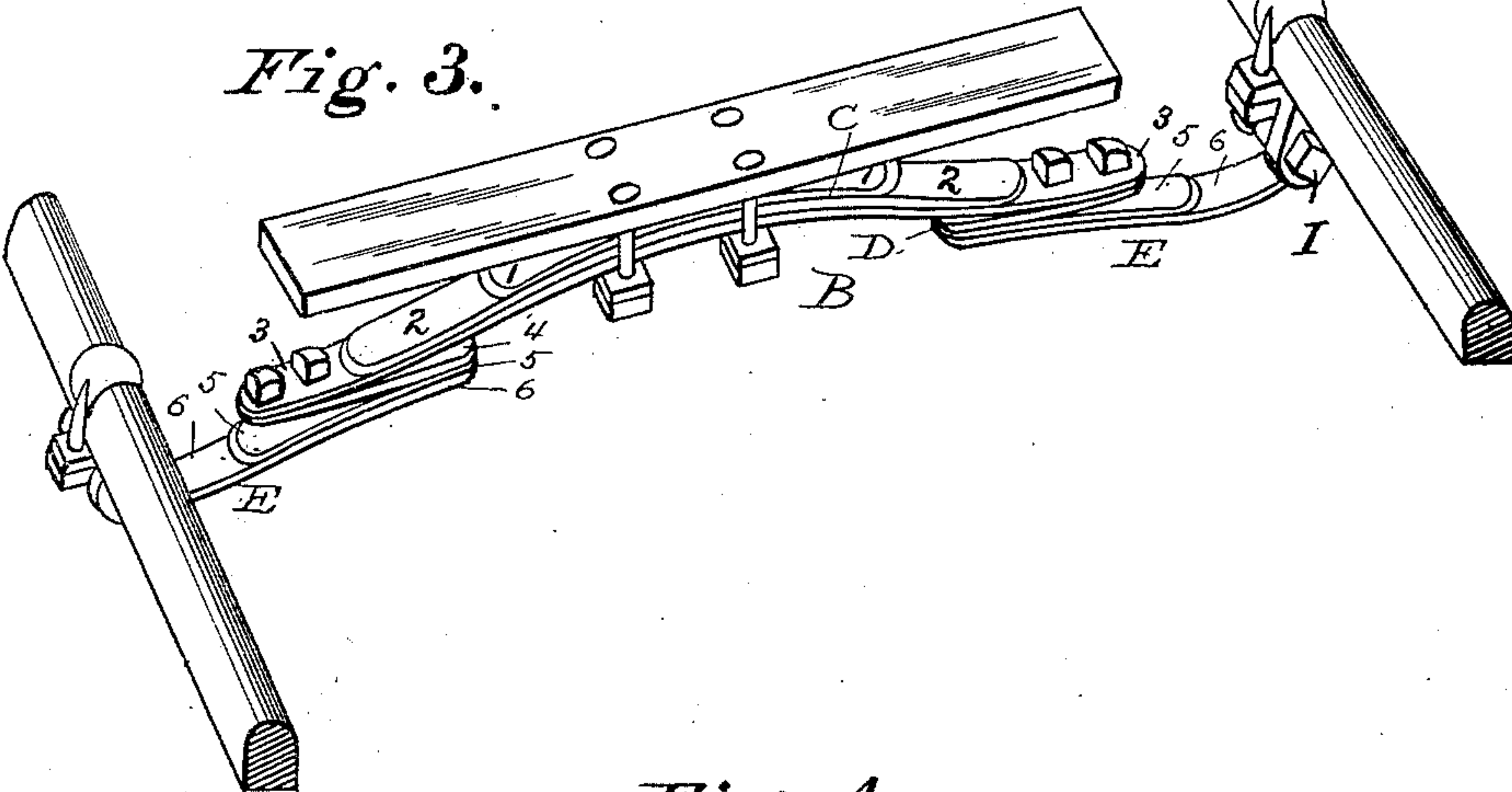
*Fig. 1.*



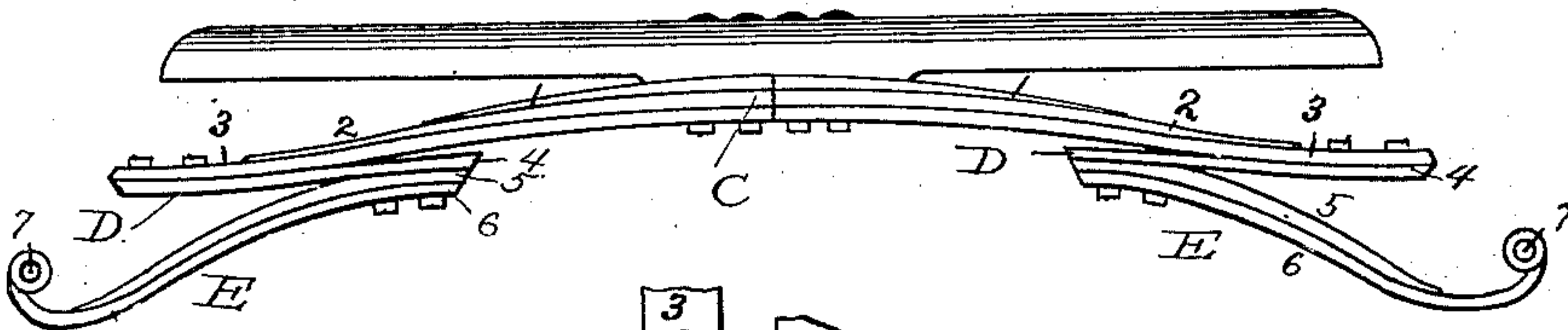
*Fig. 2.*



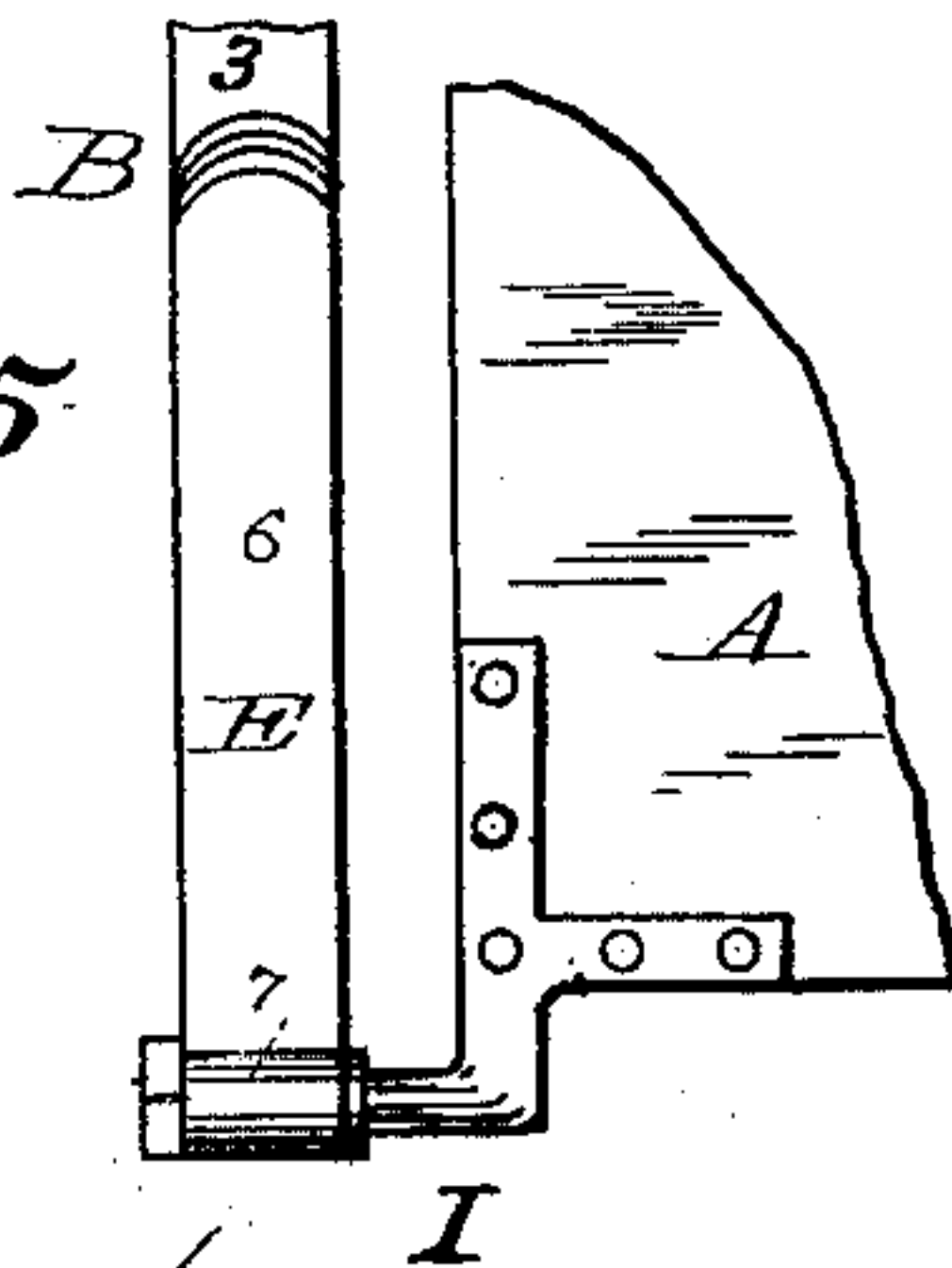
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:

Charles Behlen.  
H. Ellwood Hyman.

Inventor:

Charles A. Behlen,  
by Jere S. Swaling  
Atty.

(No Model.)

2 Sheets—Sheet 2.

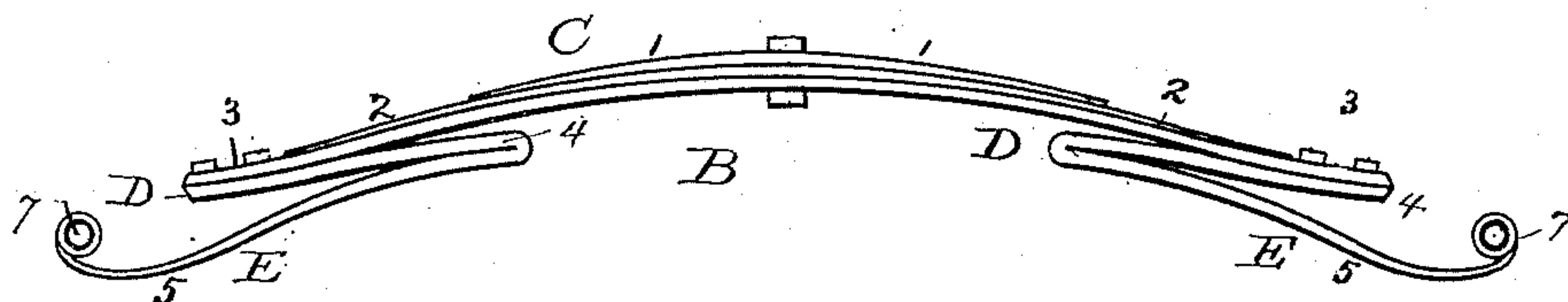
C. A. BEHLEN.

VEHICLE SPRING.

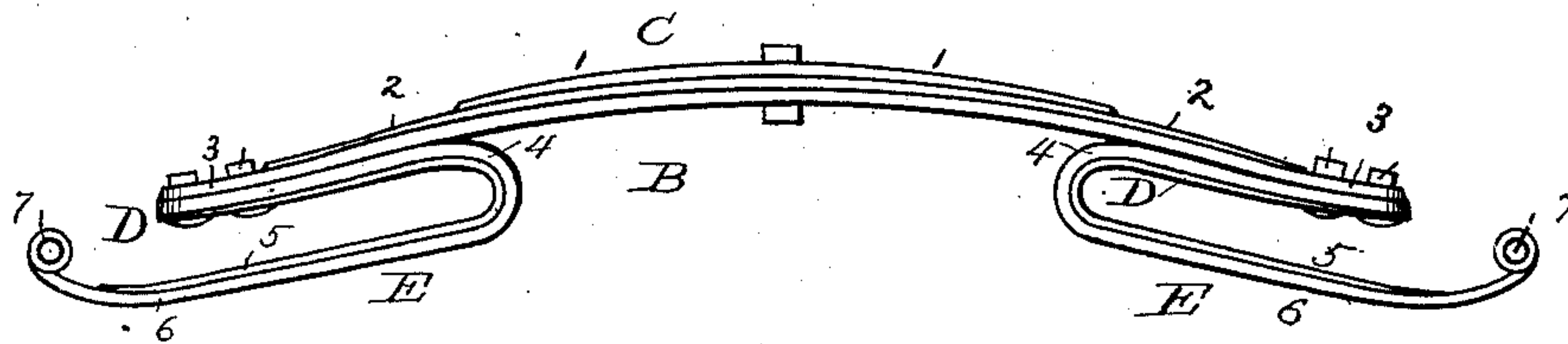
No. 333,588.

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*Fig. 6.*



*Fig. 7.*



Witnesses

*Charles Lehner.*  
*W. Ellwood Hyman.*

Inventor

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# UNITED STATES PATENT OFFICE.

CHARLES A. BEHLEN, OF CINCINNATI, OHIO.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 333,588, dated January 5, 1886.

Application filed September 7, 1885. Serial No. 176,372. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. BEHLEN, a citizen of the United States, residing at Cincinnati, Hamilton county, State of Ohio, have  
5 invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification.

My invention relates to that class of springs known as "elliptic" springs, for use on vehicles, and is designed as an improvement upon that for which Letters Patent were issued to me, bearing date October 21, 1884, and numbered 307,000, the improvements being designed to remedy certain objectionable features  
15 of the former construction, as hereinafter more fully set forth.

In the patent above referred to it is found in practice that the dip of the divided portion is such that it communicates to the outwardly-  
20 extending branches, at their point of attachment to the vehicle, a bounding or rolling movement, which cannot at once be taken up or cushioned. This is specially noticeable in getting in and out of the vehicle, where there  
25 is considerable weight on one side. To avoid this, I make the inwardly-extending branches considerably shorter than heretofore, and instead of running them away from the main upper leaf with a curvature corresponding to the  
30 latter, I extend them inward in contact with or in close proximity to the main leaf for about a quarter of the length of the latter at each end. This is practically a reversal of the former plan, and allows such a leverage to be exerted  
35 from one branch to the other as will at once take up the bounding or rolling motion attending the use of side-bar vehicles. Another great but incidental advantage is the saving of material effected.

40 A comparison of this device with similar springs, and particularly that shown in my patent hereinbefore referred to, will show that the middle inwardly-extending and the lower outwardly-extending leaves require only about  
45 one-half the amount of material necessarily used heretofore. This construction prevents in a great measure the twisting strain exerted upon the side bars of the vehicle, as the leverage of the attaching-leaves is considerably lessened, renders the spring cheaper to make, and  
50 the vehicle low and compact.

In the drawings hereto annexed, Figure 1 is a side view of the improved spring; Fig. 2, a similar view with the spring reversed in position; Fig. 3, a perspective view; Fig. 4, a side  
55 view showing a different mode of attaching; Fig. 5, a view showing the preferable manner of securing the spring to the vehicle, and Figs. 6 and 7 views showing slightly-differing forms of the spring. 60

A indicates a vehicle-body, and B the spring. The spring consists of a main semi-elliptic leaf, C, inwardly-extending leaves D, and outwardly-extending leaves E, as shown in Figs. 1, 2,  
65 3, 4, 6, and 7. Main leaf C consists of three members or plates, 1 2 3, the upper one being shorter than the others, and all bolted together, as usual. To the outer ends of the main leaf C are riveted the shorter leaves D, which usually consist of a single plate, 4, the latter extending inwardly in contact with or in close  
70 proximity to the lower plate, 3, of the leaf C, as clearly shown, for about a quarter of the length of the plate to which it is attached. The plate 4 is nearly straight, being curved slightly to conform to the curvature of leaf C, against which it bears for a portion of its length. To the inner ends of the leaves D are  
75 riveted or otherwise secured the outwardly-extending leaves E, which preferably consist of two plates, 5 and 6, the lower plate, 6, being formed with an eye, 7, to pass over the end of the iron I, secured to the vehicle, as shown in Fig. 5. These outwardly-extending leaves E  
80 extend slightly beyond the main leaf C and intermediate leaf, D, as shown, so as to allow a vertical movement of the body between the side bars when the springs are secured to the side bars at right angles to the latter. It will  
85 also be noticed that the leaves D extend about one-half of the length of the spring, so as to allow the reach to enter between them, as in my former patent herein referred to. 90

In Fig. 6 the inwardly-extending leaf 4 is made integral with the outwardly-extending plate 5 of leaf E, while in Fig. 7 both plates 5  
95 and 6 are bent inward and outward to form the leaves D and E.

While disclaiming, broadly considered, an elliptic spring having its lower leaf or leaves  
100 extending inward toward each other, but separated a distance sufficient to permit the perch

of a vehicle to pass between them when in action, substantially as set forth in my former patent, what I do claim is--

1. In combination with a vehicle-body, the  
5 herein-described spring, consisting of the main semi-elliptic leaf C, the intermediate leaves, D D, attached to the ends of leaf C and extending inwardly in contact therewith or in close proximity thereto, and the leaves E E,  
10 attached at one end to the leaves D D, and at the other ends to the vehicle, substantially as shown and described.

2. The herein-described spring, comprising the main leaf C, having plates 1 2 3, inwardly-extending leaves D, attached to the outer ends 15 of plates 3, and outwardly-extending leaves E, consisting of plates 5 and 6, riveted or otherwise secured to the inner ends of leaves D, as shown.

CHARLES A. BEHLEN.

Witnesses:

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H. E. TURNER.