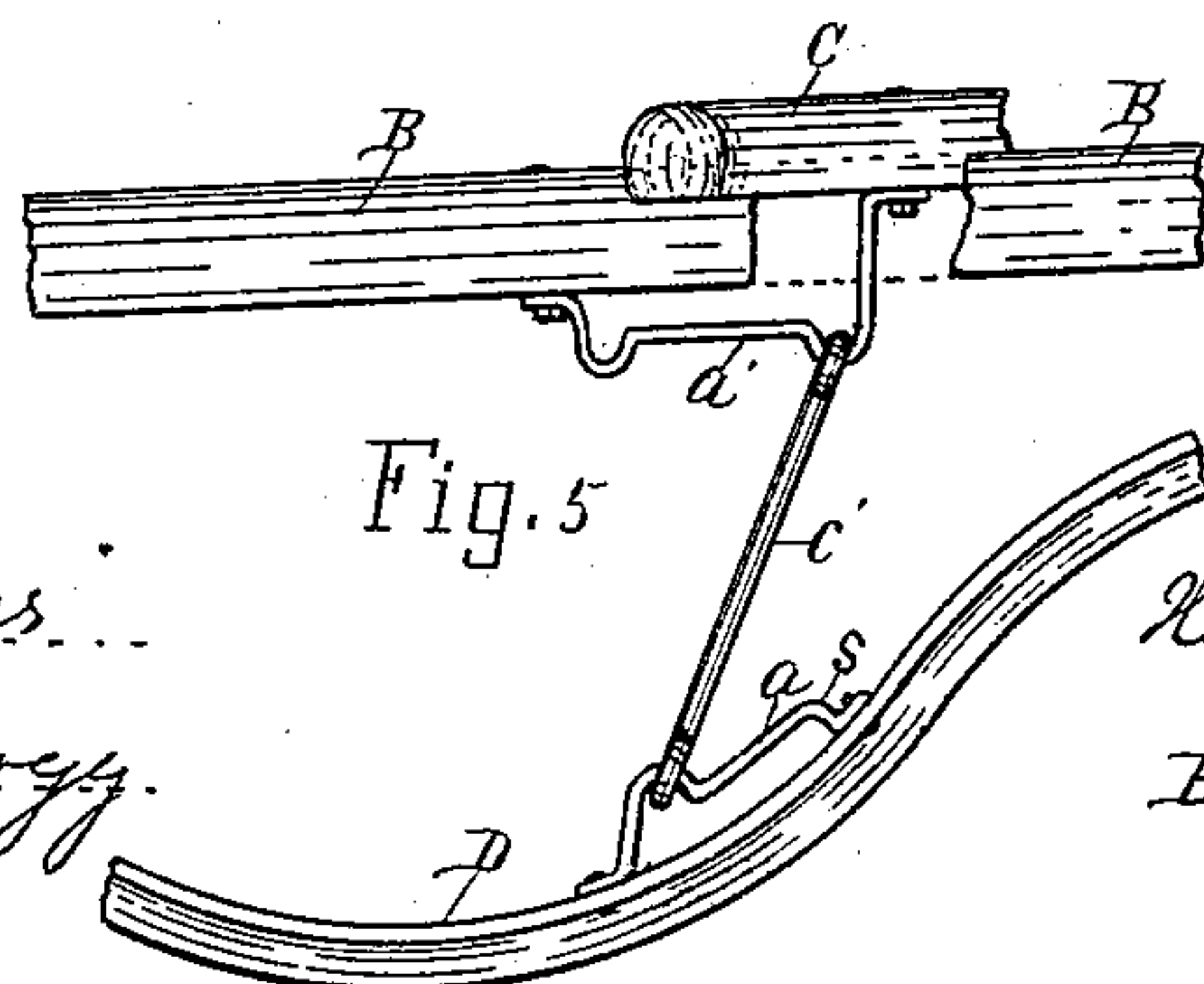
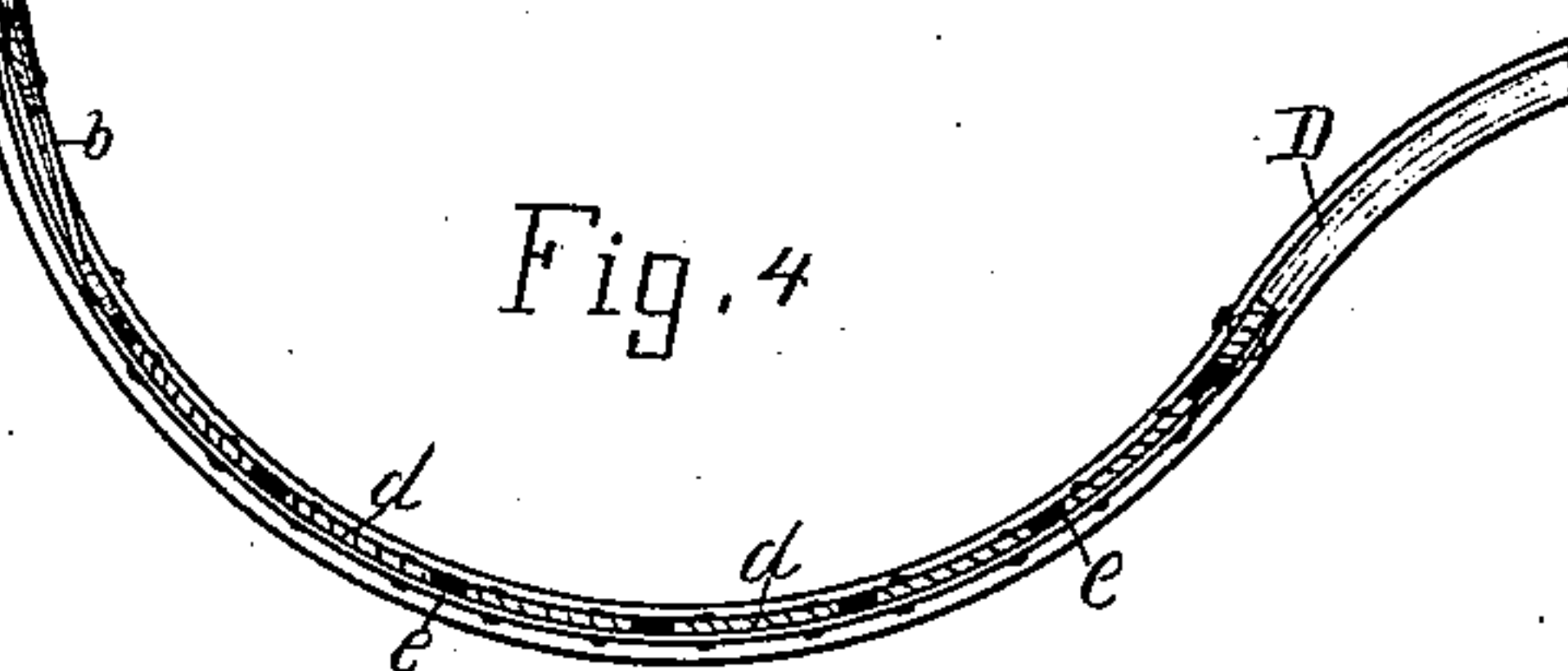
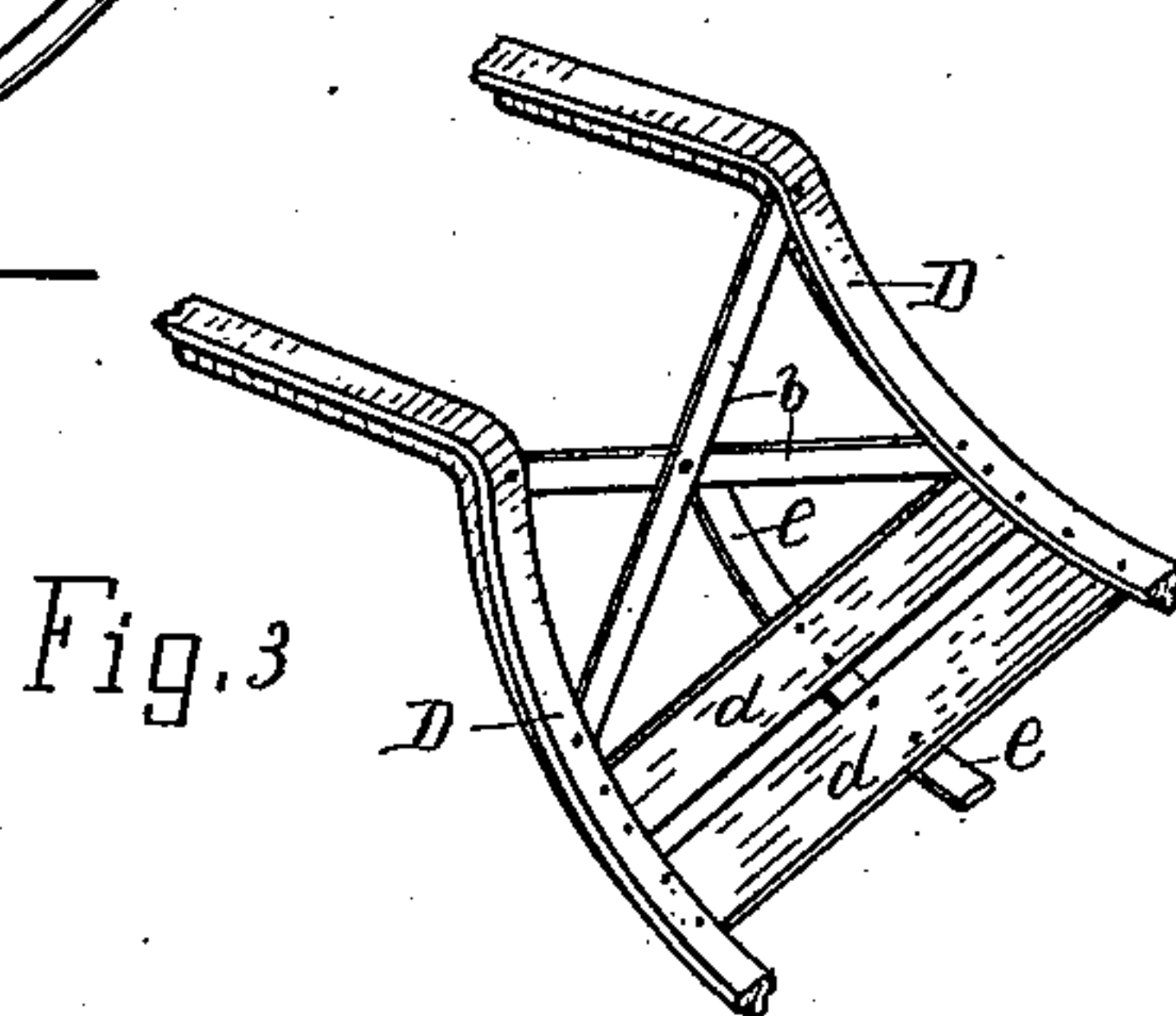
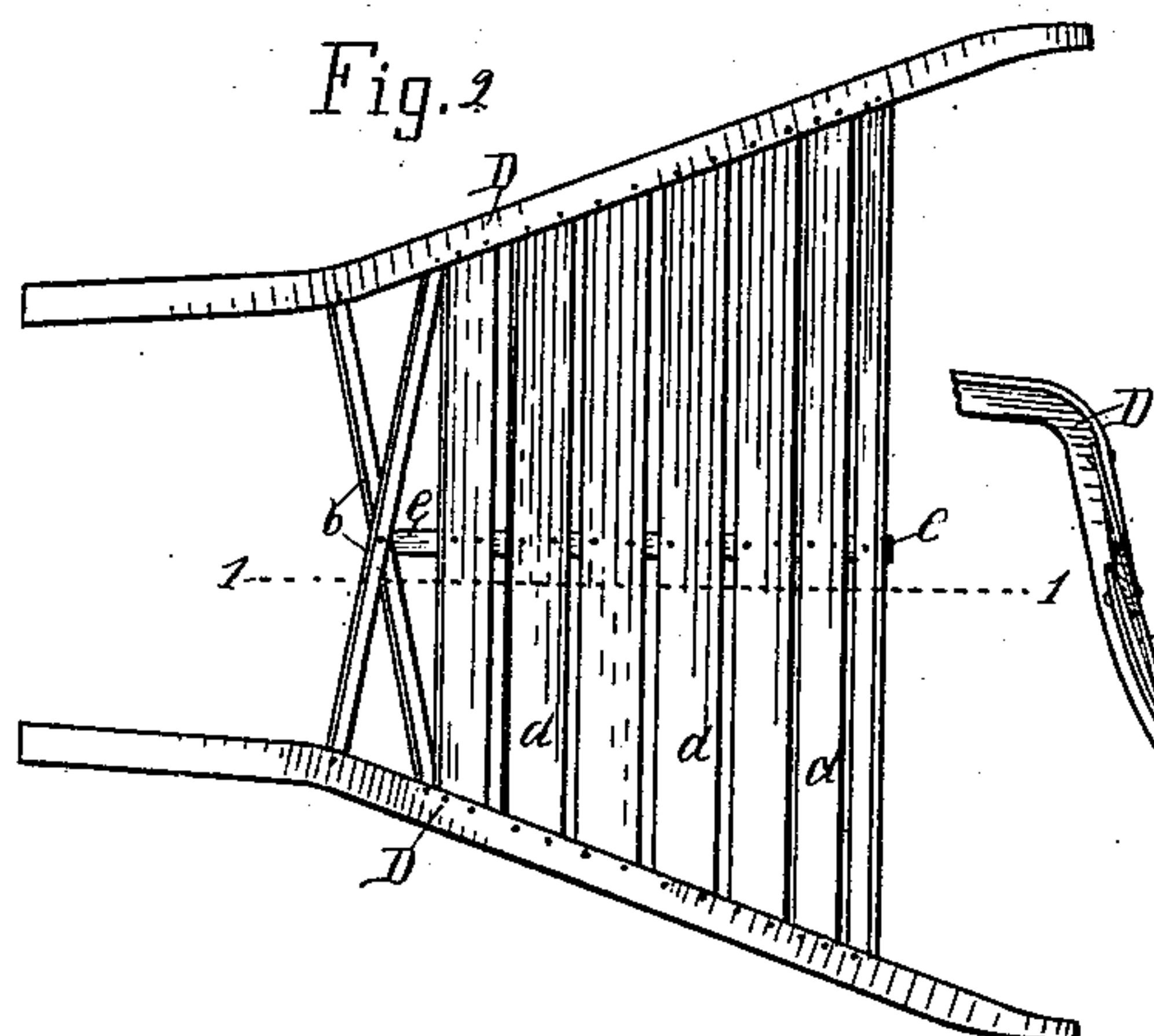
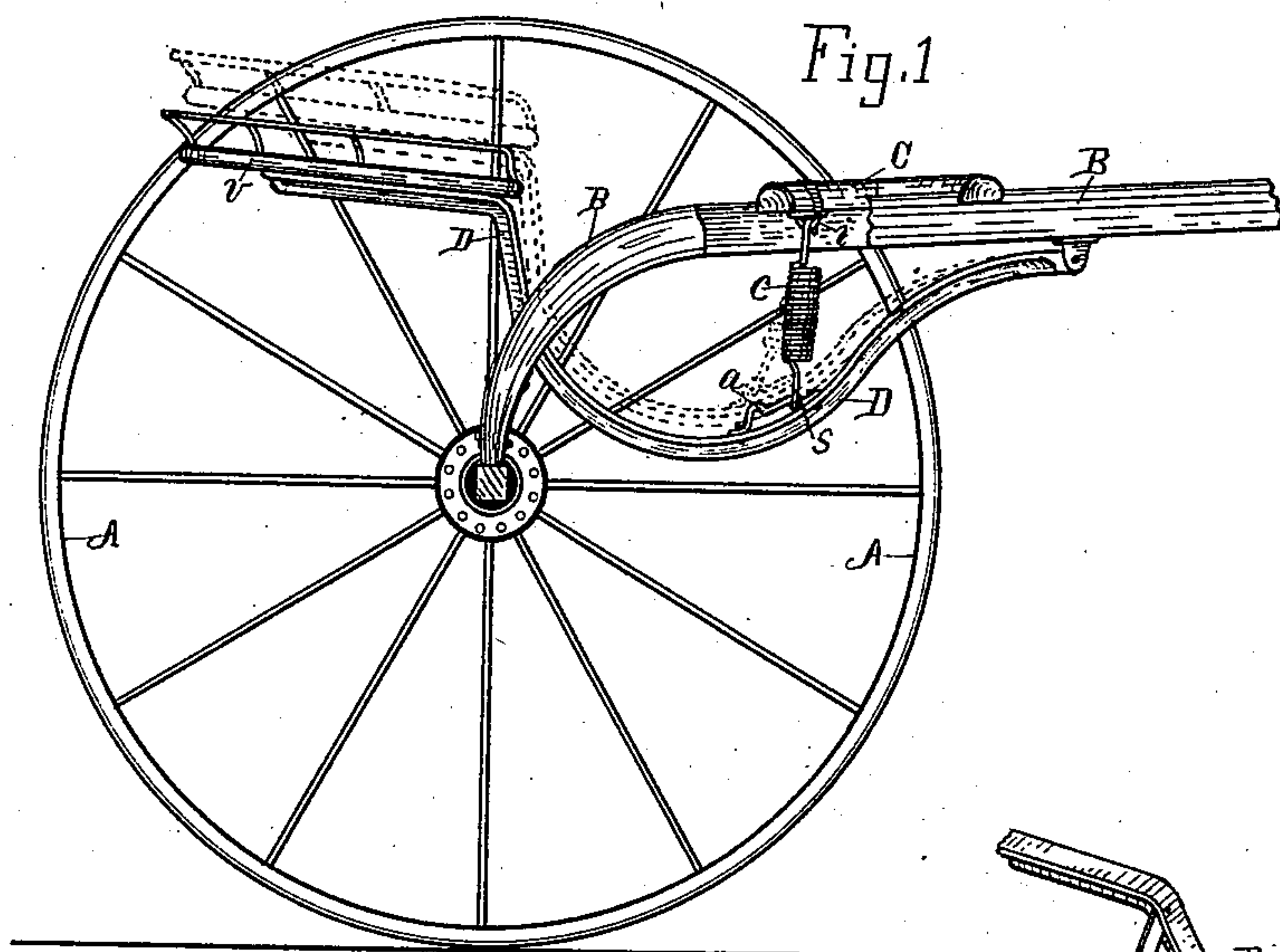


(No Model.)

H. G. M. HOWARD.
TWO WHEELED VEHICLE.

No. 352,870.

Patented Nov. 16, 1886.



Witnesses.

John C. Perkins.

Joseph E Kellogg

Inventor:

Henry G M Howard

By Lucius C. West.

arry

UNITED STATES PATENT OFFICE.

HENRY G. M. HOWARD, OF KALAMAZOO, MICHIGAN, ASSIGNOR OF ONE-HALF TO GEORGE W. MONTGOMERY, OF SAME PLACE.

TWO-WHEELED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 352,870, dated November 16, 1886.

Application filed July 30, 1886. Serial No. 209,504. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. M. HOWARD, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Two-Wheeled Vehicle, of which the following is a specification.

This invention relates to that class of two-wheeled vehicles in which the body is suspended from the thills by rigid or elastic hangers.

The object of the invention is to make the point of attachment of the hangers at one or both ends changeable by the peculiar construction below described and claimed, so as to regulate the leverage for light and heavy persons.

A further object is to construct an improved bottom to the body.

In the drawings forming a part of this specification, Figure 1 is a side elevation; Fig. 2, a plan of body; Fig. 3, a broken rear portion of the body in perspective; Fig. 4, a section on line 1 1 in Fig. 2; and Fig. 5, enlarged broken details from Fig. 1, showing additional elements and changes, all below described in detail.

Referring to the letters of reference marked on the drawings, D is the body, pivoted to thills B at forward end in ordinary manner. v is the seat, Fig. 1. One wheel, A, is removed in this figure.

The elastic hanger c in Fig. 1, attached at the upper end by joint i to the cross-bar C of the thills, is the hanger disclosed in a patent to me dated May 4, 1886, No. 341,144. In the use of these hangers I find it desirable to make their point of attachment with the body or with the thills, or both, adjustable backward and forward, so as to change the leverage which the weight of the rider exerts on the springs. This changing of the point of attachment of the hanger to effect the leverage will be understood from disclosures in the prior state of the art; but the means I employ are substantially different. I effect this by means of the coupling a or a', elongated in the direction of the body lengthwise, and provided with a series of loops or kinks. The coupling may be secured to the body D, or to the thills or cross-bar, or to the thills and body both, as in Fig. 5. The eyed end of the hanger is at-

tached to the coupling, and is movable backward and forward thereon. The eye of the hanger (or its equivalent, a hook) catches into the loop of the coupling. (Clearly shown in Fig. 5.) The couplings here shown have two loops, one at each end; but as many loops may be employed as desirable. The coupling a on the body has only one clearly-defined loop; but the forward end, where it angles down to attach to the body at s, forms the other loop or kink, the same being effectual, because the coupling from this point inclines downward, owing to the angle of that part of the body where the coupling is attached.

By changing the point of attachment of the lower end of the hanger to the rearward the weight of the rider exerts less leverage power on the spring. The same is true if the upper end of hanger is moved back. If both ends are moved back, the weight of the rider has less effect on the spring. The angle at which the spring is located when receiving the leverage strain may be also fixed as desired.

The non-elastic or rigid hanger is shown at c' in Fig. 5. In such instances the body would receive its elastic effect from springs at the forward or rear end of body, or both. The hanger c' may be attached at its upper end to a suspending-spring, and then be attached at the lower end with coupling a; but all the uses of or instances in which these couplings may be employed in connection with varying arrangements of hangers and springs need not be herein enumerated.

Referring to Fig. 1, the adjustment is for a light-weight person. By swinging the lower end of the hanger c into the rear loop the adjustment will be, as indicated by dotted lines, for heavier persons.

A peculiar coaction of the coupling and the hanger c is that the body may be raised quickly, and the lower ends of the hangers will fly forward to the point s themselves, owing to the elasticity of the hangers, thus making a speedy adjustment. The bottom and forward portions of the bulge of the body have the ordinary cross-slats, d d, transversely from one bar to the other of the body. These bars here shown are made from T metal. A longitudinal central slat-support is shown at e secured to the slats. I find the body is not properly

braced by the transverse slats alone, the side bars being liable to cant out of true position with each other. This is obviated by the X-brace between the rear slat *d* and the seat. 5 This brace *b* also fills the open space at this point cheaply. The rear end of the central support, *e*, is extended upward, and is secured to the bars of the brace *b* at the point where they cross each other. The ends of the brace 10 *b* are bolted or riveted to the side bars of the body. This secures a successful brace to the body-bars and a more firm support to the center of the slats *d*. The entire bottom, slats, brace, and support are metal; but this is a 15 matter of choice.

Of course the design is to employ hangers and couplings on both sides of the body, substantially as set forth in the illustration and description of one side.

20 I am aware of a disclosure in the prior state of the art showing a hanger-coupler having a series of holes, into any desired one of which holes the lower end of the suspending-hanger is inserted and secured by nuts or the like to 25 change the height of the body. Another disclosure shows a suspending-link insertible into any desired one of a series of notches in a casting on the under side of the seat-bar for the purpose of changing the height of the seat; 30 hence I disclaim these plans of carrying into effect the principle disclosed in this application.

Having thus described my invention, what I claim as new is—

1. In a two-wheeled vehicle, the combination 35 of a suspended body, thills, the elongated hanger-couplings provided with a suitable number of loops, and hangers having the end loosely surrounding the looped bar of the coupling and movable on said bar in adjusting from 40 one loop to another, substantially as set forth.

2. The combination of the thills, the suspended body, the elongated hanger-couplings having a suitable number of loops, and the spiral-spring hangers, substantially as set 45 forth.

3. The body composed of side bars, the transverse slats, the crossed bars forming a brace to the side bars, and a longitudinal slat-support secured to the brace-bars where they cross 50 each other, substantially as set forth.

4. The vehicle-body provided with the X-brace between the seat and rear foot-slat, substantially as set forth.

In testimony of the foregoing I have here- 55 unto subscribed my name in presence of two witnesses.

HENRY G. M. HOWARD.

Witnesses:

JOSEPH E. KELLOGG,
EDWARD B. VINCENT.