

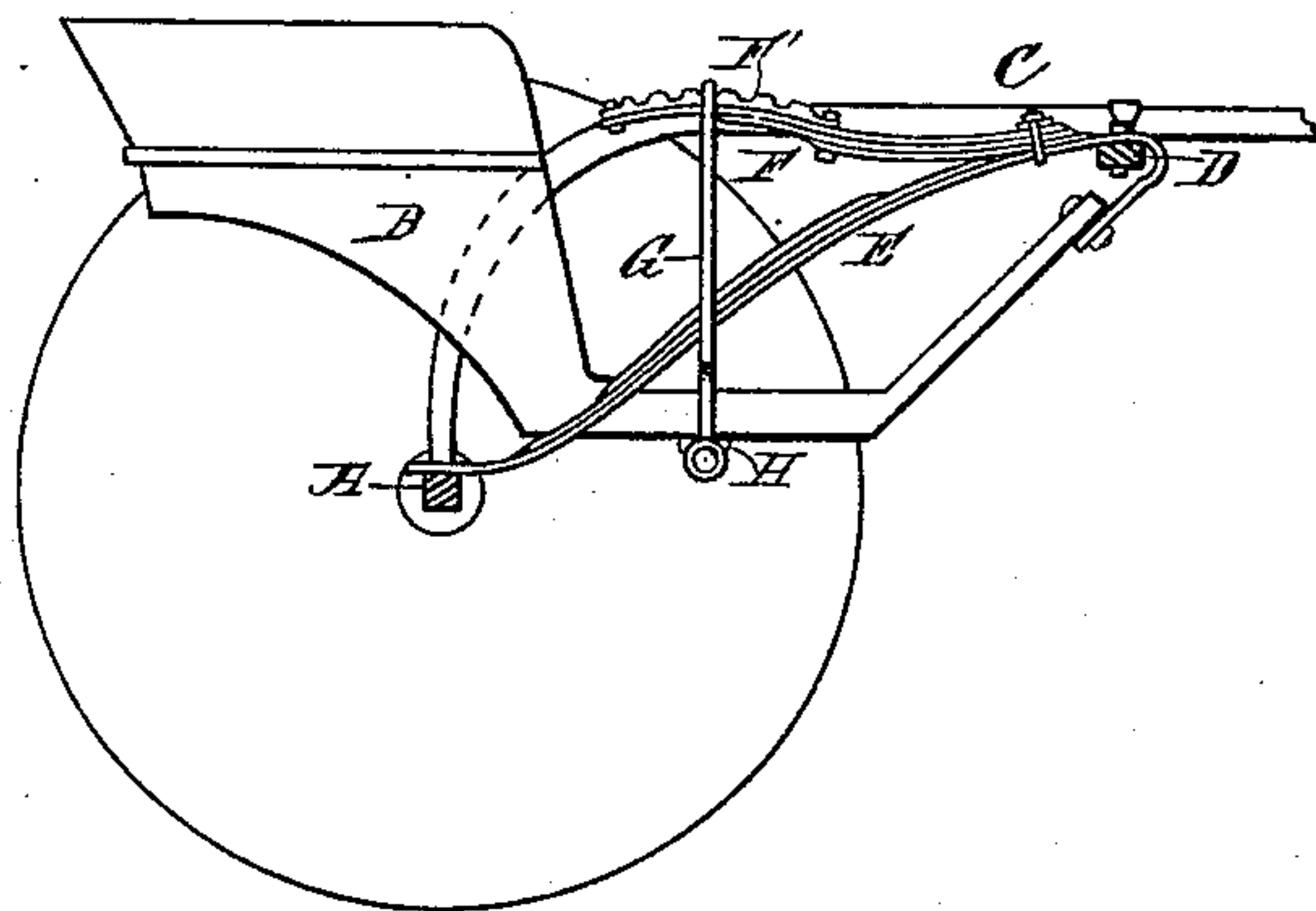
(No Model.)

D. N. KRATZER.  
TWO WHEELED VEHICLE.

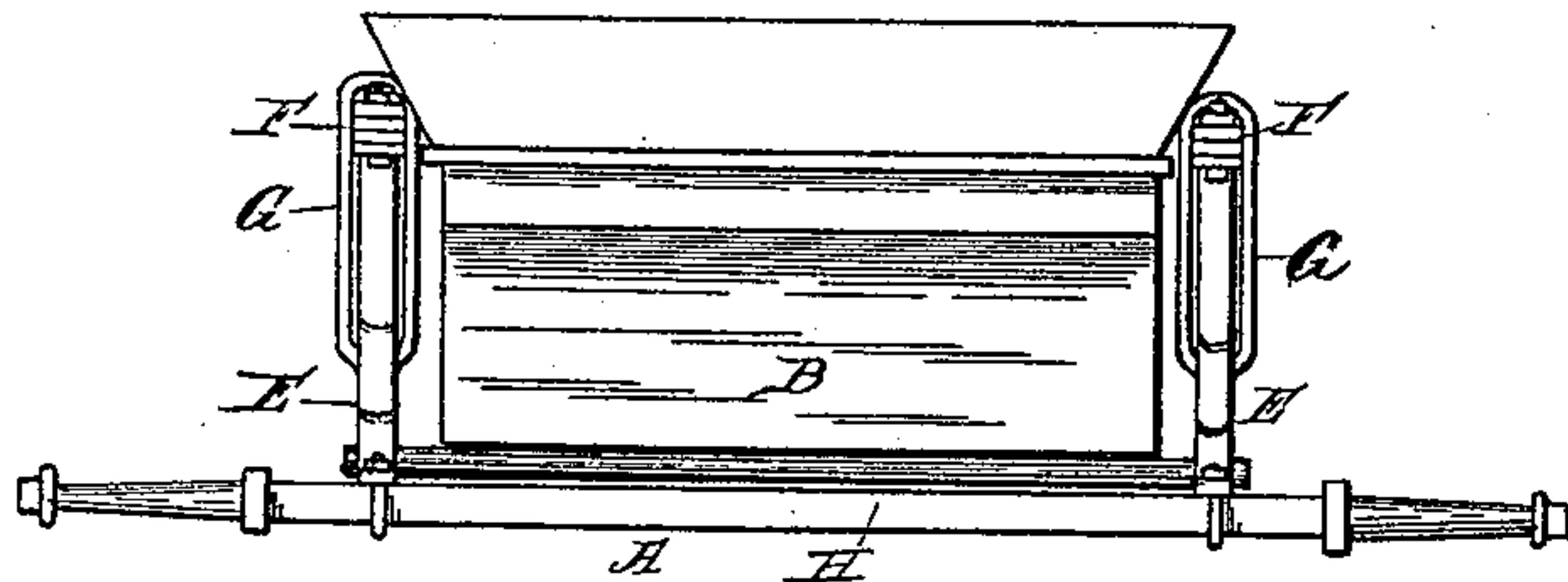
No. 450,414.

Patented Apr. 14, 1891.

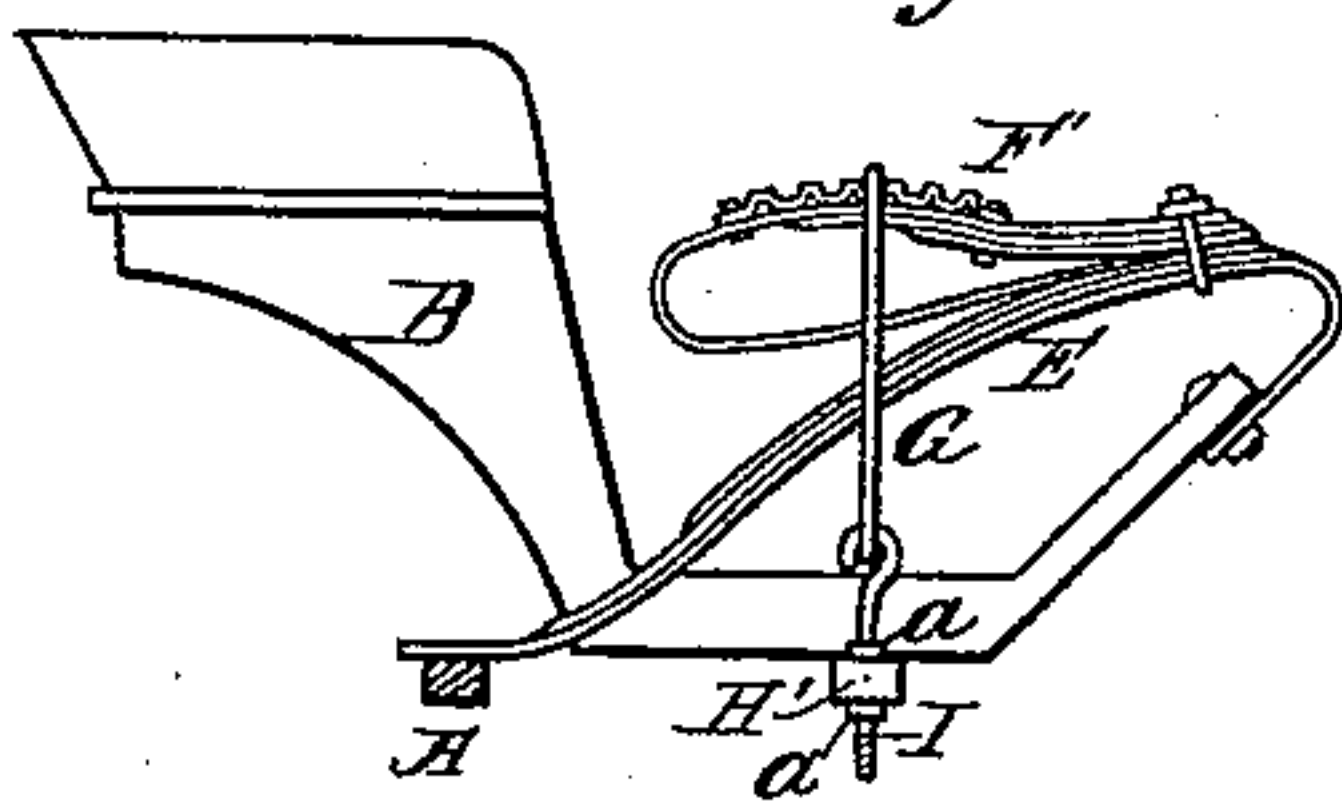
*Fig. 1.*



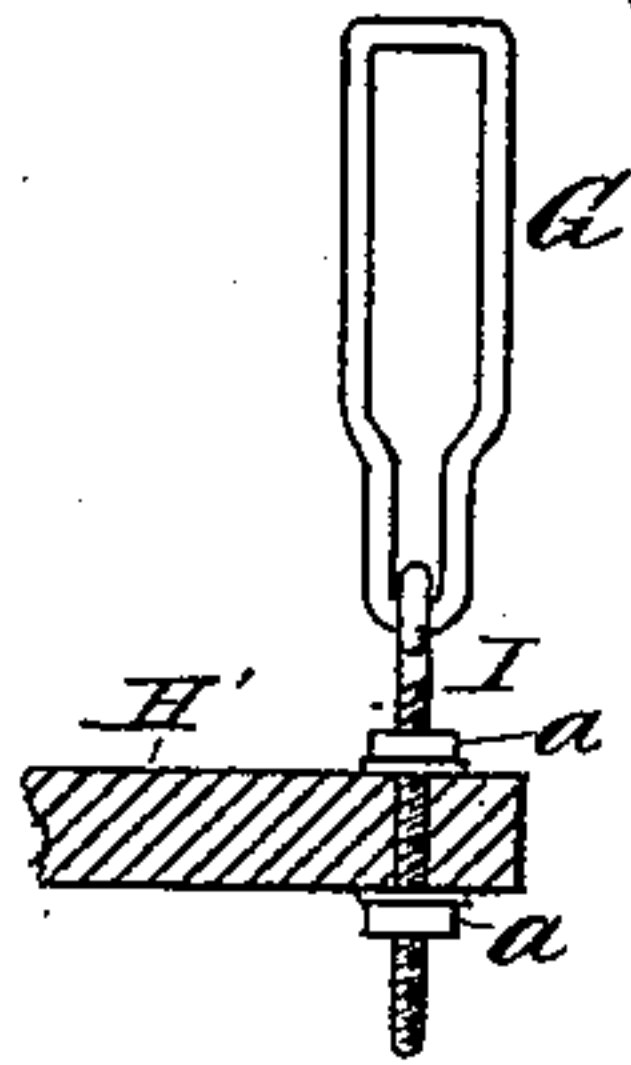
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

DAVID N. KRATZER, OF MARION, IOWA.

## TWO-WHEELED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 450,414, dated April 14, 1891.

Application filed October 6, 1890. Serial No. 367,223. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID N. KRATZER, a citizen of the United States, residing at Marion, in the county of Linn and State of Iowa, have  
5 invented certain new and useful Improvements in Two-Wheeled Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it  
10 appertains to make and use the same.

The object of this invention is to secure a more perfect mounting and adjustment of the body of a two-wheeled vehicle than hitherto and by means of simple and inexpensive de-  
15 vices.

The invention consists in the construction, combination, and arrangement of parts, as hereinafter fully set forth and claimed.

In the accompanying drawings, forming a  
20 part of this specification, Figure 1 is a side elevation of a vehicle embodying my invention in a simple form. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation of a modified form of the same, and Fig. 4 is a  
25 rear elevation of the body-supporting stirrup and a portion of its connected bar.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A is the axle, B  
30 the body, and C the thills, of a two-wheeled vehicle of a common and well-known type. The thills are connected by the usual cross-bar D. The body is supported on springs E F. The former of these extends from the cross-bar D,  
35 to which it is connected by a bolt or clip to the axle, on which it is free to play, according as it elongates or shortens by the changes in its curvature. An improvement in this spring consists in carrying the front extremity  
40 of one leaf over and under the cross-bar and running the under end backwardly a short distance and connecting it with the front end of the body B. By this means I am able to attach the body rigidly to its support at the  
45 front end, the loop formed in the spring being sufficiently flexible to allow the necessary movement of the body back of that point. The practical result is to give the parts great stability and durability at this point and to  
50 avoid the rattle incident to loose connections, such as shackles and the like.

To the upper side of the spring E is attached

a short rearwardly-extending spring F, and from this spring—one of which is provided for each side of the vehicle—depends a stir- 55  
rup G, connected at the lower end with a bar H, passing under the body and preferably immovably attached thereto. To the upper side of the spring F is attached a corrugated or notched plate F', in the notches of which the 60  
looped upper end of the stirrup rests. The lower extremity of the stirrup has a pivotal connection with the body to allow for the shifting of the upper end in the notches referred to. This may be done by pivoting the 65  
stirrup itself on the bar H, as indicated in Fig. 1, or by connecting it with an eye or hook bolt I, secured in said bar, as in Fig. 3. This admits of the stirrup being shifted on the sup-  
70 porting-spring, whereby certain important advantages are secured over that construction in which the adjustment is made by a bail pivoted in the springs and shifted along the under side of the body.

It will be noticed that the rear portion of 75  
the spring F is curved upwardly, and this curve is made the arc of a circle of which the pivotal point of the stirrup is the center. This admits of the stirrup being shifted to any notch without changing the relative position 80  
of the body. It is to be understood that this feature is not absolutely necessary, but it is desirable for the reason just stated. It will further be seen that the hook-bolt (shown in Fig. 3) is made with a long threaded end and 85  
is provided with nuts *a a*, whereby it may be adjusted in the bar H', which is preferably of wood, and the height of the body regulated thereby. This construction is preferred to the simpler one shown in Fig. 1, which admits 90  
of no vertical adjustment. By this construction I secure an adjustment of the body-support of the vehicle, according to the weight thereon, and at the same time am able to balance the load with respect to the thills. It 95  
will be observed that with respect to the load solely considered the points of leverage are the connection of the body with the thills or cross-bar, the connection with the stirrup, and the connection of the stirrup with the springs. 100  
Now by shifting the upper end of the stirrup backwardly toward the end of the spring a soft and easy resistance of the spring is secured adapted to a light load, and conversely,



as the stirrup is shifted to the forward position, a hard and comparatively short spring is provided against a heavy load; but while thus adjusting the vehicle to the requirements of the occupants the position of the fulcrum with respect to the seat or body of the vehicle and the thills is not changed—that is to say, the lower fulcrum is not changed, but the upper one (the leverage as to the thills being compound) is shifted, and this in a manner to balance the vehicle, whether the load be heavy or light. For example, it may be supposed that the vehicle, as illustrated in Fig. 1, is balanced for a weight of one hundred and fifty pounds. For double that weight the stirrups would be moved forward to, say, the first notch and for a less weight would of course be set correspondingly backward. Consequently the center of gravity, as respects the load and the forward support of the thills, is the resultant of the leverages brought to bear upon the two fulcrums and lies somewhere in the line of the stirrup. So in the case of a heavy load the center of gravity is carried forward and in the case of a light load it moves backwardly, and therefore the heavier load, instead of tending to lift up on the belly-band of the harness, tends to bear down on the back-band or saddle. By a similar process of reasoning it will appear that where the bail is pivoted to the spring at a single point and shifted along the under side of the body the effect above noted is precisely reversed. The advantage gained by this relative shifting of the fulcrum forward with the heavier load is an important one and of great practical value in the adjustment of this class of vehicles. It will be further noted that this construction admits of one or both stirrups being shifted at pleasure. Consequently when two persons of unequal weight occupy the seat the stirrup on one side may be shifted to one position for the lighter person and to a position of less leverage on the spring for the heavier one, and thus the lateral position of the body be nicely equalized and adjusted.

An improvement in the construction of the spring F is shown in Fig. 3. This consists in bending the rear end of the spring under and backwardly and placing it on the spring E for additional support. This admits of the spring F being of lighter material than if only attached at the forward end, and it is

correspondingly cheaper as well as neater in appearance.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a two-wheeled vehicle, the combination, with the body connected with the cross-bar at the front end and suspended back of that point from supporting-springs, of rearwardly-extending springs with a notched or corrugated plate on top, a pair of stirrups engaging at their upper ends with said notches, and a connection at the lower ends with said body, whereby the adjustment of the stirrups for additional load tends to throw the center of gravity forward, substantially as described.

2. In a two-wheeled vehicle, the combination, with running-gear, substantially as described, of springs extending from the front cross-bar to the axle, supplemental springs connected at the forward end with said former springs and extending backwardly at a diverging angle therefrom and having corrugated or notched adjusting-plates thereon, stirrups depending therefrom and adapted to adjust therein, and a body suspended by said stirrups near the middle and from the cross-bar at the front end, substantially as and for the purpose set forth.

3. In a two-wheeled vehicle, the combination of a continuous spring extending from the axle to the front cross-bar and having the forward end bent under said cross-bar and extending backwardly, and a body having a rigid connection with the front terminal of said spring, substantially as and for the purpose set forth.

4. In a two-wheeled vehicle, the combination of springs extending from the front cross-bar to the axle, supplemental springs connected with said former springs near the forward end and extending backwardly with a return bend resting thereon, a notched or corrugated adjusting-plate on said supplemental springs, and adjustable stirrups engaging with said notches and adapted to support the body, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID N. KRATZER.

Witnesses:

L. A. ST. JOHN,  
S. W. BRAINERD.