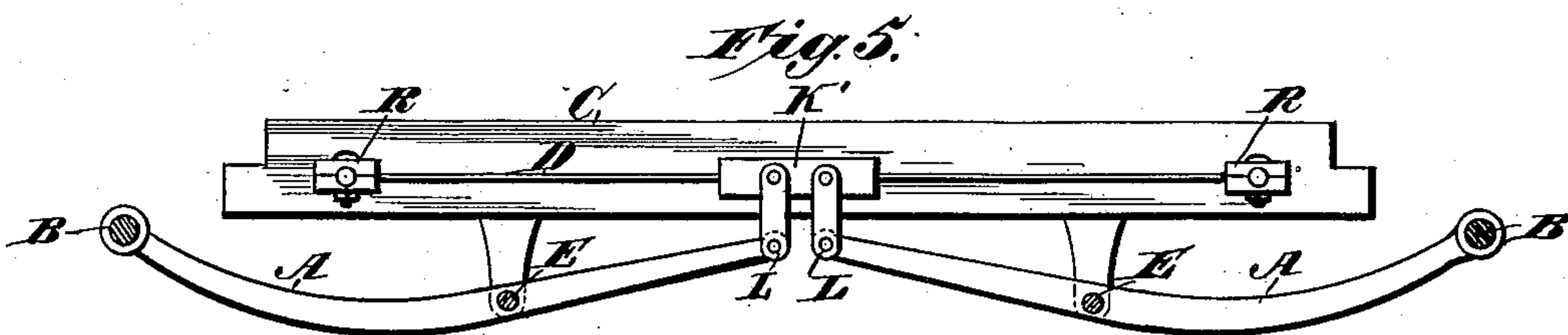
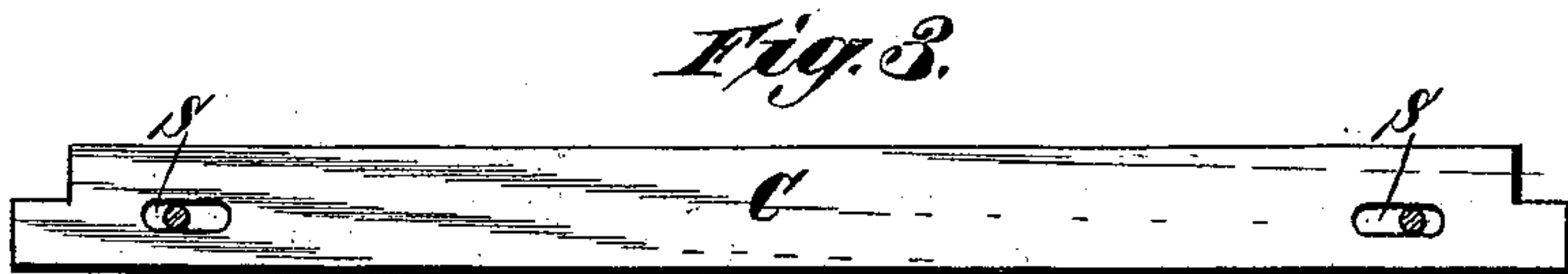
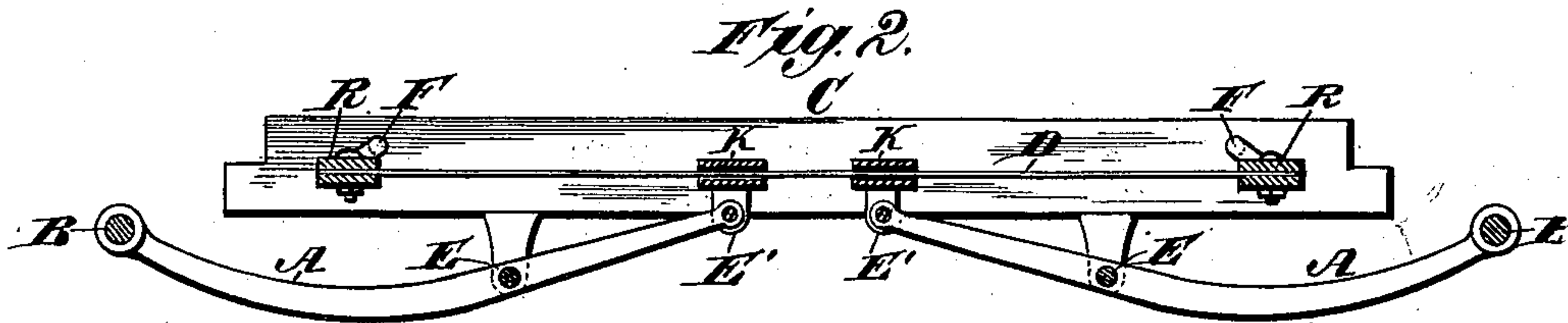
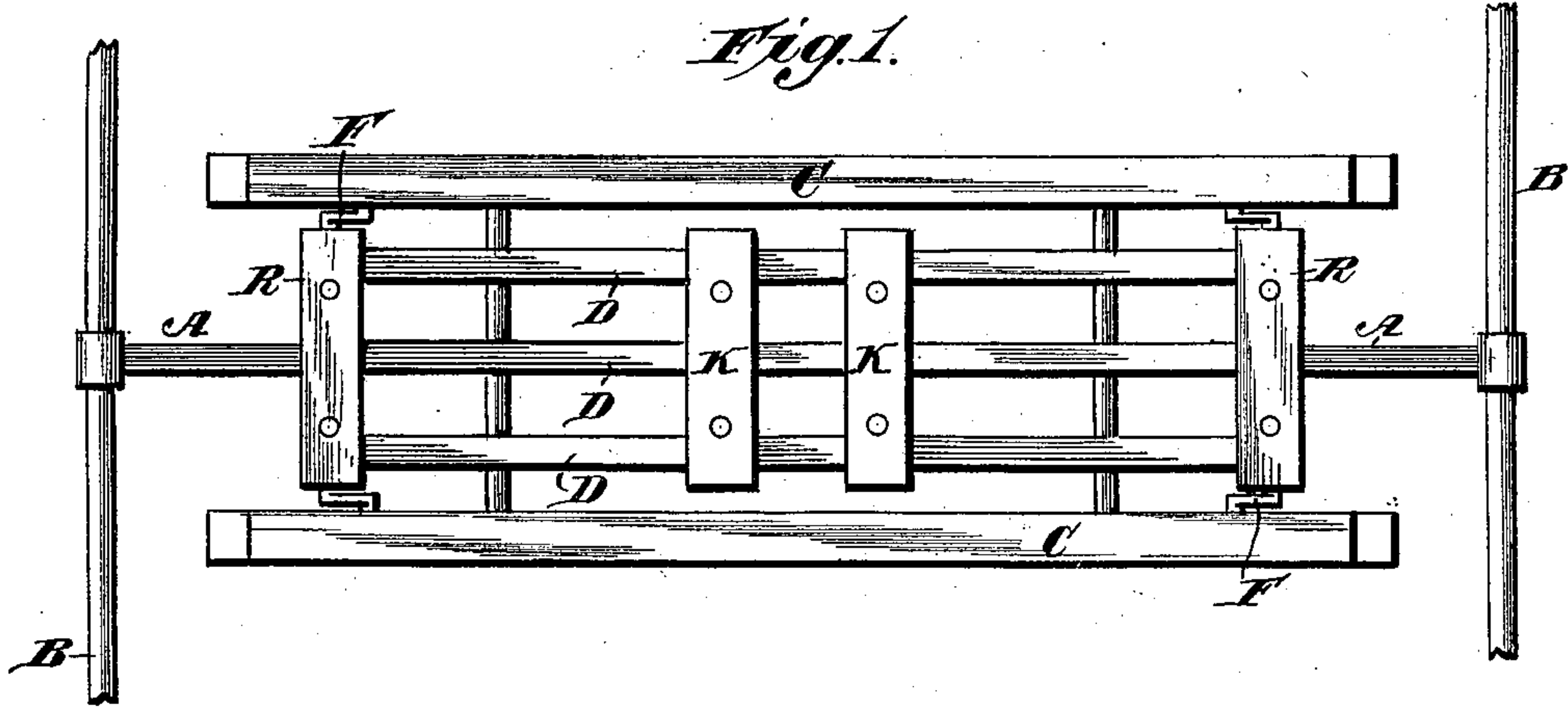


(No Model.)

S. H. RAYMOND.
VEHICLE SPRING.

No. 404,560.

Patented June 4, 1889.



Witnesses,
Robert G. Smith,
J. A. Rutherford.

Inventor,
Silas H. Raymond,
By Edward Taggart
Atty.

UNITED STATES PATENT OFFICE.

SILAS H. RAYMOND, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO GEORGE E. RAYMOND & CO., OF SAME PLACE.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 404,560, dated June 4, 1889.

Application filed March 2, 1889. Serial No. 301,782. (No model.)

To all whom it may concern:

Be it known that I, SILAS H. RAYMOND, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification.

This invention relates to a spring-connection to the body of a vehicle, and to arms which are designed in whole or in part to support the vehicle-body, as more fully described below; and the objects of my invention are, first, to construct a spring which is a perfect equalizer, preventing tipping or rocking of the body; second, to so construct the same that it can be readily applied to any kind of vehicles; third, to give durability and efficiency to the spring and attaching parts and provide for the ready and cheap replacement of any part in case of breakage. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my newly-invented vehicle-spring and a portion of the vehicle-body to which it may be attached. Fig. 2 is a longitudinal sectional view taken through the shackles. Fig. 3 is a side elevation of one of the body-pieces C, showing a modified form of attachment of spring-shackle. Fig. 4 shows a modified form of the spring, and Fig. 5 shows a modified form of the attachment to the arms.

Similar letters refer to similar parts throughout the several views.

In the drawings, C C are timbers forming a part or attached to the vehicle-body in any suitable manner. Attached to the timbers C C are two shackles. (Shown by R R.) These I prefer to attach by means of a short arm, (shown by F F,) in order to allow a swinging motion to the shackles; but instead of using the arms F F the shackle may have a journal or stud at either end, supported in a slot, as shown in Fig. 3 by S S, which method of support will allow the shackles to adjust themselves as the springs are acted upon. The spring, which may consist of one or more spring-bars, is securely connected at each end to the

shackles R R. In Fig. 1 of the drawings I have shown three rods or bars D D D extending from R to R. The form of the bars is immaterial so long as the spring spans the space between the shackles R R.

Fig. 4 shows a form of leaf-spring which I deem peculiarly adapted to my invention, as it contains strength and elasticity. I prefer to construct each of the shackles R R in two parts and to clamp the ends of the spring between such parts by means of bolts. Near the center of the spring D, I provide two shackles K K, secured upon the spring, preferably made to have a small sliding motion thereon. A A are two arms pivoted to the vehicle-body at E. The inner ends of the arms A A are pivoted to a lug E' on the shackle K, and the outer ends of the arms are supported by the side bars B B, as shown in Fig. 1.

Instead of using the two sliding shackles K K, a double shackle, provided with two links connecting the shackle to the arms A A, may be used, as shown in Fig. 5, in which figure I have shown the center shackle by K' and the connecting-links by L L. By this construction the shackles would not slide on the spring, as the links would allow for full play for the arms. I deem this form peculiarly adapted to the use of a leaf-spring.

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

1. In a vehicle, the vehicle-body, two arms, each pivoted to the vehicle-body at a point near the center of said arms, two side bars supporting the outer ends of such arms, a longitudinal spring, a movable shackle at each end of the spring and connected to the vehicle-body, and two center shackles, each of which center shackles is secured to the spring between the end shackles and pivoted, one to the inner end of each arm, substantially as described.

2. In a vehicle, the combination of the vehicle-body, two movable shackles supported by the vehicle-body, a spring with each end secured to one of these shackles and spanning the space between such shackles, two arms, and two side bars, each arm attached at its inner end to the spring near the center of

said spring and at its outer end to a side bar, and supported at a point between its inner and outer ends on a pivot connected with the vehicle-body, substantially as described.

- 5 3. In a vehicle, the combination of the vehicle-body, arms supported at the outer ends by side bars, a spring attached at each end of the body near the outer side thereof and spanning the space between such connecting-
10 points, said arms pivoted near the center of each arm to the body and at their inner ends connected to the spring near the center thereof, said body supported upon such arms,

which are in turn supported upon the side bars, said spring and arms acting as an equal- 15 izer, always keeping the vehicle-body in a horizontal position, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two wit- 20 nesses.

SILAS H. RAYMOND. [L. S.]

Witnesses:

HUGH E. WILSON,

HARRY P. VAN WAGNER.