

(No Model.)

C. A. BEHLEN.  
VEHICLE SPRING.

No. 453,924.

Patented June 9, 1891.

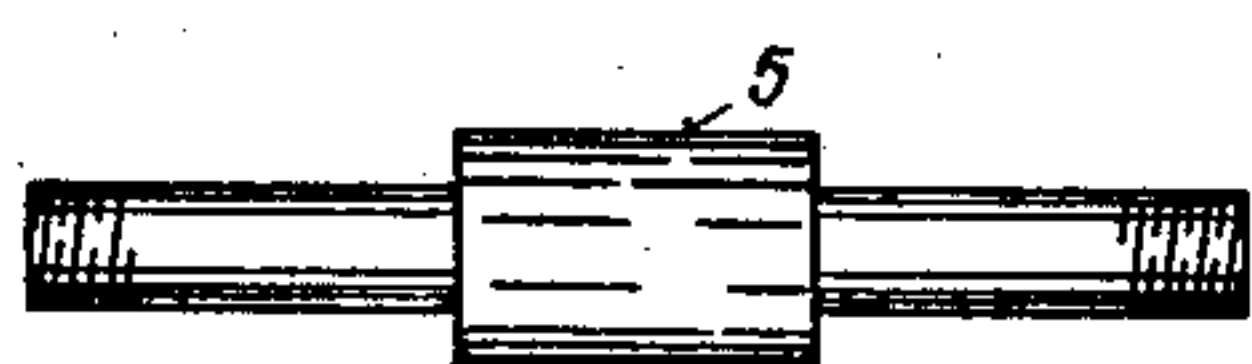
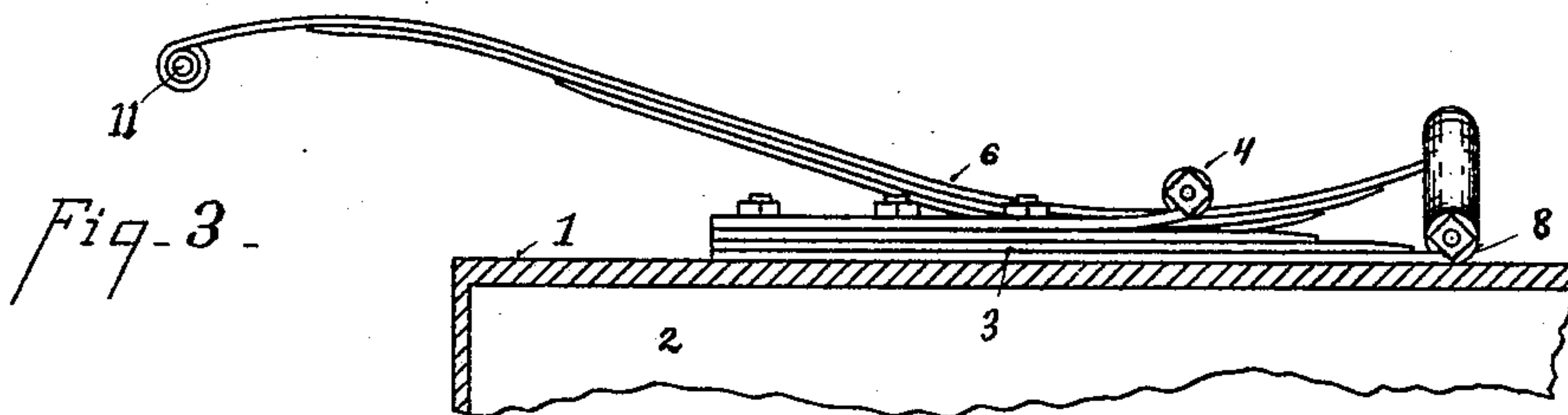
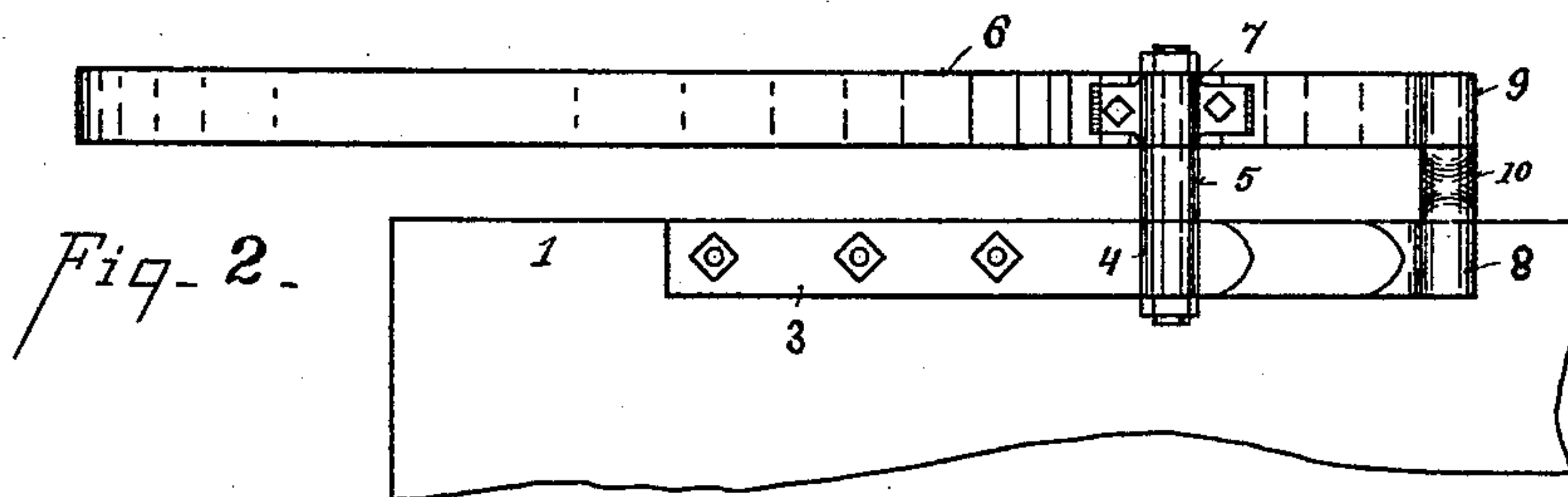
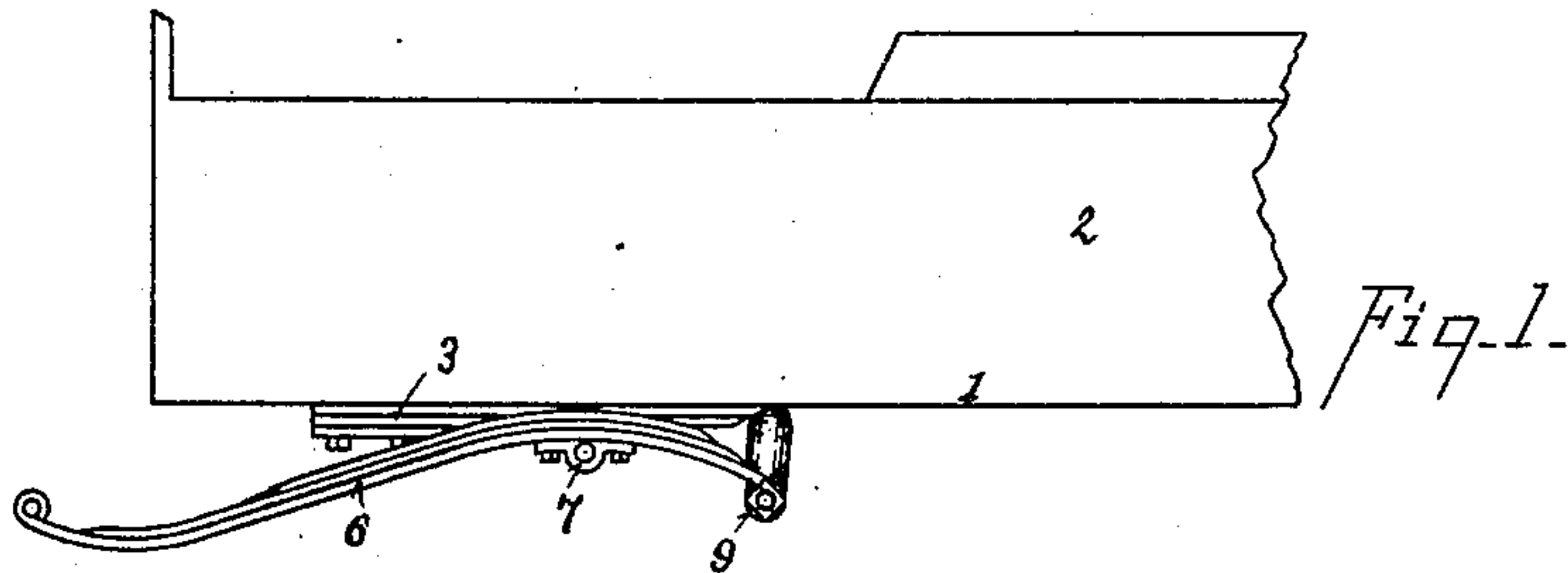


Fig. 4-

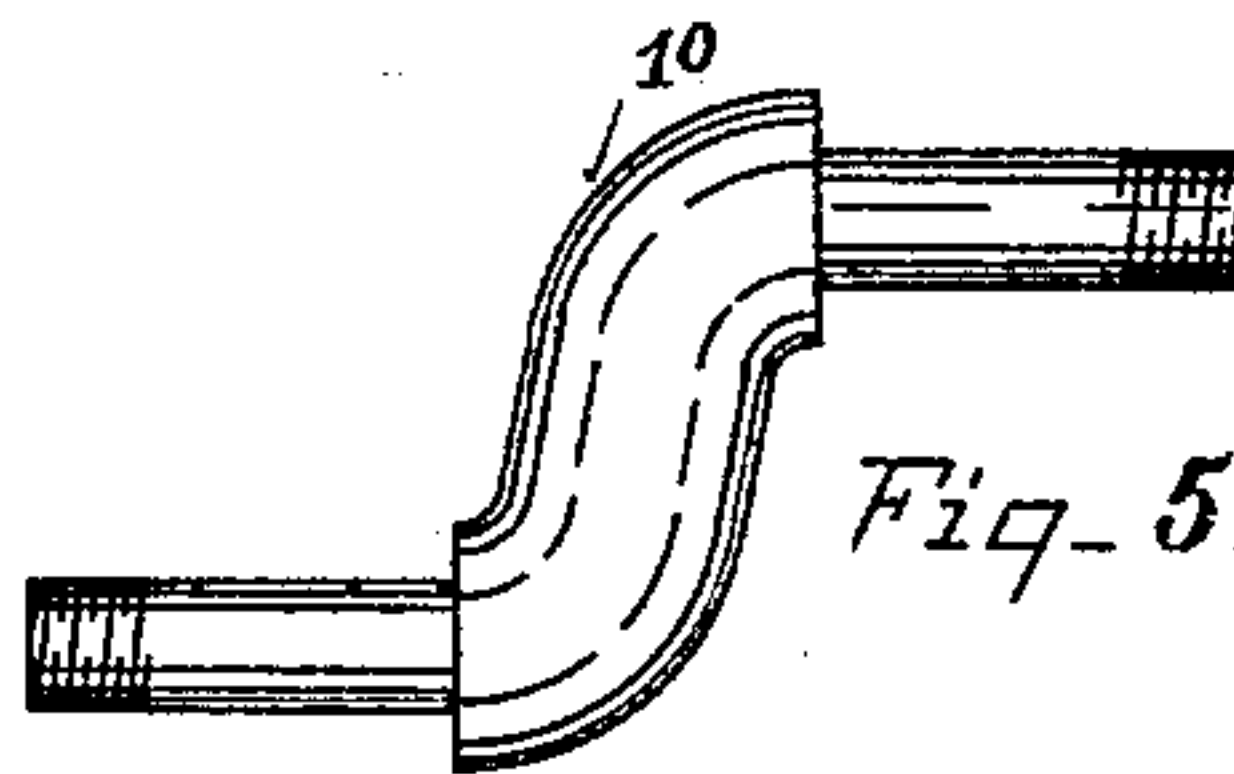


Fig. 5-

Witnesses  
C. Miles  
T. Simmons

Inventor  
Charles A. Behlen  
By his Attorneys Wood & Bond

# UNITED STATES PATENT OFFICE.

CHARLES A. BEHLEN, OF CINCINNATI, OHIO.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 453,924, dated June 9, 1891.

Application filed October 6, 1890. Serial No. 367,271. (No model.)

*To all whom it may concern:*

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

One of the objects of my invention is to dispense with the use of the side bar in buggies for attaching the spring.

Another object of my invention is to provide a compound spring, whereby an easier movement is obtained.

The various features of my invention will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my improvement in position for use. Fig. 2 is a bottom plan view. Fig. 3 is a side elevation of Fig. 2. Fig. 4 is a detail view of the central pivot-shaft. Fig. 5 is a detail view of the crank-shaft.

1 represents the sill of a carriage; 2, the sides of the body; 3, a leaf-spring securely bolted to the body or sill. The free end of the lower leaf is provided with an eye 4, which journals on the shaft 5.

6 represents a reverse leaf-spring, on which is formed an eye 7. In the preferred form of construction the shaft loosely passes through said eyes at either end, so that said shaft 5 journals in both of the springs 3 and 6. Said shaft 5 might be fastened in one of said springs without materially affecting their operation. On the upper leaf the spring 3 is turned to form an eye 8 and the lower leaf of spring 6 is turned to form an eye 9.

10 represents a crank-shaft. Each of its ends journals in said eyes 8 and 9, which is the preferred form of construction. The forward end of spring 6 is provided with an eye 11, which is attached to the running-gear in any desired manner. The weight of the carriage-bed is conveyed to the spring primarily through spring 3 and spring 6 through shaft 5; but the rear ends of said springs, being coupled together by the shaft 10, likewise transmits strain through said shaft, thereby

dividing the strain of the weight of the body and transmitting it to different portions of the spring simultaneously. The weight on the body has a tendency to compress the lower arm of spring 6, which is inclined, and turn the crank-shaft forward, and the upper leaf of spring 3 has a tendency to turn the said crank-shaft in the opposite direction, the two arms tending to move in arcs of different circles. These movements are very slight and as constructed the four leaves each have a spring motion, as follows: The forward arm of spring 6, the rear arm of spring 6, and the upper and lower leaves of the spring 3 provide for a very soft movement and secure a strong spring, as the strain is divided over the different parts. Hence this compounding of the two springs together and connecting two different points allows very great variation of load or strain with ease of motion for both light and heavy loads.

Another advantage derived from the use of this compound spring is doing away with the side bars and giving more turning-space for the wheels of the vehicle.

Having described my invention, what I claim is—

1. A compound spring for a carriage, consisting of two sets of parallel leaves, one of said springs 3 being rigidly attached to the body and the other spring 6 being pivotally connected to said spring 3 and their inner ends pivotally connected together, substantially as specified.

2. A compound spring for carriages, consisting of two sets of parallel leaf-springs 3 and 6, spring 6 being pivotally attached to spring 3 by joint 7, with its longer arm projecting outwardly and the shorter arm pivotally connected at its inner end to the inner end of spring 3, substantially as described.

3. The spring 3, having the rear extremity of its upper leaf provided with the eye 8 and the rear extremity of its lower leaf provided with the eye 4, in combination with the leaf-spring 6, having the rear and front eyes 9 and 11 and intermediate eye 7, the pivot 5, connecting said intermediate eye 7 with the eye on the rear extremity of the upper leaf

of the spring 3, and a shaft 10, connecting the rear eyes 8 and 9, substantially as described.

4. The combination of the springs 3 and 6 by means of the pivotal bolt 5, journaling in  
5 the eye of spring 3, and the crank-shaft 10, journaling in the ends of said springs, substantially as described.

In testimony whereof I have hereunto set my hand.

CHARLES A. BEHLEN.

Witnesses:

T. SIMMONS,  
C. W. MILES.