

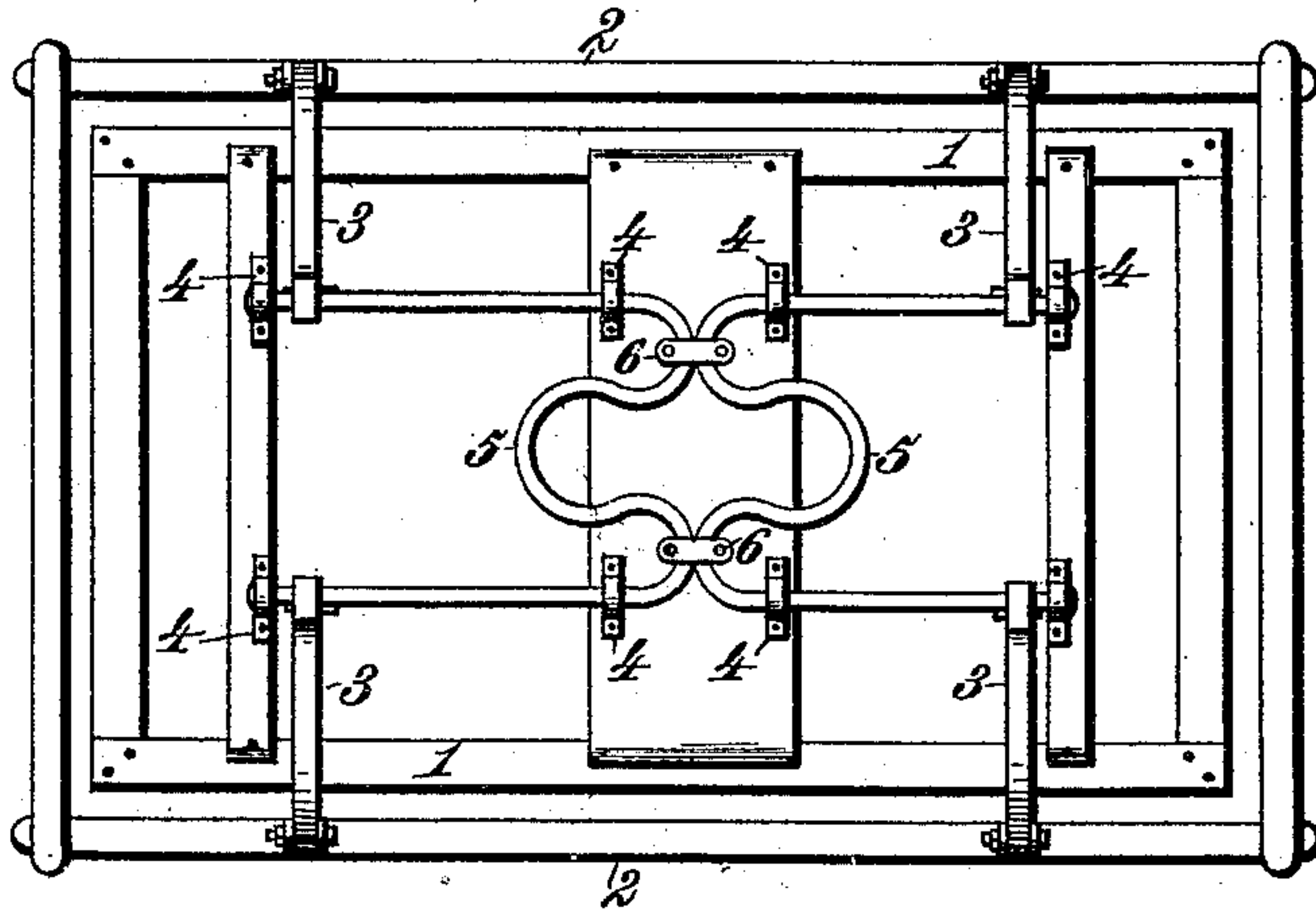
(No Model.)

G. E. RAYMOND.  
VEHICLE SPRING.

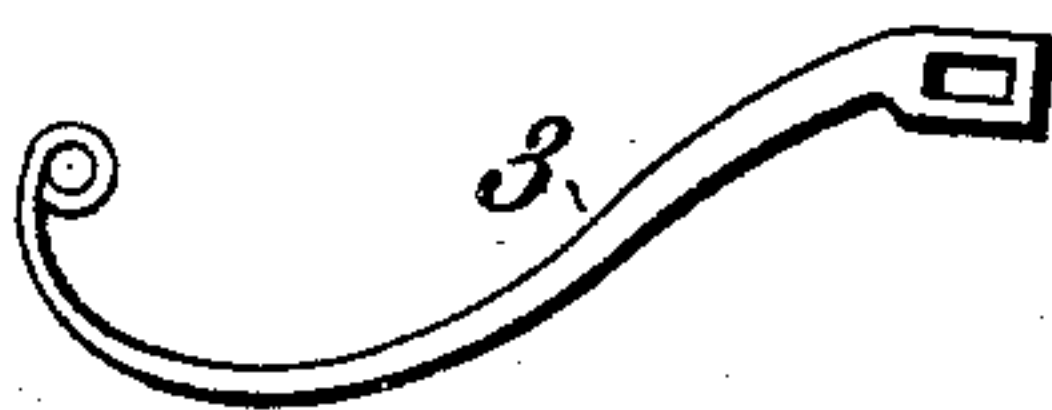
No. 452,531.

Patented May 19, 1891.

*Fig. 1.*



*Fig. 2.*



Witnesses.  
*Robert Emmett.*  
*J. A. Rutherford.*

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*George E. Raymond.*  
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# UNITED STATES PATENT OFFICE.

GEORGE E. RAYMOND, OF GRAND RAPIDS, MICHIGAN.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 452,531, dated May 19, 1891.

Application filed April 28, 1890. Serial No. 349,717. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. 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 certain improvements in that class of vehicle-springs which operate upon the torsion principle, and it relates more particularly to a spring supported in journals, so as to move freely thereon, the spring proper being supported so as to move to and from the vehicle-body at or near the center freely and without resistance, which improvement is hereinafter described in detail, and the novel features of which are pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows an inverted plan of a vehicle-body with my improved spring attached thereto. Fig. 2 shows a side elevation of one of the connecting-levers.

The spring 5 is made double or in two parts that are supported in journals 4 4 4, which are attached to and supported by the vehicle-body 1. The outer ends of the spring or springs 5 are connected to the side bars 2 by means of arms or levers 3, which are attached to the side bars by any suitable means. These arms 3 are rigid with the spring and may be made integral with the spring, if preferred. The two springs are preferably attached together by means of clips or ties 6 6. It will be seen that any downward pressure upon the body carries the central portion of the spring away from the body. This form of spring will thus produce an elastic equalizer, which, without being wholly rigid, will give an easy movement to the vehicle-body,

and at the same time will produce an equalizer which will cause all parts of the vehicle-body to descend whenever downward pressure is applied to any one part. The journals 4 may be constructed in any suitable form, and as I claim no novelty in the journal attachment it will be unnecessary to describe the same more fully.

I do not limit my invention to any particular form of loop at the center of the spring, as it is evident that the spring-rods may be bent into various forms without departing from the spirit of my invention.

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

1. The combination of the vehicle-body, the side bars, the journal-bearings secured to the under side of said body, the springs supported by and turning in said journal-bearings and having no other connection with the vehicle-body, clips for connecting said springs together, and arms or levers for directly connecting the ends of the springs with the side bars, substantially as described.

2. The combination of the vehicle-body, the side bars, the journal-bearings secured to the under side of said body, the springs supported by and turning in said journal-bearings, said springs bent between the journal-bearings and having no other connection with the vehicle-body, and arms or levers for directly connecting the ends of the springs with the side bars, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

GEORGE E. RAYMOND. [L. S.]

Witnesses:

HUGH E. WILSON,

HARRY P. VAN WAGNER.