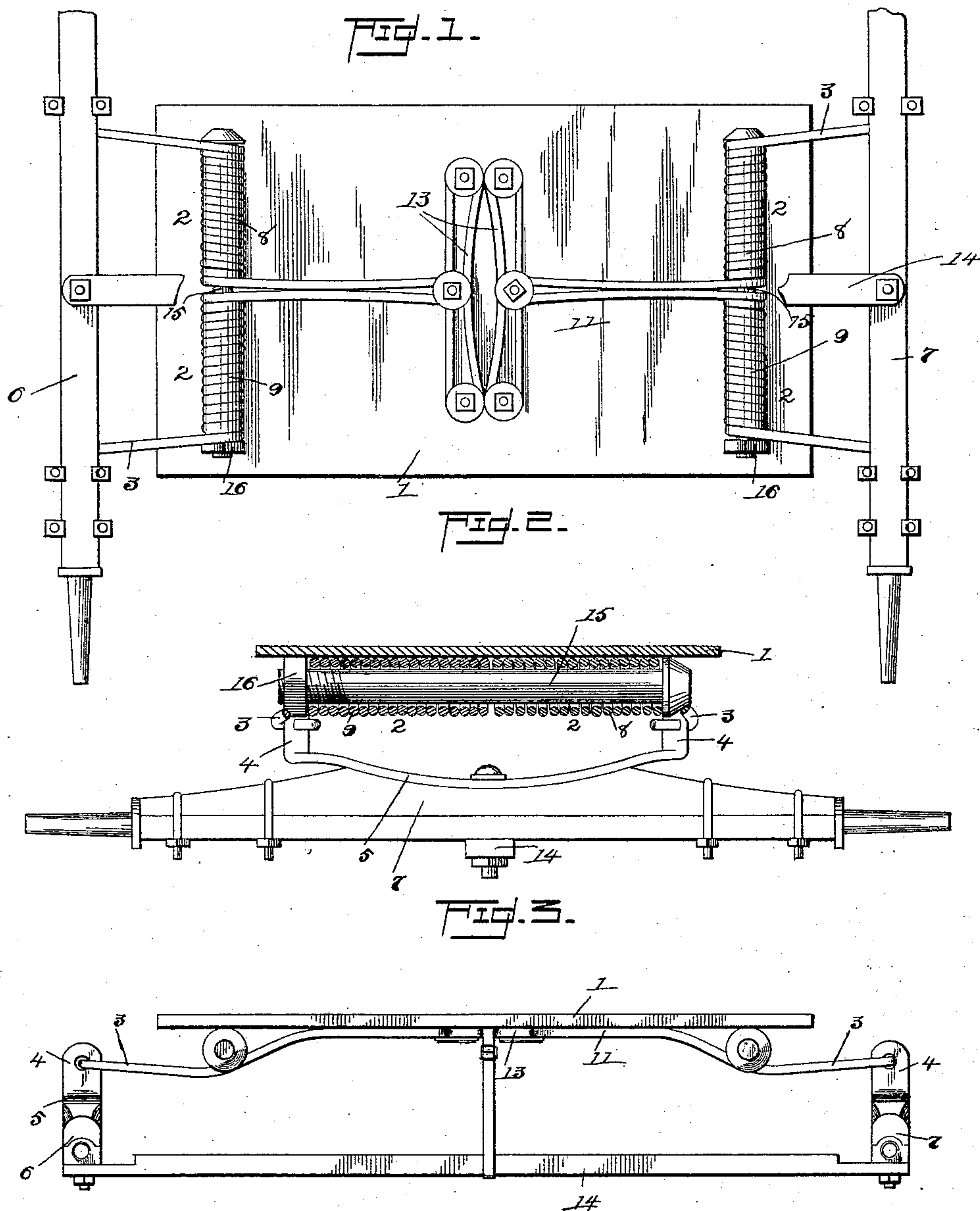


(No Model.)

J. D. BRUNNER.  
CARRIAGE SPRING.

No. 455,736.

Patented July 14, 1891.



Witnesses.

Inventor

John D. Brunner.

E. D. Duvalley. By his Attorneys,  
H. J. Riley

C. A. Snow & Co.



# UNITED STATES PATENT OFFICE.

JOHN D. BRUNNER, OF DOYLESTOWN, PENNSYLVANIA.

## CARRIAGE-SPRING.

SPECIFICATION forming part of Letters Patent No. 455,736, dated July 14, 1891.

Application filed October 29, 1890. Serial No. 369,686. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN D. BRUNNER, a citizen of the United States, residing at Doylestown, in the county of Bucks and State of Pennsylvania, have invented a new and useful Improvement in Carriage-Springs, of which the following is a specification.

The invention relates to improvements in carriage-springs.

10 The object of the present invention is to provide simple and inexpensive carriage-springs which will prevent the usual side motion common to the ordinary construction of carriage-springs, and which will be capable  
15 of ready adjustment to vary the tension.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed  
20 out in the claims hereto appended.

In the drawings, Figure 1 is a reverse plan view of running-gear provided with springs constructed in accordance with this invention, the reach being broken away to show the  
25 manner of attaching the springs. Fig. 2 is a transverse section. Fig. 3 is a side elevation.

Referring to the accompanying drawings, 1 designates the bottom of a carriage-body  
30 having arranged at its ends transverse spiral springs 2, which have their ends 3 extended longitudinally and secured in perforated up-turned ends 4 of bars 5 mounted upon the front and rear axles 6 and 7. The spiral  
35 springs 2 are composed of two sections 8 and 9, which have their inner adjacent ends extended toward the center of the body and formed into a T-shaped loop, which has its longitudinal portion 11 secured by a bolt, and  
40 the ends of the transverse portions 13 of the T-shaped loop are secured by bolts to the bottom of the carriage-body, and the loop is also secured at its angle to the body. This arrangement of springs does away with side  
45 bars, and the front and rear axles are connected by a reach 14, and the longitudinally-extending ends 3 of the springs are connected with the bars 5, which are mounted on the axles, thereby avoiding the usual side motion.  
50 By arranging the springs at the ends of the body, the vehicle may be turned in a much

shorter space than if the ordinary side bars were used. The tension of the springs is regulated by headed rods 15, which are arranged in the coil of the springs, and each rod  
55 has one end threaded and provided with nuts 16, whereby the springs may be depressed and their tension increased, or the nuts may be loosened and the tension lessened, as desired.  
60

It will be seen that the springs and the manner of attaching the same to the body are simple and inexpensive, and the ordinary side bars are dispensed with and side motion is prevented, and that the vehicle may be read-  
65 ily turned.

From the foregoing description and the accompanying drawings, the construction, operation, and advantages of the invention will readily be understood by those skilled in the  
70 art.

What I claim is—

1. In a running-gear, the combination, with the body and the bars mounted on the axle, of the spiral springs transversely arranged at  
75 the ends of the body and having their ends extending longitudinally and connected to said bars and being composed of two sections, and having their inner adjacent ends of the sections extended and formed into a T-shaped  
80 loop secured to the bottom of the vehicle, substantially as described.

2. In a running-gear, the combination, with the body and the bars mounted on the axle, of the spiral springs transversely arranged at  
85 the ends of the body and having their ends extended longitudinally and connected to said bars and being composed of two sections having their inner adjacent ends extended toward the center of the vehicle and formed into a  
90 T-shaped loop, the transverse portions of the loops being parallel and secured to the body, and the headed rods arranged within the springs and provided with nuts, substantially as described.  
95

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN D. BRUNNER.

Witnesses:

CHAS. F. MEYERS,

WILLIAM F. KELLY, Jr.