

(No Model.)

2 Sheets—Sheet 2.

P. C. SCHWALEN & J. M. POWERS.
VEHICLE SPRING.

No. 467,204.

Patented Jan. 19, 1892.

Fig. 5.

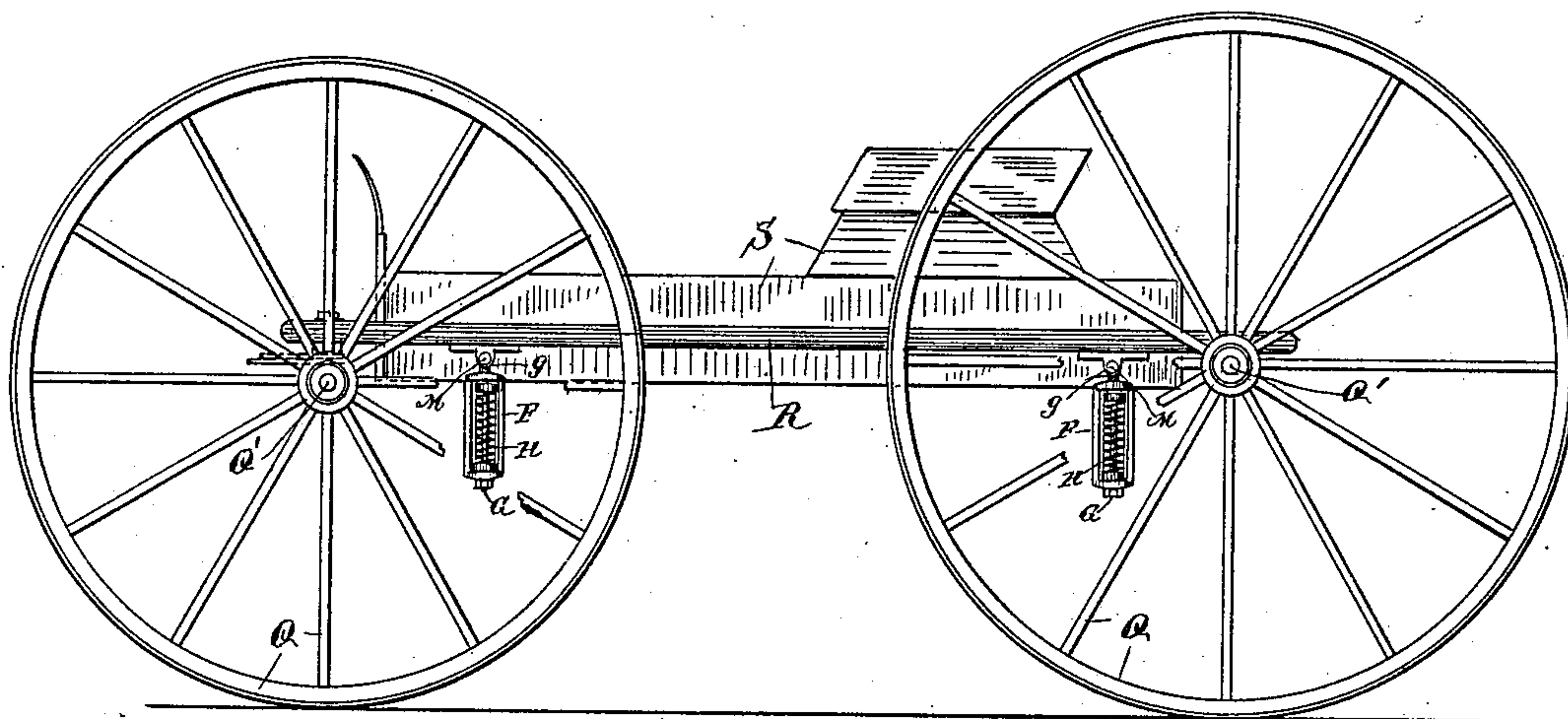
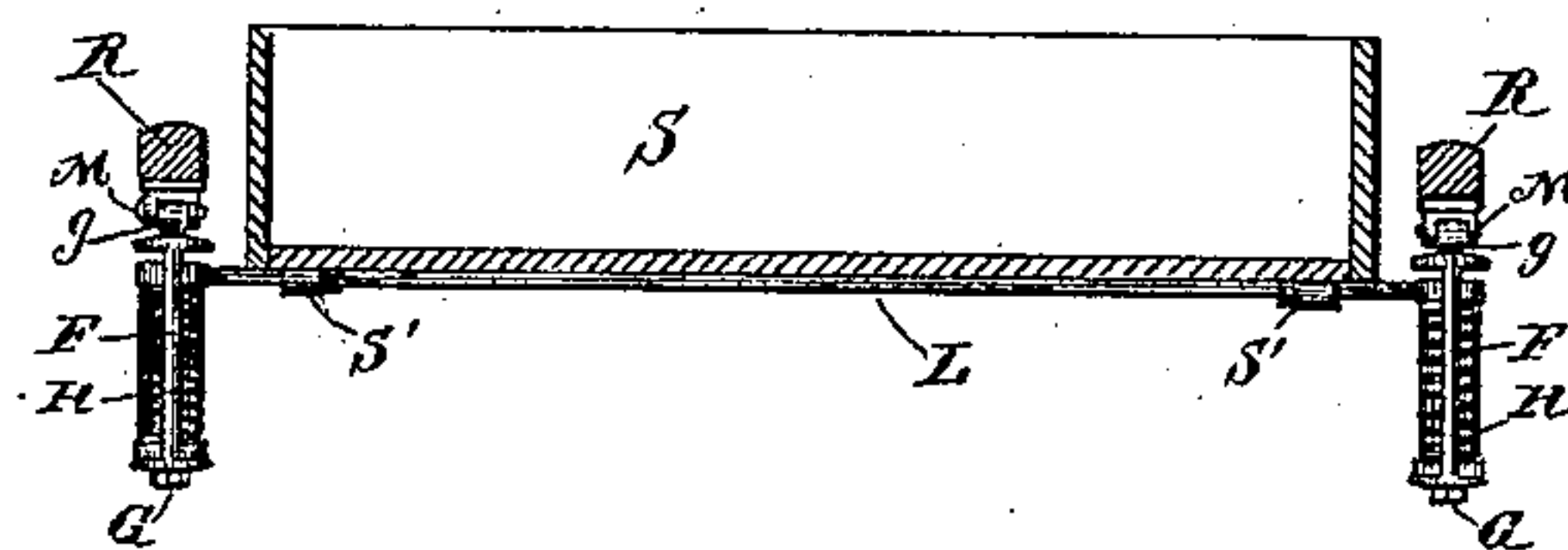


Fig. 6.



Witnesses.

A. W. Opsahl.

E. F. Elmore.

Inventors:

Peter C. Schwalen
John M. Powers
By their Attorney.

J. S. P. Williamson

UNITED STATES PATENT OFFICE.

PETER C. SCHWALEN AND JOHN M. POWERS, OF MINNEAPOLIS, MINNESOTA.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 467,204, dated January 19, 1892.

Application filed April 20, 1891. Serial No. 389,582. (No model.)

To all whom it may concern:

Be it known that we, PETER C. SCHWALEN and JOHN M. POWERS, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Vehicle-Springs; and we 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 appertains to make and use the same.

Our invention has for its object to provide an improved construction for upholding vehicle-bodies.

The invention is primarily directed to the springs and their connection, with a view of minimizing the jolt or jar on the vehicle-body and rendering the riding as easy as possible to the occupant. To these ends we employ a spring having a pivotal connection with supports independent of the body and also with the vehicle-body. This construction permits the spring to swing into the line of strain under any irregular motion which may be imparted either from the running-gear or the motion of the horse.

In our preferred construction we employ coiled springs carried by hangers, which are pivoted to the side bars, thills, or other supports independent of the body. The hangers are provided with rods which are encircled by the coiled springs, and cross-ties connect each pair of springs and work on the said rods as guides. The cross-ties have such a connection with the body as to permit a pivotal motion of the parts.

Our invention was especially designed for use on two-wheeled vehicles, such as an ordinary sulky or cart. When so employed the springs are conveniently supported from the thills with the rear end of the cart-body resting on the cross-tie, and the front end of the cart-body is pivotally connected with the thills by pivotal hangers under spring tension. These pivotal hangers may conveniently be crank-arms on a rock-shaft secured in bearings carried by the cross-bar of the thills, and the spring tension can be conveniently given by a double or reversely-coiled spring encircling the rock-shaft, having its extremities attached to the cross-bar of the thills and its center connected to the shaft.

Our invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout, Figure 1 is a side elevation of the invention as applied to a cart. Fig. 2 is a rear elevation of the same. Fig. 3 is a view of the hanger and spring detached. Fig. 4 is a detail of some of the parts shown in Fig. 3. Fig. 5 is a side elevation showing the invention as applied to a four-wheeled vehicle, such as an ordinary spring-wagon; and Fig. 6 is a cross-section of the vehicle-body and side bars shown in Fig. 5 directly back of one pair of springs.

A is the axle, B the wheels, and C D the thills, of an ordinary sulky or cart. E is the body of the same.

F are hangers of link-like form, provided with bolts G, extending through the same and having at one end an eye g.

H are the coiled springs encircling the rod G between the two ends of the hanger.

K is a buffer or anti-rattling washer, which may be placed between the spring and the link at one end.

L is the cross-tie connecting the pair of springs and working on the rods G as guides. As shown, the buffer K is fitted as a bushing in the end of the cross-tie by screw-threaded connections.

M are studs projecting inward from the thills, with which the eyes g of the bolts G engage to support the hangers and the springs.

N is the rock-shaft mounted in the bearings N', secured to the cross-bar D of the thills, and provided with the crank-arms N'', pivotally engaging the forward end of the cart-body.

P is the reversely-coiled spring encircling the rock-shaft N, having its ends secured to the cross-bar D of the thills, and attached at its center to the shaft N by a lug p or in any other suitable way. The cart-body E is provided with a plate E', having a series of hooks e for engagement with the cross-tie L. This permits the cart-body to be adjusted so as to bring the seat to any desired height with reference to the thills. The effect of this way of supporting the springs and the front end of the cart-body is to permit the springs to swing into the line of strain under any irregular motion imparted either from the wheels or from the horse. The slightest jar will

therefore be readily taken up by the springs with the minimum of discomfort to the rider.

Referring to Figs. 5 and 6, Q are the wheels of a four-wheeled vehicle, and R are the side bars supported from the front and rear axles 5 Q'. S is the wagon-body. The springs are arranged and supported in the same way as described in Figs. 1 and 2, except that two pairs of springs are employed and that they 10 are attached to the side bars R. The wagon-body is provided with keepers S', through which the cross-ties L pass, for supporting the body on the ties with the pivotal connection. The action is similar to that in the cart in 15 that both pairs of springs will swing into the line of strain, thus making the wagon-body more easy riding.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

20 1. The combination, with a vehicle-body and supports independent of the same, of one or more pairs of springs pivoted to said supports and a cross-tie supported by the springs, having a pivotal connection with said body, 25 substantially as described.

2. The combination, with a vehicle-body and supports independent thereof, of one or more pairs of hangers pivoted to said supports, each carrying a coiled spring, and a 30 cross-tie supported by the springs, having a pivotal connection with said body, substantially as described.

3. The combination, with a vehicle-body and supports independent thereof, of one or 35 more pairs of link-like hangers pivotally con-

nected to said supports, guide-rods secured one in each of said hangers, coiled springs encircling said guide-rods between the extremities of the hangers, and a cross-tie supported by each pair of springs and working 40 on said rods as a guide and having a pivotal connection with said body, substantially as described.

4. In a cart, the combination, with the cart-body and supports independent thereof, of a 45 pair of springs pivotally connected to said supports and upholding the rear portion of said body, and hangers under spring tension pivotally connecting the front end of the cart-body with the thills, substantially as de- 50 scribed.

5. In a cart, the combination, with the thills, of the pair of link-like hangers pivoted to the thills and each carrying coiled springs, the cross-tie supported by said springs, the cart- 55 body resting on said cross-tie, the rock-shaft pivotally connected to the thills and provided with crank-arms pivotally connected to the front end of the cart-body, and the double or reversely-coiled spring encircling said shaft, 60 having its extremities secured to the thills and its center engaged by the shaft, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

PETER C. SCHWALEN.
JOHN M. POWERS.

Witnesses:

A. H. OPSAHL,
JAS. F. WILLIAMSON.