2 Sheets—Sheet 1.

J. W. MARKS.

SPRING-VEHICLE.

No. 177,530. Patented May 16, 1876.

FIG. 1.

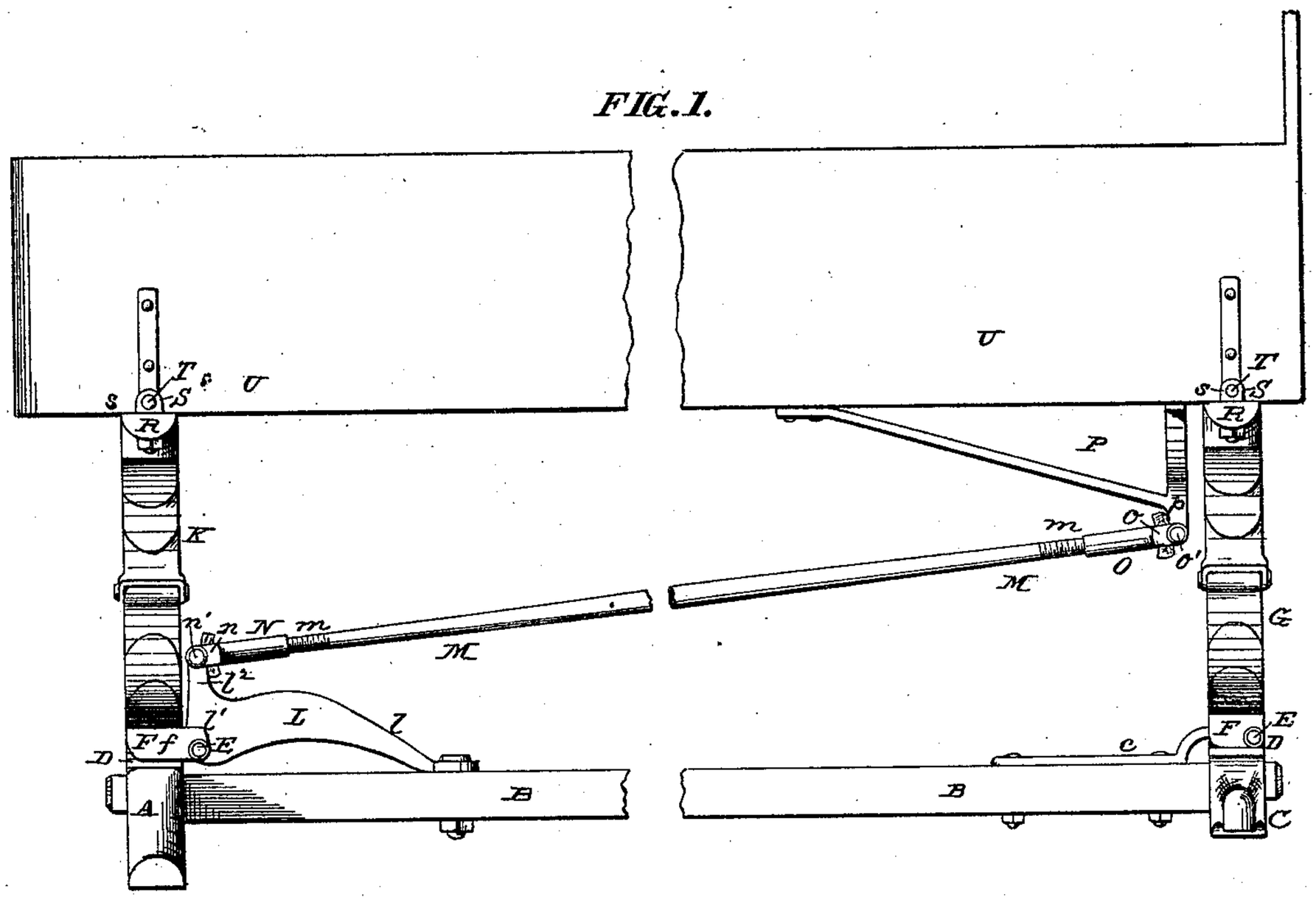


FIG. 2.

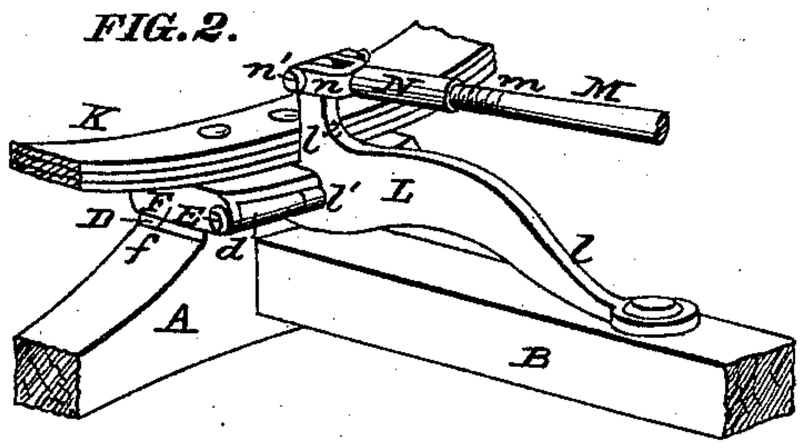


FIG. 3.

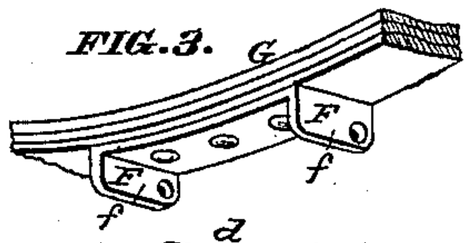
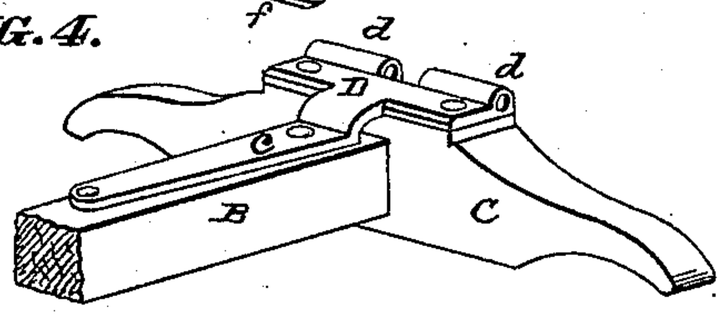


FIG. 4.



ATTEST:

Robt. Burns.

Le Blond Burdett

INVENTOR:

John W. Marks

By Knight Bros.

Attys.

2 Sheets—Sheet 2.

J. W. MARKS.

SPRING-VEHICLE.

No. 177,530. Patented May 16, 1876.

FIG. 5.

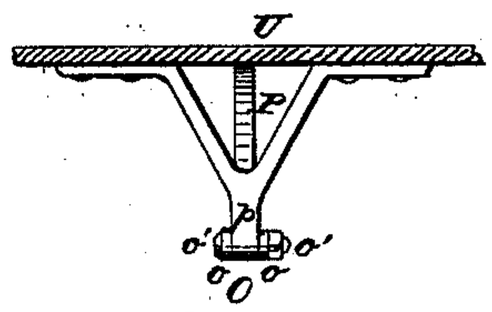


FIG. 6.

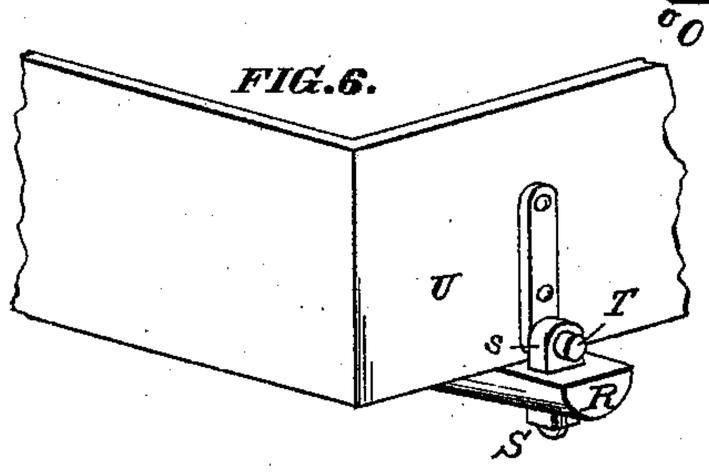


FIG. 7.

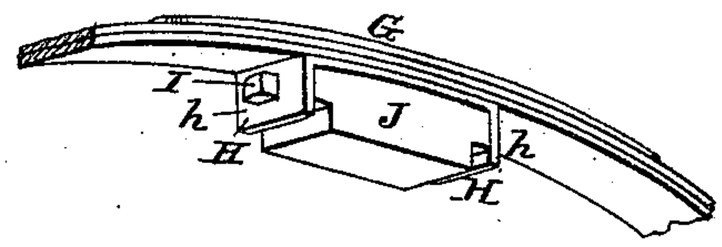


FIG. 8.

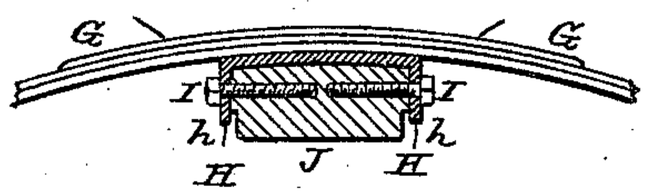


FIG. 9.

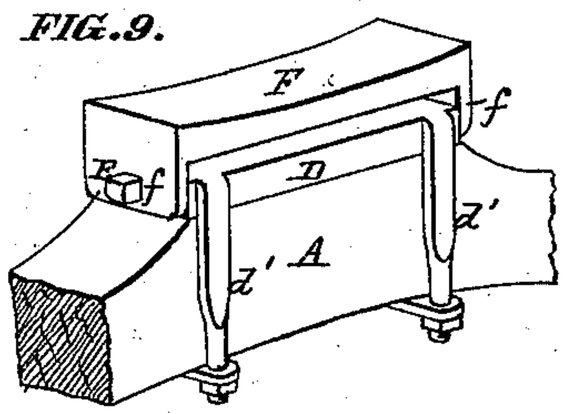


FIG. 10.

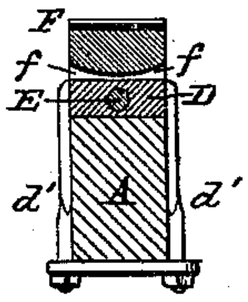
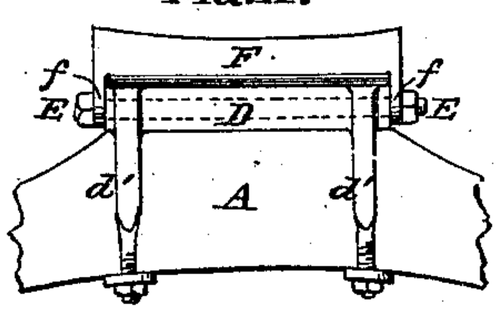


FIG. 11.



ATTEST:

Robt Burns.

Le Blond Burdett

INVENTOR:

John W. Marks

By Knight Bros.

Attys.

UNITED STATES PATENT OFFICE.

JOHN W. MARKS, OF SUMNER, ILLINOIS.

IMPROVEMENT IN SPRING-VEHICLES.

Specification forming part of Letters Patent No. **177,530**, dated May 16, 1876; application filed April 11, 1876.

To all whom it may concern:

Be it known that I, JOHN W. MARKS, of Sumner, Lawrence county, State of Illinois, have invented a certain new and useful Improvement in Spring-Vehicles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My present invention is an improvement on the spring-equalizer patented to me the 19th day of January, 1875, No. 158,956.

The first part of my present improvement consists in the combination with a strut and stay brace, substantially similar in operation to that of my former improvement, of a spider or bracket attached to the extreme forward end of the body bottom, to which the forward end of the brace is attached, and a hinge bracket connected to the running-gear, to which the rear end of said brace is attached.

The second part of my improvement relates to that class of vehicles in which the springs are hinged to the axle stock and body so as to admit of the slight oscillatory movement of the springs induced by the strut and stay brace, without any strain on the attachments.

The third part of my improvement consists in the manner of hinging the body to the spring-bars. In this connection vertical eye-bolts are fixed in the ends of the spring-bars, the eyes being above the bars, and receiving pivot-pins extending laterally from the body at the lower corners.

The fourth part of my improvement consists in making one or both ends of the strut and stay brace to screw into a socket piece or pieces, which carry the ears, by which the hinge-connection is made to the brackets aforesaid. The length of the brace is adjusted, as may be required, by turning the socket piece or cap upon the rod after the cap has been disconnected from its bracket.

The fifth part of my improvement consists in the construction of the buffer-guard or buffer-holder. Said holder consists of a plate having at the ends perforated ears, through which pass bolts that screw into the body of the india-rubber buffer-block, and hold it in place.

Figure 1 is a side view of the body of a spring-vehicle with my improvement applied thereto. Fig. 2 is a detail perspective view of the hinge connecting the rear spring to the stock beneath it. Figs. 3 and 4 are detail perspective views of the two members of the hinge shown in Fig. 2. Fig. 5 is an end view of the spider or pendent bracket to which the fore end of the brace-rod is connected. Fig. 6 is a detail perspective view of a corner of the body, showing the means of connection to the spring-bar. Fig. 7 is a detail under perspective view of the spring-buffer. Fig. 8 is a detail section of spring-buffer. Fig. 9 is a perspective view of a modified form of hinge. Fig. 10 is a transverse section of such modified form. Fig. 11 is a detail side view of such modified form of hinge.

A is the rear stock, to which the hind axle is secured. B is the reach, connecting rigidly the rear stock A to the fore stock C. D is a plate secured to the top of the fore stock, and preferably secured to the reach by an extension, *c*. This plate has ears *d d*, through which passes the pintle-pin E of the fore hinge D E F, by which the fore spring G is connected to the stock C. The upper member F of the hinge is attached to the under side of the spring G, and has end lugs or ears *f f*, through which the pintle E passes. H is the buffer bracket or guard, having end lugs or ears *h h*, through which pass screw-bolts I, screwing endwise into the india-rubber buffer-block J. The purpose of this buffer-block is similar to that of those in ordinary use, and which are strapped to the upper or lower member of the spring at one of the points of its attachment to the spring bar or stock.

The purpose of the buffer is to prevent the upper and lower members of the spring from impingement when the vehicle is loaded and the road rough.

The construction of the buffer is such that the rubber block J can be easily removed by the mere extraction of the bolts I I. The rubber has such a tenacious hold upon the bolts as to hold them in place against any jarring that takes place. The guard-lugs *h h* serve

(even when the block J is removed) to prevent the nuts and bolts by which the upper and lower members of the spring are attached to the vehicle from coming in contact with each other (the lugs coming in contact with the lower part of the spring) on the near approach of said attaching parts.

The connection between the stock A and the hind spring K is substantially similar to the described attachment of the fore stock and spring. The plate D is secured in any suitable manner to the top of the stock A, and forms the bottom leaf of the hinge, and having pintle-lugs *d* for the pintle E. Attached to the lower part of the spring K is a plate, F, forming the upper part of the hinge, and having pintle-lugs *f*. The pintle E in this hinge, besides forming the pivot for the hinge, also forms the pivotal connection of the bell-crank-formed bracket L, by which the strut and stay brace or bar M is connected to the lower member of the rear spring. The bracket L has an arm, *l*, firmly secured by its end to the reach B, and an arm, l^2, pivoted to the rear end of the strut and stay brace M. The elbow l^1 of said bracket is pivoted to the hinge, as before described. The ends of the brace M are screw-threaded at *m m*, and screw into the sockets of caps N and O, one of which is, preferably, made fast upon the brace-rod M. The cap N has ears *n n*, through which passes the pintle *n'*, which also passes through the end of the arm l^2, so as to form a hinge-joint between the brace and the bracket L. The cap O has attachment, by ears *o o* and pintle *o'*, to the lower portion or apex *p* of the three-legged bracket or spider P. The ends of the legs of the bracket P are attached to the bottom of the body in such positions that the point *p* shall be in near proximity to the fore spring.

No peculiarity is claimed in the spring-bars R R, except as to their manner of attachment to the body U. Such attachment consists of an eyebolt, S, at each end of each spring-bar, which passes vertically through said bar, and the eye *s* of which extends above the bar and receives the pivot-pin T, projecting horizontally and laterally from the body at or near each corner.

It will be perceived that even when the strut and stay brace M is made of considerable length, as in my improvement, that its moving end, at O, cannot travel in a straight line, but that it will move in the arc of a circle having a radius equal to the length of the brace M; consequently the body must move forward slight as it descends until the brace becomes horizontal. In my former patent, No. 158,956, the springs were inclined backward to accommodate this forward movement of the body in descending. This, it will be seen, did not fully accomplish the desired end, because, although there was no strain upon the spring attachments when the body was in either the upper or lower position, yet the upper part of the springs would be pushed forward on a strain when between these two positions, and consequently a strain upon the attachments would result; whereas, in my present improvement, the joints between the stocks and the springs, and those between the spring-bars and the body, allow the free movement of the parts without strain.

In the modification of hinges shown in Figs. 9, 10, and 11, the plate D has clips *d'* connecting it with the stock, and the pintle E passes endwise through said plate D. The pintle also passes through the lugs *f f* of the upper plate F, so that the hinge-joint in this modification is directly over the middle of the stock and axle.

I claim—

1. The combination of the springs G and K with hinges D E F, connecting them to the running-gear or lower works of the vehicle at A C, substantially as set forth.

2. The combination of body U, pins T, eye-bolts S, and spring-bars R R, substantially as and for the purpose set forth.

3. The combination of hinges D E F, springs G K, and strut and stay brace M, joints S T, and body U, substantially as set forth.

4. The combination of the brace M, spring K, and fixed bracket L, hinged to the brace and to the spring, so as to allow of their oscillation, substantially as set forth.

5. The combination, with the brace M, of the screw-cap N, forming the hinge-connection to the bracket L, and made adjustable on the brace, substantially as set forth.

6. The buffer-guard, composed of plate H, with lugs *h h* forming guards, and serving for the connection of the rubber spring-block J, by bolts I I.

7. The combination of guard H with lugs *h h*, rubber blocks J, and bolts I I screwing into the substance of the block to form a buffer, substantially as set forth.

JOHN W. MARKS.

Witnesses:

SAML. KNIGHT,

ROBT. BURNS.