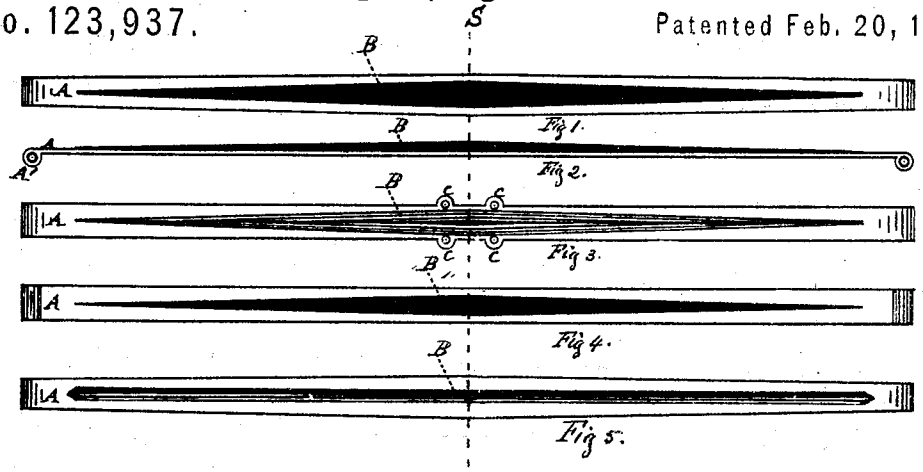
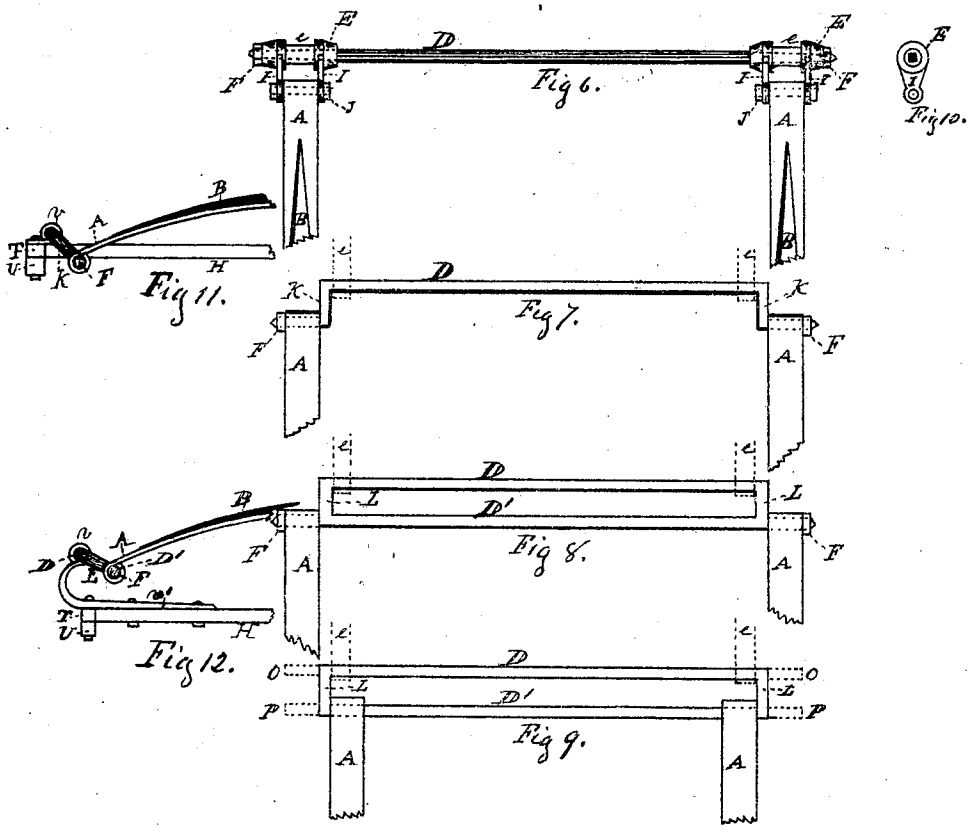
C. W. SALADEE.

Improvement in Carriage Springs and mode of Attachment.

No. 123,937. Patented Feb. 20, 1872.





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IMPROVEMENT IN CARRIAGE-SPRINGS AND MODE OF ATTACHMENT.

Specification forming part of Letters Patent No. 123,937, dated February 20, 1872.

SPECIFICATION.

Be it known that I, CYRUS W. SALADEE, of St. Catharines, in the Dominion of Canada, have invented certain Improvements in the Construction of Springs, and their connections for pleasure vehicles, of which the following is a specification embodying my invention:

The first part of my invention relates to the formation of side and elliptic springs from one or more plates of steel of uniform thickness, having a corrugation in the center lengthwise the steel, which corrugation tapers both ways from the center between the ends of the plate to the ends of the same. The second part of my invention relates to connecting the outer ends of side springs to a connecting-rod in such manner as to equalize the action of the springs, causing both sides to move in unison with each other, and so as to prevent the body of the vehicle from inclining to one side or the other when the load is all on one side, as when carrying a single passenger. I accomplish this object by several different modifications, as shown by the drawing, and as hereinafter specified.

As regards the first part of my invention, I am not ignorant of the fact that springs, both side and elliptic, have been made from single plates of steel, and strengthened from the ends toward the center by means of corrugations or "ribs" formed thereupon, extending in part or in whole throughout their entire length; but in every such modification heretofore known or used said corrugations or ribs have been impressed in or upon the steel plate of a uniform width throughout their entire length; so likewise the plates themselves are almost universally made the same width from one end to the other. This principle, however, as applied to a single-plate spring, is wholly at variance with the idea sought to be attained by its application—to wit, a perfect equalization of strain upon every portion of the plate from its cross-center to the ends, as has been fully demonstrated by practical tests, and the use of springs so formed. I propose to attain such perfect equalization of strain upon plates of steel under either of the modifications of my invention hereinafter shown and described.

Figure 1 of the drawing is a top view of a side spring whose widest portion is at the center, upon the dotted line S, and gradually tapering on both edges from the center toward each end.

A is the main plate, having rolled or pressed into its under surface a corrugation so formed as to raise a rib or brace, B, upon the opposite or upper surface, said rib having its widest and deepest portion at the center of the plate on dotted line S, and tapering each way on the top and on both edges, to a point at or near the outer ends of the plate A, as clearly shown in Figs. 1 and 2, (Fig. 2 being an edge view of the plate before it is bent.) The plate A, as before intimated, is of uniform thickness throughout, and by being made tapering on the edges from the center to the ends with the corrugation pressed into the plate A, as specified, the latter is so supported at every point from the ends to the center that the strain upon the steel is perfectly equalized throughout the entire length of the plate. In Fig. 3 the plate A is of uniform width and thickness throughout, but having the corrugation and rib B just the same as in Figs. 1 and 2, and having ears C C C C formed solid on the edges of the plate A, which are pierced with holes to receive the ends of the clips passing over the spring-bar. Fig. 4 is a bottom view of a side spring, straight on the edges, and with corrugations, as shown and described in the other three figures. Fig. 5 is a top view of a tapering plate, A, same as Fig. 1, and having a corrugation of uniform width throughout. My purpose is in all cases where I make a corrugation of uniform width to have the plate A tapering on the edges, as seen in Fig. 5, and where it is desirable to have the edges of the plate straight I make the corrugation tapering, as seen by Figs. 3 and 4. But the best form of a spring is made by having both the plate and the corrugation tapering, as seen in Figs. 1 and 2.

It will be understood without particular specification that the formation of the plates shown and described are equally applicable to elliptic springs as to side springs, and I so intend applying and using them.

As regards the second part of my invention, I am well aware that the idea of equalizing the action of springs by means of cross-bars or "connecting-rods," so applied that their rotating action shall cause both springs to vibrate in unison with each other, or so as to prevent side motion to the body of the vehicle,

and so as to distribute the load equally upon the springs, is old and well known. But I propose to accomplish this old and well-known result by a new and improved combination of parts, as shown by the drawing, and as hereinafter specified.

In the drawing, Figs. 6 and 10 represent the first modification of the second part of my invention. Figs. 7 and 11 represent the second modification of the same. Figs. 8 and 12 represent the third modification, and Fig. 9 the fourth modification; and each of the Figs. 6, 7, 8, and 9 may represent both the front and rear connecting-rods with a piece of the ends of the springs in position, while Figs. 11 and 12 are side views of the rear axle, bed-wood, piece of the perch, and spring in position. In Fig. 1, D is the connecting-rod, made of round steel or iron, or of iron or steel tubing. E and E are hubs, upon which are formed, as a part of the same, the short arms I I I I, and the outer ends of which latter are connected to the ends of the springs A, to the front and rear of the gearing of the vehicle, by the passing bolt J. The hubs E are rigidly secured to the ends of the connecting-rod D, either by means of a square hole through their entire length, with a corresponding square upon the ends of the rod to fit therein, and pass through the hub far enough to take the taps F, by which latter they are held firmly in position upon the squared ends of the rod, or in place of taps F rivet a head on the end of the rod; or a round hole may be made into the hub, extending nearly the full length of it, and with a screw-thread cut therein, and with corresponding thread on the ends of the rod D, and the connection will be equally as strong in this manner as in the others above described. When the hub is screwed upon the ends of the rod, as last above described, I am permitted to use a steel or iron tube of requisite diameter, and thus stiffen and lighten this connection. The screw-thread on one end of the tube must be cut "right," and on the other "left," so that the pressure of the ends of the springs between the arms I will tend to tighten the hubs in their position. In the center of the hubs E, between the arms I, are turned the bearings *e e*, by which to connect the tubes, in any one of the well-known modes, to the hind axle and the front bolster of the gearing.

The second modification of my invention is shown by Figs. 7 and 11. The ends of the rod D are bent so as to form the cranks K F, and the ends of the springs are hung and operated upon crank-pin, and there secured by the screw-taps F and F. Dotted lines *e* and *e* represent the point of bearing for the attachment of the rod to the axle or bolster of the vehicle. Fig. 11 is a side view of the rear axle, and showing the usual manner of connecting the rod thereto. In this figure U is an end view of the axle, T the bed-wood, V the bearing in which the rod D rotates, A the rear end of the spring, and H the outside perch broken off.

The third modification of my invention is shown by Figs. 8 and 12.

I will here remark that experience has demonstrated that a positively rigid and perfect equalization of the action of side springs through a single connecting-rod, D, cannot be attained by reason of the vibrating twist or torsion of the rod between its outer bearings. But I propose to meet this difficulty by a suitable combination of twin rods D D′ with the ends of the springs A, as may be seen by both the Figs. 8 and 9. The rod D, Fig. 8, has the ends bent at right angles with the rod, and these turned ends L are welded to rod D′, which latter extends past the ends L far enough to take the ends of the springs A and screw-taps F, as clearly shown by this figure. Fig. 9 is the same combination of twin rods as in Fig. 8, except that both rods are of equal length, and having the ends of the springs connected to the rod D′ inside the ends L, instead of on the outside, as in Fig. 8, thus forming an oblong square link, with one side of the link operating in the ends of the spring, and the other side in the bearings upon the hind axle or front bolster of the gearing. The application, however, of these two last-described modifications to the rear axle and front bolster of the gearing differs from that of the two first-described modifications in this—to wit, that the bearing *v* (see Fig. 12) must be raised above the axle, bolster, and perches far enough to admit of the lower rod D′ swinging clear of the tops of the perches when vibrating the springs.

I will here state that as still another modification of the twin-rod connection, seen in Fig. 9, both rods may extend out past the ends L, as seen by the dotted lines O P, and connect the ends of the springs to the projecting pins P, and by the projecting pins O hang and operate the whole to the bearings *v*, Fig. 12.

I desire to have it expressly understood that while I have shown and described the arrangement of a tapering corrugation, B, to a single plate for springs, the same arrangement is equally applicable and valuable in springs made of two or more plates by a suitable proportion in the dimensions of said corrugation or rib B, so as to allow one plate to fit upon the other.

I claim as my invention—

1. In side and elliptic springs, having one or more plates, a corrugation, B, having its widest and deepest dimension at the center between the ends of the plate A, and tapering to a point, substantially as shown in the drawing, Figs. 1, 2, 3, and 4.

2. The plate A, having its widest portion at its center between the ends and its narrowest dimension at the extreme ends of the spring, having a single corrugation, B, whether the latter be of uniform width throughout, as seen in Fig. 5, or tapering from the center to the ends, as in Fig. 1, substantially as and for the purpose specified.

3. The plate A, Figs. 3 and 4, of uniform

width throughout its entire length, having the tapering corrugation B, as and for the purpose specified.

4. The ears C C C C, formed solid on the edges of the plate, as and for the purpose set forth.

5. A tubular connecting-rod, D, Fig. 6, combined with the ends of side springs to pleasure vehicles, substantially as shown and described.

6. The hubs E and E, Fig. 6, having arms I and I formed thereupon as part of the same, in combination with the connecting-rod D and ends of the springs A and A, as and for the purpose set forth.

7. The connecting-rod D, Fig. 7, having cranks K and K formed upon each end, and combined with the ends of the springs A, substantially as and for the purpose set forth.

8. Connecting the ends of side springs so as to equalize their action and compel them to move in unison with each other by means of twin connecting-rods D D′, Figs. 8, 9, and 12, constructed, applied, and operating substantially as shown and described.

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