J. LOCK.

SPRING REPAIR MEANS.

APPLICATION FILED AUG. 21, 1914.

1,137,155.

Patented Apr. 27, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

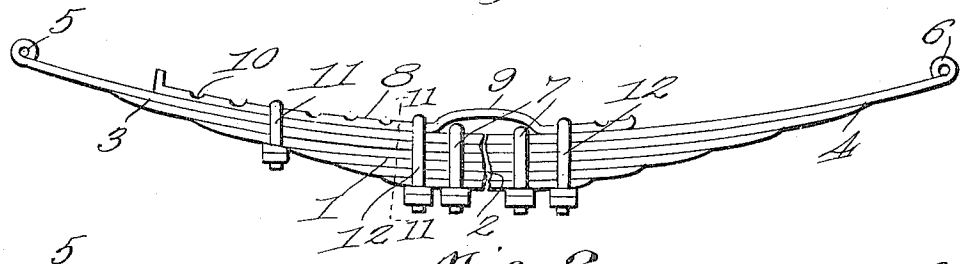


Fig. 2.

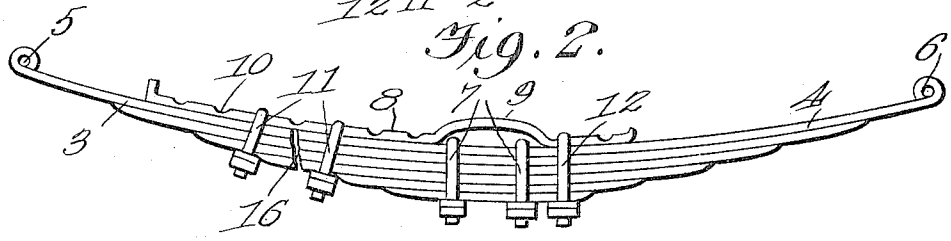


Fig. 3.

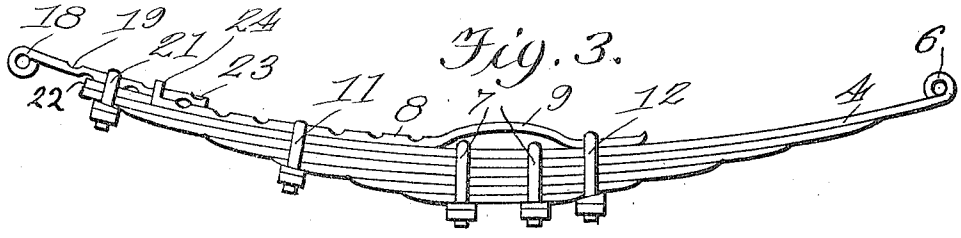
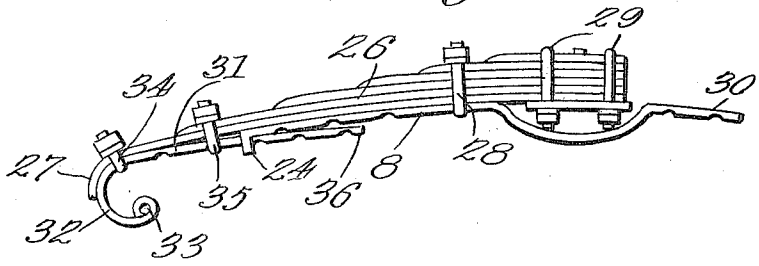


Fig. 4.



Witnesses

Hugh V. Ott

Samuel J. Ieber

Inventor

John Lock

By Carl H. Crawford

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

J. LOCK.

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2 SHEETS—SHEET 2.

Fig. 5.

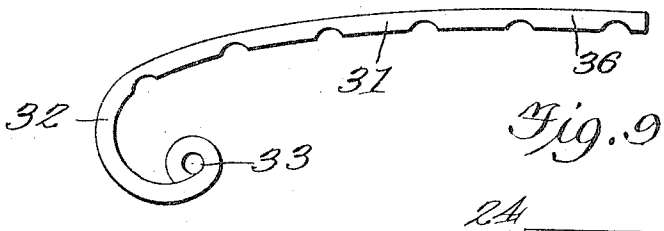


Fig. 9.

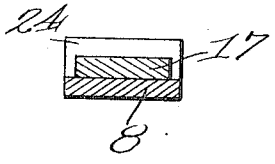


Fig. 6.

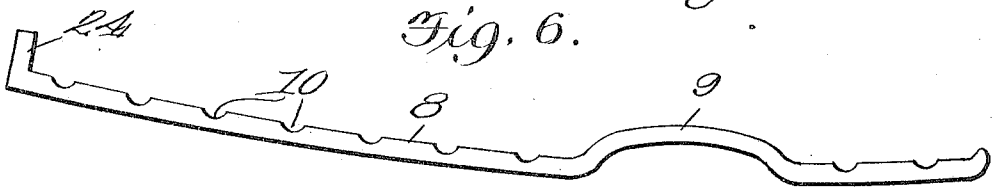


Fig. 7.

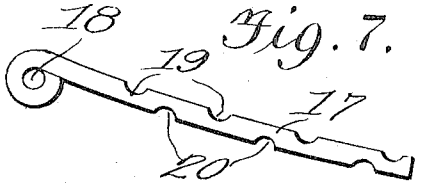


Fig. 10.

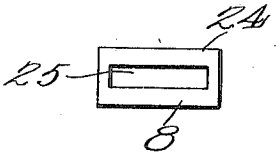


Fig. 8.

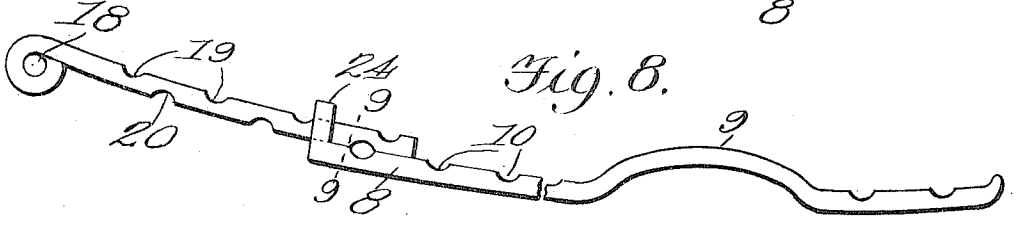
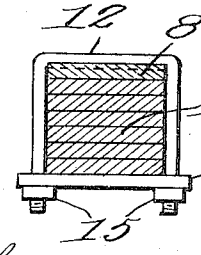


Fig. 11.



Witnesses

Hugh V. Orr

Samuel Fisher

Inventor

John Lock

By Carl D. Crawford

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN LOCK, OF SILVER CITY, NEW MEXICO.

SPRING-REPAIR MEANS.

1,137,155. Specification of Letters Patent. Patented Apr. 27, 1915.

Application filed August 21, 1914. Serial No. 857,909.

To all whom it may concern:

Be it known that I, JOHN LOCK, a citizen of the United States, and residing at Silver City, in the county of Grant and State of New Mexico, have invented new and useful Improvements in Spring-Repair Means, of which the following is a specification.

This invention relates to improvements in spring repair means, more particularly adapted for repairing or sustaining broken elliptical springs of vehicles.

It is a special object of this invention to provide a device comprising one or more parts or bars shaped to lie along and against the spring in a manner to extend in opposite directions past the point of break, together with devices for securing the bar or bars to the spring at suitable spaced points along the length of the latter.

It is a further object of this invention to provide a single or one-piece repair member or bar, which is offset or bridged between its ends and preferably nearer one end than the other of the bar, to provide for selective end for end location of the bar on the spring in accordance with the point of break of the latter, any adjustment of the bar on the spring serving to stiffen or strengthen the broken portion thereof and leaving the unbroken or intact portions resiliently free.

It is a further object of this invention to provide coacting bars which function, in cases where the break or injury may occur at one end of a spring, to stiffen the spring against undue yield but only to such extent, and not wholly rendering the spring rigid, and in this connection, it is a feature of this invention to dispose the bars in overlapping coacting relation in such a manner that they will tilt into spaced or spread relation with respect to each other, upon imposition of thrust on the spring in one direction, thereby permitting the spring to yield, notwithstanding the fact that the bars are preferably rigid.

The invention also includes a very important feature which consists in jointedly connecting the bars so that the repair device will be extensible and contractible lengthwise, and further, to so arrange the joint connection that one bar will hold the other in prescribed relation in addition to permitting the bars to separate on the jointed connection, as a fulcrum or pivot.

Other objects and features of the invention will be more fully described in connection with the accompanying drawings, and will be more particularly pointed out in and by the appended claims.

In the drawings: Figure 1 shows the device of my invention applied to a semi-elliptical frame which has been broken or ruptured at a point between its ends, midway. Fig. 2 is a similar view of a like spring wherein the rupture or break is between one end of the spring and the point of mount of the latter. Fig. 3 is a similar view showing the device of my invention applied to a spring wherein the terminal eye or shackle end has been broken off and showing how the device of my invention is applied to repair such break. Fig. 4 is a view in side elevation of a three-quarter elliptical spring having a goose neck terminal end for the shackle eye, the latter being broken off, and one form of my invention being applied to repair such break. Fig. 5 is a detail view of a goose neck repair bar. Fig. 6 is a detail view of a main or bridge repair bar. Fig. 7 is a detail view of a terminal eye repair bar. Fig. 8 is a view showing the main and terminal eye repair bars connected in one adjustment. Fig. 9 is a sectional view on line 9—9 of Fig. 8. Fig. 10 is an end view showing the slot or loop of the main bar. Fig. 11, is a sectional view on line 11 of Fig. 1.

Like characters of reference designate similar parts throughout the different figures of the drawings.

First referring to Fig. 1, 1 designates a semi-elliptical spring which is fractured or broken at 2, midway between its ends 3 and 4. The spring is provided with terminal or shackle eyes 5 and 6, for attachment to the body of the vehicle. Axle attaching or mount clips 7, of the usual form, serve to attach the spring to the axle, not shown, and said clips are of the U-shaped bolt form for embracing or surrounding the spring. Hereinafter, that portion embraced by these axle clips will be referred to as the point of mount.

To repair or sustain a spring with this kind of break, my invention includes a device consisting of a single bar 8, which is preferably rigid and unyielding, although it will be understood that the term "rigid," is most always relative and is used in this case to indicate a part which is substantially rigid and which cannot flex or yield in a manner similar to a leaf spring which is in-

tended to flex and yield. This main bar 8 is offset or bridged at 9, in such a manner as to span the clips 7 and such offset portions is nearer one end than the other, of such bar, to permit of selective disposition of the bar in accordance with the location or point of break of the spring. The bar 8 is provided with a plurality of transversely disposed and suitably spaced clip retaining grooves 10 to prevent slippage of repair clips which are adapted to seat in said grooves. These repair clips comprise U-shaped bolts 11 and 12, which are adapted to seat in said grooves and embrace the spring, the ends of said clips, extending through clip bars 14 and being threaded. Nuts 15 serve to tighten the clips and bars 14, as shown in Fig. 11. In the emergency repair illustrated in Fig. 1, clips 12 are disposed on opposite sides of the point of mount of the spring, and in this case, the point of break, and clip 11 secures the longer end of the bar 8 to the spring portion 3. Now it will be understood that the application of a rigid bar will to some extent impair the resiliency of a broken spring but it is the object of this invention to retain resiliency as far as possible, and it will be seen that while end 3 of the spring 1, will be substantially stiffened against yielding action, spring end 4 will be resiliently free. The bar 8 is shaped to lie along and flat against the spring thereby acting most effectively, when bound thereto, to resist collapse of the spring, the bridge or offset 9 acting as a stiffening or reinforced arched portion to sustain the spring against collapse under load.

In Fig. 2, the break or rupture is indicated at 16, and in addition to clip 12, clips 11 are disposed on opposite sides of the break 16, thereby stiffening end 3 and leaving end 4 practically resiliently free. It will be clear that this single one-piece member in the form of bar 8, may be applied to support and sustain the spring relative to any fracture or break in the latter, which is located in the main body of the spring inwardly between the terminal ends of the latter. Thus if any fracture occurred in end 4, the main bar 8 would be reversed from the position shown in Fig. 1 to dispose its longer end abreast of end 4.

In Fig. 3, I have shown the manner in which my invention is applied to repair a spring having its shackle eye terminal broken off. In this utility of the invention the main bar 8 is clamped upon the spring with the longer end thereof extending toward the broken end of the spring, and a shackle bar 17, having a shackle eye 18, and suitable clip retaining grooves 19 and 20 on opposite sides thereof, is employed. The shackle bar 17 may be secured to the broken end of the spring by a clip 21, and I may interpose a filler block 22, between the broken end of the spring and the bar 17, so as to permit the free end 23, of the bar 17 to lie in overlapping relation upon the end of bar 8. In order to accommodate for breakage at any point, the device of my invention consisting of bars 8 and 17, is jointed, preferably slidably, so that the device may be lengthened or shortened and in a manner so that when the spring flexes under load, the free end 23 may spread apart from bar 8 about the joint connection as a fulcrum so that the spring thus repaired will not be wholly rigid but will be able to appreciably yield almost to the same extent as before repaired. As illustrated, the main bar 8 has a bent up end 24 in which a slot 25 is formed for adjustable projection therethrough of end 23 of shackle bar 17. I preferably reduce the width of shackle bar 17, with respect to main bar 8, so that the slotted or looped end may encircle bar 17. It will be clear that the connection of the shackle bar to the vehicle will resist longitudinal displacement of bar 17, but the latter is also securely anchored by clip 21, and in the event of bad roads or a heavy load, a clip can also be applied over the free end 23 thereby rendering the spring practically rigid at one side of its point of mount. If the end 23 is free, it will be seen that the device of my invention will yield at the loop joint connection upon downward imposition of stress so as to permit the spring to lightly give under sudden jolts of a light nature, but upon rebound, the overlapping part 23 will abut against bar 8 and resist upward yielding movement of the spring. Thus it will be seen that the right hand end of spring shown in Fig. 3, is resiliently free, while the repaired end may very appreciably yield under both light and heavy loads although it will not be as resiliently free as the intact end.

In Fig. 4, I have shown the device of my invention applied to a semi-elliptical spring 26 having a goose neck end 27 in which the shackle eye is formed, the eye terminal being broken off. The main bar 8 may thus be applied even to a three-quarter semi-elliptical spring, one clip 28 being shown applied near the clips 29 and the free end 30 projecting freely beyond the point of mount. In this form of the invention, the shackle bar 31 will have a goose neck terminal 32 provided with an eye 33 for attachment with the spring shackle. Clips 34 and 35 rigidly secure bar 31 to the spring 26 and the free end 36 will lie in overlapping relation against bar 8. The free end 36 extends through the loop of bar 8, in the manner hereinbefore described, and downward thrust on the shackle bar 31 will tend to abut the free end 36 against bar 8, but there will normally be a space therebetween, as indicated in Fig. 4, so that the spring will not

be rendered entirely rigid notwithstanding the fact that the bars themselves are substantially rigid.

It is believed that the advantages and utility of my invention will be clearly understood from the foregoing description, and while I have herein shown and described specific forms of my invention, it will be understood that I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:—

1. An elliptical spring repair comprising in combination, a repair device comprising rigid repair bars one of which is provided with a loop for adjustable projection therethrough of one end of the other bar to dispose said bars in overlapping relation and permit of extension or contraction of said device, said looped terminal being proportioned to hold the overlapping bars against lateral separation with respect to each other upon thrust applied in one direction, and devices disposed in spaced relation along said device and spring for binding the former on the latter, substantially as described.

2. In a device for repairing elliptical springs, an elongated repair device extensible in the direction of its length and shaped to lie along the spring to be repaired and extending in opposite directions from the point of break of the spring, and clip devices for clamping said repair device on said spring, substantially as described.

3. As a means for repairing a broken elliptical spring, rigid bars slidably jointed for extending or contracting the same and shaped to lie along the spring to be repaired, and devices for clamping said bars to said spring at points opposite the joint connection of said bars, substantially as described.

4. As a means for repairing a broken elliptical spring, rigid bars shaped to lie along the spring to be repaired with their adjacent ends in overlapping relation, and devices for clamping said bars to said spring at points on opposite sides of such overlapping point, substantially as described.

In testimony that I claim the foregoing as my own, I hereby affix my signature in the presence of two subscribing witnesses.

JOHN LOCK.

Witnesses:
W. E. BURNSIDE,
J. M. KIRVER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."