

E. JARRELL.  
VEHICLE SPRING.

No. 395,496.

Patented Jan. 1, 1889.

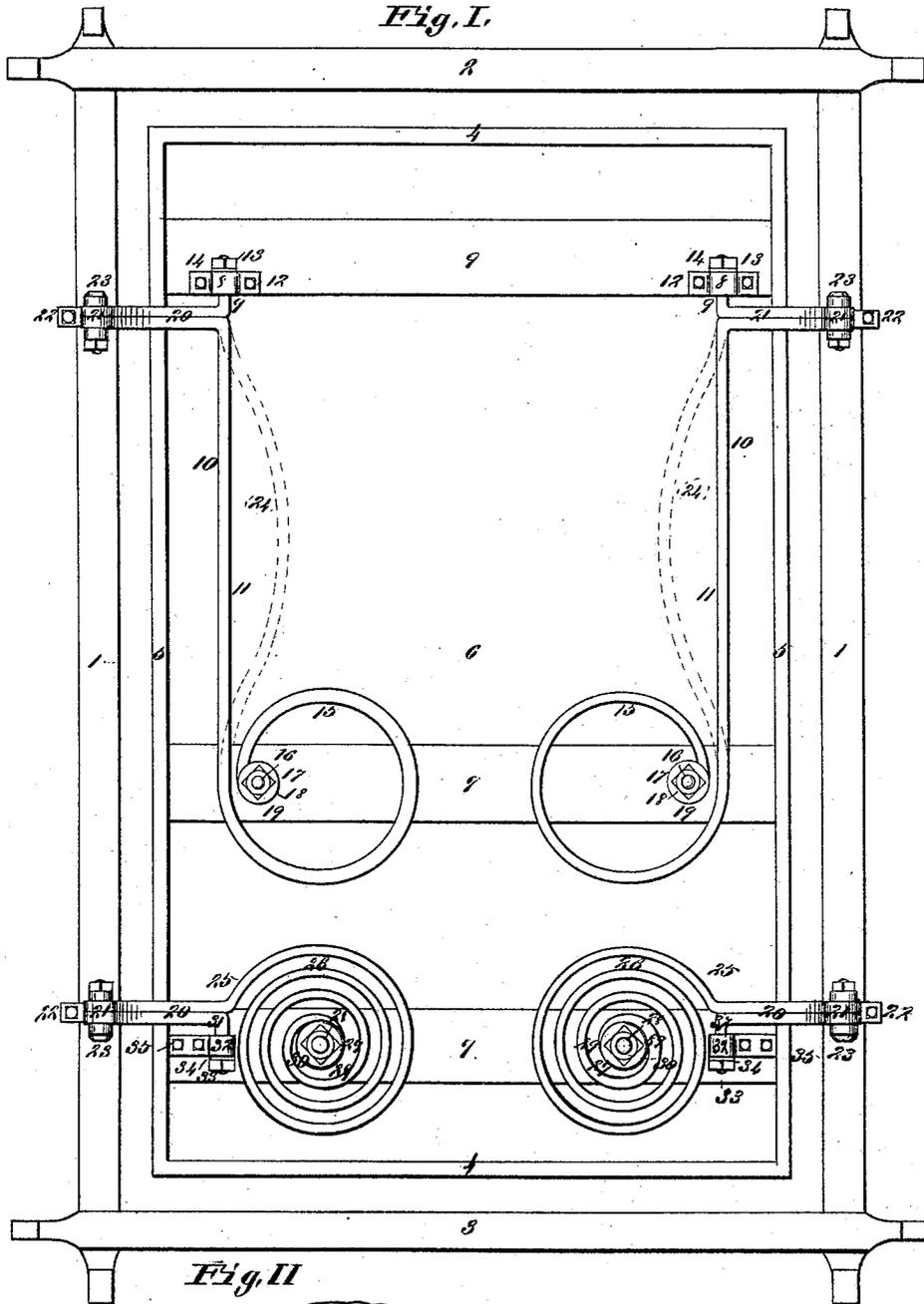
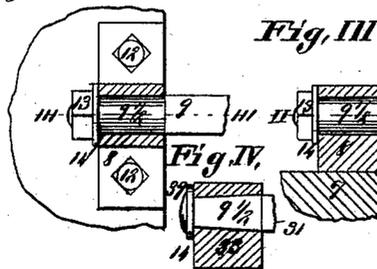


Fig. I



Attest!  
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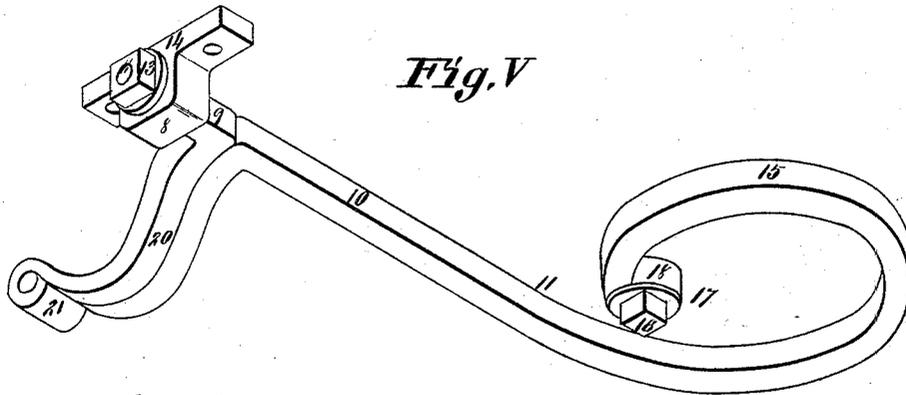


Fig. V

Fig. VII

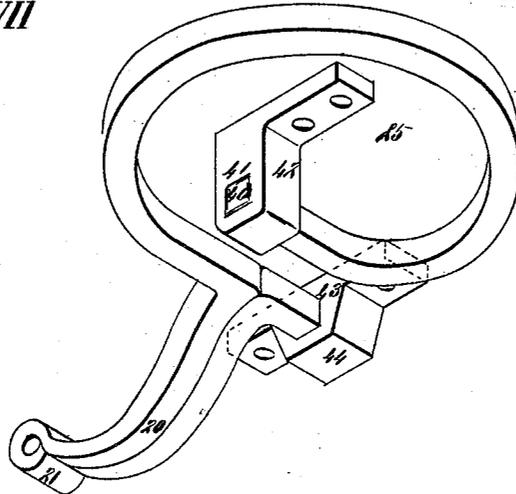
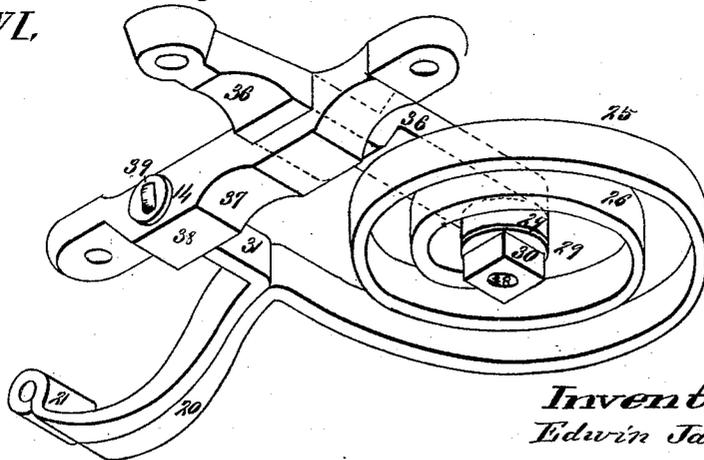


Fig. VI.



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# UNITED STATES PATENT OFFICE.

EDWIN JARRELL, OF HARPER, KANSAS, ASSIGNOR OF ONE-HALF TO HARRY W. McMUNN, OF SAME PLACE.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 395,496, dated January 1, 1889.

Application filed March 17, 1888. Serial No. 267,534. (No model.)

*To all whom it may concern:*

Be it known, that I, EDWIN JARRELL, of Harper, in the county of Harper and State of Kansas, have invented a certain new and useful Improvement in Torsional Vehicle-Springs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

10 Figure I is a bottom view of a vehicle with my torsion-springs attached; also a curved modification of the elongated arm of the spring is shown in dotted lines. Fig. II is an enlarged horizontal section on line II II, Fig. III, and 15 shows the shackle or journal-box that seats the uncoiled end of the elongated single-coil spring. Fig. III is an enlarged vertical section taken on line III III, Fig. II, showing the said shackle. Fig. IV is a vertical section, 20 and shows the journal-box or shackle that seats the uncoiled end of the multiple-coil spring. Fig. V is an enlarged perspective view of the elongated single-coil spring. Fig. VI is a like view of the multiple-coil spring, 25 and shows a modification of the means of supporting and attaching the same. Fig. VII is a perspective view of a modification with an expanded single coil.

30 This invention relates to devices for utilizing a coil-spring counter-balance to the foreshortening and expansion of torsional springs under pressure; also for the increase of spring and elastic reactionary power within a limited space; and the invention consists in features 35 of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, in which like figures of reference indicate the same parts in all the views, 1 represents the side bars, 2 the 40 axle-head, and 3 the head-block, of the carrying-frame of the vehicle.

4 represents the end sills, and 5 the side sills, of the vehicle-bed.

7 are the spring-bars, which may be mortised 45 into the side bars, bolted thereto, or secured by any other suitable means.

8 represents the shackles or journal-boxes that seat the spindles 9½ of longitudinal extensions 9 of the uncoiled ends 10 of the sin-

gle-coil rear torsion-springs, 11. The shackles 50 are secured to the rear spring-bar by the screw-bolts 12. The said ends of the springs have loose bearings within the shackle, and are held in their seats by the screw-nuts 13, which are seated on the washers 14. The coil ends 55 15 of the rear springs are secured to the middle spring-bar by the screw-bolts 16, which pass through the washers 17 and the eyelet-terminals 18 of the coil ends of the springs and through said spring-bar, and are secured 60 in their seat by screw-nuts 19.

20 represents crank-arms that extend laterally from the back of the rear springs to the side bars and terminate in loops 21, which are coupled to the clips 22, that are attached to 65 the side bars by the screw-bolts 23.

24 represents in dotted lines a modified form of the uncoiled end of the rear springs, in which said portion of the spring is of a curvilinear form instead of straight, as shown in 70 full lines.

25 represents the front torsion multiple-coil springs, and 26 are its multiple coils.

27 is the eyelet center terminal of the coils.

28 are the screw-bolts that secure said center terminus to the forward spring-bar, 29 the 75 washer on said bolts, and 30 the screw-nut that is engaged on said bolt and seated on said washer.

31 is the straight end extension of the coil, 80 which is seated and has loose bearings within the shackle or journal-box 32, and is held therein by the screw-nut 33, which is seated on the washer 34. The shackle is secured to the spring-bar by screw-bolts 35. 85

The crank-arm 20 and the loop 21, clip 22, and screw-bolt 23, by which said crank-arm is secured to the side bars of the frame, are counterparts of similar members that perform the same office for the rear springs already 90 described, as also for the modifications yet to be described, and are indicated by like numbers.

In Fig. VI is shown a modification in which 95 substantially the same multiple-coil spring is otherwise than as already described supported and attached to the spring-arm. The forward end of a spring-bearer arm, 36, is

screw-bolted to near the forward edge of the front spring-bar and projects sufficiently back of said spring-bar to suspend the eyelet center terminal of the coil-spring by its screw-bolt, which secures said coil-spring to said arm, as it does in the other springs to the spring-bar, but in this case vertically clear of the spring-bar that indirectly supports it. A shackle-strap, 37, clamps around and reinforces the attachment of the spring-bearer to the spring-bar, to which said shackle-strap is also screw-bolted at its ends. The said strap in this modification also provides at 38 the shackle loose bearing for the straight arm 31 of the torsion-spring, and the end of said arm that projects beyond the shackle-strap may, if preferred, be riveted at 39 on the washer 14, as shown in this figure and in Fig. IV, instead of, as in the other figures, being secured by a screw-nut.

In Fig. VII is shown a modification in which a single-coil forward spring is used in the place of the multiple coil, and its center tenon-terminal, 40, is seated within the slot 41 of the pendent shackle-bracket 42, to which it is riveted, and which shackle is screw-bolted beneath the forward spring-arm. In this modification also the straight arm of the spring is seated within the slot 43 of the shackle-bracket 44, which is also screw-bolted beneath the spring-bar and the said arm of the spring riveted to the shackle.

The springs may be made of either square or flat steel bars, as may accord with the judgment and taste of the builder.

One of the leading features in this invention is to overcome or avoid the well-known difficulty in torsion-springs of the longitudinal foreshortening and expansion of the spring from the alternate depression and elevation of its action. This action of the spring when its torsion produces an end movement, which is both prejudicial to the parts with which it connects, and makes thereby an unpleasant creaking noise, is very suggestive as a tell-tale of the wear to the parts that are made subject to such severe friction. The movements of this torsional spring are entirely within itself and its bearings, under the influence of the crank-arm that, when depressed by the side sills of the bed torsions the spring, at which time its spindle 9½ within its shackle or journal-box moves freely in its bearings, and the give and take of the coil-spring balance the contraction and expansion resulting from the movements of the spring.

My spring is entirely unshackled from end to end, having, therefore, more freedom of movement than any spring could have that was held captive in any way; also, the spring is free from the objectionable end movement above referred to and the consequent strain and injury to the bed-frame of the vehicle.

Another important feature in my torsional spring is that as the springs are constructed

and located in the rear with a longitudinal movement and in front with a transverse movement there is an efficient compensation provided to neutralize the jar from concussion let it come from what point it may; also, to guard against transverse concussions, the forward springs, whose room is too circumscribed for longitudinal extension, are circumferentially extended by means of the multiple coil.

At the same time the rear springs, having abundant room for longitudinal extension, are provided with a long, straight, or curved spring-bar with the compensating attachment of a single coil; also, by the freedom of movement of the balance or compensating devices of the spring and the consequent avoidance of end-pressure the steel is not subject to quick crystallization and breakage.

I claim as my invention—

1. In a torsional spring for vehicles, the coil-spring, the perforated terminal at the inner end of said coil, the spring-bar to which said terminal is screw-bolted, the crank-arm and its means of attachment to the side bar, the extension spring-bar projecting laterally from said crank-arm, the bearing-spindle and the shackle within which it works arranged when the side sills of the bed press on the crank-arm and are released therefrom for the spindle to turn in its bearings as the spring-torsions, and the spring-coil is made to compensate the torsional movement and the consequent expansion and contraction and prevent end movement of the spring, substantially as and for the purpose set forth.

2. In a torsional spring for vehicles, an end coil, a perforated terminal at the inner end of said coil, the spring-bar to which said terminal is screw-bolted, an elongated uncoiled spring-bar integral with said coil, the crank-arm placed at about a right angle from said uncoiled spring-bar, the loop at the end of said crank-arm and clip, and screw-bolt that secures it to the side bar of the vehicle, the extension-bar at about a right angle to said crank-arm, the bearing-spindle, and the shackle within which it has its bearings, substantially as and for the purpose set forth.

3. In a torsional spring for vehicles, the system of torsional springs, with a coil at one end and uncoiled extension at the other, the spring-bars to which said springs are secured, the rotating spindles at one end of said spring and shackles in which they have their bearings, the crank-arms that proceed at about a right angle from the springs, and means for securing them to the side bars, the said springs placed at both longitudinal and transverse position on the vehicle, so as to withstand concussions from any direction, substantially as and for the purpose set forth.

4. In a torsional spring for vehicles, the multiple-coil springs, the perforated center terminals to said coils, the spring bearer-

arms 36, to which said terminals are bolted, the spring-bars to which said arms are bolted, the shackle-straps that re-enforce the attachment of said arms to said spring-bars and  
5 which are provided with journal-boxes, the spindles that rotate in said boxes when the spring torsions, and the crank-arms attached to said springs that support the side sills of  
the bed, and means for securing said crank-arms to the side bars, substantially as and 10 for the purpose set forth.

EDWIN JARRELL.

In presence of—

A. W. BALLARD,

H. W. McMUNN.