C. E. STONE.

Vehicle-Spring.

No. 215,487. Patented May 20, 1879.

FIG. 1.

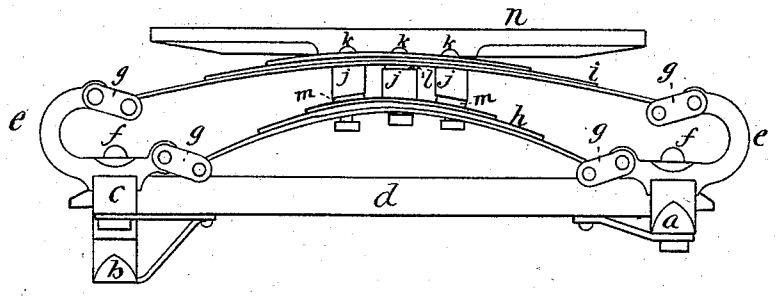


FIG. 2.

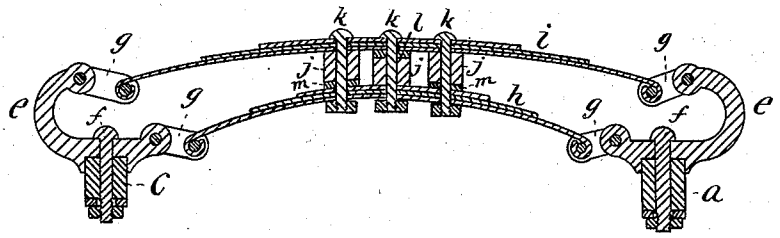


FIG. 3.

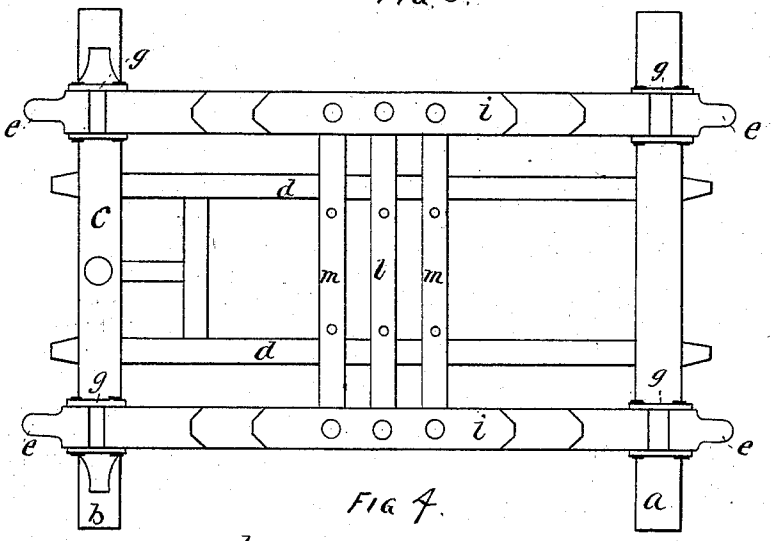
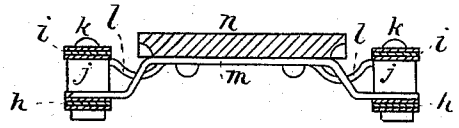


FIG. 4.



WITNESSES.
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CHARLES E. STONE, OF SALISBURY, MASSACHUSETTS.

IMPROVEMENT IN VEHICLE-SPRINGS.

Specification forming part of Letters Patent No. **215,487**, dated May 20, 1879; application filed January 21, 1879.

To all whom it may concern:

Be it known that I, CHARLES E. STONE, of Salisbury, State of Massachusetts, have invented Improvements in Carriages, of which the following is a specification.

This invention relates to that class of vehicles known as "side-spring carriages," whether light or heavy, open or covered; and the invention consists in an improved shackle, formed to be secured to the axle or rocker, and to receive the links for attachment to two springs arranged in the same vertical plane.

It also consists in the combination of two side springs arranged in the same vertical plane, and independently pivoted at the ends, so as to allow separate vertical action, and to admit of an independent end motion of the springs.

It also consists in the combination of the spring-shackles, the two springs, and the connecting-links.

It further consists in the combination of the axle and rocker, rigidly connected by one or more perches, and two springs (on each side of the vehicle) in the same vertical plane, independently pivoted at the ends, to allow vertical and endwise variations in the relative positions of the two springs.

It also consists in the means of connecting said upper and lower springs together at the center, whereby their extreme distance apart is fixed and positive, while they may be brought nearer together, according as force is exerted upon them.

It further consists in the means of attaching the body to the springs, in combination with the compressive cushions between the upper and lower springs, all as will be hereinafter fully described.

Figure 1 is a side elevation of a carriage gear and body with my improvements attached. Fig. 2 is a vertical longitudinal section taken through the center of one pair of the springs, as on line A B, Fig. 3. Fig. 3 is a top or plan view of Fig. 1, but with the body removed. Fig. 4 is a transverse vertical section as taken through the body and springs on line C D, Figs. 1 and 3.

In these drawings, *a* is the hind-axle stock. *b* is the front-axle stock. *c* is the rocker, and *d d* the perches, which rigidly connect the hind axle and rocker. *e e* are the shackles, respectively attached to the rocker and hind axle (on each side of the carriage) by the bolts *f*, or by any other well-known means. These shackles are formed with a suitable "seat" for connection with the axle and rocker, a front lower eye for connection with the link *g* of the lower spring, *h*, a goose-neck extending outward and upward from the axle and rocker, and terminating in an eye for connection with the link *g* of the upper spring, *i*. The upper and lower springs are, at the center, connected by the bolts *k*, which pass loosely through holes in each, and are held asunder by the elastic cushions *j*, through which bolts *k* pass. For the support of body *n*, the spring-brace *l* is secured on the center bolts, *k*, between spring *i* and cushion *j*, and the bent rigid bars *m m* are at their ends secured on the outer bolts, *k*, all of said bars being secured to the body.

It is to be observed that, the axles being rigidly connected together through the rocker and perches, the wheels must at all times retain the same relative positions, and will correctly "track" like any other perch carriages; and the springs, being shackled at their ends in independent links, act independently of each other in all directions except at the center, where their distance apart is limited by bolts *k*.

As the carriage is loaded the outer cushions, *j*, will, by the yielding of the lower springs, be compressed against the upper ones, and the center cushion and spring-brace *l* will be correspondingly depressed; and by reason of the bolts *k* passing loosely through the springs, the latter will in use, as they yield to the force of shocks, be free to slightly change their endwise positions relatively to each other.

The tendency of the wheels of carriages without perches is to increase and decrease the distance between the axles as the front or rear wheels are brought in contact with obstacles on the ground, and the consequent strain upon the springs, throwing the wheels out of track, and the resulting shocks to the passengers, have been the objections to double side-spring carriages as heretofore constructed; but when constructed according to my invention such objections are entirely obviated, and a better result in all respects is obtained from

the springs than would be possible if they performed the double duty of supporting the load and serving as the only connection between the axles, as has been heretofore practiced in such carriages.

I claim as my invention—

1. The side-spring shackle consisting of the member *c*, formed to be secured to the axle or rocker, and the pivotal links *g g*, for an upper and lower spring, substantially as specified.

2. In a side-spring carriage, the combination of two springs, arranged one above the other, and independently pivoted at their ends by links intermediate between such springs, and the rigid supporting-shackles, substantially as specified.

3. In a side-spring carriage, the combination of springs *h i*, arranged in the same vertical plane and connected at their centers, and links *g* and shackles *e*, substantially as specified.

4. In a side-spring carriage, the combination of a hind axle and rocker rigidly connected by perches, and two side springs arranged in the same vertical plane, substantially as set forth.

5. In a side-spring carriage, the combination, with springs *h i*, independently pivoted in links at their ends, of bolts *k* and elastic cushions *j*, for uniting the springs at their center, substantially as specified.

6. In a side-spring carriage, the combination of springs *h* and *i*, bolts *k*, cushions *j*, the bent bars *m m*, and spring-brace *l*, substantially as specified.

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Witnesses:
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