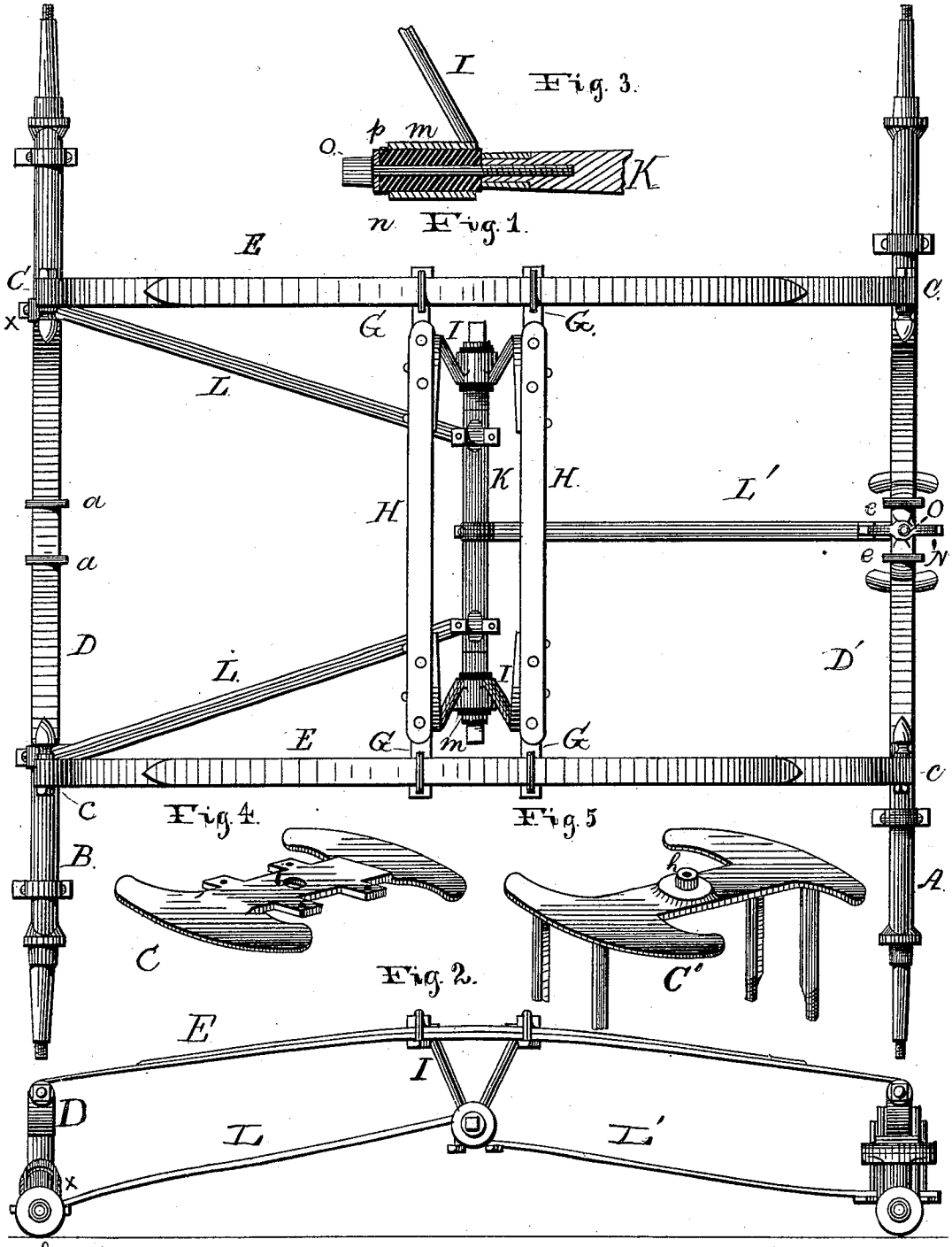
(No Model.) 2 Sheets—Sheet 1.

G. E. HARRIS.

Vehicle Spring.

No. 234,403. Patented Nov. 16, 1880.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

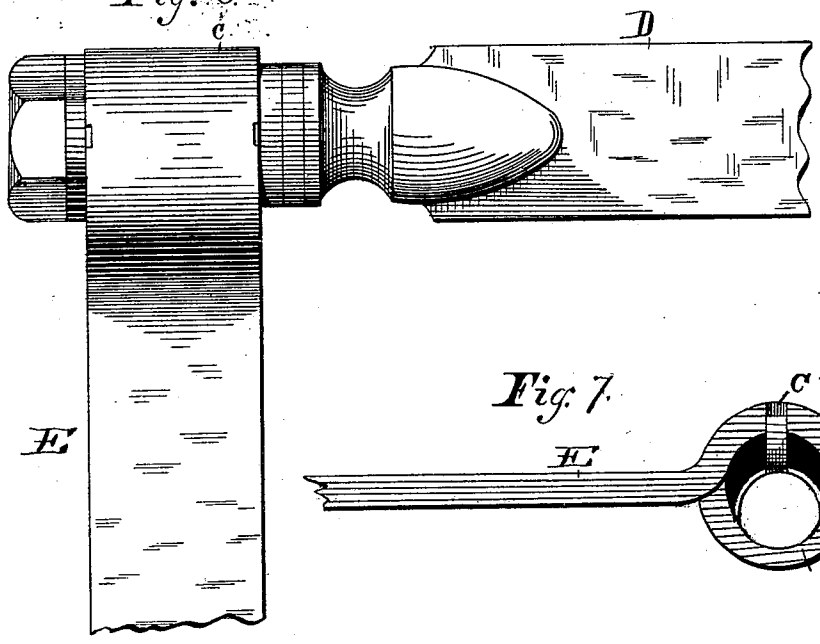
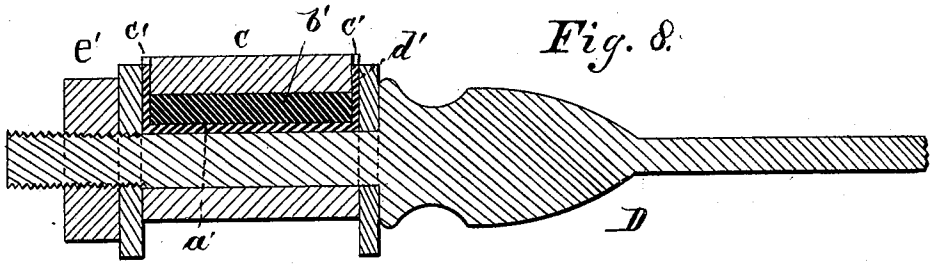


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE E. HARRIS, OF LAWRENCEVILLE, PENNSYLVANIA.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 234,403, dated November 16, 1880.

Application filed September 30, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. HARRIS, of Lawrenceville, in the county of Tioga, in the State of Pennsylvania, have invented certain new and useful Improvements in Vehicle Springs and Gearing, of which the following, in connection with the accompanying drawings, is a specification.

My invention relates to that class of vehicles in which the body is supported upon side springs secured at their extremities to end springs mounted upon and secured to the front and hind axles, and has for its object to provide improved means for supporting said body, bracing the springs, and preventing noise and rattling of parts.

In the drawings, Figure 1 is a plan view of the parts to which my improvements relate. Fig. 2 is a side view thereof; and Figs. 3, 4, 5, 6, 7, and 8 are detail views.

The side springs, E E, connected with the end springs, D D′, by means of eyes or thimbles *c c*, fitting over the rounded ends of the latter and secured thereon by nuts or pins, have attached to them, at their middle portions, iron body-supports G G, with which the body is connected, it being secured to wooden bars or blocks H H, placed transversely and secured to said supports.

The bars or body-supports G G are connected with the side springs by means of shackles or yokes, and in order to give a full side view of the body I make the transverse equalizing-bars H of sufficient size to raise it even with the tops of the side springs, E E.

To the ends of the transverse bars H are secured depending brackets I, formed at their lower ends with thimbles *m*, and within said thimbles are perforated blocks of rubber *n*, of sufficient length to project at each end.

The transverse bar K, mounted between the thimbles, is held by means of threaded bolts *o*, passing through said rubber block and into the ends of the bar. Between the heads of the bolts and the blocks of rubber *n* are placed washers *p*. Upon screwing up the bolts *o* a projecting rim of rubber will be forced out at each end of the thimble *m*, so as to form elastic cushions between the latter and the ends of the equalizing-bar and heads of the bolts *p*, completely isolating said thimbles from contact with either metal or wood surfaces.

The end spring D is firmly bolted or clipped to the hind axle at *a a*, and the front spring D, at *e e*, to the block or plate C, (shown in Fig. 4,) composing the head-block or upper part of the fifth-wheel.

Firmly connected with said bar K, by means of clips, are steel braces L L, extending backward and secured to the rear axle, B, at their hind ends. A similar brace, L′, is extended forward to the front axle. These braces serve as a reach.

Braces L L, which, as also brace L′, may be flat, round, or of other suitable shape, are firmly connected by their bolts or clips with the rear axle, B, at points below the ends of springs D, and with the bar K at points intermediate to its middle and ends.

Brace L′, which may either consist of one bar connected with the middle of the transverse bar K, or of two bars connected at different parts and extended forward in V shape, extends forward under the central portion of the front axle, A, to which it is secured by the king-bolt O passing through it and the yoke N, which extends over the top of the front spring D′, and has depending arms passing through holes in brace L′ in front and rear of the front axle. Nuts on the arms of the yoke above and below the brace L′ firmly secure the latter.

The brackets I, secured to the bars H, extend downward from the centers of springs E E to substantially the same distance below them as exists between the ends of the side springs and the rear ends of braces L L and the forward end of brace L′; consequently the braces follow a line substantially parallel with the line of curve of the side springs. By this construction I provide an effective connection capable of holding the front and rear axles and end springs in proper vertical position, and of preventing the springs from unequally settling under a load.

The braces yield to accommodate any elongation of springs E E caused by straightening out when supporting a load, for, being bent to substantially the same extent as springs E E, and connected at their middle points to the middle portions of the springs, so that they are depressed at that point and straightened out correspondingly with the springs, the braces straighten and bend to the same degree as the

springs. By this means the proper vertical position and parallelism of the front and rear axles and end springs are maintained, and an elastic or yielding movement is permitted in the axles and end springs. An easy-going vehicle is thereby provided, jolting and jarring caused by passing over irregularities in the road being obviated. The springs yield when the vehicle strikes a stone or the side of a rut, and thereby the wheels, instead of shaking and jarring the vehicle by striking rigidly, are drawn or pulled gradually over or out without shock. There is no play between the ends of the braces and the bar K or axles, the connections being made perfectly rigid. This does not interfere, however, with the necessary yielding movements of the side springs, for the resiliency of the braces readily accommodates the movements of the springs. In this respect I believe my construction presents features of advantage over all similar existing arrangements.

In all the constructions of carriage running-gear with which I am familiar, having coupling-braces connected with the axles and side springs, the braces are attached by pivot-joints to the other parts. This is open to several objections—among others liability to wear and rattle and danger of breakage. These I seek to remove.

To still further provide for securing a side-spring conveyance which shall be exempt from the rumbling and roaring sounds so troublesome in vehicles, I secure against any looseness or rattling of cross-bar K and arms I by means of the thimbles *m* and rubber blocks *n*, having their cushioning ends projecting from the thimbles, as previously described. The rubber, being a non-conductor of sound, will absorb the vibrations of the wheels and lower parts of the gearing, and thereby prevent them from reaching the body. Troublesome rumbling and roaring, very frequently experienced, due to the sounding-board-like action of the body, are thereby prevented.

By permitting no actual contact of metallic or hard surfaces, wear of parts and noise due to their vibration and contact are also prevented.

The fifth-wheel is composed of a lower plate, C′, (shown in Fig. 5,) secured to the front axle, and an upper plate or block, C, attached to the front spring, D′. Part C′ is formed with suitable bearing-surfaces for the upper plate, and has a vertical perforated pin or stud, *h*, which is adapted to project upward through a hole, *i*, in plate C, and thus serves as a pivot for the latter.

The king-bolt O passes through the perforation of the pin *h*, and is relieved of all strain.

To provide a connection for the ends of the side and end springs that will fit tightly in use and will not become loose by wear, I construct the eyes or thimbles on the ends of the side springs in the following manner: I make such thimbles with enlarged apertures, that may, if desired, be of an elliptical form. Within the aperture of each thimble, and in the upper portion thereof, I place a concave block or plate of metal, *a′*, (either steel or brass is suitable,) whose face, in connection with the lower portion of the thimble, forms a circular bearing for the pin or spindle at the extremity of the end spring.

Upwardly-projecting ears *d′* of the bearing-plates are received in grooves *c′* in the ends of the thimble, and maintain the bearing-plates in position. Above the bearing-plate is a block of rubber, *b′*, the expansion of which presses the plate downward firmly upon the end pin of the end spring, holding the same tightly, and forming a tight bearing, not at all liable to rattle. The compression of the rubber block when the wagon receives its load, although slight, gives an easy, yielding movement, while the expansibility of the packing keeps the bearing-plate closely pressed against the end pin at all times, and compensates for any wear.

Rubber washers are placed on each side of the thimble, and the whole is tightened up by means of the nut *e′*. The rubber washers and packing in this case also perform the function of absorbing vibrations and noise.

I am aware that a spring having an eye or thimble provided with an anti-rattling bearing composed of a rubber packing and metal ferrule is not broadly new, for that is shown by Patent No. 167,068, dated August 24, 1875. I do not, therefore, seek to broadly cover this feature.

My invention consists in the peculiar construction of the parts composing the bearing, and differs from what is shown in the said patent in several features. In the latter the metal ferrule, when secured in position around the end pin of the cross-bar of the wagon, forms a complete cylindrical bearing for said pin, and on account of this form will not admit of being readily adjusted to fit the pin in case the latter is too small to actually fill the interior of the said ferrule. When too small the pin will move loosely in its bearing.

I obviate these disadvantages by making my bearing-plate of semi-cylindrical form. This plate encompasses closely, but not completely, the periphery of the end pin of the end spring. When in place in the eye the pin bears on its under side upon the inner concave surface thereof, the bearing-plate being placed above and pressed firmly upon it by the rubber packing, and is securely held at all times. It will be seen that the plate admits of being readily compressed or opened to fit any sized pin.

In the other construction referred to the ferrule can only be compressed to a certain extent, and when used with too small a pin will not prevent it from rattling. Mine, on the contrary, can be made to closely fit almost any size, and will always constitute an anti-rattling bearing.

I also provide the bearing-plate with ears that engage with grooves in the ends of the eyes or thimbles and prevent the plate from becoming displaced. These features are lacking in the devices shown by said patent.

Having thus described my invention, I claim—

1. The combination, with axles A B, end springs, D D′, and side springs, E E, of supports G, bars H, brackets I, equalizing-bar K, and braces L L and L′, substantially as described.

2. The combination, with the equalizing-bar K, of the brackets I, having the thimbles *m*, the rubber packing-blocks *n*, adapted to project at each end from the thimbles to form elastic cushions between the said thimbles and the ends of the equalizing-bar and heads of the securing-bolts, and the bolts *p*, substantially as and for the purpose described.

3. The combination, with the axles and the side springs connected thereto, of the brackets depending from the middle of said springs, the equalizing-bar supported thereby, and the front and rear braces having rigid connections with the axles and equalizing-bar, substantially as and for the purposes described.

4. The combination, with the end springs having the end pin, of the side spring formed with the thimbles having the grooves *c′*, the semi-cylindrical bearing-plate *a′*, having the ears *d′*, and the rubber packing, substantially as described.

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Witnesses:
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