(No Model.)

E. J. HESS.

VEHICLE SPRING.

No. 301,593. Patented July 8, 1884.

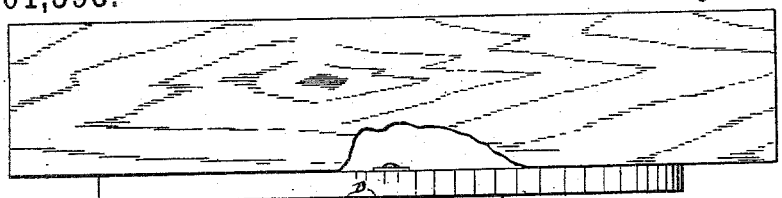

Fig. 1.

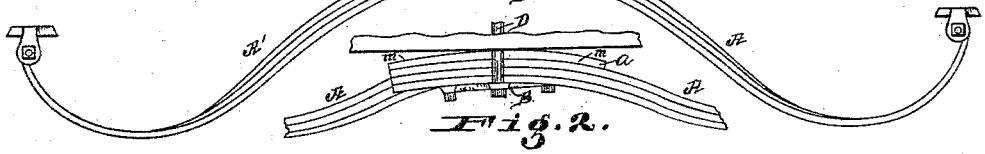

Fig. 2.

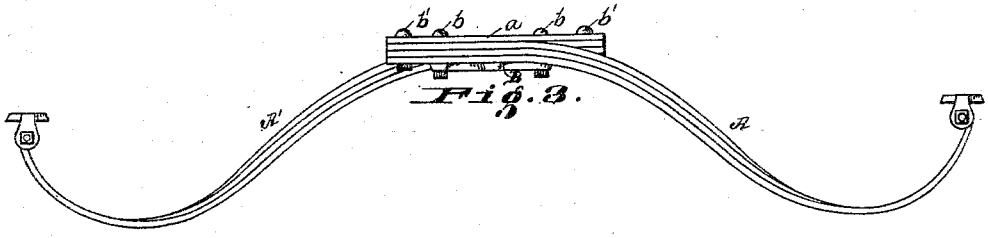

Fig. 3.

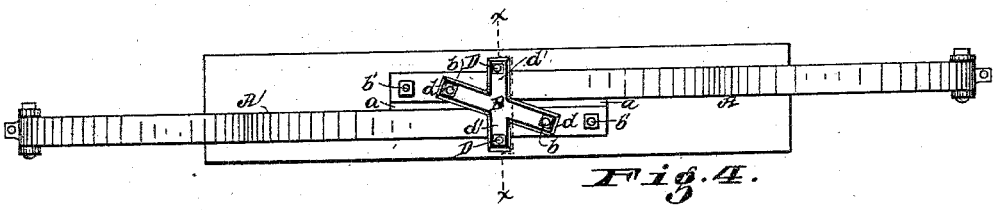

Fig. 4.

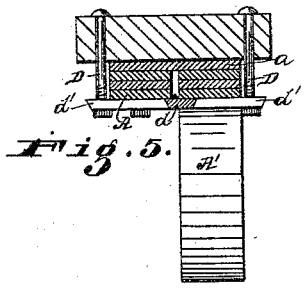

Fig. 5.

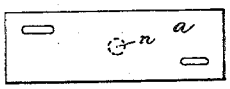

Fig. 6.

Attest.

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UNITED STATES PATENT OFFICE.

ELMER J. HESS, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO EDWARD B. HESS, OF SAME PLACE.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 301,593, dated July 8, 1884.

Application filed October 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, ELMER J. HESS, a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Vehicle-Springs and Clips, of which the following is a specification.

The various features of my invention, and the several advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

Referring to the drawings forming part of this specification, Figure 1 is an end view of an end of a vehicle-body, showing the spring attached thereto. Fig. 2 illustrates the movement of the plate, to which the springs and clip-piece are connected, when a load is placed on the vehicle. Fig. 3 represents the spring detached from the body and as supplied to the trade. Fig. 4 is a bottom view of the spring connected to the spring-bar of the body. Fig. 5 is an enlarged sectional view taken at the lines *x x* of Fig. 4, looking toward the left-hand end of said figure; and Fig. 6 is a bottom view of the elastic plate afore referred to, and illustrating certain modes of arranging the holes therein to connect it to the two halves of the spring.

The spring consists of the two halves A A′, originally made separate from each other, and composed of any desired number of leaves. The meeting ends of these two halves A A′ pass each other side by side to any desired extent, and are bolted to opposite ends of a plate, *a*, of spring-steel, two bolts, *b b′*, being preferably employed for each half-spring.

B is a clip or tie made somewhat in the form of a cross, the two arms *d* of which are secured to the spring by the bolts *b*, which secure the two halves of the spring to the plate *a*. The other arms, *d′*, of the clip form a bar which extends across the spring at right angles to its length, and the ends of these arms *d′* extend beyond the outer edges of the two halves A A′ of the spring, and the portions lying beyond said edges are provided with holes, through which are passed the bolts D, by which the spring is secured to the vehicle-body. The bar formed by the arms *d′* of the clip B is preferably in the central portion of the spring when its parts are taken together as one—that is to say, is equidistant from the outer ends of the two halves A A′ of the spring, and is at the longitudinal middle of the plate.

As furnished to the trade, the spring has the appearance shown in Fig. 3, the two halves A A′, the plate *a*, and the clip-bar B, being all bolted together. All that is necessary, then, to connect the spring to the vehicle-body is to pass the bolts D through the spring-bar and through the holes in the ends of the arms *d′* of the clip-bar.

The bolts D, in connection with the arms *d′*, operate as a clip and prevent lateral displacement of the spring, and in connection with arms *d* and bolts *b* of said tie-plate *a*, prevent the tie-plate from slipping on the spring, and prevent the spring from sliding longitudinally upon the vehicle-body or spring-bar to which the spring is connected.

The connection between the spring and the body or spring-bar being made at one point—*e. g.*, in the transverse line *x x* (see Fig. 4) passing through the bolts D D—the effect of the construction is such that when the spring is subjected to superincumbent pressure the spring operates to bend the elastic plate, and the latter combines with the spring to also operate as a spring.

The manner in which the plate is bent is illustrated in Fig. 2, the end portions, *m m*, of the plate bending away from the vehicle-body or spring-bar. This elastic plate, thus bending when the spring is deflected, imparts greater elasticity to the spring and gives the spring as an entirety greater capacity for flexion.

The capacity of the elastic plate to bend with the spring becomes of particular advantage when heavy weights are placed upon the vehicle, as the plate will bend, and at the same time bends more stubbornly and to a less extent than the rest of the spring, and hence contributes to render the spring elastic when the elasticity of the half-springs has been to a great extent temporarily taken up and exhausted by the strain of the load.

The central bolt-connection with the spring-bar or body may be made in other ways than that thus far described. For example, the bolt connecting the spring to the body or spring-bar may pass through a hole, *n*, in the center of the plate *a*, (see Fig. 6,) and if the clip B be

retained, the bolt would pass through the center of the latter and the bolts D D might be dispensed with, as well as the arms *d d'*.

So far as that feature of my invention is concerned which consists in the combination of the elastic plate *a* and the half-springs, all of clip B may be dispensed with and the bolt-connection be made between the spring and the vehicle-body or spring-bar in many suitable and obvious ways, the object to be kept in view being to make a connection with the spring-bar or vehicle-body, which shall be at or near the center between the points of attachment of the two half-springs to the plate *a*, and which point or points of said connection with said spring-bar is illustrated by the line *x x* of Fig. 4. Among other advantages, I thus obtain all of the advantages of a central connection and of a connection made by causing the ends of the two halves of the spring to pass each other, and also obtain the benefit of the elastic plate in its combination, substantially as described, with the rest of the spring.

There are certain standard lengths of spring, varying from one to three inches, and to meet this variation separate plates *a* and clips B may be formed for each standard length of spring. For springs of the shorter lengths, the clips, if employed, may have holes in the ends of the arms *d* nearer together than in the clips for springs of the longer lengths.

For the purpose of better enabling one plate *a* to be used with springs of different lengths, the holes in the plate *a* for the bolts *b b'* may be slotted, as shown in Fig. 6, and I am thus enabled to form all of halves A A' of the spring of even lengths, whether they are to form a short or long spring, and the connection of the completed spring to the body will always be at the center.

I am aware that springs have been heretofore made consisting of two halves, the central ends of which pass each other to be secured rigidly to some part of the body, and I do not therefore claim this feature; but

What I do claim as new, and desire to secure by Letters Patent, is as follows:

1. The two halves A A' of a spring secured to the plate *a*, substantially in the manner described, in combination with the clip-bar B and bolts D, adapted to secure said spring to the body, substantially as and for the purposes specified.

2. In a vehicle-spring, the combination of two half-springs, A A', the central ends of which pass each other, and the elastic plate *a*, the central end portions of the said half-springs being secured to said plate *a*, substantially as and for the purposes specified.

3. In a vehicle-spring, the combination of the half-springs A A', elastic plate *a*, and the spring-bar or vehicle-body, the central end portions of the half-springs passing each other, and being secured to said plate *a*, and the latter being connected to the vehicle-body or spring-bar at or near the transverse middle, as *x x* of said plate, substantially as and for the purposes specified.

4. The combination of the half-springs A A' whose central end portions pass one another, the elastic plate *a*, secured to said central end portions and provided with slots, substantially as and for the purposes specified.

5. The two halves A A', secured to the plate *a* by bolts *b b'*, in combination with the clip-bar B, having arms *d*, through which the bolts *b* pass to secure the clip-bar to the spring, and the arms *d'*, projecting beyond the sides of the spring, by which said spring is secured to the body, substantially as and for the purposes specified.

6. The combination of the tie and clip-bar B, having arms *d d d' d'* and the half-springs A A', and plate *a*, bolts *b'*, connecting the ends of the springs to the plate *a*, bolts *b*, connecting the ends of arms *d* and the springs to said plate *a*, and bolts D, connecting ends of arms *d'* to the spring-bar or vehicle-body, substantially as and for the purposes specified.

ELMER J. HESS.

Witnesses:
J. WM. STREHLI,
ED. R. HILL.