(No Model.)

H. N. BLACK.

VEHICLE SPRING.

No. 333,814. Patented Jan. 5, 1886.

FIG. 1.

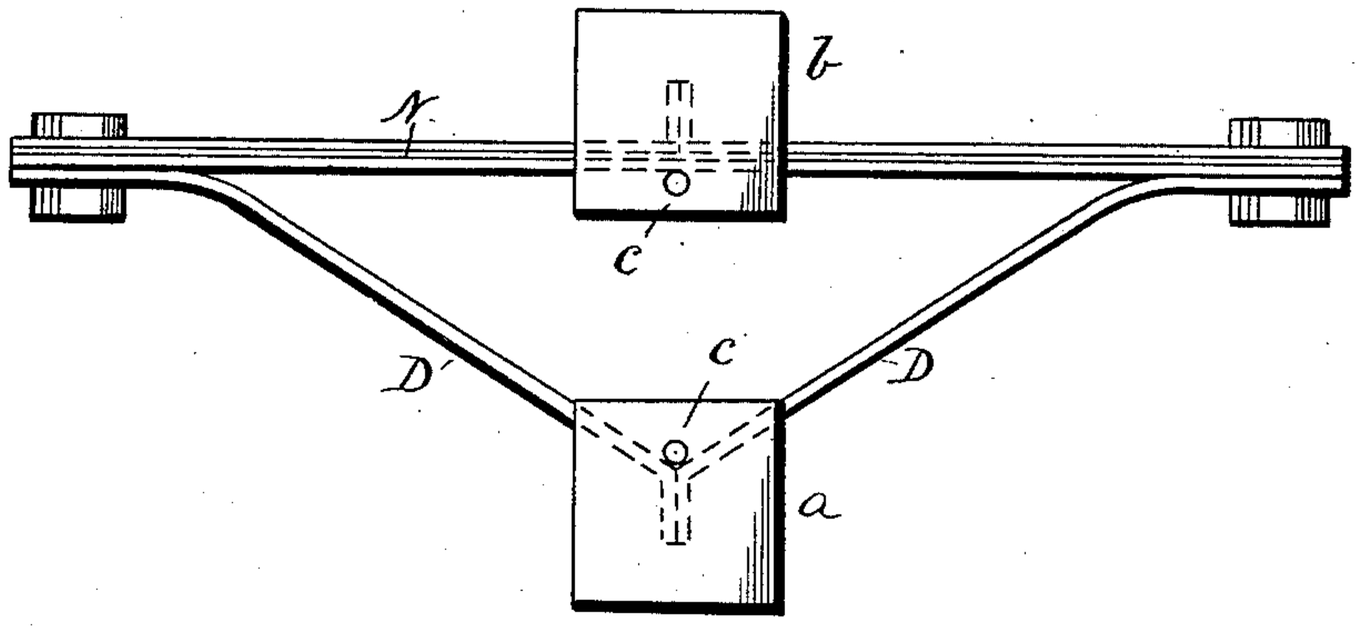


FIG. 2.

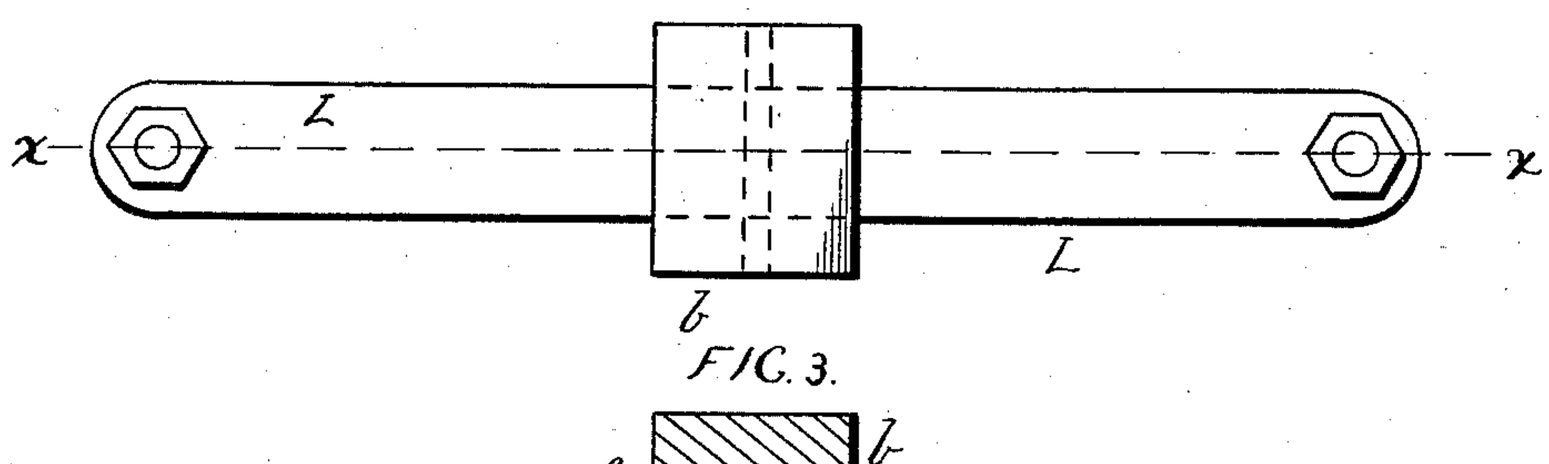


FIG. 3.

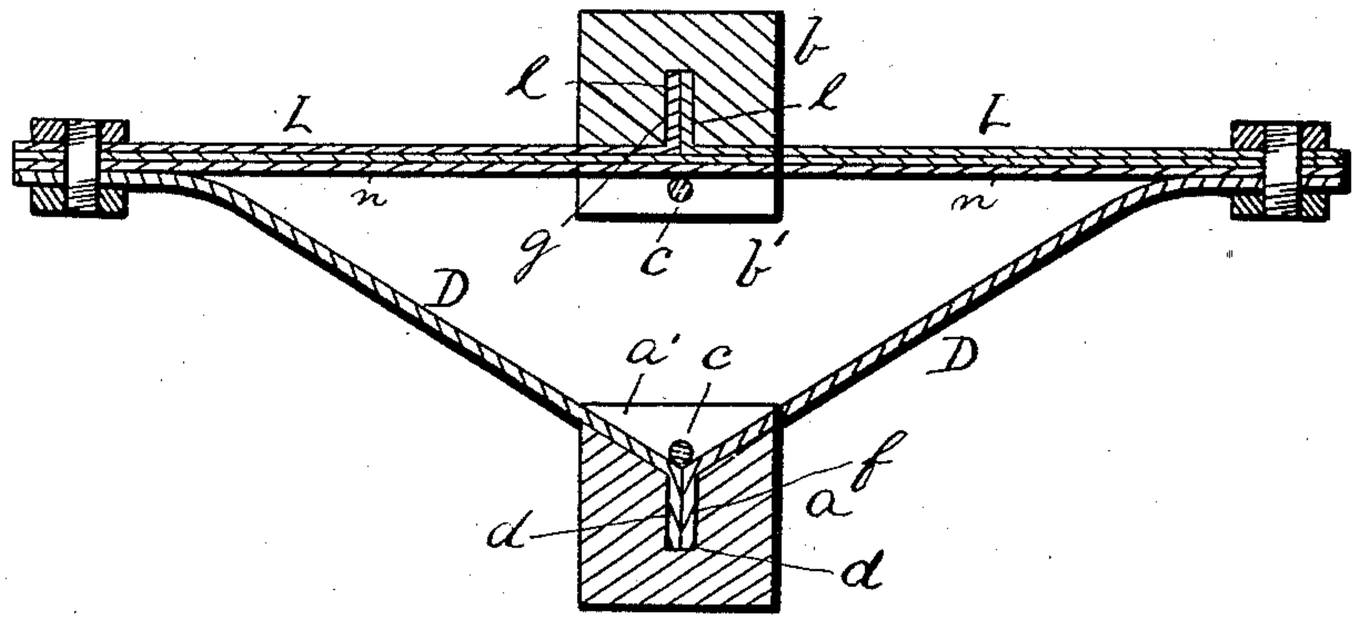
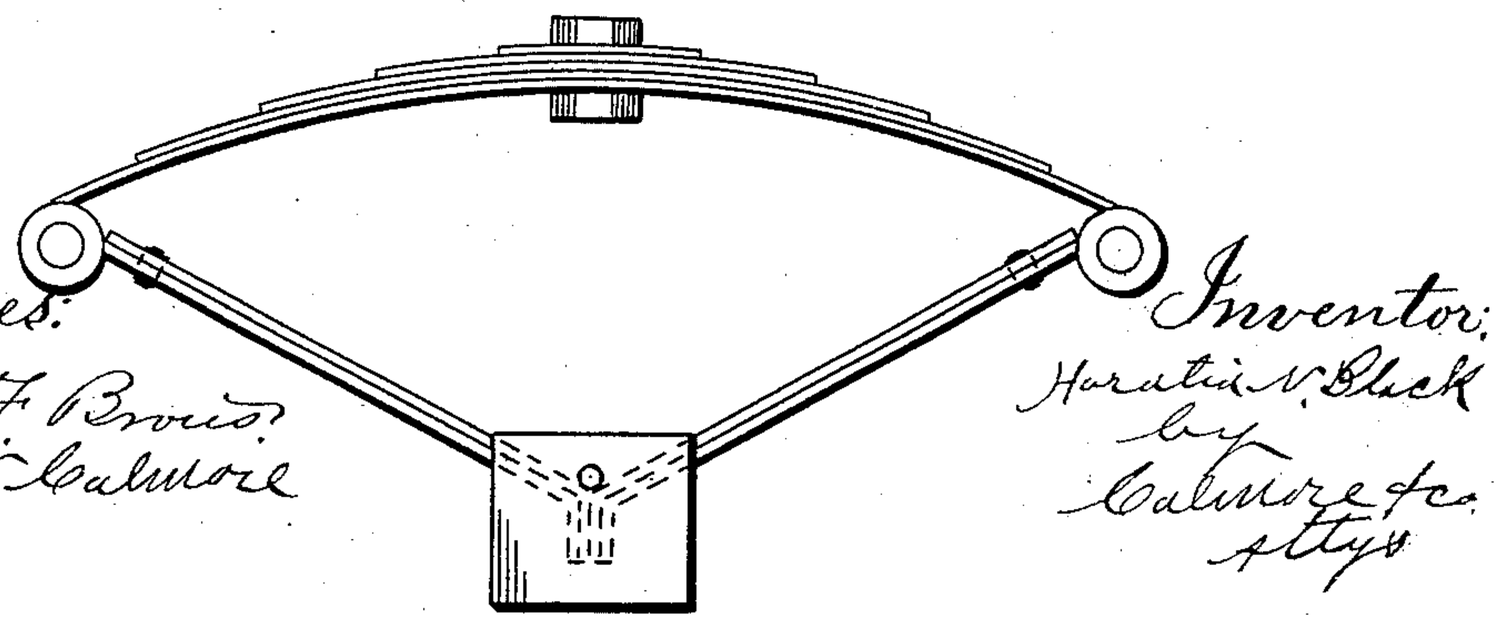


FIG. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

HORATIO N. BLACK, OF PHILADELPHIA, PENNSYLVANIA.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 333,814, dated January 5, 1886.

Application filed June 19, 1885. Serial No. 169,223. (No model.)

To all whom it may concern:

Be it known that I, HORATIO N. BLACK, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Springs, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in springs in which the spring is constructed in pile form; and the invention consists in the use of lever-bars by attaching the same to the outer ends of a divided bearing plate or seat for holding the spring-leaves, and which lever-bars and bearing-plate abut against each other in central line with the middle of the spring, the object being to follow up and secure the full elasticity of the plate or plates composing said spring, and at the same time have full control over the same.

In the accompanying drawings, Figure 1 is a side view of my improved spring, showing the blocks which first receive the weight. Fig. 2 is a top or plan view of the same. Fig. 3 is a vertical section on the line *x x* of Fig. 2. Fig. 4 is a modification of the spring, clearly illustrating my invention when used in connection with but one seat-block and a half-elliptic spring.

Similar letters refer to like parts in the several views.

In the drawings, *a* and *b* represent, respectively, the cap and sill blocks, the cap sill-block *b*, in which the spring N is secured, as shown, forming the seat. As to the reversing the spring N—that is, placing either of the sill-blocks *b* or *a* to the bottom or the top—is a matter of convenience or utility in using the spring. My construction is to assist in securing all of the elasticity of the spring N, and not in any manner interfering with its location or use.

I use in connection with a spring-plate, *n*, or a number of spring-plates, *n*, as go to form the spring N, in order to secure the proper amount of elastic strength, lever-bars D, which I connect at their outer ends with centrally-divided bearing-plates L, which butt centrally in the block *b*, and which lever-bars I also construct to butt centrally in the block *a*. By such an arrangement of lever-bars D, which can be made from common iron, I am able to construct a much cheaper and efficient spring, while at the same time firmly holding and securing all of the elasticity therefrom. The portions *d* and *l* are bent, as will be noticed, at an angle at the point where they meet or butt in the blocks *a* and *b*, respectively, and when pressure is brought to bear upon the spring N the former are thereby constructed to give or play to such an extent as will meet with the elasticity of the spring.

Safety pins or bolts *c*, passing through the seat-blocks *a* and *b*, respectively, serve to retain the spring N and lever-bars D in one direction, while grooves *a'* and *b'* in the seat-blocks prevent any lateral displacement of the several parts.

Recesses *f* and *g*, which conform to the shape and size of the bent angular portions of the lever-bars D and bearing-plates L, admit of full play to said lever-bars and bearing-plates, and, furthermore, assist in preventing any lateral displacement of any of the parts.

The lever-bars D can be constructed of one or more leaves, as may be desirable, to secure the proper strength to resist effectually the action of the spring N, and the same may be bolted or otherwise secured together.

The retaining bolts or pins *c*, as heretofore explained, do not in any manner interfere with the action of the spring or lever-bars, and any number of springs with their separate arrangement of lever-bars can be arranged side by side in accordance with the amount of work to be performed. It will thus be seen that by the use of the lever-bars I am capable of constructing a spring which, when used for purposes of freight-cars and the like, in which the same must be compact and strong and in which also, the spring portion proper is composed of straight and highly-tempered plates, which from their length heretofore were continually breaking, by the easy and simple manner in which the weight is received and distributed throughout the spring by the use of the lever-bars, renders the plates comprising it entirely free from the above-mentioned trouble. At the same time, should it be desirable to use a spring full half-elliptic, and thus have but one resting-point, and not having the divided

bearing-plate, (shown clearly in Fig. 4,) the same is rendered thoroughly free from any danger of breakage from the reason named by the manner in which the strain is distributed by the lever-bars.

Having thus described my invention, I claim as new the following, to wit:

1. The combination, with the spring N, constructed as described, of the lever-bars D, seat-block *a*, having recess *f*, groove *a'*, and retaining-pin *c*, arranged and operating in the manner and for the purpose set forth.

2. The combination, with the spring N, constructed as described, and seat-blocks *a* and *b*, of the lever-bars D, having bent angle portions *d*, bearing-plates L, having bent angle portions *l*, and retaining-pins *c*, as set forth.

3. The combination, with a spring, N, constructed substantially as described, and seat-blocks *a* and *b*, of the recesses *f* and *g*, grooves *a'* and *b'*, lever-bars D, having bent angle portions *d*, bearing-plates L, having bent angle portions *l*, and retaining-pins *c*, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HORATIO N. BLACK.

Witnesses:
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