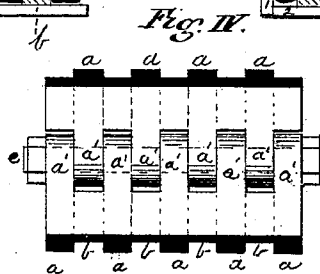
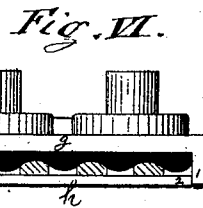
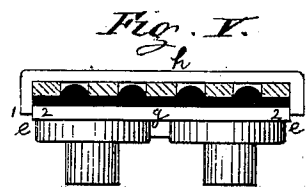
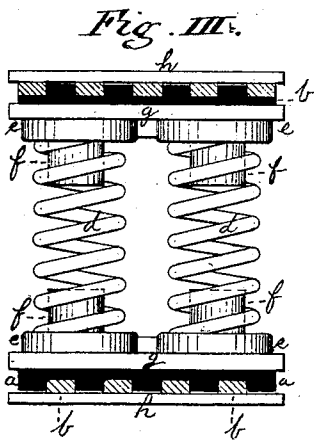
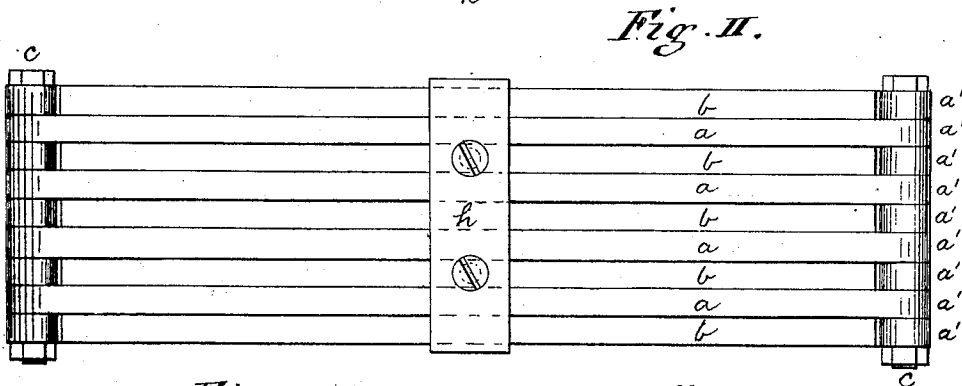
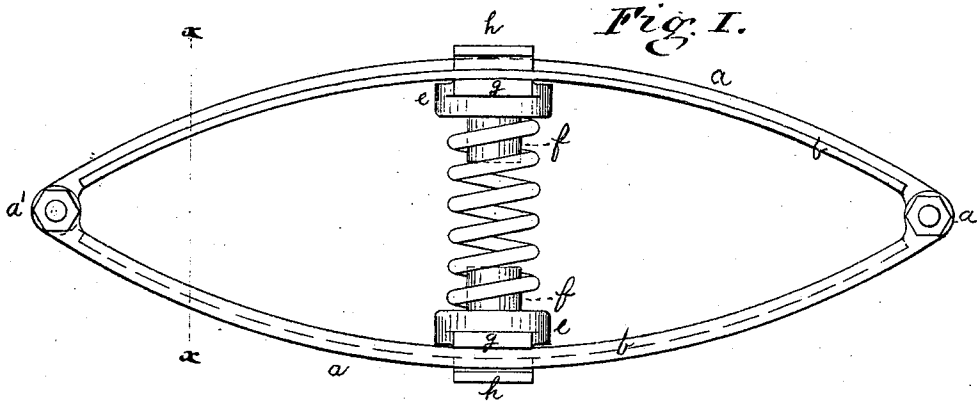


P. G. GARDINER.
Car-Springs.

No. 149,299.

Patented April 7, 1874.



Witnesses.
William N. Riblet
S. J. Todd

Inventor.

P. G. Gardiner

UNITED STATES PATENT OFFICE.

PERRY G. GARDINER, OF NEW YORK, N. Y.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **149,299**, dated April 7, 1874; application filed February 12, 1874.

To all whom it may concern:

Be it known that I, PERRY G. GARDINER, of the city and State of New York, have invented new and useful Improvements in Railroad-Car Springs, of which the following is a specification:

My invention has reference to that class of steel springs for cars which are of elliptical form, and more particularly to that class of such springs in which the elliptical plates are single or of single leaves; and the nature of my invention consists, first, in constructing the elliptical leaves or plates of bars or ribs united by connecting webbing, so as to form complete leaves; and, secondly, in combining, with the said ribbed and webbed elliptical plates, auxiliary spiral springs and clamps, with rubber or other suitable elastic material interposed between the clamps and the plates, as hereinafter described.

In the accompanying drawing, Figure 1 is a side elevation of the spring. Fig. 2 is a top view of the same. Fig. 3 represents the plates, clamps, and rubber in cross-section, the auxiliary spirals being also shown in side elevation. Fig. 4 represents a section of the plates cut off at line *x x* in Fig. 1. Figs. 5 and 6 represent, in cross-section, two varieties of form of the ribs and webs composing the elliptical plates.

In all the figures similar letters refer to similar parts.

In constructing my invention, the leaves for the elliptical portion of the spring are rolled out of plates of steel, in the form of ribs and webbing alternately with each other on the outer surface, as shown in Fig. 2, *a* being the ribs or bars, and *b* the connecting webbing, the inner surface of the leaves being made smooth or plain. The ribs *a* are made to extend beyond the webbing near the ends, where the keys or bolts are inserted, and the ends of the ribs are bent so as to form eyes, through which the bolts pass which hold the upper and lower plates jointed together. The projecting ends of the ribs in the two leaves of the elliptical plates are bent over alternately in opposite directions, so that the eyes interlock with each other, as seen in Fig. 1 and Fig. 4, *a'* being the alternate eyes of the ribs, and *c* the bolt or key. In order to produce a straight

and square set of the leaves in the spring when put together, the number of the ribs in the leaves are unequal—that is to say, if one leaf has five ribs, as represented in the drawing, the other leaf will have but four; and the same rule, of course, applies to the connecting webs. In order to make the two leaves of as nearly equal strength as practicable under this arrangement, the thickness of the ribs in the plate having the less number of ribs is increased, so that the two leaves will have as near as possible the same amount of steel in their cross-sections. Two spiral springs, *d d*, are placed between the upper and lower leaves of the spring, their ends being secured in caps *e*, which caps are provided with bosses *f*, projecting into the spirals, and which act as guides of the springs. Instead of two spirals, the number may be one or three, according to the size of the spring. The caps *e* are connected by a metallic plate, *g*, extending across the spring, and slightly projecting beyond the leaves on each side, as in Fig. 3. Upon the outer faces of the leaves at their center, and parallel to the plate *g*, is the clamp *h*, composed of a single flat metallic plate. This plate is secured to the plate *g* by screws or pins, which pass through the intermediate leaf *a*, and thus secure the spirals and their bearings in their proper position. Before screwing down the clamp-plate to its intended bearing, I insert pieces of vulcanized rubber *i* in the spaces between the ribs, so as to fill these spaces under the clamp, and of such thickness, that when the clamp is secured or fastened down to its proper place, the clamp will rest on the rubber, thus interposing an elastic cushion between the clamps and the leaves. In place of rubber, other suitable elastic substance or soft metal may be used. In Figs. 4 and 5 are represented leaves, in which the ribs are semi-cylindrical, which form may be adopted without changing the principle of my invention. In Figs. 5 and 6 is also shown a modification of the clamp *h* and plate *g*, they being constructed so as to shut one over the other, as a box-joint, as seen at 1 2. In the drawing, the connecting web between the ribs is shown as cut off, or ending just short of reaching the bolt *c*; but in some cases, where increased strength is desirable, the webs may

be lengthened so as to have their ends rest upon the eyes of the ribs.

By the construction of this spring in the manner described, the advantages of the separate bar elliptical spring are obtained in lightness, cheapness, and economy of material, and at the same time the webbing forms a strong and durable support to the ribs, preventing them from swaying out of their proper line or set; and the elliptical leaves are made of a single plate of steel, and do not require the same amount of steel as other elliptical leaved or bar springs.

Having thus described my invention, and the manner of constructing the same, what I claim therein, and desire to secure by Letters Patent, is—

1. In a car-spring, the ribbed and webbed steel plates *a*, constituting the elliptical portion of the spring, constructed and combined to operate substantially as set forth.

2. In an elliptical car-spring, the combination of the leaves *a* with the clamps and spirals, substantially as and for the purpose described.

3. The rubber cushions *i* in the intervals between the ribs, and interposed between the webs and the clamp, all combined substantially as and for the purpose set forth.

P. G. GARDINER.

Witnesses:

WILLIAM H. RIBLET,
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