(No Model.)

J. B. N. BERRY.

CAR SPRING.

No. 255,835. Patented Apr. 4, 1882.

Fig. 1.

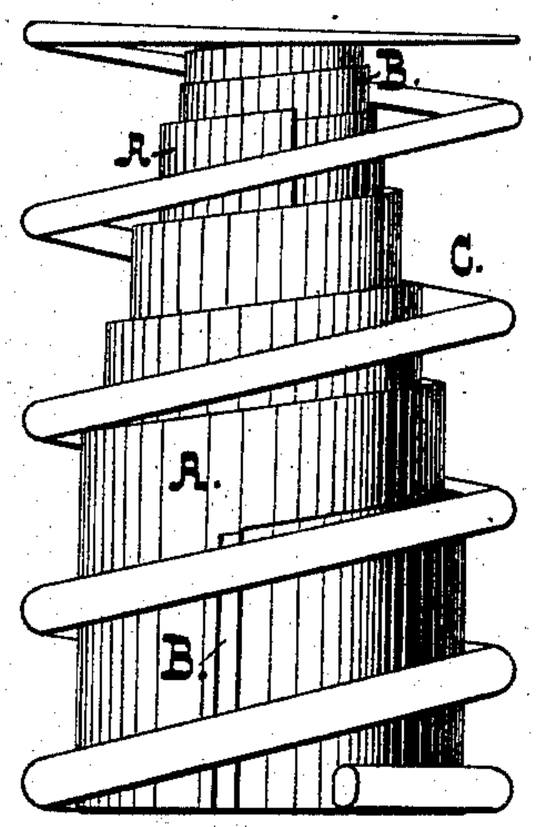


Fig. 2.

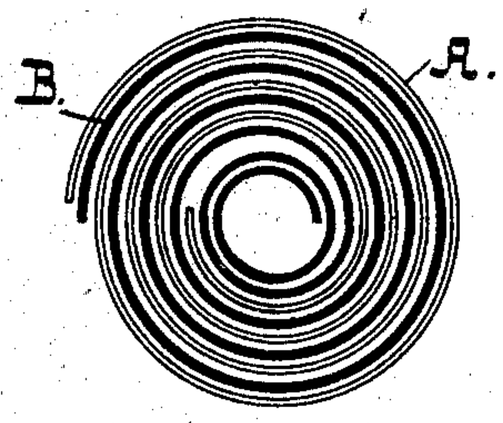


Fig. 3.

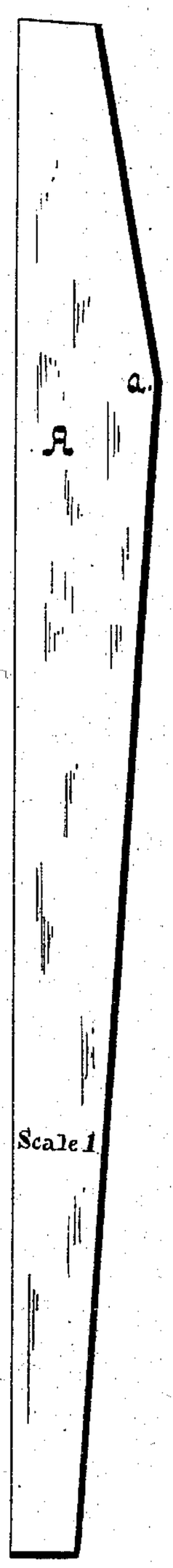
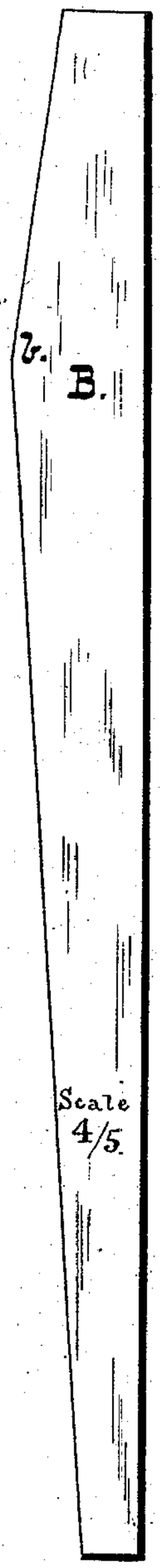


Fig. 4.



WITNESSES.

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JOHN B. N. BERRY, OF BALTIMORE, MARYLAND.

CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 255,835, dated April 4, 1882.

Application filed December 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. N. BERRY, of Baltimore city, State of Maryland, have invented certain new and useful Improvements in Car-Springs; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the spring. Fig. 2 is a top plan of the same; and Figs. 3 and 4 are plans of the blanks which constitute, when coiled, the members of the spring.

My invention relates to car-springs of the spiral volute class; and it has for its object to produce a spring in which the tension is substantially equalized throughout its length, and in which the metal is not materially strained in the bending.

It is an observed fact, and due to obvious causes, that a spiral spring in which the bar is uniform in cross-section throughout its length does not settle uniformly when subjected to pressure, and it has been sought to render spiral springs uniform in their action, either by tapering the blank edgewise from the fulcrum-point to the ends or by tapering it flatwise, or by a combination of both tapers. These methods are all objectionable—the last two by reason of the practical impossibility of rolling a blank with a taper, (and a flatwise taper is only attainable by forging,) and the former by reason of the fact that the two sides of the coil are subjected to a strain in coiling, which detracts greatly from the strength of the spring. I remedy the evil by constructing a spring as follows: Two or more blanks are cut from material of uniform thickness in the shape shown in Figs. 3 and 4—that is to say, the blanks have an edgewise taper—and these blanks are then rolled up together to form the cone-spiral. The blanks may be of the same or different lengths and of the same or different thickness.

In the drawings, A and B are the blanks, having tapers from their fulcrum-points *a* and *b;* and C is an inclosing cylindro-spiral formed from a tapering bar and coiled about the spring A B, as shown. It serves to re-enforce the spring and fits in the upper and lower bearings of the conventional spring-seats, and is adapted to sustain an exterior cover of textile fabric, leather, or rubber, which may be used to protect the spring from access of grit, &c.

It is clear that the strain of expansion on the exterior and compression on the interior surfaces of a bar or plate, when bent in a curve, diminishes, *ceteris paribus*, with the thickness of the material, and in a plate of infinite thinness would amount to nothing. The theoretically perfect spring would therefore consist of an infinite number of infinitely thin plates, each having the proper edge taper. Multiplying the plates is found in practice to be of no material benefit, as the strain in a thin plate may be removed, to all intents and purposes, by careful annealing, and a spring consisting of from two to four plates is found to answer every requisite, especially when for heavy work it is re-enforced by the exterior coil, C.

The coils of the spring close down uniformly, in consequence of which, and of the further fact that the metal of the separate coils is not strained peripherally, the spring is found to be most durable and satisfactory.

By making the leaves of unequal length the coil B projects at the top of the spring, as shown, and thereby the effect of a flatwise taper is secured, the spring B operating alone until the upper bearing descends upon the lower spring, A. The leaves A and B are unattached to each other, whereby the renewal of either, when broken or injured, is facilitated. Were they riveted or otherwise connected together this could not be done.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A car-spring consisting of two or more volute spiral members, each of uniform thickness throughout its length and having an edgewise taper, the said members being of different lengths, as and for the purpose set forth.

2. A car-spring consisting of two or more volute spiral members, each of uniform thickness throughout its length and having an edgewise taper and an inclosing cylindro-spiral adapted to sustain a covering, as and for the purpose set forth.

3. A car-spring consisting of two or more volute spiral members, each of uniform thickness and having an edge taper, the said members being concentrically coiled and unconnected with each other, as set forth.

JOHN B. N. BERRY.

Witnesses:
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ED. RAINE.