R. P. PALMER.
Vehicle Spring.

No. 230,332. Patented July 20, 1880.

Fig. 1.

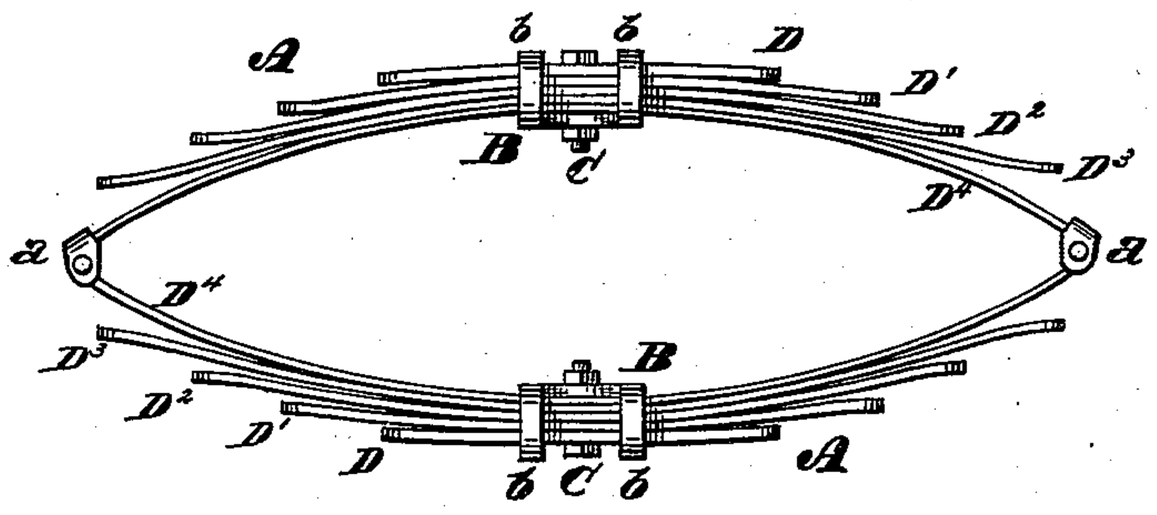
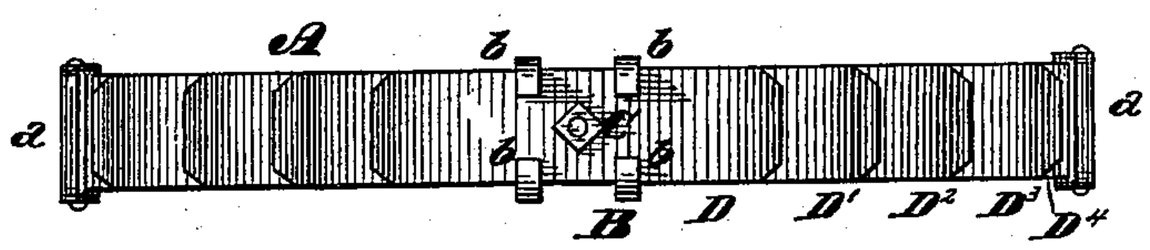


Fig. 2.



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UNITED STATES PATENT OFFICE.

RICHARD P. PALMER, OF COVINGTON, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JOHN W. O'BRIEN, OF LUDLOW, KENTUCKY.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 230,332, dated July 20, 1880.

Application filed January 20, 1880.

To all whom it may concern:

Be it known that I, RICHARD P. PALMER, of Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Springs, of which the following specification is a full, clear, and exact description, which will enable others skilled in the art to which my invention relates to make and use it, reference being had to the accompanying drawings, forming a part of the same, in which—

Figure 1 is a longitudinal elevation of an elliptic spring, shown recoiled, embodying my improvements, and Fig. 2 is a plan view of the same.

My invention relates to improvements in springs, and is shown as applied to the class of springs known as "elliptic" springs for vehicles, combining in their construction a series of leaves or plates in two sets, united at their ends by means of links or bolts, and secured together in the middle by clips and bolts.

The objects of my invention are to provide a spring which will communicate more uniform elasticity in proportion to the burden upon it than has been effected by any heretofore in use, and also the provision of more durable, firm, and economical means of securing the various leaves or plates composing the same together.

My invention consists, first, in the construction and arrangement of the leaves, which vary in length, as heretofore, and are of graduated thicknesses, being thus constructed so as to be quite sensitive to a light load, and of greater strength of compression under a very heavy load than any heretofore in use. These several leaves are but slightly curved or bent in their recoiled form, and have open ends, which allow a rolling motion on one another to prevent abrasion as the leaves are compressed under a load and facilitate ease in cleaning the same, and also provide a way for the passage of air or other manner of drying them after being damp or wet, and the open curved form of plate also prevents noise or rattle when in use.

My invention further consists in the construction and arrangement of means for securing the plates together in the middle, more fully described hereinafter.

A A represent each a set or series of spring plates or leaves, D D′ D^2 D^3 D^4. These leaves vary in length, and the two sets A A are united together at the ends of plates D^4 by means of links or bolts *a*.

The leaves D D′ D^2 D^3 D^4 are of graduated thicknesses. The plate D, being the thickest and heaviest, is made the outer one, and the plate D^4, being the thinnest and lightest, is made the inner one, or the spring proper, thus imparting to the spring uniformity of compression. These leaves or plates are preferably so constructed that all are of a different curve, but must be made to have a space between their ends, which may be slightly bent or curved outward to prevent abrasion by contact with each other, as shown in the accompanying drawings, and hereinbefore described, and are also combined or secured together in the middle by clips B and bolts C. The clips B are of such length and proportion as will give additional strength to the inner plate, D^4, at its usual breaking-point.

b b represent shanks or embracing-arms, formed by cutting out a portion of the metal in the sides of clip B, as shown, and are lapped or bent over the outer plates, D, of the spring, which gives additional strength to the clip and spring, making the spring more rigid by preventing any lateral movement of the same, necessitating the employment of but one bolt passing through it, and serving to hold the plates together firmly in case the nuts on the bolts C become loosened in use. By thus cutting out a portion of the metal in clip B to form the clamping arms or shanks *b b*, neatness of appearance and economy in the use of material, as well as other features above described, are attained.

It is obvious that my improvements, herein shown and described, may be likewise applied in the construction of semi-elliptic and similar forms of springs used for various purposes.

Having thus described my invention, what I claim is—

1. A vehicle-spring consisting of a series of independent semi-elliptical leaves or plates

successively decreasing in thickness from the outer to the inner plates, which latter are united at their ends, the outer series of plates being clamped one upon the other and to the inner plates at their middle portions, and having their free ends entirely disconnected and diverging from one another and from the connected inner plates, substantially as shown, for the purpose described.

2. In a vehicle-spring, the clip B, with arms or shanks *b b*, which overlap the outer plate, D, in combination with bolt C, constructed and arranged substantially as shown, and for the purpose described.

In testimony whereof I have hereunto set my hand this 15th day of January, A. D. 1880.

RICHARD P. PALMER.

Witnesses:

JOHN E. JONES,

JOHN W. O'BRIEN.