(No Model.)

R. VOSE.

CAR SPRING.

No. 333,983. Patented Jan. 5, 1886.

Fig. 1.

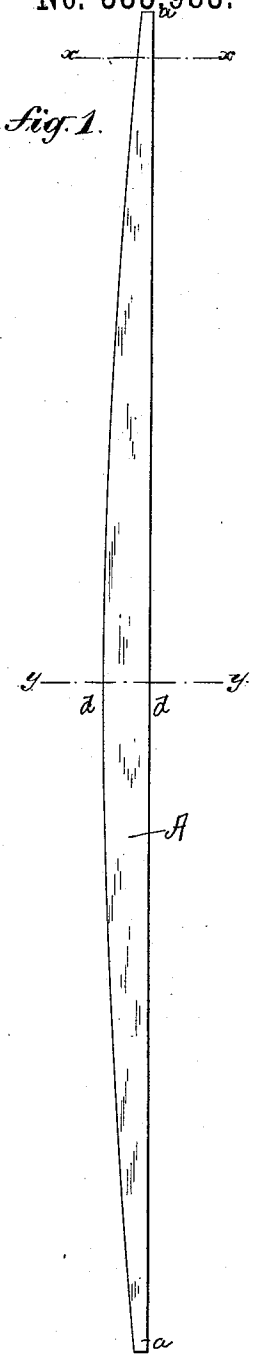


Fig. 2.



Fig. 3.

Fig. 4.

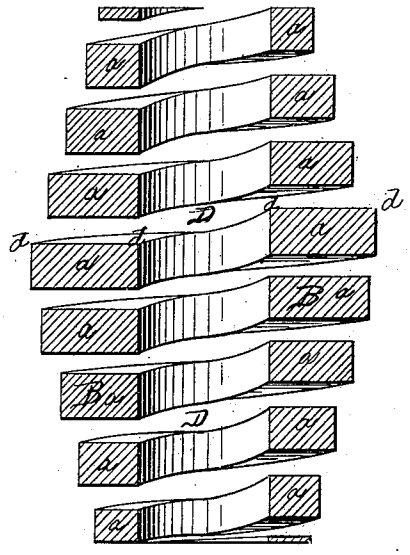
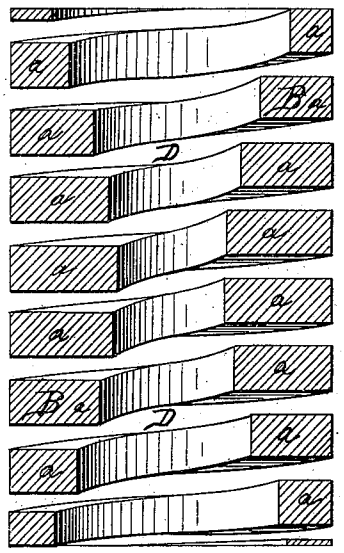


Fig. 5.



Witnesses:
Henry Eichhorn
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UNITED STATES PATENT OFFICE.

RICHARD VOSE, OF NEW YORK, N. Y.

CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 333,983, dated January 5, 1886.

Application filed October 28, 1885. Serial No. 181,148. (No model.)

To all whom it may concern:

Be it known that I, RICHARD VOSE, of the city, county, and State of New York, am the inventor of an Improvement in Car-Springs, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same.

My invention consists in making a car-spring spiral in form by winding or coiling a bar of steel whose depth or thickness is uniform and equal throughout, but the width of which varies from end to center and center to end, the width varying on one side only, the other side being a straight line with no variation from end to end or center to end, so that whether coiled upon a mandrel of equal diameter or upon a tapered or double conical shaped mandrel, its straight side or edge always to the mandrel, the spiral coil at and each side of the center will have more metal than the coils at either end or near the end.

In the drawings, Figure 1 represents a side view of the bar of steel. Fig. 2 is a cross-section on line *x x*, Fig. 1. Fig. 3 is a cross-section on line *y y* of Fig. 1. Fig. 4 is a sectional view of a spring coiled on a straight mandrel, and Fig. 5 is a like view of a spring coiled on a double-tapered mandrel or a mandrel whose diameter is not equal.

A is the bar of steel, of uniform and equal thickness throughout, as at *a a*, one side of which is a straight line from end to end, and the other side of varying curve or irregularity.

B represents the spiral or coil; D, the mandrel-hole.

The bar A is widest at or near the center at *d d*. Its width at the center relative to the width at the ends may be of any proportion desired. In the drawings I show one-half width at the ends and one and one-half inch in width at the center. The spiral is made by coiling said bar on its edge on a mandrel, when it will be seen the coils have equal thickness throughout the spring, while the width at the center at *d d* is three times as great. Thus where the greatest strength is needed—viz., at the center—the greatest amount of steel is found. When used, the load first compresses either end of the coil toward the center. The load increased, the center of the spring is brought into requisition, and as the load increases the heavy weight acts on that part of the spring last where the greatest amount of metal is placed to receive the heaviest weight, and the center of the spiral coil is the last part to be shut together or exhausted. These spirals, thus constructed, may be grouped together in quartets or pairs, as may be required, so as to bear heavy burdens. The coils nearest the ends of said spirals, being weaker than the center, will be brought into use under a light load, and not until the load is increased will the center act. I thus obtain a graduated spring in a single coil.

It will be readily seen from the drawings that if a double-tapered mandrel, E, is employed on which to coil the bar, the result will be the same, except the exterior edge will be cylindrical and the interior edge will be bulging, as shown in Fig. 5.

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

1. A spiral spring formed of a bar of uniform thickness throughout, but whose width from end to end varies, the width being greatest at the center on one side from a straight line drawn through said bar, the opposite side being perfectly straight, wound on its edge on the mandrel to shape said spiral, substantially as described, and for the purpose specified.

2. A spiral spring formed of a bar of uniform thickness throughout, whose width varies from end to end, the width being greatest at the center on one side, the opposite side being a straight line, said bar being wound on a double mandrel, as shown in Fig. 5, substantially as described, and for the purpose specified.

Witness my hand this 27th day of October, 1885.

RICHD. VOSE.

Witnesses:
CHAS. R. CLARKE,
NATHAN LEVENSON.