

No. 742,114.

PATENTED OCT. 20, 1903.

J. CUMMINGS.
VEHICLE SPRING.

APPLICATION FILED JAN. 2, 1903.

NO MODEL.

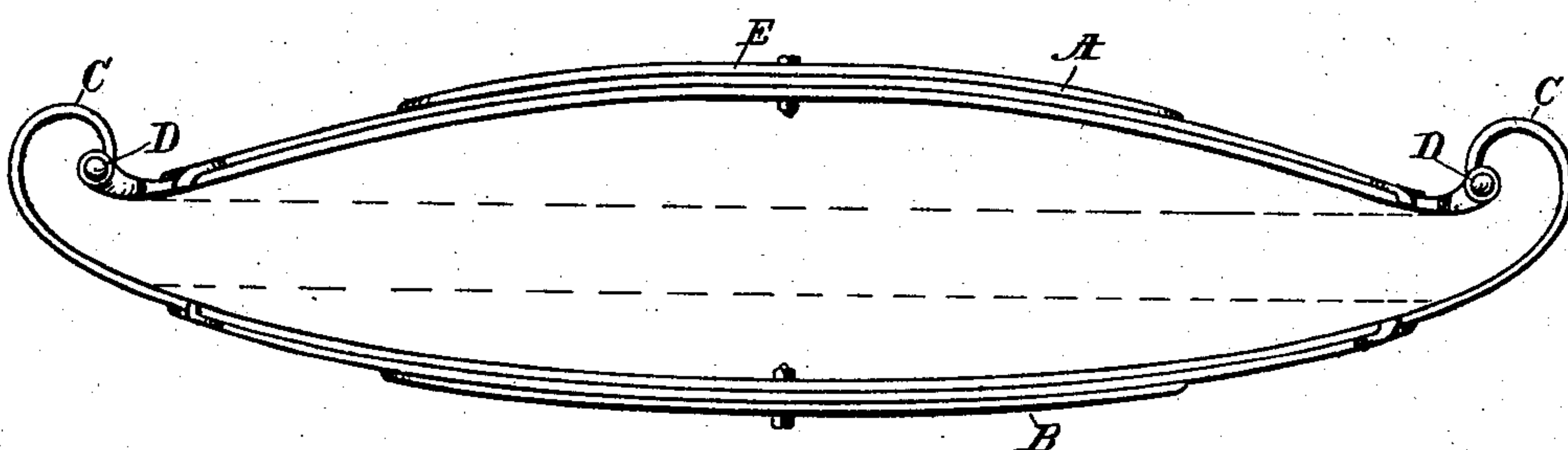


Fig. 1.

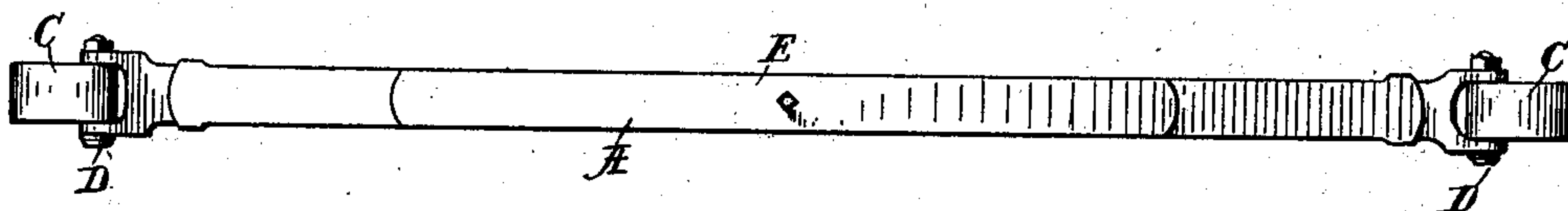


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN CUMMINGS, OF GRAND RAPIDS, MICHIGAN.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 742,114, dated October 20, 1903.

Original application filed June 2, 1902, Serial No. 109,932. Divided and this application filed January 2, 1903. Serial No. 137,424. (No model.)

To all whom it may concern:

Be it known that I, JOHN CUMMINGS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Vehicle-Springs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in vehicle-springs; and its object is to provide a spring of greater elasticity within any given dimensions and to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My device consists, essentially, of a pair of elliptical springs, the upper spring being of greater curvature than the lower and the lower spring being of less curvature and of greater length than the upper spring and extending beyond the ends of the same and thence in upwardly and inwardly turned involute curves and attached directly to the ends of the upper spring, said springs being so proportioned that with a given load the normal outward movement of their respective and pivotally-connected ends will be equal in the respective springs notwithstanding the difference in length and curvature, whereby greater elasticity is obtained than in the ordinary form of elliptical springs and the necessity for the use of shackles to connect the springs is dispensed with, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is an elevation of a vehicle-spring embodying my invention, and Fig. 2 plan view of the same.

Like letters refer to like parts in both of the figures.

The device herein shown is substantially the same as that shown in my application, Serial No. 109,932, filed June 2, 1902, on improvement in vehicles, of which this application is a division pursuant to the requirements of the Patent Office.

A represents the upper spring, having its middle portion curved upward, substantially as indicated by the dotted horizontal line,

and having a horizontal middle portion E to engage and support the body of the vehicle.

B represents the lower portion of the spring, having its middle portion curved downward to a less extent than the upper spring, substantially as indicated by the dotted line, and having its ends prolonged beyond the ends of the upper spring and at a distance below the same and thence extending upward, inward, and downward in involute curves, as indicated at C, and pivotally attached directly to the outer ends of the upper spring, as indicated at D. By means of this construction I provide a lower spring of considerably greater length than the upper spring and having great flexibility, and by virtue of its difference in curvature and length the ends at D will move outward under a given load to the same extent that the shorter spring A, having greater curvature, will also move outward, and thus I am able to pivot these springs directly to each other without bringing any undue longitudinal horizontal strain upon either spring or interference with the normal elasticity of the same. I thus secure great elasticity and durability within the given vertical and horizontal dimensions and at the same time simplify the construction and dispense with the shackles heretofore used to accommodate the different respective outward movements of the ends of a curved spring and its supports that have not a like movement—such, for instance, as a spring of different length or the usual form of jacks or curved supports having an involute form at their outer ends and independently attached to the axle, of which construction I am fully aware; but such jacks or supports do not have the elasticity of the lower spring and do not permit of the outward and downward movement of their outer ends to the same extent of the like movement of the spring attached thereto as in the device herein shown. They are thus too rigid to act as springs and do not yield freely to the outward movement of the ends of the upper spring, whereas in the device shown the ends of the lower spring move outward without any resistance whatever, and said spring is also very elastic, thus providing a much softer and easier riding spring than either the usual elliptical springs of equal

dimensions of the single spring supported upon jacks.

I am also aware that springs of different lengths have been coupled directly at their
5 outer ends; but in all such the curvature has been greatest in the longer spring, and thus they fail entirely to operate as in my device and are wholly impractical in that the upper spring operates like a "bow-string," and
10 thus interferes with the normal elasticity of both springs and tends to put undue inward strain on the curved ends of the lower spring.

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

1. The combination of two springs of different lengths and different curvatures, and pivotally connected directly to each other at the ends, the longer spring having a curvature of greater radius than the shorter spring
20 whereby the ends of the respective springs normally move outward to the same extent under a given load.

2. The combination of a pair of elliptical

springs, having the lower spring of less curvature than the upper spring, and extending
25 beyond the ends of the upper spring, and thence upward, inward, and downward in an involute curve and pivoted directly to the ends of the upper spring. 30

3. The combination of an upper spring having a horizontal middle portion, and downwardly-curved oppositely-extended ends, a lower spring of greater length than the upper spring, and having less curvature than
35 the upper spring in its middle portion, and also having its respective ends extend beyond the ends of the upper spring, and thence upward, inward, and downward in involute curves, and pivoted directly to the
40 respective ends of the upper spring.

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

JOHN CUMMINGS.

Witnesses:

LUTHER V. MOULTON,
GEORGIANA CHACE.