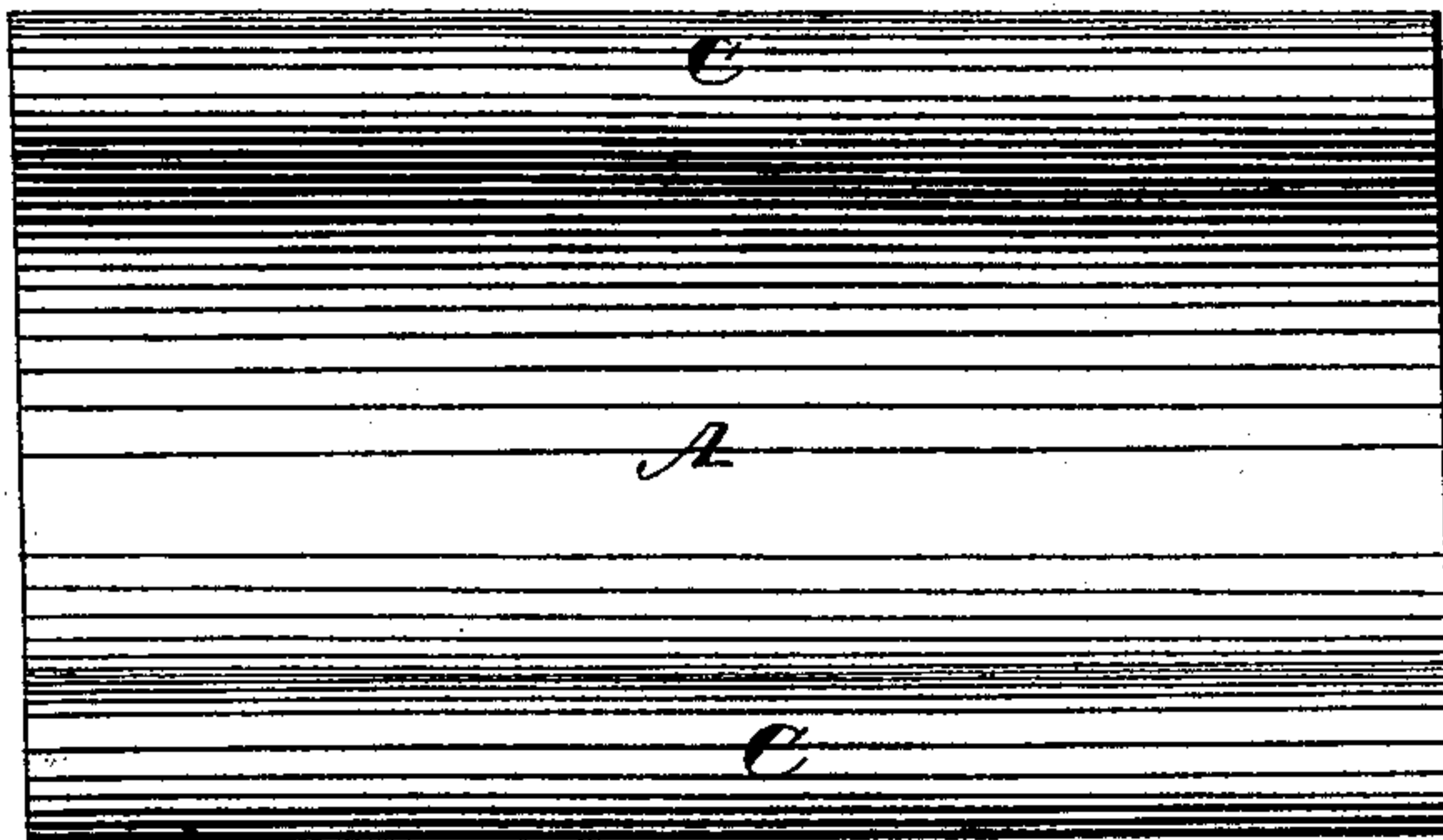


F. E. OLIVER.  
Car Spring.

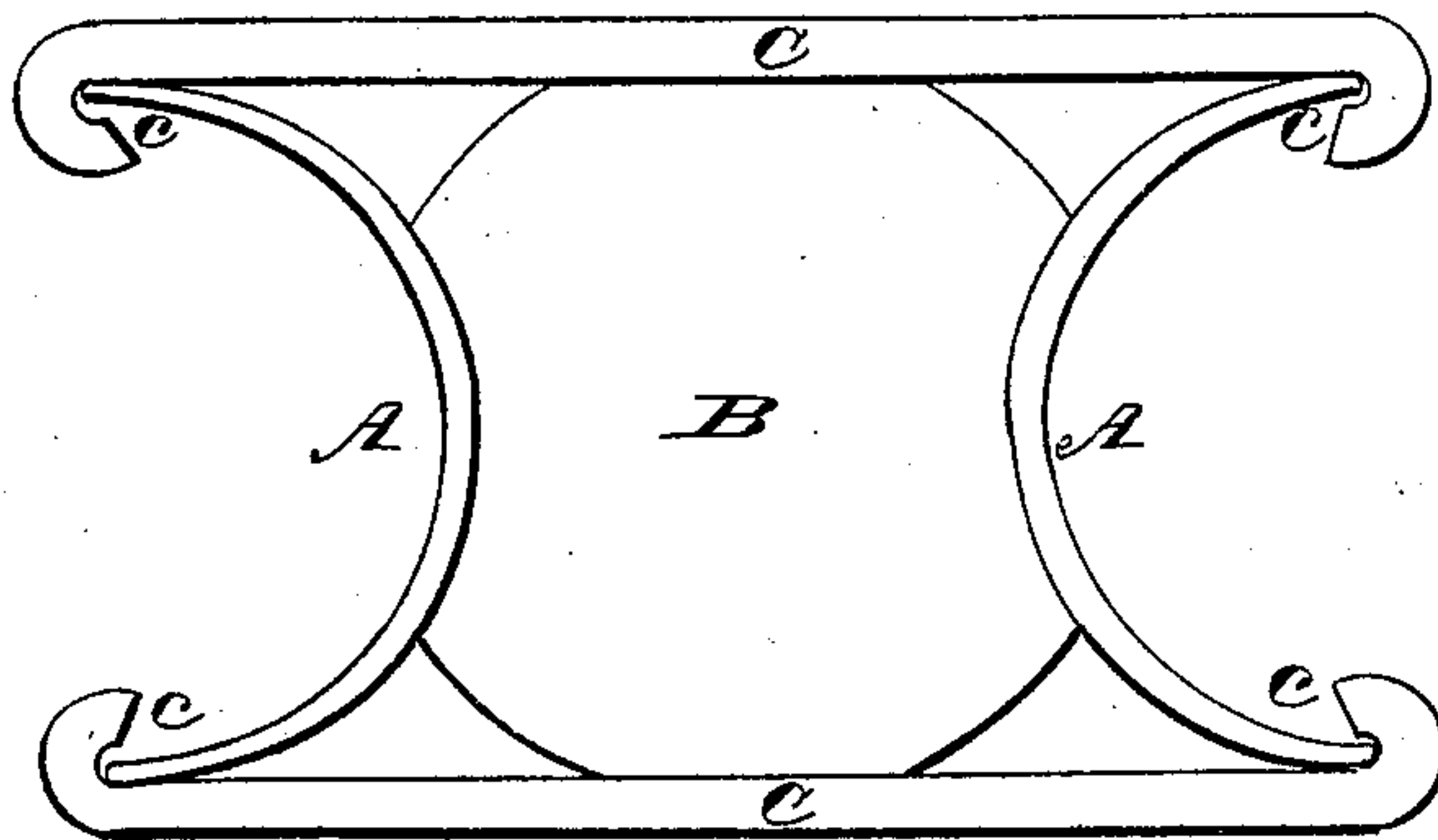
No. 42,682.

Patented May 10, 1864.

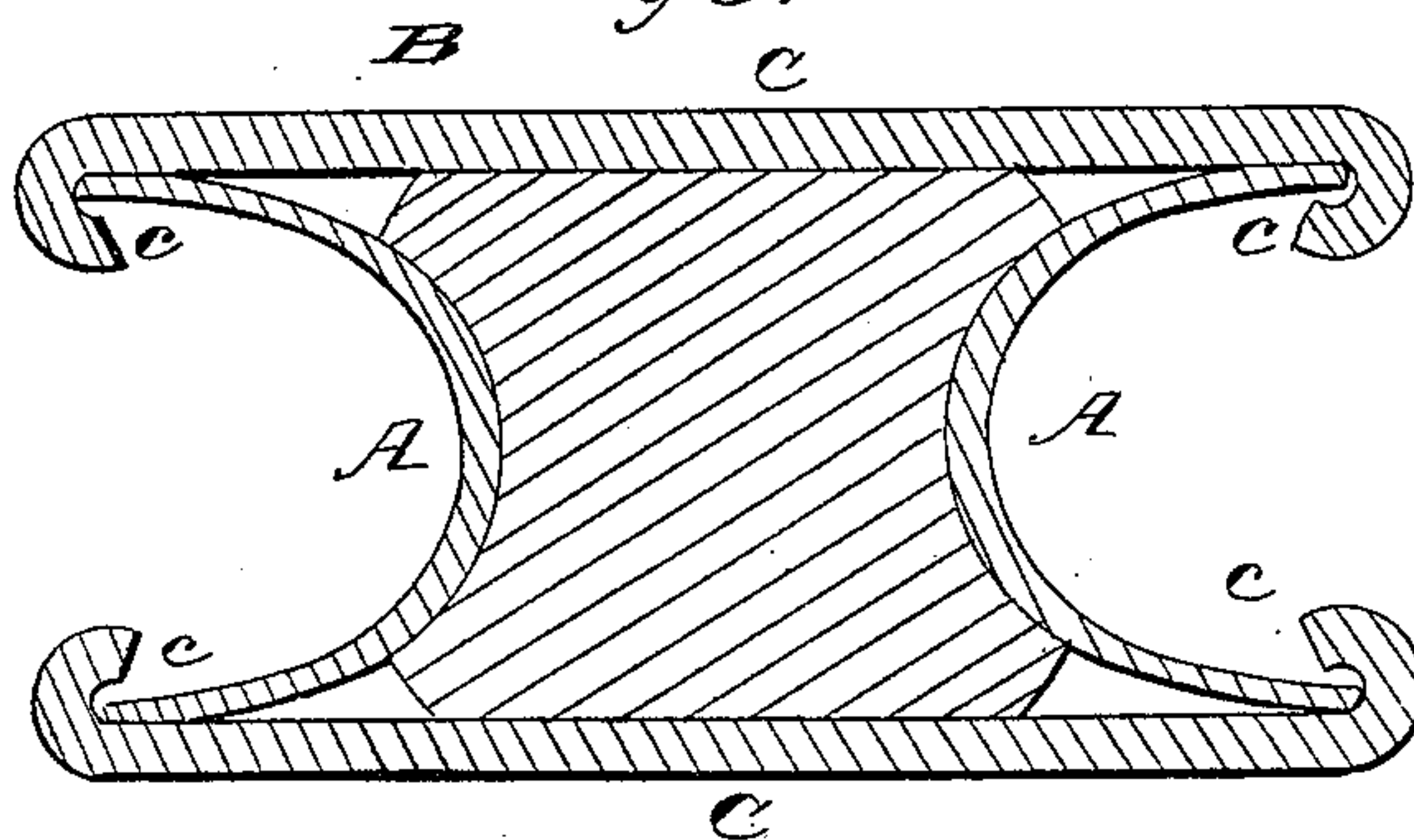
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses  
*Randolph*  
*St. King*

Inventor  
FRANCIS E. OLIVER  
By *Robbing & Burr*  
*Atty's*

# UNITED STATES PATENT OFFICE.

FRANCIS E. OLIVER, OF NEW YORK, N. Y.

## IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. 42,682, dated May 10, 1864.

*To all whom it may concern:*

Be it known that I, FRANCIS E. OLIVER, of the city, county, and State of New York, have invented a certain new and Improved Railroad-Car Spring; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, of which—

Figure 1 is a side elevation of my improved spring; Fig. 2, a front elevation of the same. In both of these views the spring is represented as being at rest. Fig. 3 is a vertical transverse section of the same, representing the various parts thereof in their active positions or as they appear when subjected to pressure.

My spring is composed, essentially, of the C-shaped metallic spring-plates A A and the auxiliary spring B, of india-rubber or other suitable and equivalent elastic substance, the whole being confined between any suitable bearing or cap plates, C C, whose edges are so shaped as to form pockets *c c* for the reception of the edges of the spring-plates A A. The plates A A are placed with their convex surfaces facing each other and bearing against the central compensating-spring, B, which is of such size and shape as to come in contact with the bearing or cap plates C C, and thereby sustain a portion of the direct pressure of the weight to which the spring may be subjected.

The various parts of the spring are combined with each other without the use of bolts, pins, screws, or rivets, and the spring-plates are left intact.

The peculiar combination of the metal and rubber portions of the spring is such that the

one is protected by the other, and the whole thereby rendered more durable and efficient in all respects.

In the accompanying drawings I have represented the curved metallic plates of my improved spring as used singly; but I do not wish to be understood as limiting myself to this precise arrangement of them. If deemed desirable, additional strength and stiffness may be imparted thereto by the addition of other plates of a similar form to be combined therewith, as is usual in ordinary elliptic springs, or in any other suitable manner. It is also evident that the form of the bearing-plates may be changed at pleasure without affecting the principle of the spring.

The advantages of my improved spring are cheapness of construction, compactness, and durability.

Having thus fully described my improved railroad-car spring, what I claim therein as new, and desire to secure by Letters Patent, is—

An improved spring composed of two or more metallic C-shaped plates united at their upper and lower edges by suitable bearing-caps, and combined with a central compensating-spring of india-rubber, gutta-percha, or other equivalent elastic material, substantially in the manner and for the purpose herein set forth.

The foregoing specification of my improvement in railroad-car springs signed by me this 22d day of March, A. D. 1864.

FRANCIS E. OLIVER.

In presence of—

CHRISTIAN VON HESSE,  
ALBERT HUGHES.