

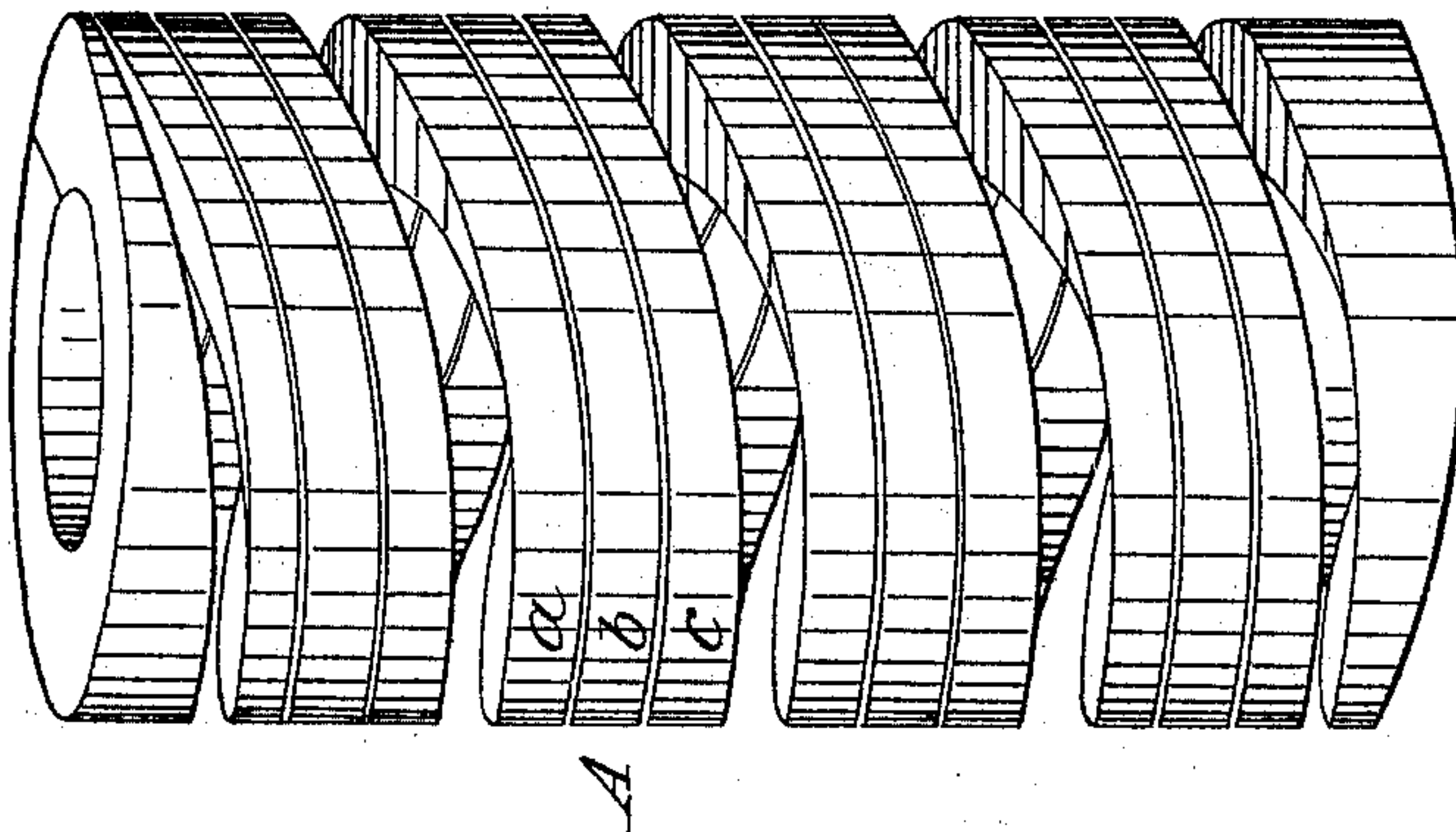
C. FRENCH.  
Car Spring.

2 Sheets—Sheet 1.

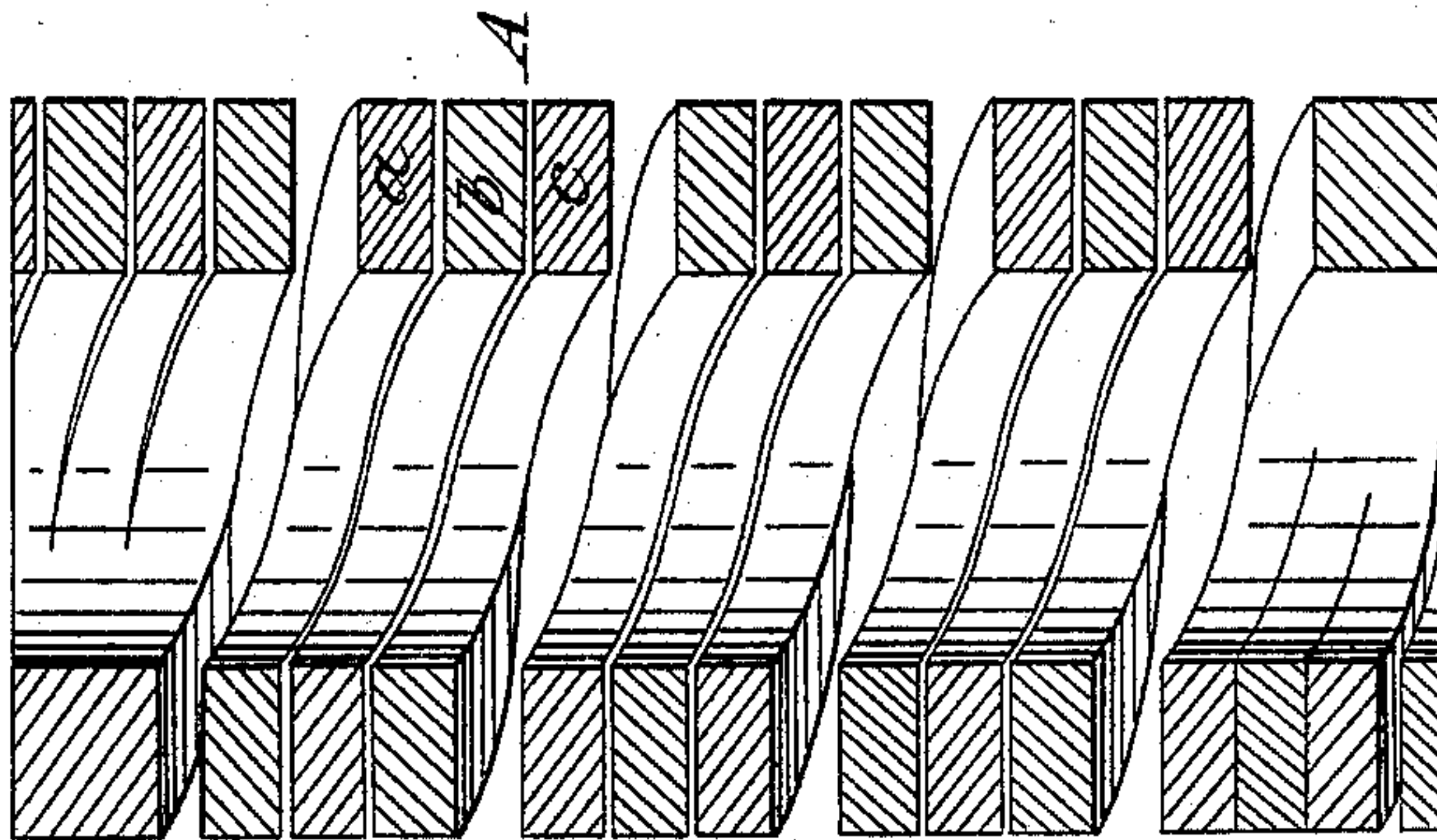
No. 15,869.

Patented Oct. 7, 1856.

*Fig. 2.*



*Fig. 1.*



Witnesses:

*W. P. Fitzgerald*  
*John S. Murray*

Inventor:

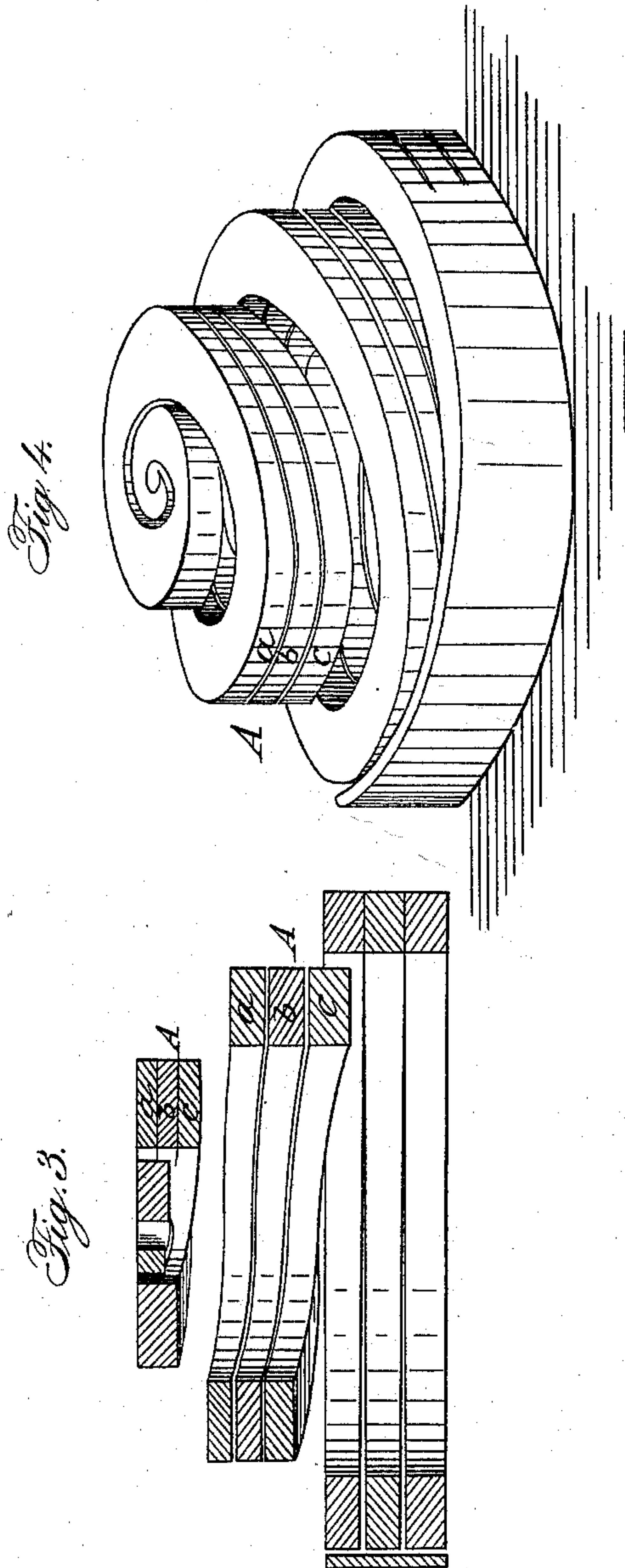
*Carlos French*

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Inventor:

*Carlos French*



# UNITED STATES PATENT OFFICE.

CARLOS FRENCH, OF SEYMOUR, CONNECTICUT.

## COILED SPRING FOR RAILROAD-CARS.

Specification of Letters Patent No. 15,869, dated October 7, 1856.

*To all whom it may concern:*

Be it known that I, CARLOS FRENCH, of Seymour, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Coiled Springs for Railroad-Cars, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Figure 1 is a perspective view of my improved spring in a spiral form and Fig. 2 is a vertical section of the same. Fig. 3 is a perspective view of it in a rising volute form, and Fig. 4 a vertical section of the same.

Coiled springs as heretofore constructed have consisted of a single plate or rod bent or coiled into the desired form, which, when but little resistance is required will be found to answer, but when great pressure is to be resisted it has been found necessary to multiply said springs and they have been placed side by side and one within the coil of another of larger diameter and the plates have been made wider and thicker but these expedients have been found very objectionable and even impracticable when very powerful and compact springs are required, such as car springs for example. The lateral space required (if the leaves are made conveniently thin) to accommodate the requisite number is too great for compactness and convenience, and if the leaves be made thick enough to support the pressure with little lateral expansion of the box in which they are placed, they will be too thick and rigid for the proper elasticity—will hardly possess the qualities of a spring, but will be likely to cause sudden jarring and to break before they will bend.

The object of my invention is to avoid all these inconveniences and preserve a proper elasticity and compactness while I give sufficient strength to sustain the required pressure.

To accomplish these objects I divide each leaf into two or more, according to the pres-

sure to be resisted, or make each leaf of two or more leaves sufficiently thin to bend without breaking, the leaves of the compound leaf being placed the one above the other, and welded together at one or both ends. The component leaves should be placed very nearly parallel and in close proximity with each other, that all, or most of them, may yield at the same time so as to afford their combined rigidity and elasticity, while a sufficient space is left between the outer leaves of the coil to allow sufficient yielding or contraction.

The spring is much more powerful and durable when both ends of the leaves composing the set are welded together, but a great improvement over any coiled spring in use is produced by welding them at one end only.

The coil may have the form of the spiral represented in Figs. 1 and 2 or the rising-volute form represented in Figs. 3 and 4 of the accompanying drawing, both equally possessing the feature of division for elasticity, and union for strength and rigidity, with less lateral expansion than any heretofore known of equal power.

In all the figures A represents the compound leaf, and *a, b, c*, the component leaves. When made in the rising-volute form of Figs. 3 and 4 the leaves should be welded at the bottom in a form to add little to the diameter of the coil, but to give sufficient vertical thickness to support the spring.

Having thus fully described my improvement in coiled springs for resisting great pressure, what I claim as new and desire to secure by Letters Patent is—

Composing the coiled leaf of two or more leaves placed the one below the other, said component leaves being welded together at one or both ends thereof, substantially as set forth.

CARLOS FRENCH.

Witnesses:

W. P. N. FITZGERALD,  
JOHN J. MURRAY.