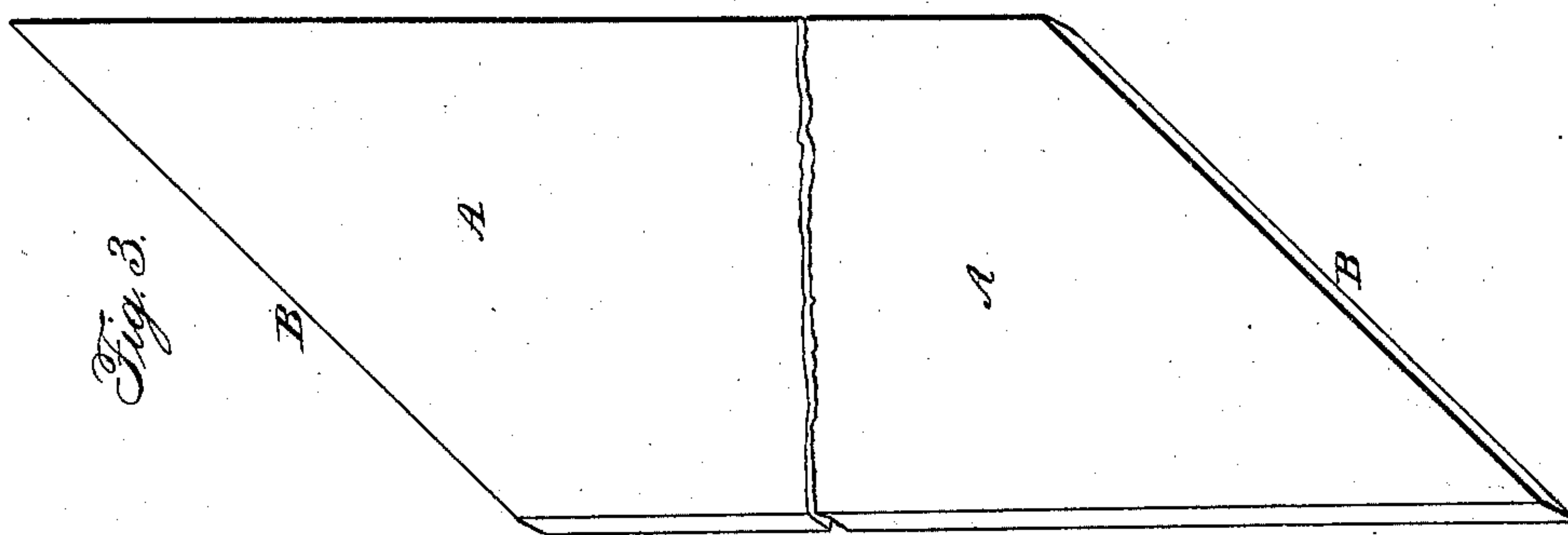
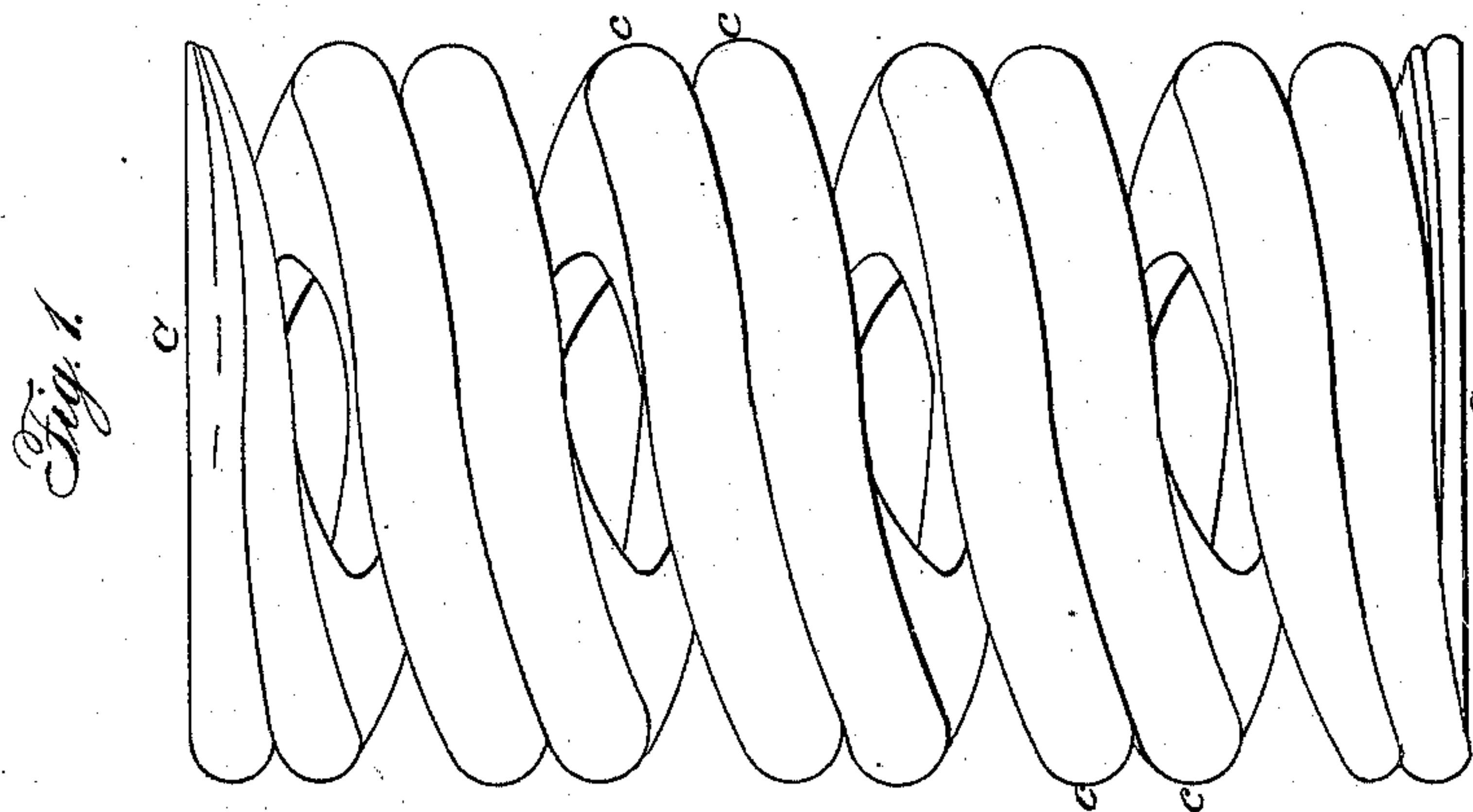
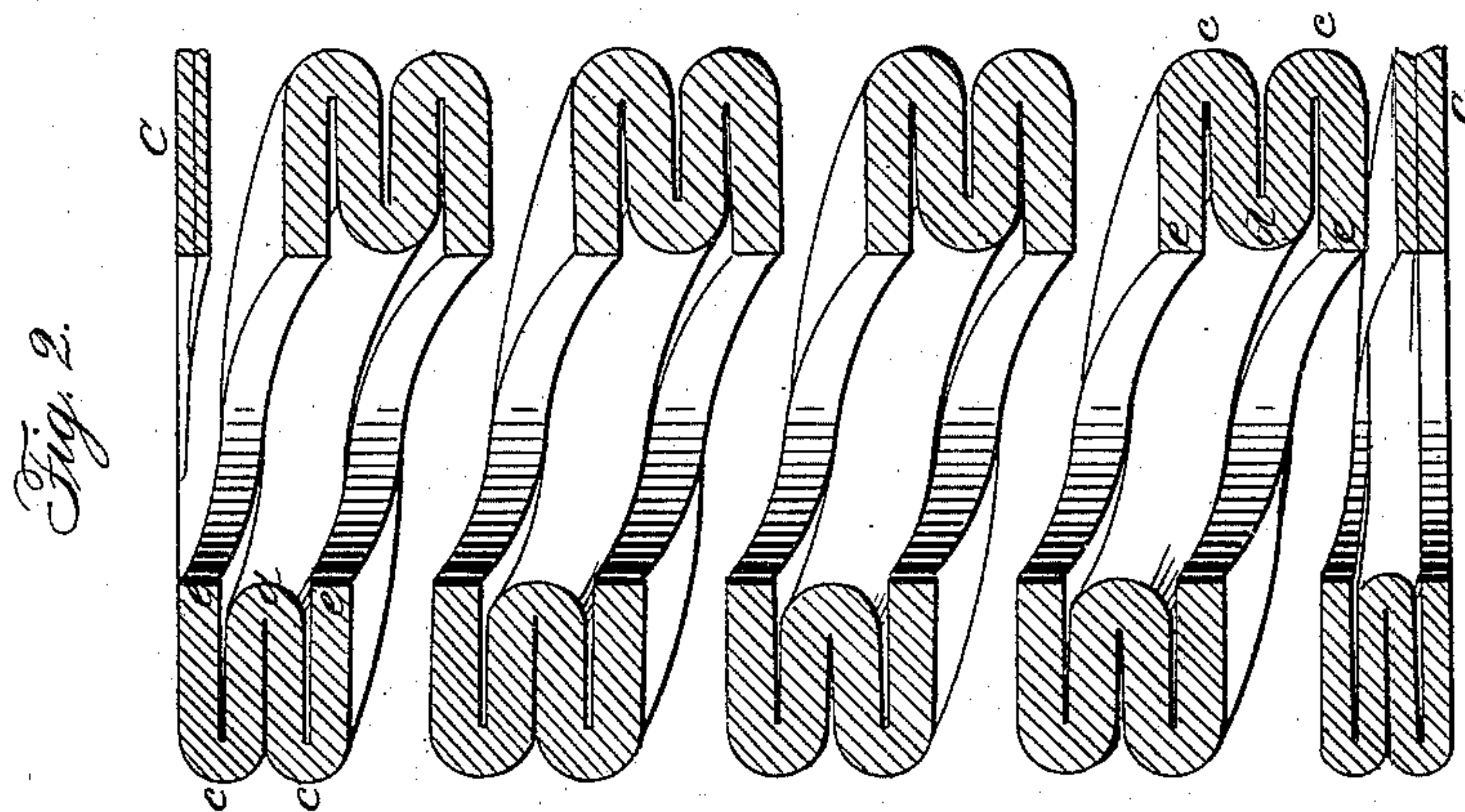
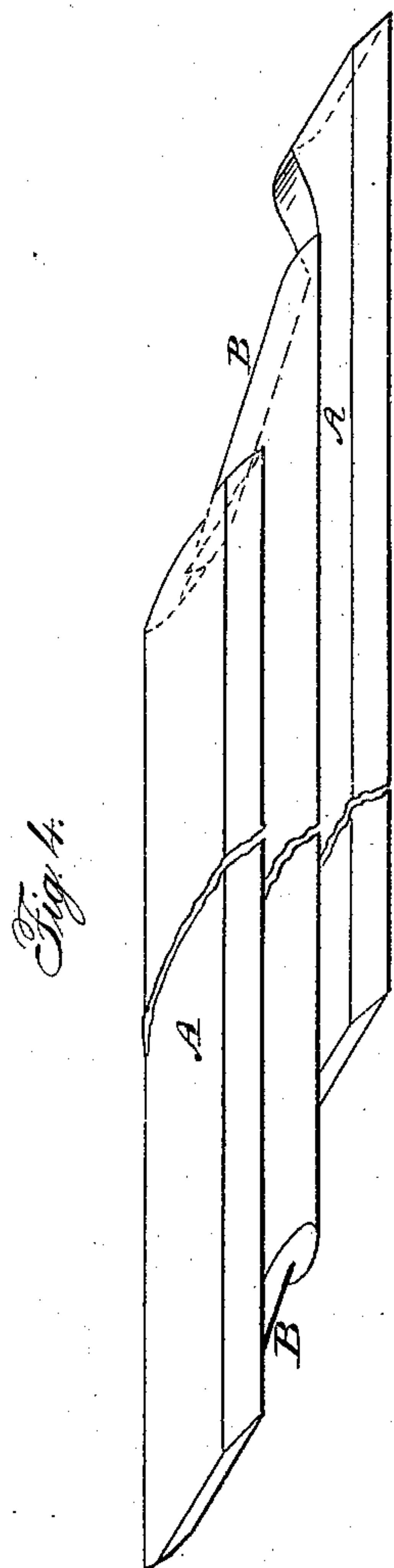


C. FRENCH.
Car Spring.

No. 56,032.

Patented July 3, 1866.



Witnesses:

Geo. D. Patton
E. C. Wilson

Inventor:

Carlos French.
By atty. A. B. Stoughton.

UNITED STATES PATENT OFFICE.

CARLOS FRENCH, OF SEYMOUR, CONNECTICUT.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **56,032**, dated July 3, 1866.

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 certain new and useful Improvements in Folded Plate-Springs for Cars and other Purposes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents an elevation of one of the springs. Fig. 2 represents a vertical section through the same. Fig. 3 represents the form of the blank from which the spring is eventually formed. Fig. 4 represents the form of the blank after it has been folded and before it is bent into the form of the spring.

It is usual to make stout steel springs from a series of plates or leaves welded together. This is not only expensive, but the weld often gives way, and it is very difficult to properly temper the springs when so made.

My object is to avail myself of the advantages of the series of plates or leaves for the sake of elasticity and strength, and to avoid the expense of welding and its uncertainty of holding, and to leave the metal in better condition for tempering; and my invention consists in folding the plate from which the spring is to be formed into two, three, four, or more folds, and when the folds are hammered or rolled down and a proper heat taken the folded plate is wound or bent over or around a mandrel or former to give it the desired shape.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

The plate of steel A, Fig. 3, of proper thickness for the spring, of sufficient width to make the requisite folds, and of suitable length to form the spring, is sheared or cut off at its ends, as shown at B, so as to leave it of a rhomboidal form, and the edges B are drawn down, so that the spring when made shall

terminate in a flat plane instead of a spiral one when bent in the form shown at Figs. 1 and 2. This plate A is then folded as seen in Fig. 4 and in section in Fig. 2, where are seen two rounded edges, *c c*, on the outer side and one round edge, *d*, and two square edges, *e e*, on the inside, or, in other words, two folds on the outer side and one fold on the inner side, and two edges.

Of course more or less folds may be used, and single or double plates may be so folded when the springs are to sustain heavy burdens or weights. The plate being thus folded, which may be done by a machine prepared for the purpose, and the folds pressed close together, a heat is taken, and if the spring is to be of the spiral form, as shown in Figs. 1 and 2, it is wound around a mandrel, leaving room or space enough between the turns to allow for the play of the spring under its load. The folded plate in this form of spring is bent edgewise around the mandrel or former. It is obvious, however, that the folded plate may be bent into any other form of spring that may be desired and still maintain the advantages of the leaf-spring without any of its disadvantages, as above stated.

The beveling and chamfering of the ends of the plate or blank cause the finished spring, as seen in Figs. 1 and 2, to terminate in flat and parallel planes, as shown at C in said figures.

Having thus fully described the nature, object, and purpose of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

A car or other spring made of a steel plate previously folded into two, three, four, or more folds, and then bent into form around a mandrel or over a former, substantially as and for the purpose described.

CARLOS FRENCH.

Witnesses:

A. B. STOUGHTON,
EDM. F. BROWN.