

A. FRENCH.
ELLIPTIC SPRING.

No. 193,080.

Patented July 17, 1877.

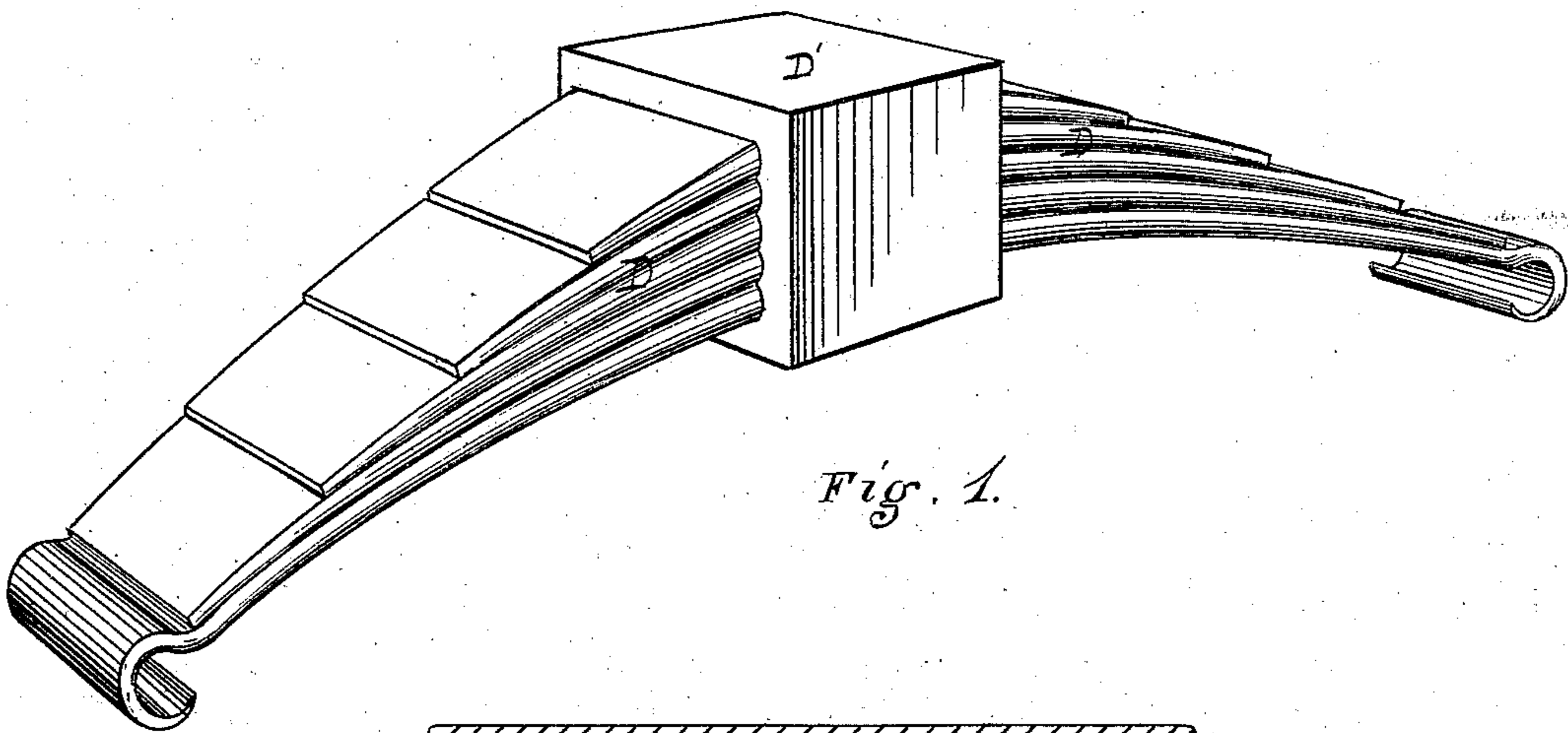


Fig. 1.

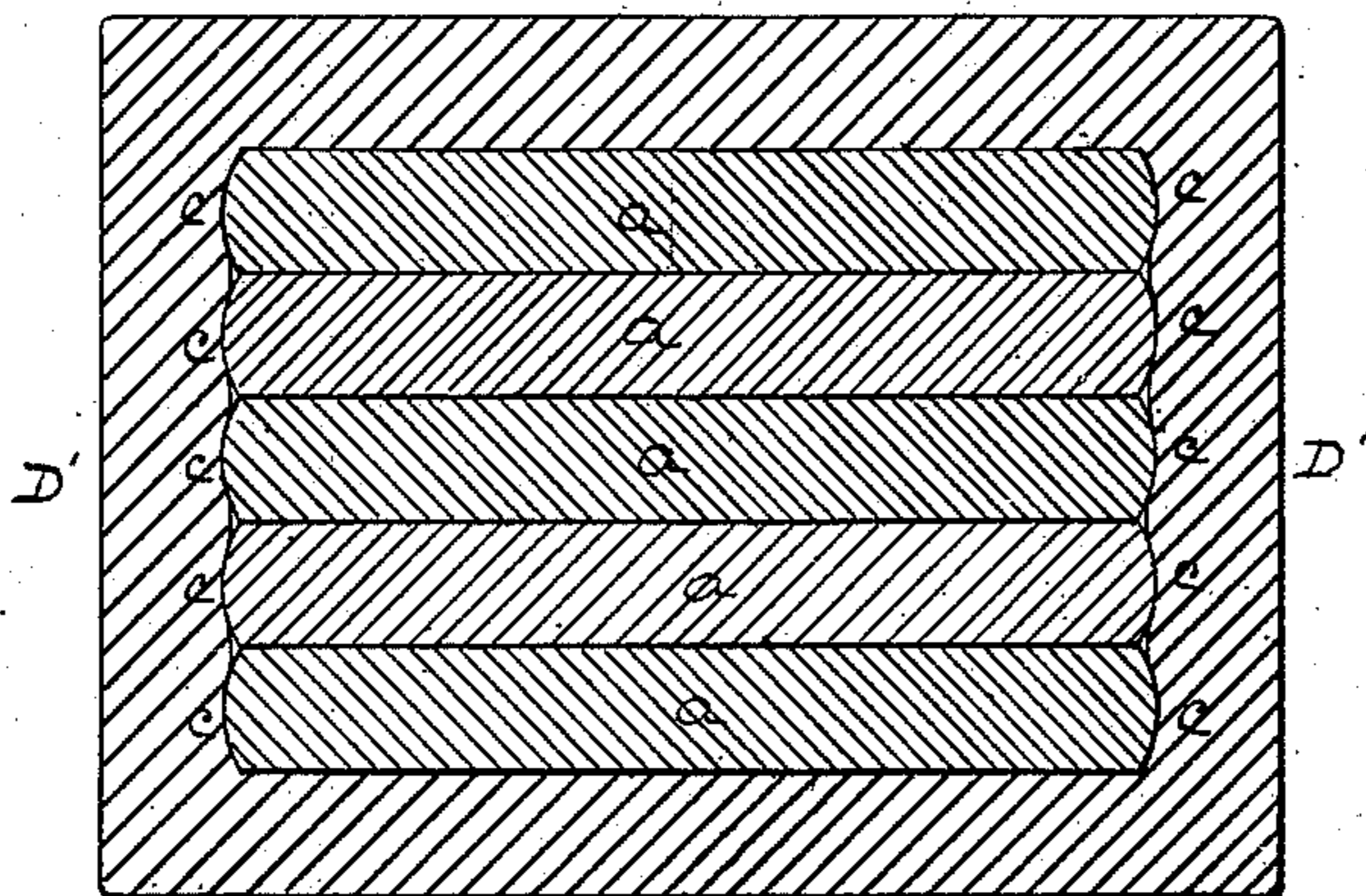


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

AARON FRENCH, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO A. FRENCH & CO., OF SAME PLACE.

IMPROVEMENT IN ELLIPTIC SPRINGS.

Specification forming part of Letters Patent No. 193,080, dated July 17, 1877; application filed May 22, 1877.

To all whom it may concern:

Be it known that I, AARON FRENCH, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in the Manufacture of Elliptic Springs; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of one-half of an elliptic spring illustrative of my improvement, and Fig. 2 is a transverse section thereof through the band.

My present improvement relates to the manufacture of elliptic springs or half-springs, with compressed bands, and more particularly to the spring itself, the method of operation involved in making the spring and band, and a construction of machine adapted to carry out the said operation, forming the subject-matter of a reissued patent, the original of which was granted to me February 6, 1877, No. 186,999.

In the manufacture of elliptic or semi-elliptic leaf-springs, particularly the heavier sizes, such as are designed for railroad-car use, a solid welded band has to be placed around the several leaves of the spring at each extremity of the minor axis of the ellipse. This band has heretofore, after being cut, bent, welded, and slipped loosely on, been tightened onto the spring by hammering, first, two opposite faces, and then giving the half-spring a quarter turn, hammering the two other opposite faces, (one, of course, resting on a die, and the other being struck by a hammer,) and so on alternately until the band was thought to be properly tightened. I have found, however, that this mode of tightening spring-bands does not in all cases give a satisfactory result. I have hence invented the mode of operation and mechanism described in the patent above referred to, a characteristic feature of which is that the dies gripe the band on all its four lateral faces simultaneously, and compress the band into the spring from all sides at once, or first on two opposite sides, and then, while still held under pressure on

such two sides, on its two other opposite sides, so that thereby the leaves composing each half-spring shall be firmly and securely locked as against displacement in any direction. Referring to said patent for a description of a machine adapted to operate such dies in carrying out this operation, I will now describe more particularly the banded spring in what I believe to be its best form for practical use.

The middle section or portion of the leaves of one-half of an elliptic car-spring (the number of leaves not being material) are represented at D, and the band referred to at D'. The latter is cut, bent, and welded in the usual or any desired way, and, being properly heated, is slipped loosely onto the half-spring D. The half-spring, with the band thereon, is then placed between suitable dies, which, either simultaneously or two by two, as above stated, close down on the outer faces of the band, such dies being actuated by force applied in any suitably way known in the art for operating reciprocating dies. The application of such force is continued, so as to compress each side of the band tightly onto the top and bottom leaves of the spring, as a result of which the leaves are compressed and held tightly together, and also onto the edges of the leaves, until, by the action of such pressing-force, the edges of the several leaves will make slight prints or indentations along the inner faces of the band adjacent thereto, to such extent as to have independent seats, whereby each leaf will be independently locked in position. This latter feature of construction is represented more fully and (on account of the proportionate smallness of the drawing) in a somewhat exaggerated form in Fig. 2, where the edges of the leaves *a* are represented as seated in the prints or indentations *c*, formed on the inner faces of the band in the manner described. The work thus produced is vastly superior in its quality to any heretofore made, not only in the fact that the band gripes the leaves of the spring so tightly that they cannot be or become loose or liable to displacement in any direction, but also in the fact that the external face of the band is left with a smooth finish on its bearing sides, and with well filled corners, such as cannot

be secured by other known modes of manipulation. Such a spring and band will work better in use and give better results when combined with a car-body than any other like device yet made.

I claim herein as my invention—

A banded elliptic half-spring, having a band gripping tightly the top and bottom leaves of the spring, and also seated by independent

seats or prints on the edges of the spring-leaves, substantially as set forth.

In testimony whereof I have hereunto set my hand.

AARON FRENCH.

Witnesses:

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