J. LUDLUM.

SPIRAL-SPRINGS.

No. 194,157. Patented Aug. 14, 1877.

Fig. 1.

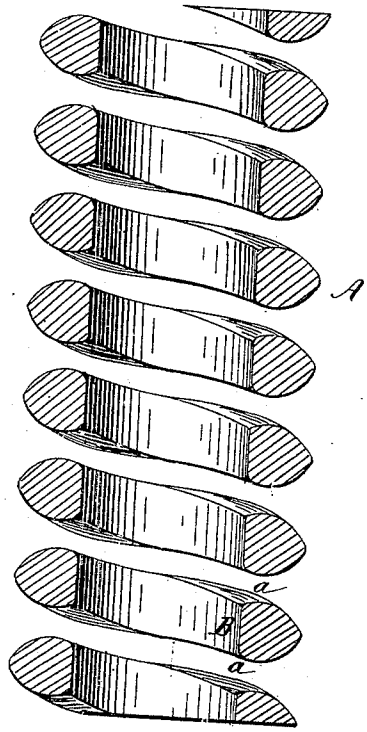
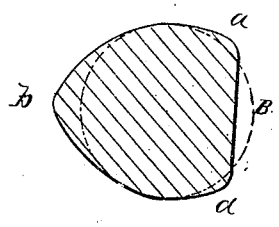


Fig. 2



WITNESSES:

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JAMES LUDLUM, OF POMPTON, NEW JERSEY.

IMPROVEMENT IN SPIRAL SPRINGS.

Specification forming part of Letters Patent No. **194,157**, dated August 14, 1877; application filed May 28, 1877.

To all whom it may concern:

Be it known that I, JAMES LUDLUM, of Pompton, in the county of Passaic and State of New Jersey, have invented a new and Improved Spiral Spring, of which the following is a specification:

Figure 1 is a central vertical section of a spiral spring made on my improved plan. Fig. 2 is an enlarged section of one of the coils.

Similar letters of reference indicate corresponding parts.

My invention consists in the peculiar form of bar used in making the spring, whereby the line of greatest resistance may be brought into any required relation to the axis of the spiral; the object being to so dispose the metal of which the spring is made as to utilize it to the fullest extent, and also to economize space.

In Fig. 1, A is a spiral spring, made from a bar of steel having a peculiar form, which is fully shown in the enlarged section, Fig. 2. This bar differs from a round bar in having its inner surface flattened at B, and having the projecting rounded corners *a* at opposite sides of the flattened portion, and in extending the side *b*, which is opposite the flattened side B.

The idea of the plan on which the bar is made is to bring the vertical diametrical line of a round bar nearer the axis of the spiral. To accomplish this the natural method would be to make one side of the bar flat, and add to the diameter of the bar to compensate for the deficiency in material due to flattening the side. This plan partly accomplishes the object; but it is more effectively accomplished by adding to the bar at the point *a a* and *b*, rendering it almond-shaped. The transverse section of the bar has the general form of a triangle having two similar curved sides and a right base, and having all of the corners rounded.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A spiral spring consisting of a coiled steel bar having convex sides and flattened on one of its edges, substantially as shown and described, for the purpose specified.

JAMES LUDLUM.

Witnesses:
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