L. Y. LEÓN.

SPRING.

APPLICATION FILED APR. 17, 1908.

903,587. Patented Nov. 10, 1908.

Fig. 1.

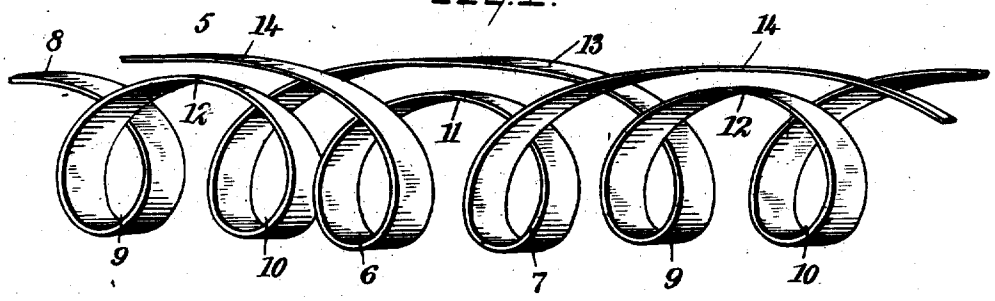


Fig. 2.

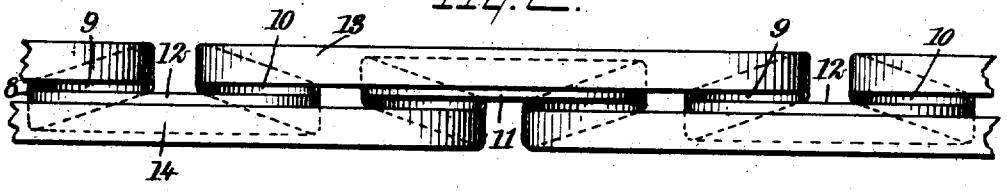


Fig. 3.

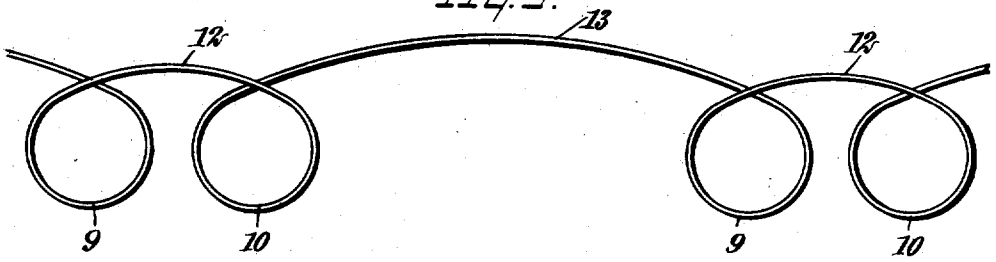
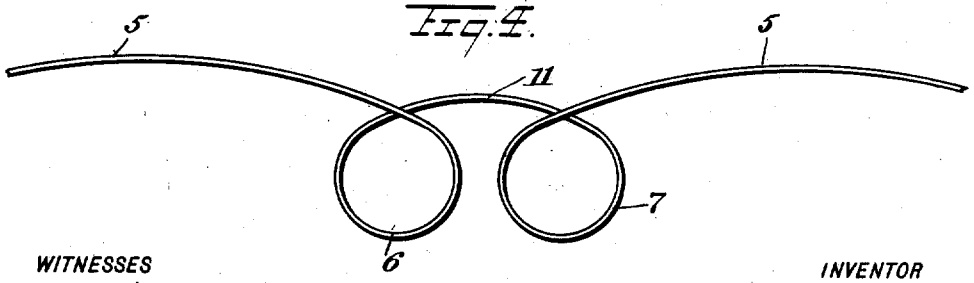


Fig. 4.



WITNESSES

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LUIS Y. LEÓN, OF SAN JUAN, PORTO RICO.

SPRING.

No. 903,587. Specification of Letters Patent. Patented Nov. 10, 1908.

Application filed April 17, 1908. Serial No. 427,706

To all whom it may concern:

Be it known that I, LUIS Y. LEÓN, a subject of the King of Spain, and a resident of San Juan, Porto Rico, have invented new and Improved Springs, of which the following is a full, clear, and exact description.

My invention relates to springs, my more particular purpose being to produce a kind of spring consisting of two members each having substantially the form of a ribbon, these two members being disposed symmetrically in relation to each other for the purpose of increasing the durability and the elasticity of the metallic members of the spring.

Although the industrial and mechanical arts abound with artifices for the production of elastic surfaces, it is a fact that the forms of springs have not been given as much attention as some other features of construction.

It happens that oakum, leather disks, and rubber in its various forms are employed in parts of machines where metal would be much beter for the purpose. Rubber would apparently fulfill many of the conditions exacted of a perfect spring, if it were not so expensive and did not decompose so rapidly when the extent of its vulcanization is only slight. If, however, means be taken to preserve the rubber, such means would necessarily detract from the elasticity of the rubber, which is its most important physical quality.

The springs of my invention are intended, as far as practicable, to take the place of rubber and are believed to be, for many purposes, much more suitable than the latter. These springs have the advantage of economy, durability and great elasticity, as compared with rubber, and further are well adapted to resist extreme temperatures.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective, showing one of my improved springs consisting of two metallic ribbons arranged together as a pair, each ribbon being wound upon itself and disposed in a definite symmetrical relation to the other ribbon; Fig. 2 is a plan view of the construction shown in Fig. 1, and exhibits how the two metallic ribbons are intertwined so that convolutions of one ribbon have a definite relation to convolutions of the other ribbon, certain parts of each ribbon being disposed substantially in the same plane as corresponding parts of the other ribbon; Fig. 3 is a side elevation showing a part of one of the ribbons, this view exhibiting two pairs of convolutions, these two pairs being spaced widely apart, and Fig. 4 is a side elevation showing a single pair of convolutions close together.

A continuous ribbon 5 of spring steel, or other metal, is provided with convolutions 6, 7 so wound that the rotation is always in the same direction. Another ribbon 8 is similarly provided with convolutions 9, 10. The convolutions 6, 7 are connected together by a portion 11, the convolutions 9, 10 being similarly connected by portions 12. Each pair of convolutions 9, 10 is connected with the next succeeding pair by a portion 13. Similarly each pair 6, 7 of convolutions is connected with the next succeeding pair by a portion 14.

When the two ribbons 5, 8 are placed together, as in Fig. 2, it will be noted that different portions of the one ribbon are disposed concentrically to somewhat analogous portions of the other ribbon, so that the two ribbons occupy a minimum of space. It will also be noted that from one end of the spring to the other the convolutions of one ribbon are arranged symmetrically with relation to the convolutions of the other ribbon, the general principle of construction being clear from Figs. 2 and 3.

Referring more particularly to Fig. 1, it will be noted that the diameter of the convolutions 6, 7 should never be so great that when the spring is relaxed these convolutions will be brought into engagement with the convolutions 10 to the left of the convolutions 6, or 9 to the right of the convolutions 7.

The springs above described may be either of the so-called "extension" type or the so-called "compression" type, depending upon the use to which the springs are to be placed. They may also be used exteriorly or interiorly with reference to hollow objects to which they are applied. In carriage wheels, pump pistons and similar apparatus, requiring expansive pressure, they act as compression springs.

In applying the springs to any surface which it is desired to render elastic, the ribbons are always employed in pairs, one be-

ing right-handed and the other left-handed. By this means there may be obtained an elastic surface of indefinite length and having a width equal to or slightly greater than the width of one of the ribbons.

While for convenience I show the metallic ribbons as divested of any coverings, it will be understood that they may be covered after the manner of other springs. It will be understood that the particular circular form given to the convolutions is merely a representative of the general idea, and that I do not limit myself to this exact shape of convolutions for the reason that the ribbons may be varied somewhat in shape without departing from the spirit of my invention. It will be noted that the two ribbons, being parallel to each other throughout a goodly portion of their respective lengths, as indicated in Fig. 2, are disposed compactly, and yet this compactness does not interfere with a reasonable degree of movement due to the lengthening and shortening of the spring as a whole, and consequently to the contraction and expansion of the individual convolutions.

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

1. A spring comprising a plurality of ribbons of resilient material, each ribbon being bent to form convolutions, the convolutions of each ribbon being spaced apart unequally so as to form pairs separated by intervals, the two ribbons being closely intertwined so that a pair of convolutions of one ribbon is disposed intermediate successive pairs of convolutions of the other ribbon.

2. A spring comprising a pair of ribbons each provided with convolutions disposed closely together in groups, the groups being separated by wide intervals, said ribbons being generally parallel with each other and so disposed that a group of convolutions of each ribbon mate an interval between groups of convolutions of the other ribbon.

3. A spring comprising a plurality of ribbons of resilient material, each ribbon being bent to form convolutions, and also being bent slightly in a direction lateral to its length so that its convolutions occupy two distinct planes, said ribbons being so intertwined with each other that the two planes of one ribbon coincide with the two planes of the other ribbon.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUIS Y. LEÓN.

Witnesses:
S. M. WOODSON,
LEE WENDIZ.