June 27, 1944. M. J. RYMLAND ET AL 2,352,569

SPRING ASSEMBLY

Filed March 6, 1942

Fig. 1.

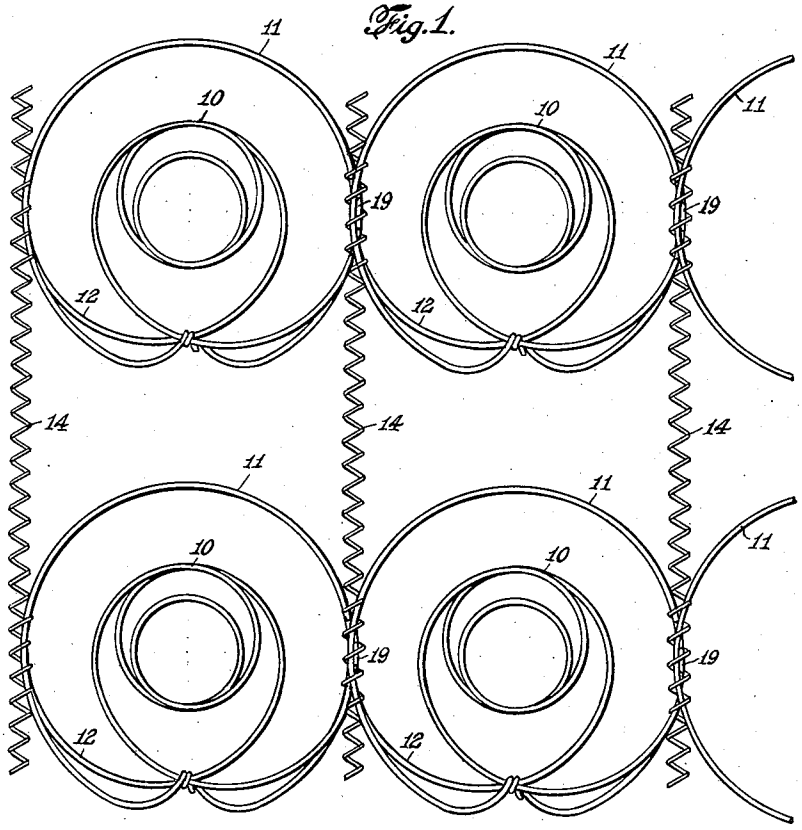


Fig. 2.

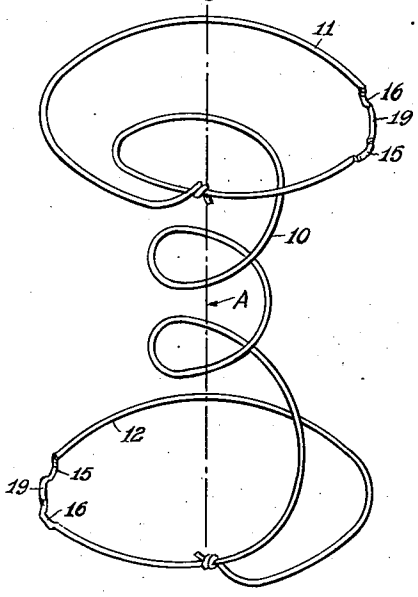


Fig. 3.

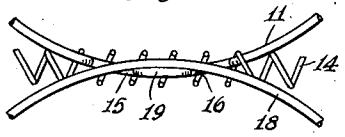
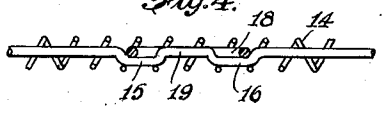


Fig. 4.



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SPRING ASSEMBLY

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3 Claims. (Cl. 5—269)

This invention relates to improvements in spring assemblies and more particularly to the construction of spring cushion units which are made up of a plurality of coil springs secured together.

The general object of the invention is to improve the locking together of adjacent coil springs. More specifically the objects are to lock the springs together in such manner as to eliminate all rattling or other noise, to prevent rotation of the individual coils of the unit relative to one another, to improve the overall flexibility of the spring cushioning unit and to give it a flatter surface.

The spring units of this invention may be used in chair and sofa cushions, mattresses, box springs and the like in the same manner as other spring units.

The invention will be understood from the following description of the present preferred embodiment, taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a plan view of a group of spring elements as they would be arranged in the construction of a spring cushion unit;

Fig. 2 is an elevational view of a double-cone type coil spring such as is shown in Fig. 1;

Fig. 3 is a detailed plan view, partly in section, of the overlapping portions of two adjacent coil springs and their associated helix;

Fig. 4 is a side elevation of the same parts shown in Fig. 3.

Referring to Fig. 1, the coil springs 10 are preferably arranged in parallel rows, the springs of each row being joined together and the several rows interconnected to produce a spring cushion unit of any size and shape desired. As shown in Fig. 2, each coil spring 10 comprises an upper end coil 11 and a lower end coil 12 with intermediate coils of lesser diameter. The springs are so formed that the end coils are substantially flat, that is, the wire is so bent that the end coils lie in parallel planes, the spring unit as a whole providing flat upper and lower surfaces for the application of upholstering material.

For joining the adjacent springs of each row together and to the springs of adjacent rows, there are used a plurality of helical springs 14 of small diameter (herein referred to as helices). Springs of this general construction, in which helices surround overlapping or adjacent portions of the end coils of adjacent coil springs are known. In them, however, any side strain placed on the coil springs is taken up entirely by the helices and it is hence necessary to make the helices of heavy enough wire to stand the strain.

In accordance with the present invention, a hinge joint is formed between adjacent coil springs by interlocking the end coils, the helix serving only to hold them in interlocked position. The end coils of each coil spring 10 are provided with a pair of indentations 15 and 16 which extend in a direction parallel to the axis, A, of the coil spring. These indentations are of a depth at least equal to and preferably the same as the diameter of the wire from which the coil springs are made. They are of such width, as may be seen from Fig. 3, as freely to receive an arcuate segment 18 of the plain of unindented portion of the end coil of an adjacent spring. Between the indentations 15 and 16 is the upstanding locking portion 19, behind which the plain end coil segment 18 passes when two springs are placed in overlapping position.

The spacing of the indentations 15 and 16 is preferably such that the amount of overlapping is a minimum, with the end coils interlocked as shown in Figs. 3 and 4. While the coils are held in interlocked position, the helix 14 is passed around the overlapping portions of the end coils and secures them together permanently. The diameter of helix used should be such as to fit snugly around the overlapped and interlocked coils without any free play. It is also apparent that the dimension and spacing of the indentations 15 and 16 is dependent on the diameter of the end coils of the springs used and may be varied accordingly.

It will be observed that by means of this construction the end coils all lie in a common plane. By the interlocking of the end coils in the manner just described, it is possible to use a helix of lighter wire, of smaller diameter and one in which the convolutions are more closely spaced, thus providing increased flexibility in the helices which form a substantial portion of the surface of the spring unit. Side strain applied to any single coil spring of a row is transmitted, not to the helix, but directly to the end coil of the spring with which it is interlocked.

This construction provides between adjacent springs a simple and effective hinge joint held together by a closely fitting helix. When one spring is compressed, thus moving the end coils into different planes, the connection between the springs within the helix is tightened, due to the fact that the hinge joint is made of two arcuate sections. Thus during the movement of the

springs relative to one another there is absolutely no rattling or other noise.

As shown in Fig. 2, the indentations of the lower end coil 12 are diametrically disposed relative to the indentations of the upper end coil 11. When a number of such springs are assembled, as shown in Fig. 1, each coil is held against rotation at both the top and the bottom and thus maintains its initial position in the assembly, by reason of the fact that it is impossible to rotate an end coil when its indentations 15 and 16 are engaged with an adjacent coil inside a helix. The construction of the spring shown in Fig. 2, it will be noted, is symmetrical and it may be assembled either end up with any number of identical springs, thus eliminating the necessity of making more than one type of spring.

The foregoing detailed description is to be taken as merely illustrative of the invention which is to be limited only in accordance with the appended claims.

What is claimed is:

1. In a spring assembly comprising a row of coil springs having their end coils arranged adjacent one another, each end coil having a pair of spaced indentations extending in a direction parallel to the spring axis and interlocking with a plain arcuate segment of the corresponding end coil of the next adjacent spring, and a helix surrounding the interlocking portions of adjacent springs and securing them in interlocking position.

2. In a spring assembly comprising a row of coil springs having their end coils arranged adjacent one another, each end coil having a pair of spaced indentations extending in a direction parallel to the spring axis and interlocking with a plain arcuate segment of the corresponding end coil of the next adjacent spring, and a small bore helix closely encircling by a plurality of its convolutions the indented portion of an end coil and the segment of the adjacent end coil passing therethrough for locking the end coils together.

3. In a spring assembly, in combination, a plurality of rows of coil springs, the springs of each row being adjacent one another, the end coils of each coil spring having a pair of spaced indentations extending in a direction parallel to the spring axis, each end coil overlapping the corresponding end coil of the next adjacent spring and lying in said indentations, and helices extending from row to row and surrounding the overlapping portions of the end coils of the springs in each row, joining them together and to the springs in other rows.

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