

Nov. 30, 1937.

L. H. HAMILTON

2,100,543

SPRING STRUCTURE

Filed Aug. 31, 1935

2 Sheets-Sheet 1

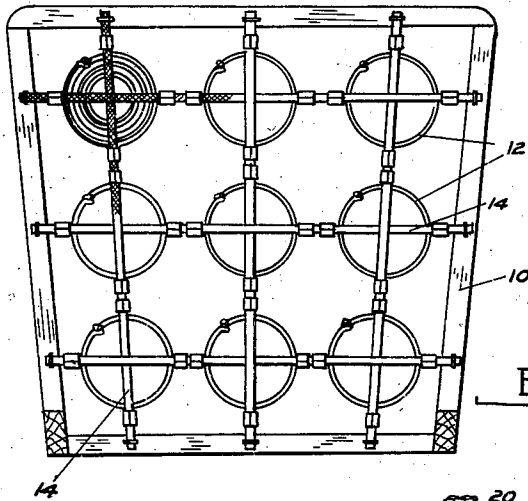


Fig 1

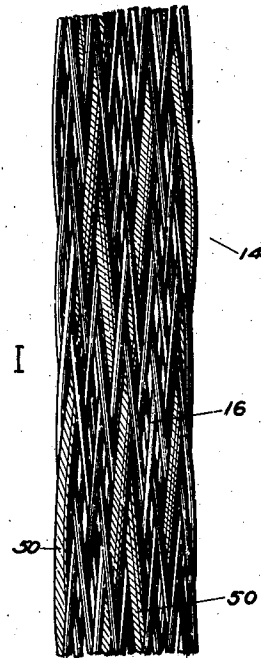


Fig 2

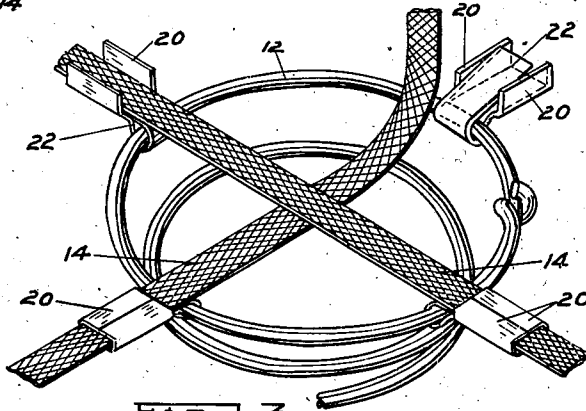


Fig 3

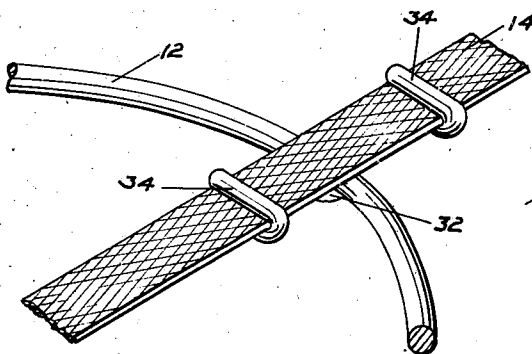


Fig 4

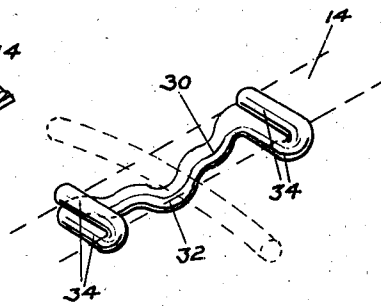


Fig 5

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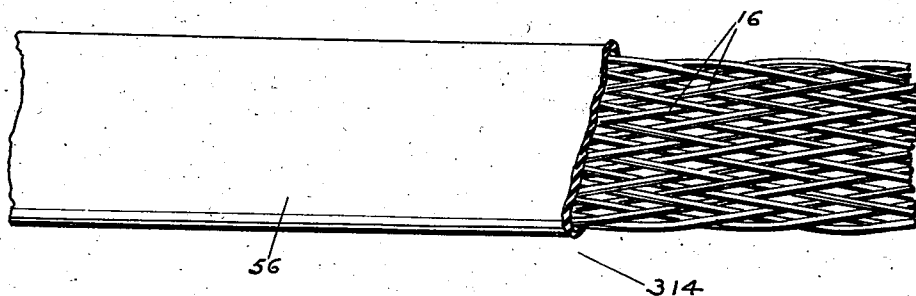
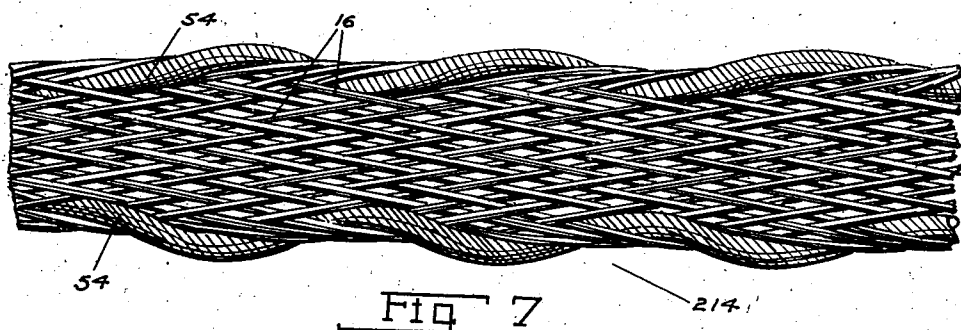
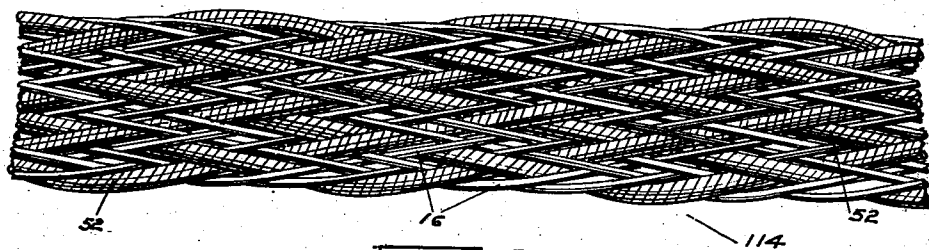
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2 Sheets-Sheet 2



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2,100,543

SPRING STRUCTURE

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Application August 31, 1935, Serial No. 38,689

3 Claims. (Cl. 5—263)

This invention relates to spring structures such as are used in seat cushions and the like, and to the supporting of the coil springs used in such structures.

5 An object of the invention is to provide inexpensive spring-supporting means which is strong, durable, non-deteriorating, sanitary, and vermin-proof, and which will not cause noises, and which is more readily applicable to all shapes and sizes of furniture frames than previous metallic structures. It is also desirable to arrange the parts to facilitate the repair of the cushion structure. Having this object in mind, I support the spring coils on braids made up of longitudinally inter-
10 woven wires of considerable tensile strength. The possibility of noise, such as rattles and other sounds due to looseness and the like, is eliminated by attaching the bottom spring coils firmly to the braid by means which compress the braid at the point where the spring coil is supported, so that there is no possibility of relative movement of the wires in the braid, or of the braid wires relatively to the spring coils.

20 Preferably the spring coils are attached to the braid by novel clips having portions encircling and compressing the braid, and parts encircling and holding the spring coils. Two forms of such clips are shown.

One illustrated clip is made of a sheet metal stamping having side lugs adapted to embrace and be bent around the braid, and an end lug adapted to encircle and hold the spring coil. Preferably the end lug extends back between the side lugs, and is firmly held by the side lugs when they are bent to place around the braid.

35 The other novel clip illustrated is made of wire. The wire has a central section formed with a bend or hump adapted to encircle the spring coil, and end sections (shown extending at right angles to the central section) of doubled formation which include superposed parts embracing and compressing and holding the braid.

40 Another important feature of the invention relates to cushioning and deadening the sound of the upper spring coils, as they bottom against the above-described braid or its equivalent under heavy load, by collapsing substantially into the plane of the bottom coil, by providing the braid with non-metallic means which is engaged by the coils as they bottom in this manner.

50 In one arrangement non-metallic fibrous strands, of greater diameter than the wires, are interbraided with the wires. In another arrangement such strands are incorporated into the braid along its edges. In a third embodiment

the braid is inclosed and embedded in rubber or rubber-like material.

The above and other objects and features of the invention, including various novel combinations of parts and desirable particular constructions, will be apparent from the following description of the illustrative embodiments shown in the accompanying drawings, in which:

Figure 1 is a bottom plan view of a seat cushion embodying my invention;

10 Figure 2 is a plan view on a larger scale of a section of the braid used;

Figure 3 is a perspective view showing the attachment of the braid to the bottom coil of one of the springs;

15 Figure 4 is a view corresponding to part of Figure 3, but showing a wire clip;

Figure 5 is a perspective view of the wire clip;

Figure 6 is a plan view of a braid having fibrous strands interbraided with the wire;

20 Figure 7 is a similar view showing such strands run in along the side edges of the braid; and

Figure 8 is a similar view showing the wire braid inclosed and imbedded in rubber material.

The spring structure of Figure 1 includes a suitable frame 10 within which are arranged rows of coil springs 12. The present invention has to do with supporting the coil springs 12.

The springs are supported on braids 14 of interwoven wires 16 (Figure 2) extending longitudinally of the braid. These wires are of considerable tensile strength, so the braids 14 may be of light weight and construction. They are, however, of somewhat open structure, permitting a small amount of relative movement of the different wires.

To make sure that there will be no noise during or caused by relative movement of the wires, or of wires relatively to the spring coils supported thereby, I consider it important that the braid be compressed adjacent the spring coils they support, to prevent or minimize relative movement of the braid wires, by means firmly attaching the spring coils to the braids and preventing them from moving relatively thereto. This is preferably accomplished by the use of novel clips, of which two forms are shown.

The clips shown in Figures 1 and 3 are of sheet metal stampings, having side lugs 20 adapted to receive the braid between them as shown in the two upper clips in Figure 3, and to be bent around over the braid to grip and embrace the braid substantially throughout its width as shown in the two lower clips in that figure. These clips also have relatively long end lugs 22, bent around the

end coil of the spring 12 and extended back into the space between the side lugs 20 (see the upper right-hand clip in Figure 3) under the braid 14, so that they are firmly held by the side lugs 20 when the latter are finally bent into place.

The clips illustrated in Figures 4 and 5 are made of wire, each having a straight central portion 30 formed with a bend or hump 32 encircling and holding the end coil of the spring 12. At the ends of the portion 30, and preferably at right angles thereto, are end portions 34 of doubled formation, with the braid 14 embraced and compressed between the parts thereof.

In both forms, the clips should be close enough to the wire on the inner side of the bottom coil of the spring to avoid any interference with the next adjacent coil when the spring is compressed enough to force the adjacent coil into the space within the bottom coil.

An important feature of the invention relates to providing the braids 14 or their equivalent with non-metallic means cushioning and deadening the sound of the upper coils of the springs 12 as under a heavy load they collapse into the plane of the bottom or end coils and thereby engage the supporting braids. It will be appreciated that it will not usually take a very heavy load to cause at least the second coils to bottom in this manner, and that without the provision of cushioning and sound-deadening material this could at times produce a metallic clicking noise which some people would consider objectionable.

The non-metallic material may take the form of fibrous sisal or hemp strands inter-braided with the wires 16 and of somewhat greater diameter than the wires. Four such strands 50 are shown interbraided with 17 metal wires in Figure 2. The braid 114 in Figure 6 is shown with 7 such strands 52 interbraided with 14 strands of wire.

Figure 7 shows a braid 214 provided with similar strands 54 run into the structure of the braid along its side edges. In Figure 8 the wires of the braid 314 are shown inclosed and imbedded in rubber or rubber-like material 56.

While several illustrative embodiments are shown in detail, it is not my intention to limit the scope of my invention to those particular embodiments, or otherwise than by the terms of the appended claims. The present application is a partial continuation of my application No. 759,851, filed December 31, 1934.

I claim:

1. A yielding supporting structure comprising a plurality of coil springs, and devices each supporting a plurality of said springs and each of which includes a considerable number of metal wires extending entirely across the structure and

which are braided together to form a wide and flat spring support of great strength and resilience, and means for attaching the wires to the springs including means for embracing and holding substantially the entire width of said support, said means including attaching clips each having a portion underlying its supporting device at one side of the bottom coil of one of the springs and provided at its end with a relatively long lug bent around said bottom coil and into the space between said portion and said device and provided at its sides with lugs bent inwardly over said supporting device and holding the supporting device and the end lug gripped in place.

2. A yielding supporting structure comprising a plurality of coil springs, and devices each supporting a plurality of said springs and each of which includes a considerable number of metal wires extending entirely across the structure and which are braided together to form a wide and flat spring support of great strength and resilience, and means for attaching the wires to the springs including means for embracing and holding substantially the entire width of said support, said means comprising clips each embracing a bottom coil of a spring and having parallel portions gripping and embracing said support substantially throughout its width immediately adjacent said coil and holding the individual wires of the support in place substantially in a plane underlying said coil.

3. A yielding supporting structure comprising a plurality of coil springs at least the bottom coils of each of which are adapted to collapse into substantially the same plane under heavy loads, and devices each supporting and attached to the bottom coils of a plurality of said springs and each of which includes a considerable number of metal wires extending entirely across the structure and which are braided together to form a wide and flat spring support of great strength and resilience, each of which is provided at least on its upper face with non-metallic material projecting above the plane of said wires and engaging and cushioning and deadening the noise of said coils as they collapse into the plane of the bottom coil, and means attaching said supports to said bottom coils including clips attached to said bottom coils of the springs and each having parallel portions gripping and embracing said support substantially throughout its width immediately adjacent one of said coils and holding the individual wires of the support in place and the non-metallic material compressed with the support substantially in a plane underlying said coil.

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