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C. S. REED

2,002,158

SPRING STRUCTURE

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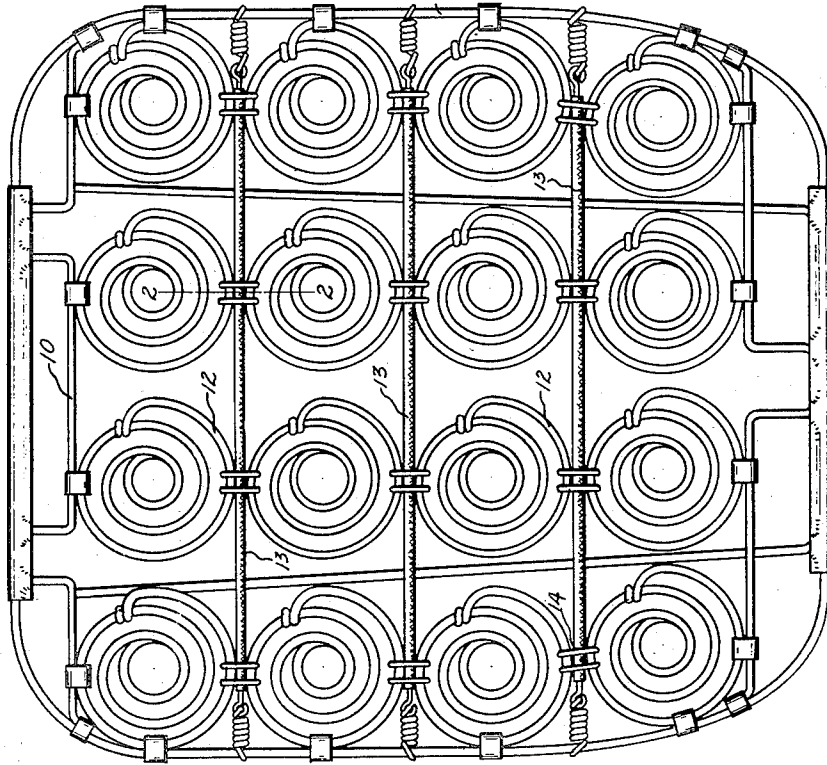


FIG. 1

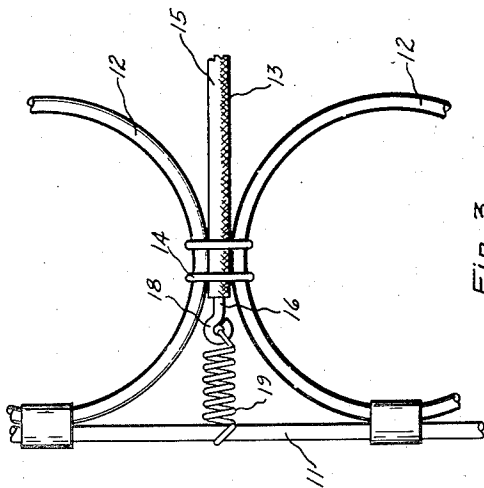


FIG. 3

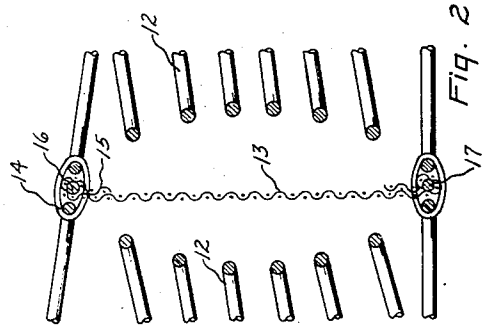


FIG. 2

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SPRING STRUCTURE

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3-Claims. (Cl. 155—179)

The present invention relates to improvements in spring structure for seats, backs, cushions and the like, and particularly relates to spring structures of the Costigan type as illustrated in Re-issue Patent No. 18,860.

In spring structures of the above described type, especially when the same is to be used in seats and backs of vehicles where it is subjected to repeated extreme deflection, it is necessary to provide some means for preventing the flexible wire or its equivalent employed in reinforcing the upper edge of the listing strips between adjacent rows of springs from working out of position. The present practice is to clip the top helices of adjacent springs to the reinforced edge of the listing strips through the use of a wire or metal contractible fastener. This fastener pierces the listing strip and encircles the member reinforcing the edge thereof. Especially when wire is employed to reinforce the listing strips, unless at least one end of the same is secured to the upper border, differential deflection of the rows of springs to which the listing strips are attached results in a shortening of the overall length of the wire and relative movement between the wire and the associated elements tends to work the wire out of proper position. As any non-yieldable interconnection between the border frame and the central spring coils interferes with the individual action of the component parts of the spring structure and impairs the "feel" and riding qualities of the same, such practice is objectionable.

Thus it becomes the object of the present invention to provide a spring structure of the Costigan type in which the listing strips are reinforced at the edges with some member, such as wire, which is substantially of a non-longitudinal extensible character, there being longitudinally extensible resilient members connecting the ends of the reinforcing members with the upper frame to correctly position the members and to assist in the alignment and positioning of the springs connected to the listing strip. With such an arrangement, a straight wire member having sufficient transverse rigidity to distribute the stress upon the listing strips retaining the spring coils under initial compression may be advantageously employed. At the same time, the wire members reinforcing the listing strips may be yieldably positioned from the upper border obviating any objectionable limitation being placed upon the deflection of the spring coils relative to the upper border frame.

In the drawing:

Fig. 1 is a plan view of a spring structure of the

Costigan type embodying the present invention.

Fig. 2 is an enlarged cross-sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary view of a detail of construction.

Having reference to Fig. 1, a spring structure 10 is shown of any suitable configuration and contour having an upper border frame 11 which in most cases will be fabricated from wire. Coil springs 12 of any suitable well known construction are shown as arranged in rows with vertically disposed listing strips 13 of fabric or other flexible material located between adjacent rows. The border rows of springs located within the frame 11 are clipped thereto in the usual manner. The listing strips 13 between adjacent rows of springs are hemmed or otherwise constructed to accommodate and position reinforcing members along their longitudinal edges as disclosed in the above patent. Suitable fasteners or clips 14 embrace the top helices of adjacent springs and pierce the strips 13 to encircle the upper edges 15 which are reinforced by the longitudinally extending flexible wire members 16. The lower edges of the strips 13 may be secured to the bottom helices of the springs in a manner similar to the top helices; however, the member 17 reinforcing the lower edges need not be flexible nor connected to the frame of the spring structure in the manner to be hereinafter described in view of the fact that the lower or base helices of the springs are not deflected during use. As fully described in the above mentioned patent the listing strips 13 function to retain the springs under an initial compression to improve the riding quality of the structure and to effect the proper contour.

According to the present invention, the wire members 16 reinforcing the listing strips are terminated short of the upper border frame 11 at both ends and are looped at the ends to provide eyes 18. These looped portions prevent the wire upon shortening through central deflection from being drawn through the fasteners 14 securing adjacent top helices of border springs. For yieldingly maintaining the wires 16 in proper position at all times, helical springs 19 connect the ends of the wire with the frame 11. These springs may be secured at opposite ends to the eyes 18 and frame 11 in any suitable manner. It is to be observed that eyes 18 at the ends of the reinforcing wires are spaced from the fasteners 14 a sufficient distance to permit a certain amount of shortening of the wires along the hem 15 upon deflection of the central spring coils.

By the foregoing described arrangement, the wires 16 are yieldably positioned within the hem of the listing strips 13 obviating any possibility of the wires working out of place and being projected through the upholstery. At the same time, differential deflection of the springs in a row attached to a common reinforced edge of the listing strip is made possible without any objectionable tendency to suspend the central spring from the border springs and/or frame thus permitting more complete individual action of the respective springs.

It is to be understood that the fasteners or clips 14 can not in commercial construction be applied sufficiently snug to prohibit slippage of the wire 16 in the hem 15. For this reason no particular attention need be given this operation.

Having described one particular embodiment of the invention it is to be appreciated that I contemplate other possible forms and structural changes, especially those having reference to the yieldable connections between the reinforcing member and the border frame, which fall within the scope of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. In a spring structure, a base frame, an upper frame, rows of springs arranged within and between said frames, certain of said springs constituting border springs, strips of fabric of less height than the normal expansion of said springs arranged between adjacent rows of springs, members reinforcing the longitudinal edges of said strips of which at least the upper members are flexible, the upper members being terminated short of said upper frame, fastening means se-

curing said members to said springs to place the same under compression, and longitudinally extensible resilient members connecting the ends of the upper reinforcing members to said upper frame whereby substantially individual action of the springs within said border springs is permitted.

2. In a spring structure, a base frame, an upper frame, rows of springs arranged within and between said frames, strips of fabric of less height than the normal expansion of said springs arranged between adjacent rows of springs, flexible members reinforcing the longitudinal edges of said strips, the upper members being terminated short of said upper frame, fastening means securing said members to said springs to place the same under compression, and longitudinally extensible resilient members connecting the ends of the upper reinforcing members to said upper frame.

3. In a spring structure, a base frame, an upper frame, rows of springs arranged within and between said frames, strips of fabric of less height than the normal expansion of said springs arranged between adjacent rows of springs, wire members reinforcing the longitudinal edges of said strips of which at least the upper members are flexible, the upper members being terminated short of said upper frame, fastening means piercing said strips and embracing said members securing said strips to said springs to place the same under compression, said means fixedly engaging said strips and slidably embracing said members, and longitudinally extensible resilient members connecting the ends of the upper reinforcing members of said frame.

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