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C. S. REED

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SPRING STRUCTURE

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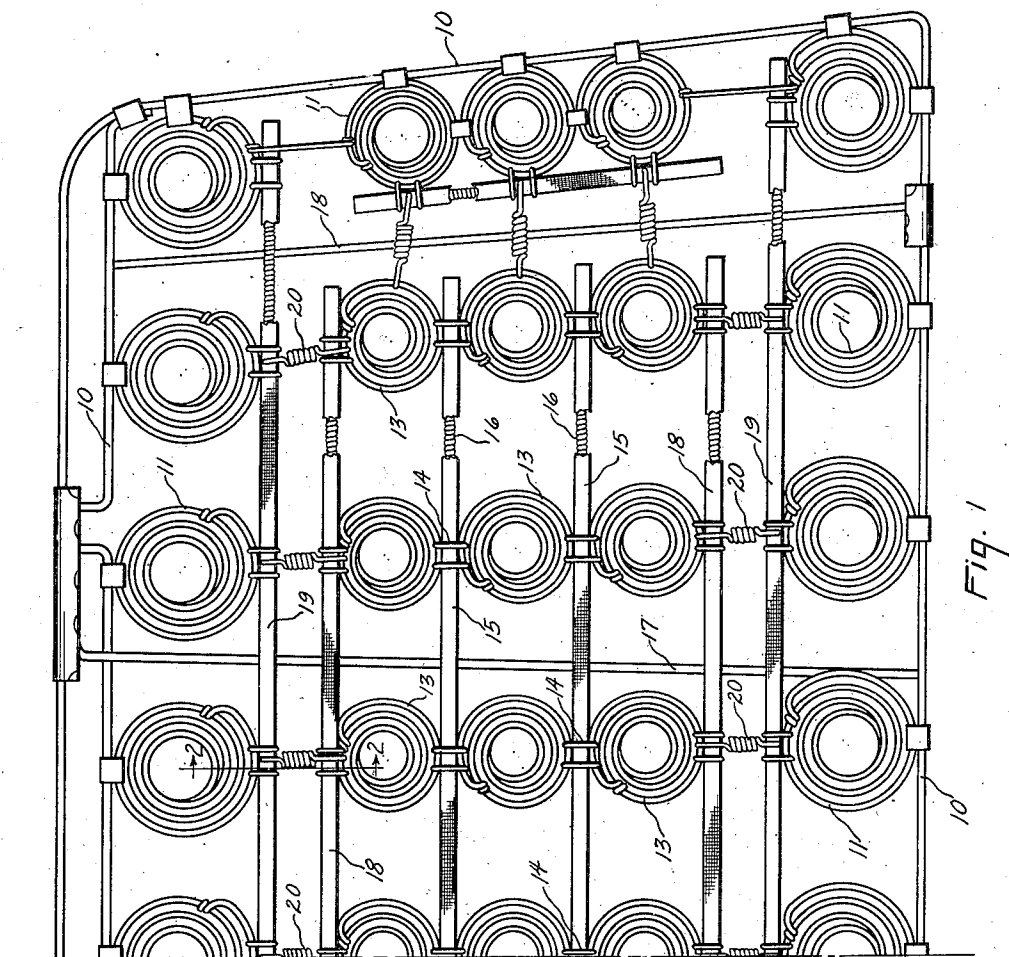


Fig. 1

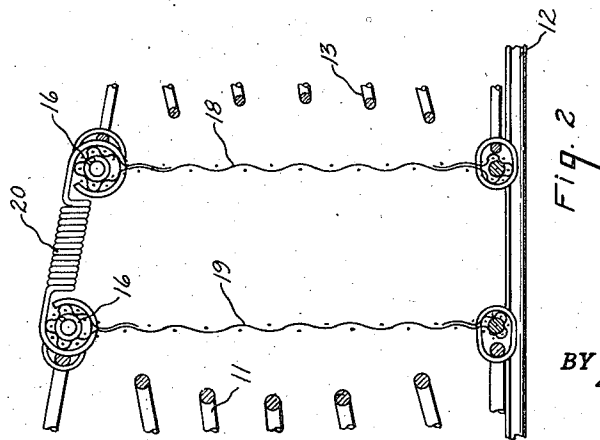


Fig. 2

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SPRING STRUCTURE

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1 Claim. (Cl. 155—179)

The present invention relates to improvements in spring structure and has particular reference in seat constructions for vehicles.

In the design of seat constructions to be used in vehicles, it is necessary to provide for extraordinary use and extreme riding conditions. At the present time this is accomplished by a marginal upper frame which is usually of wire and is supported in position by a marginal row of coil springs and braced in some suitable manner. The front of the marginal frame and front marginal springs are relied upon primarily to impart the proper contour and shape to the seat construction and to provide a resilient support for the thighs of the occupant; the central part of the seat construction supporting the bulk of the occupant's weight and being subjected to the maximum deflection and compression. The practice has been to so interconnect the central springs with the marginal frame and springs that excessive compression of the central spring tends to draw the marginal frame and spring inwardly. Repeated inward deflection of the front of the marginal frame has a tendency to permanently distort the same with the result that the same sags inwardly destroying the contour of the entire spring structure and trim and materially affects the riding qualities. Also, this inward distortion of the marginal frame often results in the diagonal braces being loosened and projected forwardly through the trim. Furthermore, in constructions of the type just described, the helices of the central coil springs can be considered as suspended as a unit from the marginal frame and springs with the result that upon compression the central springs do not have an opportunity to function in an unrestrained manner but are stiffened to a degree and rendered less yieldable to localized pressure. This last mentioned characteristic impairs the maximum "feel" and possible riding quality of the construction.

Thus it becomes the primary object of this invention to provide a spring construction of the general type disclosed in the Costigan Reissue Patent No. 18,860 and the Burch Patent No. 1,793,421 in which the central area of coil springs is positioned and aligned by the marginal springs and frame yet is capable of action substantially free from restraint due to differential compression or deflection between the central area and marginal area of the seat construction; permanent distortion and excessive inward deflection of the marginal frame being also avoided.

Other objects and advantages reside in the hereinafter described combinations and arrange-

ments of parts. The invention is clearly defined in the appended claim.

In the drawing,

Fig. 1 is a plan view of one-half a spring structure embodying the present invention.

Fig. 2 is a transverse sectional view taken upon line 2—2 of Fig. 1.

In general the present invention resides in a spring structure in which the marginal frame and coil springs may be of usual construction. Within the marginal area is provided a central area of spring coils which may likewise be of usual construction and association. Between the marginal and central area resilient means are provided, preferably in the form of close wound helical springs, for yieldably suspending and positioning the central area from the marginal frame in a manner permitting excessive differential compression or deflection between the respective areas without objectionable inward distortion of the marginal frame. With the present invention specifically applied to the Burch and Costigan type of constructions heretofore mentioned, a pair of parallel vertical listing strips are provided in the space between the adjacent rows of coil springs defining the inner border of the marginal spring area and the outer border of the central spring area. The edges of the strips are reinforced with a flexible member and are secured to the adjacent top helices of the springs. Close wound helical springs are connected at opposite ends to the top helices of adjacent springs and extend between the pairs of parallel listing strips. These strips together with those located between adjacent rows of springs in the central area function to retain the springs under compression and to assist in the lateral support and alignment of the springs. By having pairs of listing strips in spaced opposed relation between the marginal and central areas, the proper contour and compression of the adjacent springs in the two areas may be readily maintained; the listing strips act as a marginal frame work for the central area preventing uncontrolled relative shifting of the two areas. As the spacing of the adjacent rows of springs is greatest at the junction between the marginal and central areas, the addition of the listing strips located at this point acts to support the upholstery and avoid the formation of pockets in which the padding may accumulate.

That the invention may be clearly understood, specific reference is made to the drawing wherein a spring construction particularly designed for the seat cushion of a vehicle is illustrated as com-

prising an upper marginal or border wire frame 10 to which the top helices of a marginal row of coil springs 11 are clipped or secured in any suitable manner. The springs may be of any one of the several known types and may have their base helices secured to a marginal base frame 12 in a manner well known in the manufacture of spring structures.

The coil springs 13, which constitute the central area, have their adjacent top helices secured together by suitable means such as wire clips 14. These clips may also have the additional function of securing the top helices of adjacent rows of springs to the reinforced edges of the listing strips 15 which are employed as in the patents to Burch and Costigan heretofore mentioned to retain the springs under initial compression and to render the construction quiet in operation. The upper edges of the listing strips 15 are shown as reinforced by close wound helicals 16 although any suitable flexible member may be employed for this purpose. The lower edges of the listing strips 15—18—19 are preferably reinforced in some suitable manner as disclosed in the above mentioned patents and suitably clipped or secured to the bottom coils of the spring 13 as shown in Fig. 2. The springs 13 may be lighter and thus softer than the springs 11 but this is not essential and I do not care to limit myself to any particular selection of springs in the marginal and central areas. Usual diagonal braces are designated as 17; it being understood that any other suitable lateral bracing may be employed.

Paralleling the front and rear sides of the marginal frame 10 and located between the marginal and central spring areas, are spaced parallel listing strips 18—19. These strips may be identical with the strips 15 and may be clipped to the top helices of the springs 11—13 in the same manner as heretofore described. The spacing between the springs 11 and the marginal springs 13 of the central area, and likewise the spacing between the listing strips 18—19, is such as to permit the insertion of longitudinally extensible members such as close wound helical springs 20. These springs function to position and align the springs of the central areas from the marginal frame 10 yet at the same time permit differential compression of the marginal and central areas through longitudinal extension without objectionable drawing in and distortion of the marginal frame 10. The helicals 20 also permit the central area of springs 13 to function substantially independently of the marginal area with the result that the riding action is improved and the central springs are more sensitive to localized pressure imparting a softer feel to the construction.

Although only a single row of springs 11 is shown in what is termed the marginal area, obviously, two or more rows may be employed within

the scope of the invention if it is desired to locate the central area of springs further inwardly.

The single embodiment of the invention represents one practical and effective manner of carrying out the present invention. Other modifications and changes are contemplated but it is thought that the foregoing disclosure is sufficient to enable those skilled in the art to resort to such modifications and changes without departing from the scope of the invention as defined in the claim.

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

In a spring construction for vehicle seats, the combination of an upper border frame of wire having front, end and rear sides, of front and rear marginal rows of spaced coil springs having the top helices thereof clipped along said front and rear sides, inner rows of coil springs substantially paralleling said front marginal rows and being similarly spaced and in substantially aligned relation with respect to the springs of said front marginal rows, adjacent rows of said inner rows being closely disposed with springs in adjacent rows thereof in opposed relation and the top helices thereof clipped together, the most adjacent of said inner rows to said front marginal row being spaced a substantially greater distance from said front marginal row than the spacing of adjacent inner rows, a flexible vertically disposed strip located between adjacent rows of said inner rows, a spaced pair of flexible vertically disposed strips located between said front marginal row and said inner row most adjacent thereto, said strips between said adjacent inner rows being secured at the upper edges to the top helices of the springs and to the lower part of the spring structure at their lower edges to hold the springs under compression, said spaced pair of strips being similarly secured to the inner side of said front marginal row and to the outer side of said inner row most adjacent thereto, horizontally disposed helical springs connecting the top helices of aligned spaced springs in said front marginal row and said inner row most adjacent thereto, said spaced pair of strips bridging the spacing between the springs in rows with which they are associated and acting to render support to the upholstery padding in the region of maximum spacing between the springs and to control the contour of said marginal row and said inner rows most adjacent thereto, said horizontally disposed helical springs constituting the only direct connection between the upper part of said inner rows of springs and said front marginal row of springs whereby permanent distortion of said front side of said upper frame following excessive differential depression of said front marginal row and said inner rows of springs is obviated.

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