Sept. 9, 1952 A. J. HORTON ET AL 2,609,865

SPRING STRUCTURE

Filed April 7, 1949 3 Sheets-Sheet 1

Fig-1

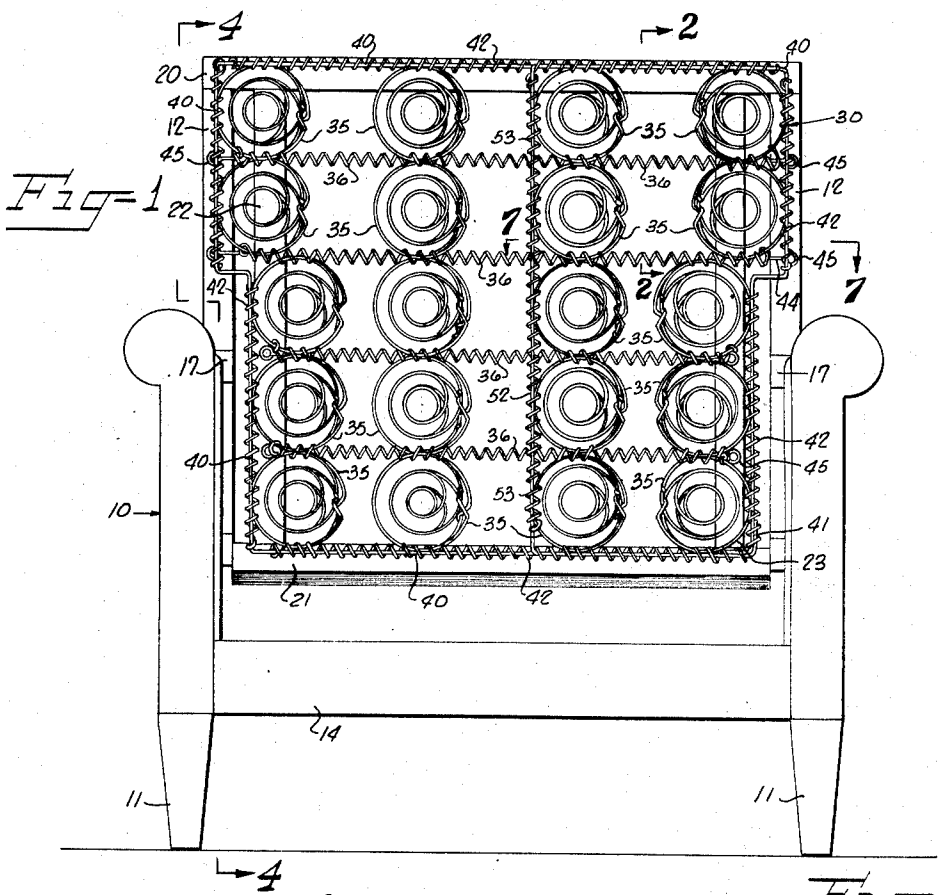


Fig-2

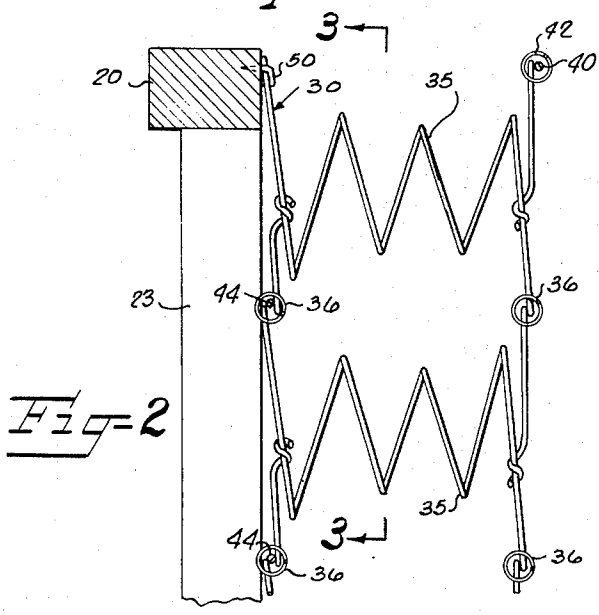
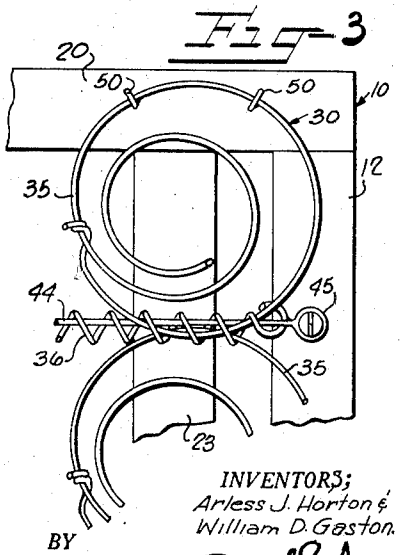


Fig-3



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SPRING STRUCTURE

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Fig-4

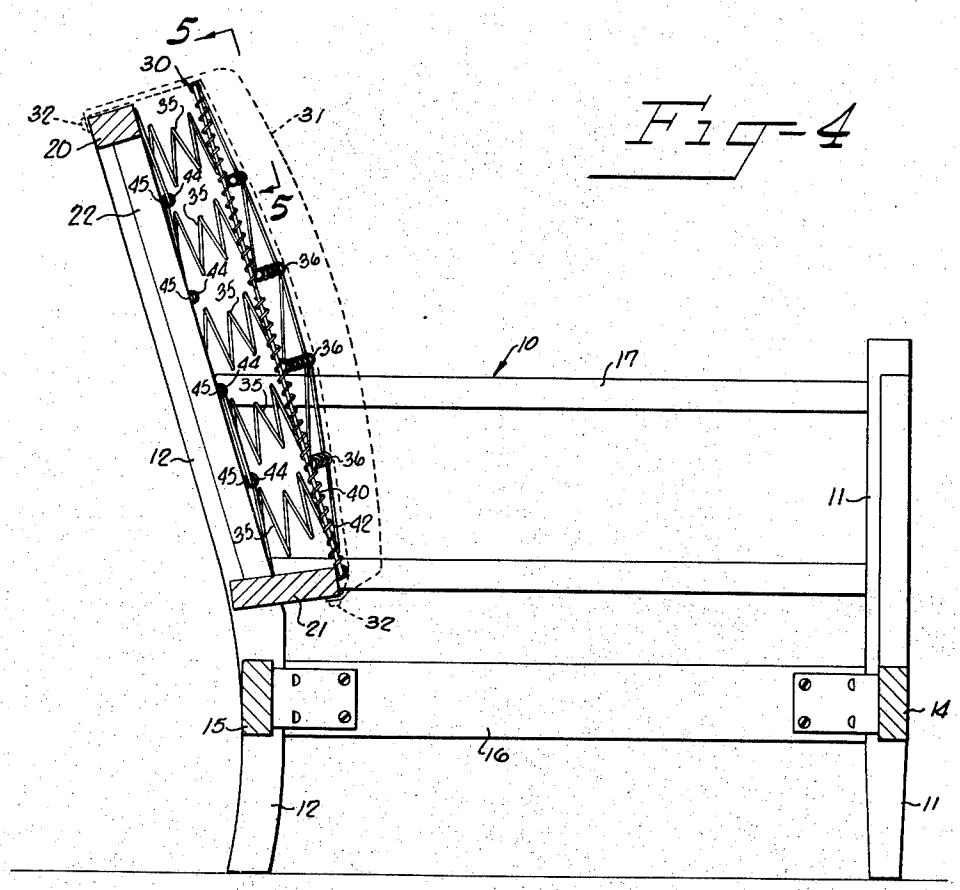
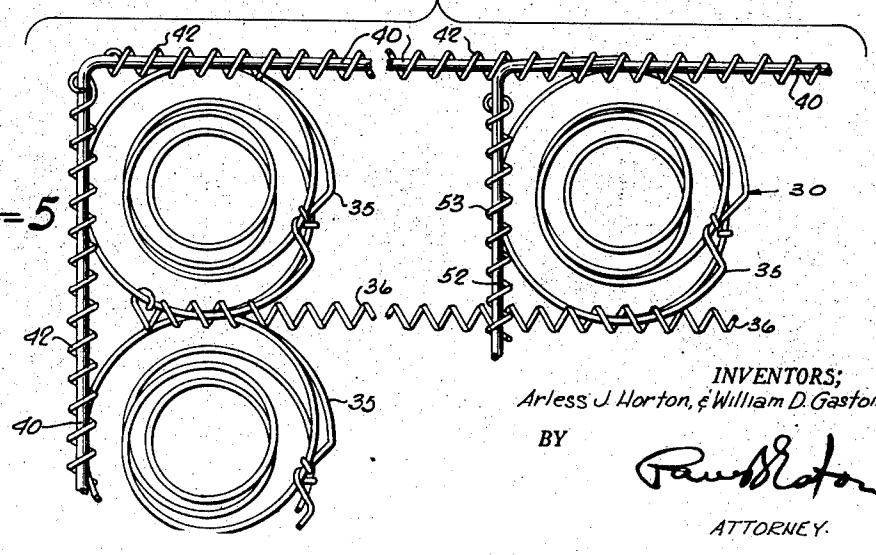


Fig-5



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SPRING STRUCTURE

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Fig. 6

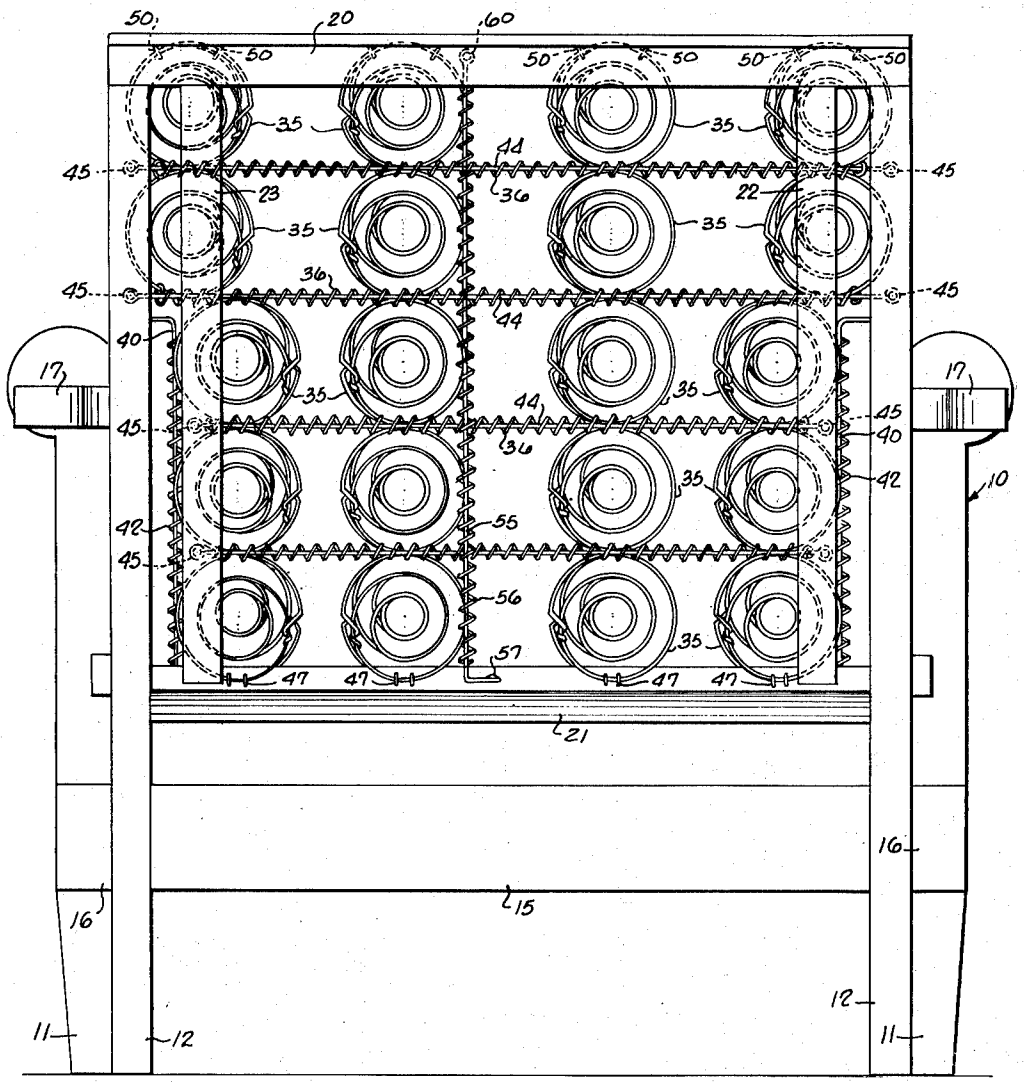
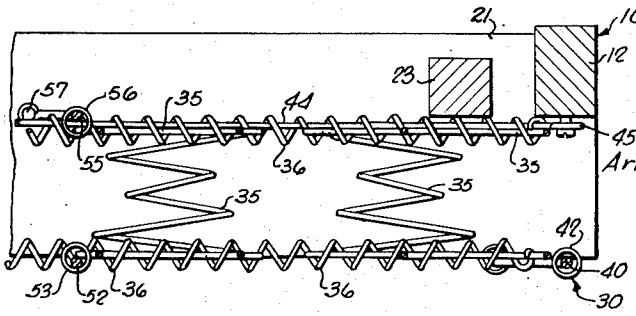


Fig. 7



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SPRING STRUCTURE

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Application April 7, 1949, Serial No. 86,026

7 Claims. (Cl. 155—179)

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This invention relates to an improved chair or sofa construction and more especially to a coiled spring assembly for supporting the upholstery for the back portion.

It is an object of this invention to provide a coiled spring unit or assembly which is adapted to be secured to the back framework of a chair, sofa, or the like for supporting the upholstered back of the chair, the coiled spring unit being provided with a reinforcing rod disposed intermediate its ends and extending from the upper border wire of the coiled spring unit to the lower border wire of the same, and which is disposed adjacent a substantially vertical row of coiled springs in the coiled spring assembly and to which it is connected by a coiled wire extending from the upper to the lower ends of the coiled spring unit, as a result of which the weight of a person or object pressing against the coiled spring unit will be more evenly distributed throughout the coiled spring unit and to substantially decrease the pressure of the individual coiled spring against the padding and upholstery to thus extend the life of the upholstery.

Heretofore coiled spring assemblies for the backs of chairs, sofas and the like, have been made up of a plurality of spaced vertically disposed rows of coiled springs of the double cone type, the foremost coils of which have been interconnected at their proximate edges by horizontally disposed coiled wires which extend transversely of the vertical row of coiled springs, surrounding the proximate portions of adjacent rows of coiled springs. The foremost coils of the coiled springs disposed around the periphery of the coiled spring unit, which is generally rectangular in shape, are generally surrounded and interconnected by a border wire of substantially larger diameter in cross-section than the wire used in the forming of the coiled springs or the coiled wires. The framework of the chair, sofa, or the like is generally made in such a manner that the rearmost coils of the coiled spring unit, at the periphery thereof, or at opposite sides and across the upper end thereof, may be nailed or stapled to the framework of the chair, and the support member of the framework of the chair for supporting the lower end of the coiled spring unit at the back of the chair has generally been made substantially wider than the other parts of the framework at the back of the chair, so that the border wire at the lower side of the coiled spring unit may be stapled or secured, in any other suitable manner, to the front edge of the framework, and the rearmost coils at the rear ends of the coiled springs may be stapled or secured in any

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other suitable manner to the top surface of the frame member which supports the lower end of the coiled spring unit.

It is another object of this invention to provide wires of substantially larger diameter than the coiled wires, or the wires from which the coiled springs are made, and which are adapted to extend within and over the length of the horizontally disposed coiled wires which serve to interconnect the rear ends of the vertical rows of coiled springs. These wires, which extend longitudinally of and are surrounded by the coiled wires which connect the various vertical rows of coiled springs, are looped at opposite ends thereof to receive nails, screws or the like for securing these horizontally disposed wires against the front surface of the framework of the rear of the chair, thus serving as an improved means by which a coiled spring assembly may be secured to the framework of the back of the chair.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a chair framework showing the improved coiled spring assembly applied to the front surface of the back of the framework of the chair;

Figure 2 is an enlarged elevation with parts in section and is taken substantially along the line 2—2 in Figure 1;

Figure 3 is an elevation with parts in section and being taken substantially along the line 3—3 in Figure 2;

Figure 4 is a vertical sectional view taken substantially along the line 4—4 in Figure 1 and showing the chair framework with the improved coiled spring unit secured to the back portion thereof, the upholstery for the back of the chair being shown in dotted lines;

Figure 5 is an enlarged elevation of the upper central and upper left-hand corner portions of Figure 1 and is taken substantially along the line 5—5 in Figure 4;

Figure 6 is an enlarged elevation looking at the back side of the chair;

Figure 7 is a sectional plan view taken substantially along the line 7—7 in Figure 1, omitting the central portion thereof.

Referring more specifically to the drawings, the numeral 10 broadly designates the skeleton framework of a chair comprising front posts 11, rear posts 12, connecting front and rear bottom rails 14 and 15, respectively, connecting bottom side rails 16 and arm rests 17.

Connected to and spanning the distance be-

tween the upper ends of the rear posts of the chair framework 10 is an upper horizontally disposed frame member 20. A lower frame member 21, of substantially greater width forwardly and rearwardly than the posts 12 and the frame member 20, is disposed immediately above the rear bottom rail 15 (Figures 1, 4 and 6) being connected at opposite ends thereof to the proximate sides of the rear post 12. Substantially vertically disposed frame members 22 and 23 are spaced inwardly a short distance from the proximate sides of the posts 12 and are connected at their upper and lower ends to the upper frame member 20 and the lower frame member 21. The members 11 to 23 inclusive are united together in a well known manner to form a skeleton framework of a chair, sofa or the like.

A coiled spring unit or assembly, broadly designated at 30, is adapted to be mounted on the front surfaces of the back frame members 12, 20, 21, 22 and 23 for supporting a suitable upholstering material 31 shown in dotted lines in Figure 4. The upholstering material 31 is suitably secured, as by nails, screws or the like 32, to the associated frame members as shown in Figure 4.

The shape of the coiled spring unit 30 as shown in Figure 1 is of a type used in forming a T-shaped rear cushion for a sofa, chair or the like. However, it is to be understood that the invention is not limited to any particular shape or size of coiled spring unit, the coiled spring unit shown in Figure 1 being by way of illustration only. Obviously, the coiled spring unit may be off-set on one side, both sides, or may not be off-set on either side, or may be of any other desired shape. Also, the number of rows of coiled springs and the number of springs in each row will be changed as the size of the coiled spring unit is changed according to the size of the chair, sofa or the like.

Although the coiled spring unit 30, as shown in Figure 4, is disposed on a slight angle relative to the vertical, the coiled spring unit 30 shall be assumed to be disposed in a vertical plane for purposes of description.

The coiled spring unit 30 comprises a plurality of spaced vertical rows of coiled springs 35 which in this instance are shown to be doubled coiled springs, that is; the end-most coils of each of the coiled springs are of the same diameter, the diameter of the coils of the coiled springs gradually decreasing as they extend towards the centermost coil of each spring.

Referring to Figures 1 and 6, it will be noted that the two uppermost coiled springs in the outside vertical rows are off-set with relation to the rest of the coiled springs in each of these rows and the proximate portions of the endmost coils in each of the coiled springs overlap or engage one another and a plurality of coiled wires 36 are wound about or surround the overlapping portions of the coiled springs 35 and extend from one vertical row of coiled springs 35 to the next at both the front and rear ends of the coiled springs to thus interconnect the vertically disposed rows of coiled springs as well as interconnecting each of the coiled springs in each of the rows.

The front endmost coils of the coiled springs 35 at the periphery of the unit 30 are engaged at their outer edges by a border wire 40, the opposite ends of which overlap each other as at 41 in Figure 1. This border wire 40 is connected to the front endmost coil of the coiled springs 35, with which it is in engagement, by a plurality of coiled wires 42, which surround the border wire 40 and are also interlaced with the proximate portions of the front endmost coils of the coiled springs 35.

It is with the parts heretofore described that this invention is adapted to be associated. Heretofore, in order to prevent the centermost coiled springs 35 in the coiled spring unit from bulging forwardly in such a manner as to place an undue pressure against the upholstering material 31, a heavy fabric strap of, say, the approximate width of the diameter of one of the endmost coils of the coiled springs 35, has been suitably secured to the rear surface of the uppermost frame member 21 and has then been brought forwardly over the upper edge of the border wire and downwardly across the front of the coiled spring unit 30 at a point intermediate its ends and has then been suitably secured to the lower frame member 21. This has not been entirely satisfactory, and in order to eliminate the necessity of providing a band of material of this type, and also to provide an improved manner in which the coiled spring unit 30 may be secured to the framework 10 of the chair, there is provided a plurality of rods 44 of substantially larger diameter in cross-section than the coiled wires 36, and one of these rods 44 is disposed within the coils of each of the coiled wires 36 at the rear ends of the coiled springs 35 only, there being no rods in the coiled wires 36 at the front ends of the coiled springs 35.

It may be observed in Figure 6 that each of these rods 44 extends from one side of the coiled spring unit 30 to the other and is looped as at 45 for the reception of nails, screws, staples, or the like for securing opposite ends of each of the rods 44 to either the rear posts 12 of the chair framework 10 or the vertically disposed members 22 and 23. It is manifest, that the rods 44, which are connected to those coiled springs 35 which are in the same horizontal plane as the offset portion of the coiled spring unit 30, are connected at opposite ends thereof to the rear posts 12 of the chair framework 10, and the opposite ends of each of the rods 44 which are not adjacent the off-set portion of the coiled spring unit 30 are connected to the vertically disposed frame members 22 and 23.

The lowermost edges of the rearmost coils of the coiled springs 35 at the bottom of the coiled spring unit 30 in Figures 1, 4 and 6 are connected, as by staples 47 to the upper surface of the transverse frame member 21 in the usual manner and the uppermost coiled springs 35 are connected as by staples 50 to the front surface of the upper horizontal frame member 20 (Figures 2 and 6).

The lower horizontal leg of the border wire 40 in Figures 1 and 4 may be connected, if desired, by any suitable means to the front edge of the lower frame member 21. Extending from the lower horizontal leg to the upper horizontal leg of the border wire 40, midway of their ends in Figure 1, is a reinforcing rod 52, the opposite ends of which are bent at right angles and are inserted between the coiled wires 42 and the border wire 40 to thus secure the opposite ends of the reinforcing rod 52 to the border wire 40. It will be noted that this reinforcing rod 52 extends adjacent one of the rows of coiled springs 35 and is surrounded by a coiled wire 53 which is also interlaced around the proximate portions of the front endmost coils of the coiled springs 35 to thus serve in restricting the tendency of

the centermost coiled springs 35 to bulge excessively forwardly of the border wires 40.

The rearmost coils of the coiled springs 35, to the foremost coils of which the reinforcing rod 52 is connected, are connected to a reinforcing rod 55 by a coiled wire 56, the reinforcing rod 55 and the coiled wire 56 being similar to the reinforcing rod 52 and the coiled wire 53 respectively. The lowermost end of the reinforcing rod 55 in Figure 6 is bent at right angles and is looped for reception of a screw, nail, or staple 57 for securing the lower end of the reinforcing rod 55 to the transverse member 21. It will be noted that the upper end of the reinforcing rod 55 is looped as at 60 for reception of a suitable screw, nail, or the like for securing the rod or wire 55 to the front surface of the upper frame member 20 thus completing the structure of the coiled spring unit 30.

It is thus seen that we have provided a coiled spring unit for securing to the front surface of the rear portion of the framework of a chair, sofa, or the like, having an improved means for securing the coiled spring unit to the framework of the chair and also having reinforcing means extending from the upper to the lower end of the coiled spring unit to thus increase the life of the coiled spring unit as well as any upholstery that may be applied over the same.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. A coiled spring unit for the back frame of an upholstered chair, sofas, and the like comprising a plurality of spaced rows of coiled springs, a border wire surrounding the rows of coiled springs, a plurality of coiled wires disposed around the border wire and being interlaced with the outer edges of the front ends of the coiled springs, a plurality of coiled wires extending transversely of the unit and each coiled wire being interlaced with the proximate edges of the front ends of the coiled springs, a substantially rigid, straight reinforcing wire secured to and extending from one edge of the coiled spring unit to the other for reinforcing the center portion of the coiled spring unit, a plurality of coiled wires extending transversely of the unit and each coiled wire being interlaced with the proximate edges of the rear ends of the coiled springs, a rod encircled by each of the last-named coiled wires and means for securing the ends of the rods to the back frame.

2. A coiled spring unit for the backs of upholstered furniture such as sofas, chairs and the like having a back frame comprising a plurality of spaced parallel rows of coiled spring units each of said rows having a plurality of coiled springs having foremost and rearmost coils, coiled wires interlaced between the proximate edges of the foremost coils of the rows of coiled springs for connecting the same to each other, a coiled wire extending between the proximate edges of parallel rows and interlaced around proximate portions of the rearmost coils in two adjacent rows for connecting the proximate edges of the rearmost coils in the rows to each other, a reinforcing wire disposed within each of the last-named coiled wires, the opposite ends of each of the reinforcing wires being looped for reception

of means for securing the coiled spring unit to the back frame of the chair.

3. In a chair having a back frame, a coiled spring structure positioned against the front surface of the back frame, said coiled spring structure comprising a substantially rectangular front frame and a plurality of horizontal rows of coiled springs having their front portions disposed in substantially the same plane as the front frame, coiled wires interlaced around the proximate edges of the front ends of the coiled springs in adjacent rows, a plurality of transversely disposed bridging members secured at their ends to the sides of the back frame and extending between the proximate rear edges of the rows of coiled springs, a plurality of coiled wires extending from near one end of the bridging members to the other and being disposed around the bridging members and interlaced with the proximate edges of the rear portion of the coiled springs and a vertically disposed bridging member secured to medial portions of the upper and lower portions of the front rectangular frame.

4. In a chair having a back frame, a coiled spring structure positioned against to the front surface of the back frame, said coiled spring structure comprising a substantially rectangular front frame and a plurality of parallel horizontal rows of coiled springs having their front portions disposed in the same plane as the front frame, a plurality of transversely disposed bridging members secured at their ends to the sides of the back frame and extending between the proximate rear edges of a plurality of coiled springs, a coiled wire for each of the bridging members and extending from near one end of the bridging members to the other, being disposed around the bridging members and interlaced with the proximate edges of the rear portion of parallel rows of the coiled springs and a vertically disposed bridging member secured to upper and lower medial portions of the front rectangular frame, and a vertical bridging member having its upper and lower ends secured to the upper and lower portions of the back frame and having a coiled wire disposed therearound and extending from near one end of the rear bridging member to the other end and being interlaced with proximate sides of the rear end of adjacent rows of the coiled springs.

5. In an article of furniture having a back frame, a coiled spring unit for mounting on the back frame comprising a plurality of coiled springs having front end coils and rear end coils and being disposed in parallel spaced rows, a border wire surrounding the rows of coiled springs and engaging the outermost edges of the front end coils of the coiled springs, a plurality of coiled wires mounted on the border wires and being entwined with the outermost edges of the front end coils of the coiled springs for securing the border wire to the engaging coils of the coiled springs, a plurality of coiled wires extending from one side of the coiled spring unit to the other side and entwining proximate portions of the front end and rear end coils of the coiled springs in each row, a rod encircled by each of the coiled wires connected to the rear end coils of the coiled springs, looped portions on opposite ends of each of the rods, means penetrating the looped portions for securing said rods and the associated coiled spring unit to the back frame.

6. In an article of furniture having a back frame, a coiled spring unit for mounting on the

back frame comprising a plurality of coiled springs having front end coils and rear end coils and being disposed in parallel spaced rows, a border wire surrounding the rows of coiled springs and engaging the outermost edges of the front end coils of the coiled springs, means for securing the border wire to the engaging coils of the coiled springs, a plurality of coiled wires extending from one side of the coiled spring unit to the other side and entwining proximate portions of the front end and rear end coils of the coiled springs in each row, a rod encircled by each of the coiled wires connected to the rear end coils of the coiled springs, looped portions on opposite ends of each of the rods, means penetrating the looped portions for securing said rods and the associated coiled spring unit to the back frame, a second rod disposed transversely of the first-named rod and also being disposed intermediate the ends of the first rod and extending adjacent one side of the rearmost coils of one of the rows of coiled springs, a coiled wire surrounding said second-named rod and also being interlaced with the proximate portions of the rear end coils of the adjacent coiled springs for securing the rod to the coiled springs, means on opposite ends of the last-named rod for securing the same to the back frame.

7. In an article of furniture having a back, in combination, a framework, a coiled spring unit for mounting on the back portion of the framework comprising a plurality of coiled springs having front end coils and rear end coils and being disposed in parallel spaced rows, a border wire surrounding the rows of coiled springs and engaging the outermost edges of the front end coils of the coiled springs, means for securing the border wire to the engaging coils of the coiled springs, coiled wires extending from one side of the coiled spring unit to the other and entwining proximate portions of the rear coils of the coiled springs in each row, a rod encircled by each of said coiled wires, looped portions on opposite ends of each of the rods, means penetrating the looped portions for securing said rods and the associated coiled spring unit to the framework, a plurality of interlacing coiled wires extending between each row of coiled springs and being connected to the proximate portions of the front endmost coils of each of the coiled springs thus connecting adjacent coiled springs together, a reinforcing rod extending adjacent one edge of one of the rows of coiled springs and adjacent the front endmost coil thereof, means connecting the last-named rod to the adjacent front end of the coils of the adjacent coiled springs and means connecting opposite ends of the last-named rod to opposite end portions of the border of the coiled springs.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
426,022	Jeffery	Apr. 22, 1890
1,764,967	McElroy	June 17, 1930
1,806,405	Mailloux	May 19, 1931
1,925,480	Coxon	Sept. 5, 1933
2,048,414	Sternberg	July 21, 1936
2,265,426	Foster	Dec. 9, 1941
2,291,390	Krakauer	July 28, 1942