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SPRING ASSEMBLY

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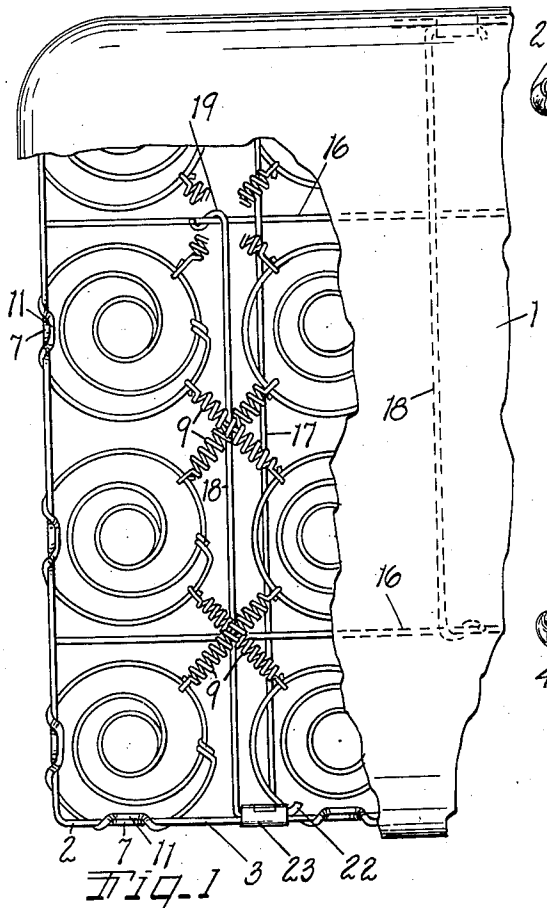


Fig. 1

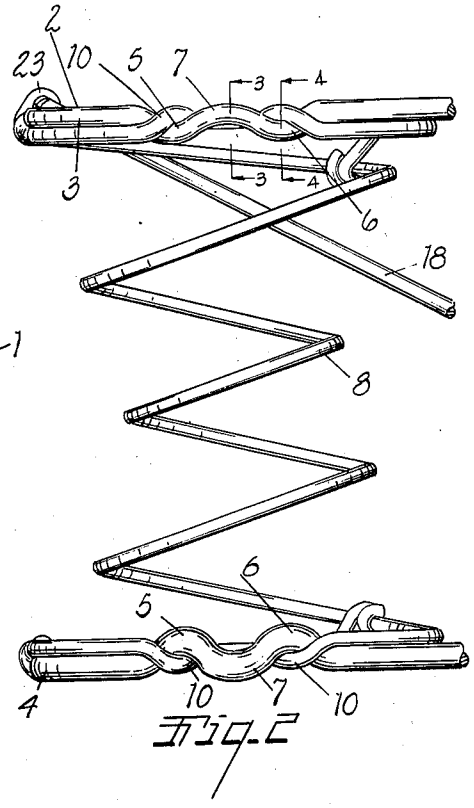


Fig. 2

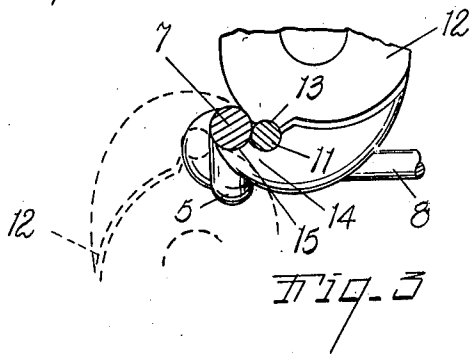


Fig. 3

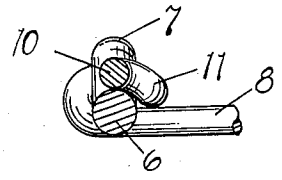


Fig. 4

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SPRING ASSEMBLY

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3 Claims. (Cl. 5—260)

This invention relates to improvements in spring assemblies.

This is a division of our copending application Serial No. 391,934, filed May 5, 1941.

The main objects of this invention are:

First, to provide an improved spring structure or assembly of the coil spring type in which the border body springs are very securely anchored to the border frame members or member.

Second, to provide a structure embodying these advantages in which the border frame and the springs are pre-formed prior to assembly and very quickly assembled and when assembled are securely retained in their co-engaging relation.

Third, to provide a structure having these advantages in which the parts may be assembled by relatively unskilled workers.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

Preferred embodiments of the invention are illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary top plan view illustrating a cushion structure incorporating a spring assembly of the invention, part of the upholstering of said structure being removed to show structural features and the relation of the parts to the assembly.

Fig. 2 is an enlarged fragmentary view in side elevation, viewed from the right of Fig. 1, further illustrating structural details and relationships of the spring assembly or unit.

Fig. 3 is an enlarged fragmentary view on line 3—3 of Fig. 2, illustrating the manner of assembling or locking the border coil springs on the border frame of the assembly, successive positions in the manipulation involved in this operation being shown in the solid and dotted lines.

Fig. 4 is an enlarged fragmentary view in section on line 4—4 of Fig. 2, further indicating the relation of the spring and frame parts in operative assembled position.

The invention relates to spring structures such as illustrated in Fig. 1 as embodied in an upholstered seat or similar cushion structure 1 for an automobile seat, a chair, or the like. However, it will be appreciated that the provisions of the invention are equally well adaptable for incorporation in mattresses or other spring applications.

As illustrated in the drawing the spring assembly or structure of the invention is designated generally by the reference numeral 2 and comprises a pair of upper and lower rectangular border frames 3, 4 which are in general identical. These frames are formed of a suitable gauge of wire rod stock and are each provided with a plurality of spaced pairs of offsets 5, 6 disposed a substantial extent downwardly or normal to the plane of the frame and connected by an intermediate upwardly curved portion or ridge 7, which is at the apex thereof approximately colinear with the frame. Each pair of these offsets defines a W-shaped spring receiving and securing element, it being understood that the respective offset of the upper and lower frames are vertically aligned as illustrated in Fig. 2 and are disposed to extend vertically inwardly of the spring structure.

The individual spring members of the assembly are indicated by the reference numeral 8 and are connected to one another by the crossed coil connectors 9 in a conventional manner. The end coils of the border springs are offset upwardly from the plane of the coil at spaced points to provide rounded shoulders 10, which are in turn bent inwardly a distance substantially equal to the gauge of the frame member 3, then turned downwardly and joined by an integral bight 11. The lateral spacing of the inwardly offset shoulders 10 of the spring coil corresponds to the spacing of the recesses 5 and 6 of the various locking offsets on the frame, and bight 11 is adapted to engage interiorly of or behind the ridge 7 connecting the said recesses 5, 6, whereby in operative position the end coil of the spring not only has end engagement with the recesses 5, 6 to prevent endwise movement on the frame, but also the top coil is engaged on either side thereof by the frame shoulders 10 and ridge 11 to prevent lateral displacement through inadvertence.

In assembling the spring with the frame, the bight 11 thereof is first gripped by a special plier-like tool 12 having a curved abutment 13 and an elongated curved bill 14 angularly overlapping said abutment and terminating in a concave nose or seat 15. The bight 11 is gripped between the coacting curved surfaces of the bill and abutment, with the tool in a depending position underneath the frame and spring. The bight is then shifted laterally, drawing the bight outwardly beneath the frame to the position illustrated in dotted lines in Fig. 3, after which, engaging the concave seat 15 of the bill with the outer surface of the frame at curved ridge 7 thereof, the tool is rotated by a continuous movement in clockwise direction as viewed in Fig. 3 from the dotted line to the solid line position thereof. This springs the end coil sufficiently to

permit bight 11 thereof to pass over the upwardly curved reach 7, following which, upon release of the tool and said bight, it snaps downwardly over the said ridge with the shoulders 10 of the spring offset engaged in the recesses 5, 6 of the frame in the manner clearly illustrated in Fig. 2. A very effective engagement is thus provided, bight 11 having internal restraining engagement with the frame offset. It will be evident that a similar and equally simple and quick manipulation is performed in securing the bottom end coil of the spring to the bottom frame 4.

In structures of this type, it is desirable to hold the frame members against undue buckling or torsional movement as well as to support the border frame members against lateral swaying movement. We accomplish this by providing diagonally disposed braces 18 which extend from the bottom stay members 16 and 17 to opposed side members of the top border frame. These bottom stay members are welded to the opposite sides of the bottom border frame so that it is restrained against any buckling or twisting movements.

The brace members or struts 18 are provided at one end with laterally disposed spiral hooks 19 which are engaged with the stay members 16. These spiral hook members may be readily engaged by a swinging movement. At their other ends, the braces 18 are provided with angularly disposed arms 22, the angles of these arms being such that when the ends of the braces are brought into juxtaposed relation to the frame member to which they are to be attached they are in diverging relation thereto.

With the hooks engaged, the arms 22 are clamped to the border frame 3 by means of suitable clips 23, during the closing of which the arm 22 is brought into parallel relation or substantially parallel relation to the frame member to which it is secured. This applies a clamping stress to the spiral hook 19—that is, the tensioning of the arm 22 resulting from shifting or transferring it from its axial relation to parallel relation tends to rock the hook axially and applies clamping stress to opposite sides of the member with which it is engaged with a result that the parts are held under clamping tension so that there is no slippage or clicking noise resulting from movement as the body springs are compressed or extended.

We have illustrated an embodiment of our invention which incorporates the principles of the invention in a highly desirable manner. It should be understood that the foregoing terminology is used in a descriptive manner and not in a limiting sense, the scope of the invention claimed being set forth in the following claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a spring assembly, the combination of top and bottom border frames having pairs of vertically spaced curved seat defining offsets, the inner ends of the arms of which are joined by reversely curved intermediate portions, the pairs of offsets being spaced longitudinally of the border frames, and the pairs of offsets of the two said frames having the offsets of a pair in vertically aligned and oppositely facing relation, and a plurality of border springs having in their end coils inwardly disposed loops which are pre-conformed in their entirety, the bight portions of which are disposed angularly relative to the arm portions, the arm portions of said loops being engaged in the seats defined by said pairs of offsets with the central portions of the angularly disposed bight portions of the loops in sprung engagement with said portions intermediate said offsets.

2. In a spring assembly, the combination of a plurality of border springs having certain coils thereof provided with inwardly disposed loops which are pre-conformed in their entirety, the bights of which are disposed angularly relative to the arms of the loops, and top and bottom frames of round stock having pairs of vertically disposed offsets therein providing curved seats with which the arms of the loops of said springs are engaged, the inner ends of the arms of the offsets merging in reversely curved intermediate portions providing lugs with which the central portions of the angularly disposed bight portions of said loops have sprung engagement, said border frames being in superimposed substantial intersecting relation to the coils of the spring having said loops therein.

3. In a spring assembly, the combination of a border frame of round stock having spaced pairs of curved offsets therein providing seats, the inner ends of the arms of the offsets merging in reversely curved intermediate portions, the pairs of offsets and the said intermediate portions being in the same plane, and a plurality of border springs having inwardly disposed loop-like hooks pre-conformed in their entirety in corresponding coils thereof, the springs and the border frame being disposed in superimposed substantial intersecting relation with the arms of the loop-like hooks engaged in said seats constituted by said offsets and with the centrol portions of the bight portions thereof in retaining engagement with said portions intermediate of the offsets.

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