July 3, 1934. C. D. KARR 1,964,950

SPRING ASSEMBLY

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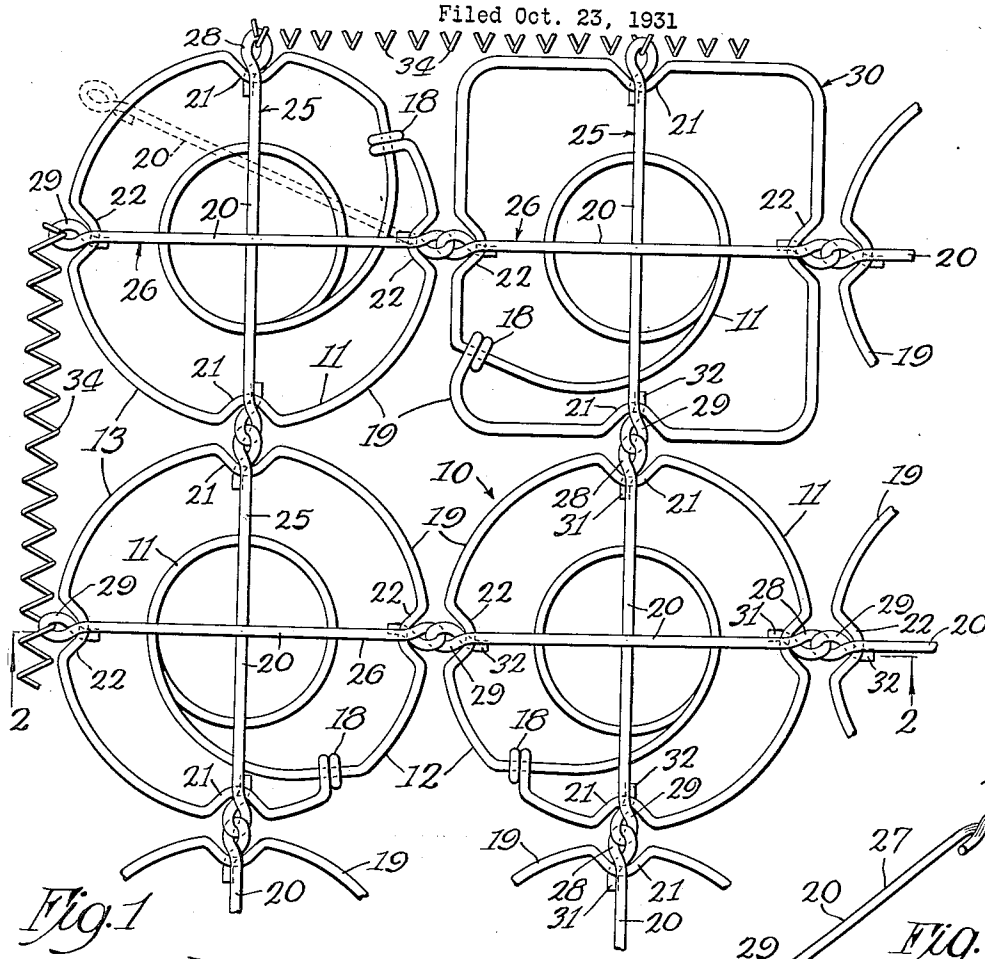


Fig. 1

Fig. 3

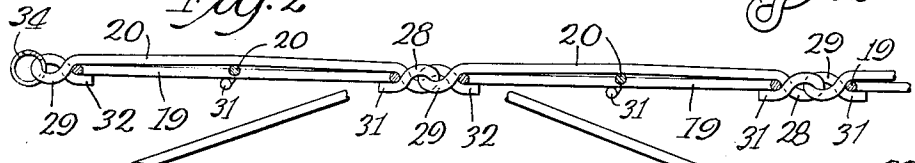
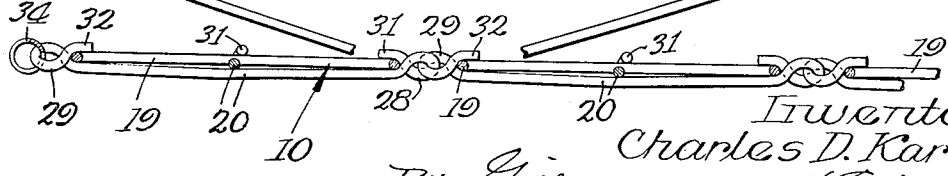


Fig. 2



Fig. 4



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SPRING ASSEMBLY

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9 Claims. (Cl. 5—246)

This invention relates to spring assemblies and more particularly to spring constructions especially adapted for use in mattresses, cushions, upholstered furniture and the like.

One of the objects of the invention is the provision of a new and improved spring assembly having novel means for connecting the individual units comprising the assembly.

Another object of the invention is the provision of a new and improved spring unit connecting member that is flexible and that may be readily connected to the spring units, and disconnected therefrom.

A further object of the invention is the provision of new and improved means for connecting the individual units of a spring assembly together with novel means for attaching it to said units.

A further object of the invention is the provision of a new and improved spring assembly that is inexpensive to manufacture, easily assembled, efficient in use and one in which the connecting members are duplicates, thereby permitting standardization of the structure with the consequent possibilities of mass production.

A further object of the invention is the provision of a new and improved spring construction, together with a novel method of assembling or disassembling the same.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawing, in which—

Fig. 1 is a plan view of a spring assembly embodying the invention with parts broken away;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a perspective of one of the links; and

Fig. 4 is a perspective of the modified form of the link.

Referring now to the drawing, the reference character 10 designates a spring assembly comprising a plurality of spiral springs or spring units 11, arranged in rows extending in a plurality of directions.

In the form of construction selected to illustrate one embodiment of the invention, these springs are arranged in rows 12 extending longitudinally of the assembly and in rows 13 extending transversely of the assembly.

The spiral springs 11 may be duplicates of each other, or, if desired, certain of the spirals as the marginal springs may have terminal coils having straight portions for forming a straight marginal edge, as shown at 30. In either case the terminal coil or turn of each spiral unit is knotted as at 18 to form a closed terminal coil or turn 19 which when in use is in a plane that is substantially horizontal.

In the fabrication of spring assemblies for use in mattresses, cushions, upholstered furniture and the like, it is desirable that each spring unit shall have freedom of movement in all directions; that is, it should have such a connection with each of the adjacent units as to permit universal movement of each unit.

In the construction shown, which is by way of example only, this is accomplished by the mechanism that will now be described. Each of the terminal coils of the spirals is provided on opposite sides with distorted portions arranged in alignment with the rows in which the spirals are arranged. As shown, these distorted portions are in the form of recesses or indentations 21 and 22 arranged 90° apart. The indentations 21 are on opposite sides of the coil and are in alignment with the longitudinal row 12 in which the spring is arranged and the indentations 22 are on opposite sides of the coil and are in alignment with the transverse row 13 in which the spring is arranged.

Suitable members are provided for connecting the spirals or spring units together. The flexible connecting member 25, extending along the rows in one direction, and the flexible connecting members 26, extending along the rows in another direction, are employed for this purpose.

These members are substantially alike and only one need be described. Each flexible member comprises a plurality of what, for convenience, will be termed links 20, which are looped together forming a connecting chain. The links are duplicates of each other, and each comprises a body portion 27, terminating in eyes 28 and 29, which are duplicates and similarly arranged at each end of the link, whereby the links may be readily assembled, it being immaterial whether or not they are turned end for end. This is an important feature of the invention since it is conducive to standardization and mass production. Each link has its ends, after forming the eyes 28 and 29, bent to form hook-like portions 31 and 32 that are adapted to engage in the recesses or indentations in the terminal coils of the spirals.

The eye 28 is arranged at a right angle to the eye 29, and both eyes are arranged at an angle of 45° to the plane of the terminal coil when ap-

plied thereto. By means of this arrangement, the links may be duplicates which facilitates manufacture and assembly, and the connections will not only permit a hinge movement between the spring units, but will permit what might be termed a pivotal movement, as well. In other words, the spirals may be said to be connected together by a universal connection.

The hooks 31 and 32 are spaced apart substantially the distance between the distorted portions of the terminal coil whereby the coil must be distorted in attaching the links thereto.

In fabricating the assembly, the links are first connected together to form the chains or connecting members 25 and 26. These chains are duplicates except that in certain constructions, as bed mattresses, some are longer than others, the longer ones extending longitudinally of the assembly and the shorter ones transversely thereof.

One set of connecting members is first attached to the corresponding springs and then the other set. Inasmuch as the first set is more easily applied than the other, the set extending longitudinally of the assembly is preferably applied first, and afterward those extending transversely across the assembly.

The springs may be first arranged in rows and one set of chain members laid on each row or the springs may be attached one at a time without any previous arrangement. When one set of chain members has been applied, the other set is then applied over the first set.

In any event, each link of the chain or connecting member is attached to the corresponding spiral by hooking one of the hook members, as the hook member 31, on the terminal coil seating the same within the recess 22, as indicated in dotted lines in Fig. 1, and then rotating the other end of the link around with the hook engaging the coil until same seats within the other recess 22. During the rotation of the link or coil beneath it, the latter will be distorted, and when the hook member 32 seats within the cooperating recess 22 the coil will resume its normal shape. It is removed by reverse movement.

After one set of connectors are applied, the springs will be connected together in one direction only and will be in separate, individual rows. These rows are then connected together by the other set of connector members. This may be done by placing the connectors across the first set of connectors, along the rows of springs extending in another direction. The separate links are then connected to their corresponding terminal coils in the manner first described except that more force is required because the first links will resist to a great extent the distortion of the coils. If desired, the links of the last set of connector members to be applied may be provided with one or more corrugations 33 (see Fig. 4) which will permit the link to be temporarily elongated while applying same to the terminal coil. The links of the last set of connector members to be applied will extend across the first set and the two links across each terminal coil will rigidify the coil to a marked extent, and will prevent the fabric or mattress from sinking or being depressed into the ends of the spirals.

When the last set of connector members is applied, not only will the rows of springs extending in one direction be connected together, but each individual spring will be connected to each adjacent spring and the connections will be such as to permit hinged and pivotal movement of each spiral independent of those remaining.

Moreover, the entire assembly may be rolled or folded in any direction, and the entire structure may be easily disassembled for replacement or repairs.

If desired, a helical 34 may extend about the assembly and be connected to the ends of the connector members 25 and 26 for forming the marginal edge.

The connector members or chains 25 and 26 are preferably detachably connected to the spirals whereby the parts may be readily disassembled as well as assembled. It is understood, however, that the free ends of the hook members may, if desired, be bent to permanently connect the links to the spirals.

What I claim, therefore, is:

1. In a spring assembly, a plurality of spiral springs arranged in rows running in two directions, each spring having its terminal turn provided with two pairs of indentations, one pair of indentations being in alignment with one row of springs extending in one direction and the other set being in alignment with another row extending in another direction, a connector for each row of springs, each connector comprising a plurality of links connected together by eyes extending at 45° to the plane of said terminal turn and at a right angle to each other, the ends of said links forming hook members engaging said indentations.

2. A connector member, comprising duplicate links having the end portions bent to form eyes, the eyes of one link engaging the eyes of adjacent links, the planes of connecting eyes extending at substantially right angles to each other, the ends of said links extending inwardly of said eyes to form hook members, said eyes of each link being arranged substantially at right angles to each other and at an angle of 45° to the plane substantially determined by said link and the adjacent ends thereof.

3. A spring assembly comprising a plurality of spiral springs arranged in rows longitudinally and transversely of the assembly, each spring having its terminal turn provided with two sets of indentations, one set of indentations being in alignment with a longitudinal row of said springs and the other with a transverse row, elongated flexible members comprising links having interengaging eyes and each having means detachably engaging said indentations and extending across said springs in the directions of said rows, connecting said springs together, and flexible means extending about said assembly for forming a marginal edge thereof, said flexible means and flexible members constituting the sole means connecting said springs and rows together to form said assembly.

4. In a spring assembly, a plurality of spiral springs arranged in rows, each spring having its opposite sides provided with recesses in its terminal coil in the plane thereof, a linked member extending along each row, each link of said member interengaging the adjacent link and having a recess engaging member at each end thereof removably seating in said recesses for holding the springs of said rows together and constituting the sole means for this purpose and means for holding said rows together.

5. In a spring assembly, a plurality of spiral springs arranged in rows, a terminal turn of each spring being provided with indentations arranged at opposite sides of said turn, means

extending parallel with said rows connecting the springs of each row together, said means comprising links pivoted together in a chain-like member, each link extending across a terminal turn and provided with recesses opening in opposite directions detachably seating in said indentations, said members constituting the sole means for connecting the springs of each row together and means connecting said rows together.

6. In a spring assembly, a plurality of spiral springs arranged in rows transversely and longitudinally of said assembly, the terminal turns at the upper ends of said springs being provided with indentations at opposite sides of said coils in alignment with said rows, a plurality of connecting members extending longitudinally of said rows, each connecting member comprising a plurality of links looped together, said links having recesses at the ends opening in opposite directions and detachably seating in said indentations whereby said springs will be connected together in rows extending both longitudinally and transversely of said assembly with each spring having a pair of links extending at right angles across a terminal coil thereof.

7. In a spring assembly, a plurality of spiral springs arranged in rows both longitudinally and transversely to said assembly, each spring having a plurality of seats in the terminal coil arranged 90° apart about said coil, a pair of links extending across each coil at right angles to each other, each link having its ends bent to form connecting loops engaging in adjacent loops of adjacent links in the same row and a recess inwardly of each of said loops, at each end of said link, the recesses of each link opening toward each other and receiving the seats at opposite sides of said coil, each link extending diametrically across said coil.

8. A spring assembly comprising a plurality of spiral springs arranged in rows extending longitudinally and transversely of the assembly, each spring having its terminal turn provided with two sets of indentations, one set of said indentations being in alignment with the transverse rows of said springs, and the other set of indentations being in alignment with the longitudinal rows of springs, a set of flexible members for connecting the springs of the longitudinal rows together and a set of flexible members for connecting the springs of the transverse rows together, each flexible member comprising links, each extending across a spring, means for pivotally connecting the links of each member together, each link being provided with open hook means seated in two of the indentations on the corresponding spring and constituting the sole means for retaining the links in position on said springs, each of said flexible members being removable from said springs by compressing each of the engaging springs lengthwise of said member and moving each of the links of said member laterally.

9. A spring assembly comprising a plurality of spiral springs arranged in rows at an angle to each other, said springs each having a terminal turn provided with an indentation at opposite sides thereof in alignment with said rows, respectively, a set of flexible members for connecting the springs of the rows extending in one direction, a set of flexible members for connecting the springs of the rows extending in the other direction, each of said flexible members comprising a plurality of links looped together, each link extending across a single spring and provided with open hooks engaging in said depressions, each flexible member being removable as a unitary structure entirely from the engaging springs by compressing said springs longitudinally of said links and moving said flexible members laterally.

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