Dec. 13, 1955 G. R. BELLGRAU 2,726,409

SPRING ASSEMBLY UNITS

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Fig. 1

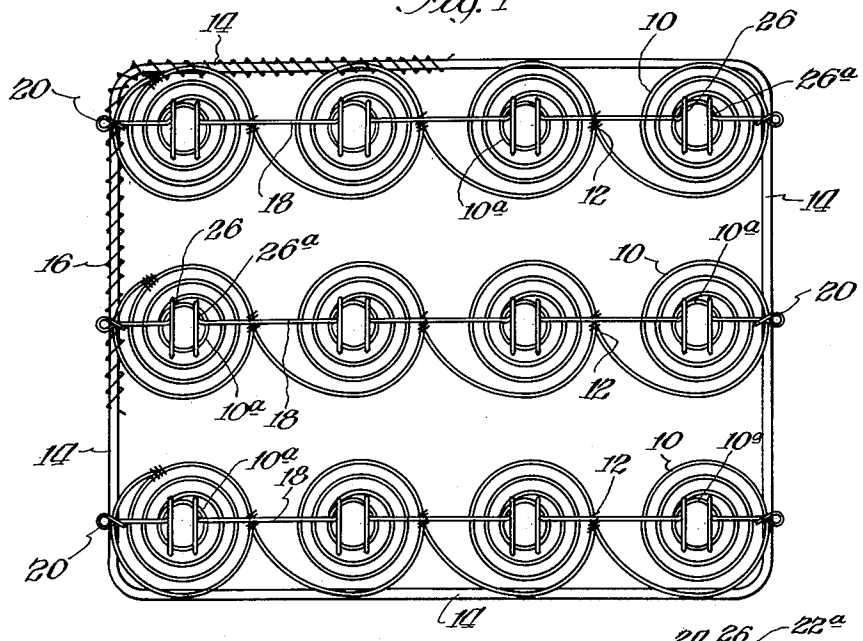


Fig. 2

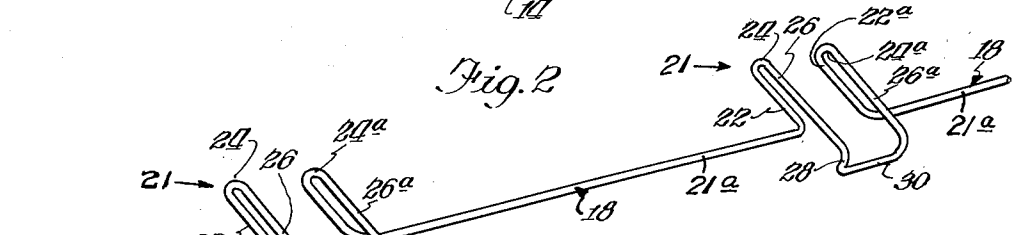
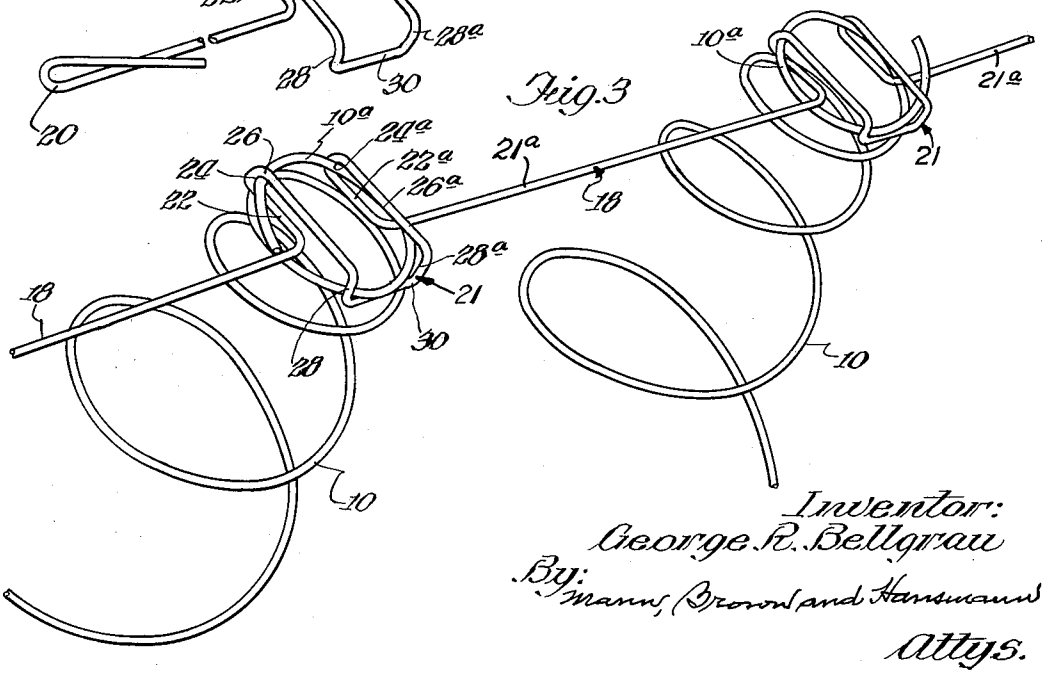


Fig. 3



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SPRING ASSEMBLY UNITS

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4 Claims. (Cl. 5—266)

My invention relates to spring assembly units for box springs, cushions, sofa beds and the like.

One of the objects of my invention is to provide a spring assembly unit which may be readily assembled with either independent or interconnected coil springs.

Another object of my invention is to provide a spring assembly unit in which the individual parts may be cheaply and easily prefabricated in quantity.

Another object of my invention is to provide a spring assembly unit which permits greater flexibility in manufacture.

Another object of my invention is to provide a spring assembly in which the coil springs are supported by a combined support, tie wire and spring clip.

A further object of my invention is to provide a spring assembly unit with a support for each of the rows of springs, which support contains spring clips formed integrally therewith by bending the wire support.

A still further object of my invention is to provide a base support for a spring assembly unit which includes integrally therewith combined individual platform supports for the base of the coils of the springs, and clips to secure the base of the coils to the support.

Other objects and advantages of my invention will become apparent as the description proceeds.

In the drawings:

Fig. 1 is a bottom view of my new, improved spring assembly unit;

Fig. 2 is a perspective view of a portion of the combined base support and spring clips, shown inverted; and

Fig. 3 is a view similar to Fig. 2 showing in addition the base of the coil springs held by the clips.

The spring assembly unit comprises a plurality of rows of coil springs **10** which may be of any suitable or conventional type. For purposes of illustration, I have shown rows of coil springs in which the top convolution of the spring is twisted around and connected as at **12** to the top convolution of the next adjacent spring. This type of construction is to be distinguished from those in which the individual coils are independent of each other. It is, of course, apparent that either individual or interconnected coil springs may be used in my spring assembly unit.

The coil springs **10** are arranged in rows as shown, the number of coil springs in a row, and the number of rows, being determined by the desired size of the spring assembly unit. The unit illustrated is that for a cushion, whereas a box spring unit, or a sofa bed unit, would ordinarily have more coils per row and more rows of coils.

Overlaying the outer edges of the top coils of the marginal springs of the group is a border wire **14** which may be of either round or flat stock and is generally of a square or rectangular shape to conform to the shape of the ultimate completed unit. The border wire and the marginal springs are held together by one or more helical tie wires which envelop the border wire and the portions of the top convolutions of the marginal springs overlapped by the border wire. The helical **16** generally extends the full

length of the border wire and for purposes of illustration only a portion of this helical **16** is shown. It will thus be seen, as shown in Fig. 1, that the top convolutions of the coils **10** are secured to each other and that the tops of the rows of coils are held in place by the border wire **14** and the helical **16**. When independent coils, as distinguished from interconnected coils, are used the internal coil springs may be held together at the top by means of stack wire, helicals or clips, or in any other conventional manner.

The bottoms of the coil springs of each row are secured in place and to each other by means of a continuous wire which constitutes a base coil support, tie wires and clips. This wire, generally designated as **18**, is of a gauge generally corresponding to that of the coil springs and terminates at its outer ends in loops **20** by which these supports are secured to base boards or other base structures to be used in the finished assembly. Each of these wires is appropriately bent to form clips **21** for providing additional support for the coils and for retaining the lower convolution **10***a* of each of the coil springs **10** in proper position, the clips being interconnected by substantially straight portions **21***a*. The clip **21** is formed by bending the wire **18** transversely or laterally of the axis of the wire at approximately a 90° angle, forming a leg portion **22**. The leg portion **22** is of a length less than the radius of a circle generated by a bottom convolution **10***a* of the coil spring **10**. The wire **18** is then bent back downwardly upon itself in the same vertical plane as the leg portion **22** to form a loop **24** and a lower leg portion **26** which is of a length less than the diameter of a circle generated by the bottom convolution **10***a* of the coil spring **10**. The wire is then bent upwardly at approximately a 90° angle in the same vertical plane wherein loop **24** is disposed and extends a short distance beyond the normal axis of the wire **18** forming a leg **28**. The wire is then bent at approximately a 90° angle to form a longitudinal member **30** extending in a horizontal plane. This longitudinal member **30** is of a length less than the diameter of a circle generated by the bottom convolution **10***a* of the coil spring **10**. At the end of the longitudinal member **30** the wire is then bent to form additional legs **28***a*, **26***a*, and **22** with a loop **24***a* formed between the legs **26***a* and **22***a*, these portions being symmetrical to those heretofore described.

The number of clips, the distance between the clips, and the size of the clips will be determined by the number, size and position of the coil springs used. Since spring assembly units of a given size are generally manufactured in large quantities, these combined supports, tie wires and spring clips may be preformed in quantity of sizes and dimensions to be used in specific spring assemblies.

After the top convolutions of the coils have been secured together by the border wire and helicals as heretofore described, the unit is turned over presenting the bottom convolutions **10***a* of the coils **10**, and the assembly of the combined support, tie wire and spring clips into the unit is as follows. The tie wire **18**, with the appropriate number and size of clips, is brought adjacent a row of springs with the leg portions **26** and **26***a* of all of the clips extending into the coils **10** in a plane normal to the plane of the bottom convolution of the coil spring, and the longitudinal member **30** extending just below the bottom convolution of the coil springs. All of the clips are then rotated about a 90° angle and slid forwardly until the bottom convolutions of the coil springs are engaged by the loops **24**, **24***a*. The clips are then rotated in the same direction approximately 180° confining one lateral arc of the bottom convolution of the coils within the loop and bringing the longitudinal member **30** of the clip adjacent an opposite lateral arc of the bottom con-

volution of the coil spring. It is apparent that in this position because the legs **26**, **26***a* are less than the diameter of the bottom convolution of the coil springs that the latter extend slightly beyond the cross-member **30**. By means of an appropriate tool the bottom convolutions of the coil springs and the longitudinal members **30**, together with the legs **28**, **28***a*, are deformed relative to each other to permit the bottom convolution of the coils to snap within the space defined by these members. Upon removal of the tool, the deformed portions will return to their normal positions, as shown in Fig. 3. When the bottom convolution of the coil spring is inserted within the clip it is held against movement in either a vertical or horizontal direction. Each of the clips of each row is secured in place in like manner and additional combined supports, tie wires, and clips are applied for each of the rows of the spring assembly unit.

With the clips **21** connected to the coil springs **10** and the latter in their normal upright positions, the straight portions **21***a* engage the undersides of the bottom convolutions **10***a* at opposite points. The leg portions **22** and **22***a* of each clip **21** pass over one lateral side of the corresponding convolution **10***a*, and the loops **24** and **24***a* pass around and under the convolution. The doubled back leg portions **26** and **26***a* extend under and across the convolution to its opposite lateral side, and the upwardly turned portions **28** and **28***a* extend upwardly around this side of the convolution. It will be seen that the longitudinal member **30** is hooked over and thus lies above the bottom convolution **10***a*.

With this improved spring assembly it is apparent that I have provided a unit in which the individual springs are secured in place and prevented at both top and bottom from shifting out of their intended position. An important feature of the invention is the provision of the novel combined spring support, tie wire and clip. This element is formed from a single wire and serves to support the clips, to tie the adjacent springs of a row together and to prevent relative movement between the springs and the support and tie wire. It is also apparent that I have provided a combined base support, tying means and spring clip unit which permits the use of interconnected springs in an assembly of this type. Heretofore, it has been necessary to twist or screw the springs into place on the lower support wires and such required twisting and turning of the individual springs prevents the use of interconnected springs. With my improved unit the tie wires and spring clips may be rotated relative to the rows of interconnected coil springs eliminating the turning or twisting of the individual coils to secure them in place. The clip which is formed as an integral part of the support and tie wire prevents the individual springs from shifting relative to the tie wire, and in addition provides a platform to support substantially the whole of the bottom convolution of the coils. The portions intermediate of the clips serve to tie together in spaced relationship the various coils of the row thereby insuring in use the proper positioning of the coil springs.

With this construction a ready assembly of the unit is permitted and a trained operator may complete the assembly of these units within a relatively short time. The base supporting tie wire adds greatly to the reduction in assembly time because of the ease with which it may be applied and secured in place. Likewise, with this type of base supporting tie wire it is possible to ship completed units, or, alternatively, rows of springs held together merely by the wire **18**, which rows do not include border wires or helicals. The springs being effectively secured in place by the clips, the possibility of the springs becoming detached from the wire **18** is greatly lessened. With this added advantage of being able to supply rows of springs clipped together the manufacturer of completed box springs, cushions and sofa beds is in a position to maintain a large stock of such springs clipped to base supports and utilize such rows of springs in any appropriate spring assembly unit. This provides greater flexibility to the manufacturer in the purchasing of his requirements.

Having thus described my invention, what is claimed to be new and desired to be secured by Letters Patent is as follows:

I claim:

1. An assembly for use in a spring unit, comprising, in combination, a plurality of spaced coil springs arranged in a row, each of said springs having a bottom convolution, a continuous supporting wire interconnecting and supporting said springs, said wire having a plurality of clips formed therein and holding said bottom convolutions and a plurality of generally straight portions interconnecting said clips and engaging the undersides of said convolutions at opposite points, each of said clips comprising a pair of interconnected legs extending laterally from said straight portions and doubled back downwardly in the opposite lateral direction around said convolution at one lateral side and moved therearound by inserting said legs upwardly through said bottom convolution and rotating said wire about its longitudinal axis, said legs extending across and under said convolution to the opposite lateral side thereof and having interconnected outer end portions extending upwardly around said opposite lateral side and connected thereto by an upward snapping action.

2. An assembly for use in a spring unit, comprising, in combination, a plurality of spaced coil springs arranged in a row, each of said springs having a bottom convolution, a continuous supporting wire interconnecting and supporting said springs, said wire having a plurality of clips formed therein and holding said bottom convolutions and a plurality of generally straight portions interconnecting said clips and engaging the undersides of said convolutions at opposite points, each of said clips having a pair of longitudinally spaced legs extending laterally from said straight portions and doubled black downwardly in the opposite lateral direction around one lateral side of said convolution and extending across said convolution under and then upwardly around the opposite lateral side of said convolution, each of said clips having a generally longitudinal portion interconnecting the outer ends of said legs and lying above said opposite lateral side of said convolution in interlocking relation thereto, said clips being connected to said springs by inserting said longitudinal portions upwardly through said bottom convolutions, rotating said wire about its longitudinal axis to move each of said longitudinal portions over, around and under the first mentioned side of the corresponding convolution and under the second mentioned side thereof, and hooking said longitudinal portions over said opposite side by an upward snapping action.

3. An assembly for use in a spring unit, comprising, in combination, a plurality of spaced coil springs arranged in a row, each of said springs having a bottom convolution, a continuous supporting wire having a plurality of clips formed therein and holding said bottom convolutions and a plurality of generally straight portions interconnecting said clips and engaging the underside of said convolutions at opposite points thereon, each of said clips comprising a pair of legs having interconnected outer ends, said legs extending laterally from said straight portions and being doubled back downwardly around one lateral side of said convolution and thence extending thereacross in the opposite lateral direction to the opposite lateral side thereof, said legs being moved around the first mentioned lateral side by inserting said legs upwardly through said bottom convolution and rotating said wire about its longitudinal axis, and means for attaching said interconnected outer ends of said legs to said opposite lateral side of said convolution.

4. An assembly for use in a spring unit, comprising, in combination, a plurality of coil springs arranged in a row, each of said springs having a bottom convolution, a continuous supporting wire interconnecting and supporting said springs, said wire extending in the direction

of said row under one side of said bottom convolution of each of said springs, thence laterally of the direction of said row over and around one lateral side of said convolution in a U-shaped loop, thence laterally in the opposite direction to and beneath the opposite lateral side of said convolution, thence upwardly, thence in the direction of said row above the second mentioned lateral side of said convolution, thence downwardly, thence laterally in the first mentioned lateral direction under the second mentioned lateral side of said convolution across said convolution to, under and around the first mentioned lateral side of said convolution in a second U-shaped loop, thence over said first mentioned lateral side in the second mentioned lateral direction, and thence in the direction of said row under said bottom convolution at a point opposite from the point at which the wire first passed under said convolution.

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