United States Patent

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[72] Inventor **Daniel Krakauer**
Great Neck, N.Y.

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[73] Assignee **Kay Manufacturing Corp.**
Brooklyn, N.Y.

[54] **INSTALLATION AND CLIP FOR ANCHORING FURNITURE SPRING**
7 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **5/263,** 5/265
[51] **Int. Cl.** **A47c 23/04**
[50] **Field of Search** 5/254, 259, 263, 266, 270, 271

[56] **References Cited**

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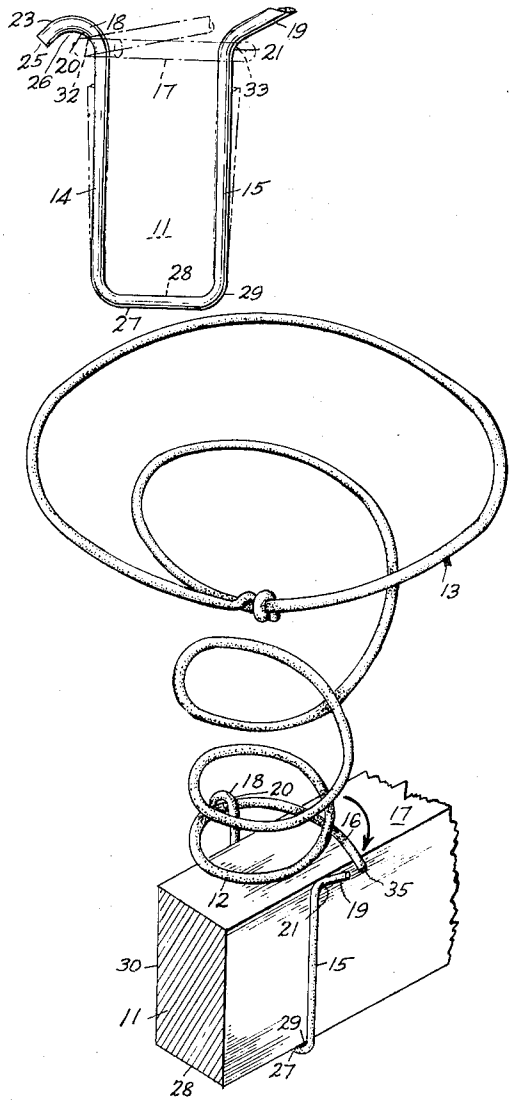
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Primary Examiner—Casmir A. Nunberg
Attorney—Harry Jacobson

ABSTRACT: A cone spring is anchored to the top of a wooden bedding or furniture slat of rectangular cross section by a generally U-shaped preformed wire clip. Each leg of the clip has an outstanding finger at its upper end. One or both fingers may be straight and at least one straight finger is inclined upwardly and makes an angle greater than 90° with its leg. Such finger serves, in cooperation with the bottom turn of the spring, to lock said turn to the top of the slat by its camming action progressively as the turn is inserted between the fingers and the top of the slat and the spring is rotated. The bottom turn ends in a straight tip portion tangent to the remainder of the turn. A high and wide entrance space results, into which the turn may be speedily and dependably inserted to reach under the fingers and over the slat top.



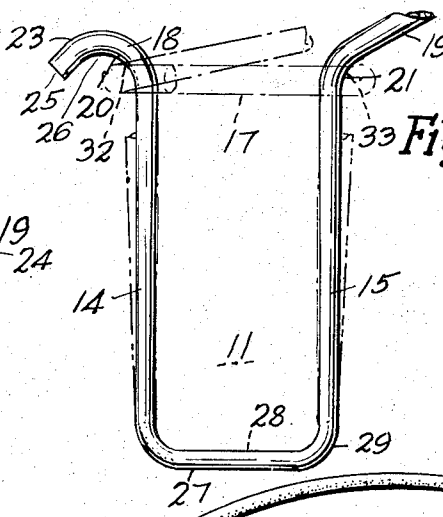


Fig. 3

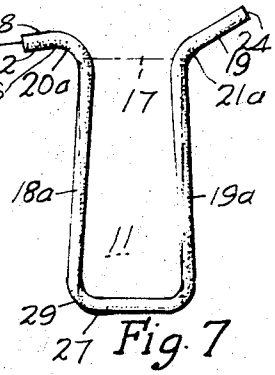


Fig. 7

Fig. 4

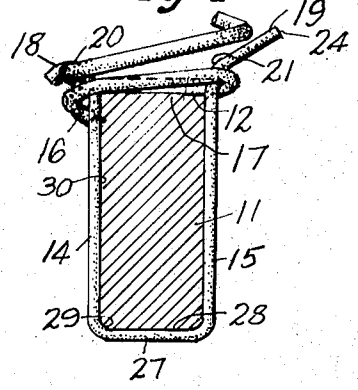


Fig. 1

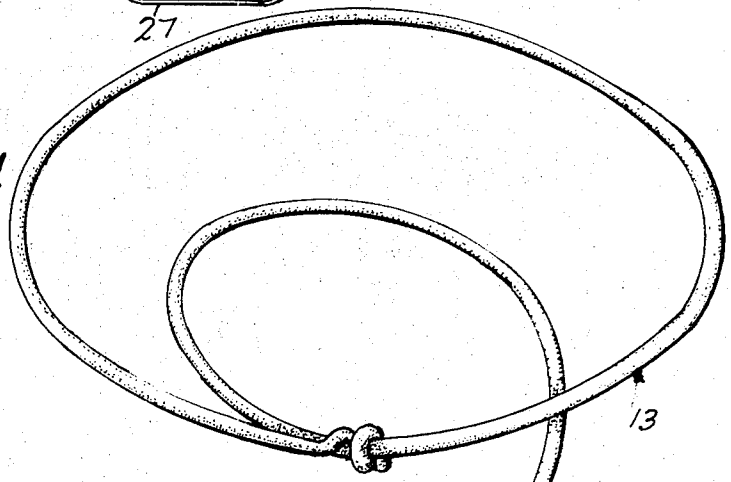


Fig. 5

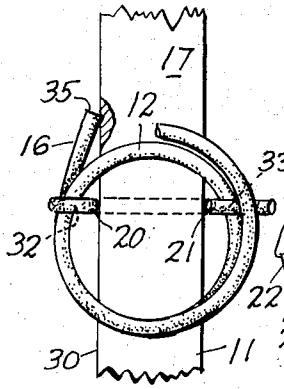


Fig. 6

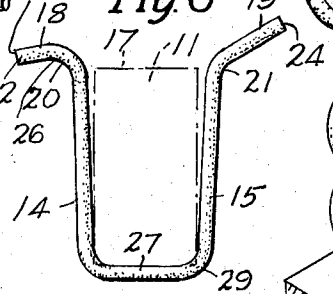
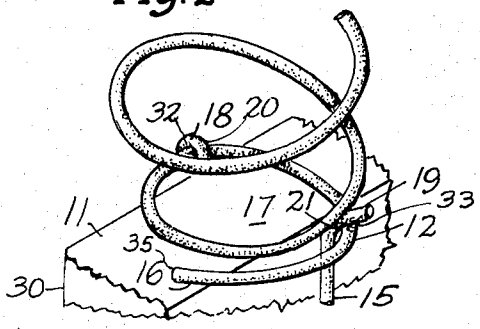
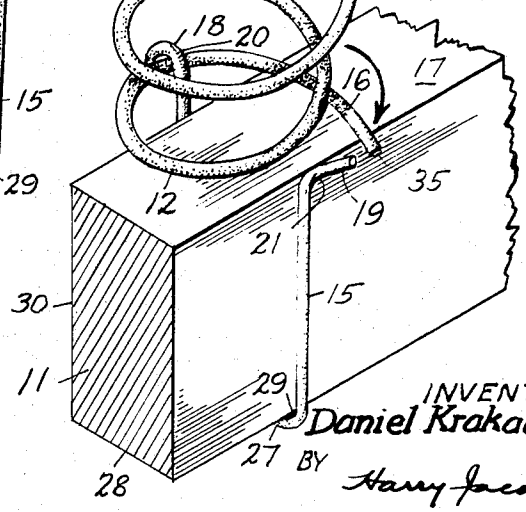


Fig. 2





INVENTOR
Daniel Krakauer
BY
Harry Jacobson
ATTORNEY

INSTALLATION AND CLIP FOR ANCHORING FURNITURE SPRING

This invention relates to box spring coil installations and particularly to that type employing a clip to anchor a spring coil to a crossbar or slat.

As shown in my copending application for patent for Box Spring Structure, Ser. No. 873,582, the inner unit for a box spring may include wooden crossbars or slats of rectangular cross section arranged with their wide faces upright, together with spring coils set on the tops of the slats and stapled thereto, thereby dispensing with the conventional long wires for connecting and supporting the bottom turns of the rows of spring coils.

The present invention involves the use of a preformed anchoring clip of special construction to replace the staples and to form the securing means for the installation, thereby to attain economy of materials and labor in the assembly of the inner box spring unit without sacrifice of efficiency.

The invention is directed to such a clip and the installation thereof, in which the clip is preformed, U-shaped and resilient and is provided with upper fingers designed to cam and wedge the bottom turn of the spring coil between said fingers and the top surface of the slat and also to urge the legs of the clip firmly against the sides of the slat when the bottom turn of the coil is first inserted between the clip fingers and the top of the slat and then rotated.

The present invention is further directed to an installation comprising a box spring or furniture coil having a straight tangent tip at the end of its bottom turn, the coil being secured to the top of a slat of rectangular cross section by a generally U-shaped wire clip embracing the slat and provided with diverging, parallel or converging legs terminating in outwardly extending fingers which cooperate with each other and with the bottom turn of the coil and the slat to compensate for irregularities in the shapes and dimensions of the parts, one of the fingers being straight and inclined upwardly as well as outwardly and serving as a cam to force the bottom turn against the top of the slat and making the assembling of the installation speedy and relatively inexpensive.

The various objects of the invention will be clear from the description which follows and from the drawings, in which

FIG. 1 is a perspective view of the installation as it appears before the bottom turn of the coil has been rotated or screwed to any material extent in the direction of the arrow into the clip fingers.

FIG. 2 is a similar fragmentary view of the same as the installation appears after the coil has been rotated enough to carry its tip down on to the top of the slat.

FIG. 3 is an elevational view of one form of the anchoring clip in its operative position embracing a slat which is shown in dash-dot lines, and also showing in dash-dot lines the initial divergence of the clip legs.

FIG. 4 is a fragmentary elevational view of a modified form of the installation wherein the coil has been rotated to the maximum extent and is stopped by a sidewall of the slat.

FIG. 5 is a top plan view of the same.

FIG. 6 is an elevational view of a shorter clip and narrower slat showing upwardly diverging legs on one form of the clip.

FIG. 7 is a similar view of a modified form of the clip in which the legs converge upwardly.

In the practical embodiment of the invention shown herein, the generally U-shaped wire anchoring clip **10** embraces a slat **11** of a box spring or other piece of furniture and holds the bottom turn **12** of the spring coil **13** to any selected point of the slat. Said slat is preferably of wood of substantially rectangular cross section of standard dimensions such as for example, nominally termed in the trade 1 by 2, but in practice being about three-fourths inches thick and about 1⅝ inches wide. Even these dimensions vary slightly due to variations in seasoning, shrinkage and dressing processes so that the distance between the bottoms of the legs **14** and **15** of the clip is not made less than the maximum thickness of the slat.

The bottom turn **12** terminates in a substantially straight tip **16** extending preferably tangentially from the arcuate part of the turn, resulting in the divergence of the tip away from the center of the turn and thereby increasing the effective diameter of said turn at said tip. Such divergence aids in screwing the coil into its locked position by providing a high and wide entrance space for the turn under the outstanding fingers of the clip as will later be pointed out. Said tip and the turns of the coil yield and adjust to pressure whereby it becomes possible to wedge the turn **12** by camlike action between the clip fingers and the top surface **17** of the slat. For this purpose also, the clip legs terminate at the free ends thereof with fingers **18** and **19** respectively. Each of said fingers is joined to its leg by a suitable bend, though the bends do not each subtend the same angle. The bend leg **18** is relatively long and extends through an arc greater than 90° to provide a downwardly and outwardly inclined portion of any suitable shape obstructing the turn **12** should said turn tend to leave the bend **20** after being inserted thereinto. On the other hand, the bend **21** connecting the finger **19** to its leg, extends through an arc less than 90°, whereby said finger **19** is inclined upwardly and outwardly and is consequently enabled to perform its progressive camlike function in cooperation with the turn **12** and the top of the slat. Said finger **19** is preferably substantially straight throughout its length beyond the bend **21**, while the finger **18** may have either a straight tip portion **22** (FIG. 6) or a hooklike portion **23** (FIG. 3) or be partly straight and partly hooked. The end edge **24** of the finger **19** becomes arranged at a level higher than that of the end edge **25** of the tips **22** or **23**, making it easy for the operator quickly and dependably to insert the relatively wide tip **16** of the turn **12** and also part of said turn under and between the fingers and over the top of the top surface **17** of the slat as shown in FIGS. **1** and **2**, before rotating the coil into its final position. Said tip, being tangent to the remainder of the bottom turn **12**, consequently is at a greater distance from the center of the turn than the curved remaining part of said turn so that the distance between the bends **20** and **21** may be much less than the diameter of the bottom turn at the major part of said tip.

For final assembly of the parts after the terminal part of the turn **12** has been hooked under the fingers **18** and **19**, rotation of the coil carries the tip **16**, which is initially in contact with the under side of a relatively high part of the finger **19**, past the finger and on to and partly across and well above the top **17** as shown in FIG. **2**. However, since the turn **12** reduces in diameter as the tip is passed until the arcuate part of the turn is approached, the distance between the points of contact of the coil with the fingers gradually lessens to cause two types of movement of the clip relatively to the slat under pressure resulting from the rotation of the coil.

It being understood that the turn **12** has a minimum inside diameter not less than the thickness of the slat plus twice the thickness of said turn material, one type of movement resulting from upward pressure on the fingers caused by rotation of the coil, is upward bodily movement of the clip which urges the straight bottom **27** thereof firmly against the flat bottom edge **28** of the slat. The corner bends **29** joining the lower ends of the legs to the bottom **27** consequently press into and indent and grip the relatively soft corners of the slat and anchor the clip at said bends. At the same time, the downward reaction to the upward wedging force on the finger **19** by the turn **12** and the downward and inward camming action of the straight upwardly inclined finger on said turn after its tip **16** has passed said finger and the effective diameter of said turn is reduced, causes the point of contact of said finger with said turn to move progressively inwardly and downwardly and presses said turn on to the top of the slat, the obliquity of parts of the turn where it makes contact with the slat top being nullified by the resilience of the coil turn.

Firm anchorage of the coil and clip are achieved usually when the end edge **35** about reaches that side **30** adjacent the finger **18** so that somewhat less than a complete turn of the coil is sufficient in most instances. (FIG. **2**). Should the inner diameter of the coil turn be so much greater than the distance between the points **32** and **33** of the bends in contact with the

turn, that rotation of the coil about its axis does not occur, then instead the turn pivots about the bend **20** and slides into a position such as that illustrated in FIGS. **4** and **5**. There, the line which would join the points of contact **32** and **33** is a chord of the turn and not a diameter thereof as it would normally be. This characteristic of the action of the fingers takes up and compensates for a limited range of dimensional differences from the expected normal in the slat and clip. Obviously, in order that the turn rest on the slat as it should, the coil tip **16** projects a substantial distance beyond the finger **19**. For additional security if desired, the coil may be rotated until the end edge of its tip **16** passes the finger **18** and presses into and indents the side surface **30** of the slat below the top **17** as shown in FIG. **5**. Obviously also, the finger **18** of FIGS. **6** and **7** may be inclined upwardly like the finger **19** to duplicate the cam action thereof and to make it possible to install the clip with either finger on the left or right thereby to save time and labor.

The distance from the top **17** of the slat to the highest point **26** of the lowest element of the bend **20** is slightly more in the installed position of the clip, than the thickness of the coil turn **12** which the bends receive, to compensate for allowable tolerances in the dimensions of the parts, especially of the slat lumber after assembly thereof in the installation.

Referring to the clip shown in FIG. **6** and indicated in FIG. **1** as initially having upwardly diverging legs **14**, **15**, the legs are pulled toward each other during the rotation of the coil until they are tightly pressed against the respective sides **30**, **31** of the slat, the clip bottom being pulled up against the slat bottom thereby locking the slat, coil and clip together against separation during use of the box spring in which the described installation is an element.

In that form of the clip shown in FIG. **7**, the legs **18***a* and **19***a* converge, and the initial distance between the bends **20***a* and **21***a* is somewhat less than the minimum thickness of the slat. To mount the clip, it is positioned under the slat and raised. Said bends press against the lower parts of the slat sides and act as cams to spread the legs apart as the clip moves up. At the top of its movement, the clip becomes self-maintained in position ready for the insertion of the coil turn into the fingers.

It will be understood that the space allowed between the top of the slat and the operative positions of the respective fingers is usually slightly more than the thickness of the clip wire, whether the legs diverge, converge or are parallel. However, should the above-mentioned space be initially less than the thickness of the coil wire, said space nevertheless increases to receive the coil wire without undue stress or distortion in the case of the diverging or converging legs. Said legs when straightened into parallelism with the sides of the slat, swing the bends slightly upwardly as well as toward or from each other. It may be desirable to tilt the coil after it has been hooked initially into the finger **18** to enable the coil tip to pass under the finger **19**.

It will be understood that various changes may be made in the specific forms of the invention herein disclosed without departing from the spirit of the invention defined in the appended claims.

I claim:

1. A preformed generally U-shaped anchoring clip for securing the bottom turn of a coil spring to the top of a slat, said clip comprising a pair of legs each terminating in an outwardly extending finger at the free end thereof, at least one of said fingers being straight and inclined upwardly at an angle greater than 90° to the leg from which said finger extends, said finger constituting a cam for said bottom turn, each leg having a relatively sharp bend at the lower end thereof adapted to cut into the bottom corners of said slat in the operative position of said clip around said slat.

2. The preformed clip of claim **1**, a substantially straight bottom on the clip spacing said legs apart and joined by said bends to said legs, the clip being resilient and the fingers cooperating with each other and adapted to cooperate with said bottom turn and constituting means for exerting upward pressure on the bottom and legs of the clip as well as transverse pressure on said legs urging said fingers toward each other and upwardly in the operative position of the clip wherein said bottom turn is under said fingers on the top of said slat and the slat is embraced by said clip.

3. The preformed clip of claim **2**, said legs diverging upwardly and being movable at the upper parts thereof toward each other and into contact with the adjacent sides of a slat embraced thereby, by said turn in the operative position of said clip wherein said turn is under said fingers and on the top of said slat.

4. A coil spring installation comprising the clip of claim **1**, a slat of substantially rectangular cross section embraced by said clip, a spring coil having a bottom turn on the top of said slat and under and between said fingers and adapted to slide progressively downwardly and inwardly on the rotation thereof relatively to the top of said slat and limited in the downward movement thereof by said top and the forcible contact of the clip bottom with the bottom of said slat, said one of the fingers cooperating with the other finger and the top of said slat and urging said clip upwardly and the legs inwardly, and also urging said turn downwardly, the clip having a straight bottom.

5. The coil spring installation of claim **7**, said turn terminating in a substantially straight tangent tip portion increasing the effective diameter of said turn at said tip portion over that at the curved part of said turn.

6. A substantially U-shaped clip for securing the bottom turn of a coil spring to a furniture or bedding slat, said clip having a pair of upwardly diverging legs joined by corner bends at the lower ends thereof to a straight bottom, and means at the upper end of each leg adapted to cooperate with said bottom turn for progressing camming said turn toward, and forcibly against, the top of said slat, for forcing said legs toward each other and for forcing said clip bottom against the bottom of said slat thereby to compress said slat between said turn and said clip bottom and to lock said turn forcibly to said slat top, said means comprising an outstanding straight finger at the upper end of each leg, at least one of said fingers being inclined upwardly and making an angle greater than 90° with the leg from which said one finger extends, said one finger cooperating with the other finger, with said turn and with the top of said slat to lock the clip and said spring to the top of said slat, said top being flat and the bottom of the slat being flat and forcibly engaging the straight bottom of the clip.

7. A coil spring installation comprising the clip of claim **11**, a slat of rectangular cross section and a spring having a bottom turn held in pressed engagement with the top of said slat by the fingers of said clip, said bottom turn terminating in a substantially straight tip portion extending tangentially to and from the curved part of said bottom turn thereby to increase the effective diameter of said bottom turn at said tip portion over the diameter of the curved part of said turn to provide an entrance space for said tip portion between said one finger and the top of said slat, said space being highest at the extremity of said one finger, said one finger being joined to the leg from which said finger extends by a bend in an arc of less than 90°.

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