

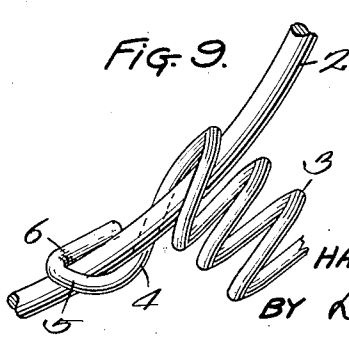
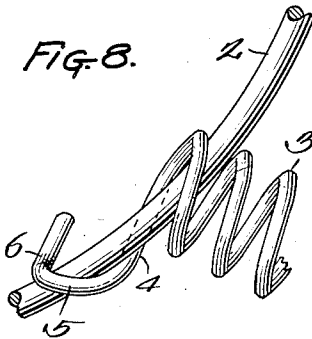
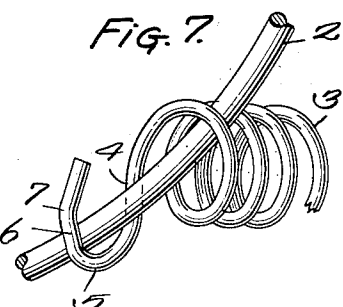
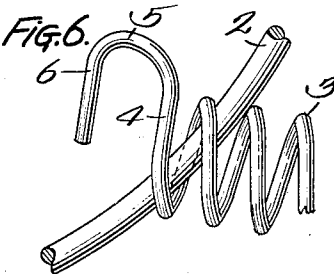
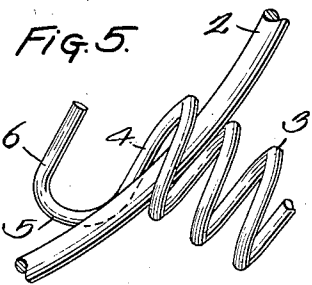
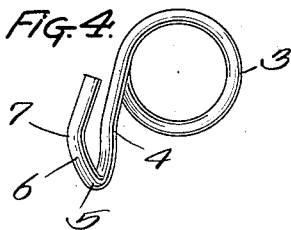
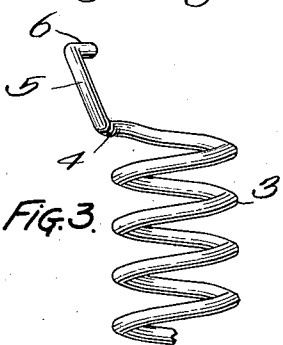
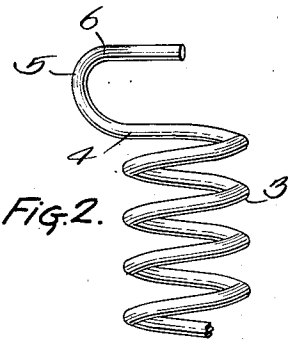
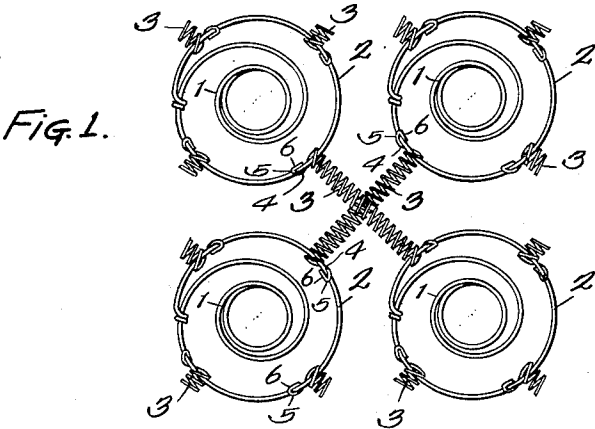
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2,010,676

SPRING

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SPRING

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1 Claim. (Cl. 5—269)

This invention relates to improvements in springs and more particularly to upholstering spring structures wherein vertically disposed weight supporting or cushioning springs are connected with one another by horizontally disposed spiral spacing springs.

It is an object of this invention to provide a construction of this kind arranged in such a manner as to permit a maximum amount of flexibility without being permanently distorted and at the same time to provide a construction to permit great economy in the manufacturing and assembling of the parts.

It is another object of this invention to so construct the smaller horizontally disposed spiral spacing springs, usually termed helicals, in such a manner that the ends of the helicals may be readily attached to the upper and larger spiral of the load supporting springs and when so attached will prevent relative horizontal movement between the helical and spiral.

With these and other objects in view, reference is made to the accompanying sheet of drawing which illustrates a preferred form of this invention with the understanding that minor detail changes may be made without departing from the scope thereof.

In the drawing—

Figure 1 is a fragmentary top plan view showing four adjacent large spiral load supporting springs as joined together with the improved smaller spiral space springs or helicals.

Figure 2 is a fragmentary view in front elevation of the end of one of the improved helical springs.

Figure 3 is a similar view in side elevation looking at the left side of Figure 2.

Figure 4 is a top plan view of Figure 3.

Figures 5, 6, 7, and 8 are fragmentary top plan views illustrating the steps in attaching the helical to the coil.

Figure 9 is a fragmentary top plan view illustrating the helical attached to the coil, as illustrated in Figure 1.

As illustrated in Figure 1, the embodiment of this invention includes a number of large weight supporting spiral springs 1 arranged side by side with their axes substantially parallel and the top coils or convolutions 2 lying in substantially the same horizontal plane. The coils 2, except at the edges and corners, are joined on four sides to the adjacent coils by means of small spiral or helical springs 3 preferably threaded one on the other to cross each other at right angles, as shown in Figure 1.

In order to connect the ends of the helicals 3 to the coils 2 in such a manner as to provide a rigid and permanent connection and which will prevent relative movement of one over the other, each end of the helical is formed with a terminal of peculiar construction. As shown in Figures 2, 3, and 4, the end convolution of each helical is continued to form a portion 4 tangential to said convolution, as shown particularly in Figure 4, and is then continued upwardly away from the said convolution to form a curved portion 5 lying in a plane forming an acute angle with the axis of said helical, as shown particularly in Figure 3. The curved portion 5 is continued toward the axis of the helical to form a portion 6 extending parallel to the said upper convolution and terminating approximately in line with the axis of said helical, as shown in Figure 2. The end portion 6 intermediate its extent is bent to leave the plane of the portion 5, so that its extremity lies substantially in the plane passing along and adjacent the exterior convolutions of the helical 3 with the bend therein forming the apex of an obtuse angle 7, as shown particularly in Figure 4. The particular advantage and ease of assembly of this particularly formed terminal of the helical is illustrated in Figures 5 to 8, inclusive, illustrating the manner of attaching the terminal to the coil.

The assembly is started with the coil and helical in horizontal relation, the helical held in the position shown in Figure 2 is passed over the coil 2 between the terminal convolution and the next following, in the manner shown in Figure 5, and then is rotated through an arc of 180 degrees to the right, as shown in Figure 6. In these two positions the helical and coils are in horizontal relation. The helical is then rotated downwardly about the coil as a pivot and in this relation the helical is then rotated to the left through an arc of approximately 90 degrees bringing the portion 6 of the terminal upon the upper side of the coil, as shown in Figure 7. After the portion 5 of the terminal has engaged the coil 2 the helical is then rotated about the coil as a pivot and returned to the horizontal, as shown in Figure 8. In this position, the portion 4 of the terminal engages the under surface of the coil and the portion 6 of the terminal engages the inner surface of the coil with the angular extremity thereof extending under the coil, and the portion 5 causes the portions 4 and 6 of the terminal to coact with the upper convolution of the helical to firmly grip the coil to such an extent that relative movement between the coil 55

and helical in a horizontal plane is prevented, thereby completing the assembly. In this position, the axis of the helical passes to one side of the axis of the coil, but when the opposite end 5 of the helical is attached to the oppositely disposed coil, the axis of the helical passes through the axes of the two coils and exerts still greater tension upon the terminal and last convolution at each end to lock the ends of the helicals to 10 each convolution.

In the assembled position, if desired, the termination 6 may be forced toward the portion 4, as shown in Figure 9, by the use of pliers, although this is not necessary, to insure the helicals from 15 becoming detached from the coils. It being understood that the assembly may be accomplished by holding the helical 3 stationary and the coil 2 moved to accomplish the steps in assembling, as above described. However, it is 20 customary to attach the bottom coils of the weight supporting springs 1, in the formation of mattresses, to the base member or support with the top coils 2 lying in substantially the same plane with the axes of the convolutions substantially parallel. The assembler grasps in one hand 25 a pair of helicals 3 intertwined, as shown in Figure 1, and engages in succession each end of each helical with the adjacent top coil 2 by twisting and rotating each helical about each top coil 30 by a movement of his fingers and wrist, the resiliency of the helical allowing of this movement when one end has been so engaged.

From the above description of the construction of the helical and its mode of application, it is 35 seen that by rotating first in one plane, then in another and returning to the first plane the continuation of the end convolution is entwined about the coil and provides a three point tensional engagement which prevents relative movement of 40 the coil or helical. As illustrated in Figure 8,

when the helical has been attached to the coil and the axes of the same are substantially at right angles to each other, the coil 2 passes between the outer convolution and the next following convolution, then the outer convolution 5 passes over the coil with the tangential continuation passing under the coil with the return curved portion 5 returning the continuation about the coil so the portion 6 passes above the coil, 10 the coil passing under, over and under the outer convolution and continuation forms a three point contact with the coil and the helical being resilient the three contacts grip the coil to prevent side- 15 wise or sliding movement of the terminal over the coil. When both ends of a helical have been so attached to their respective top coils 2 the body of the helical places the respective ends under sufficient tension to cause the three point 20 contact with the coil 2 to immediately grip said coil. When desired, by the application of pliers or other tools the extremity of the portion 6 may be brought nearer the portion 4 on the underside of the coil, although the bend of the portion 6 forming the obtuse angle 7 directs the extremity in 25 this direction.

What I claim is:

The combination of a coiled spring provided with closed undeformed end coils with a helical spring terminating in means to engage said closed end 30 of the coiled spring and resist longitudinal movement thereover by continuing and bending the end convolution of the helical to pass over, under and then over said coil and terminating the end portion passing over the coil in the direction of 35 the helical to entwine the coil and provide a three point tensional engagement of the helical with the coil, said bent portion lying in a plane substantially parallel to the axis of the helical.

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