No. 742,251. PATENTED OCT. 27, 1903.

J. A. STAPLES.

SPRINGWORK.

APPLICATION FILED OCT. 6, 1900.

NO MODEL. 3 SHEETS—SHEET 1.

FIG. 1.

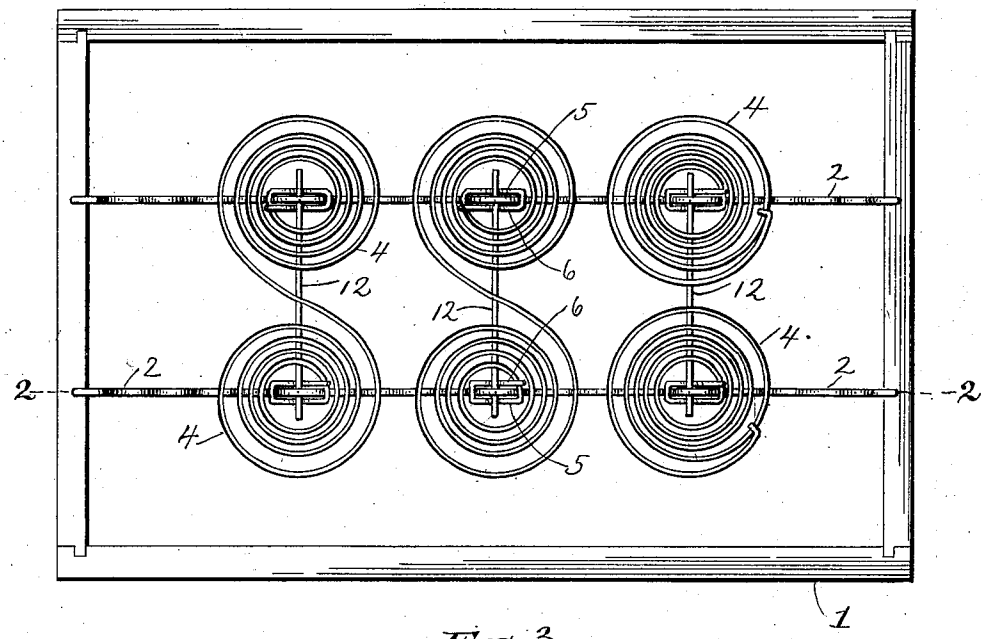


FIG. 3.

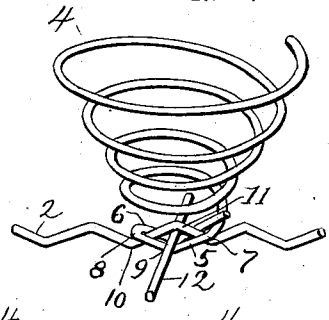


FIG 2.

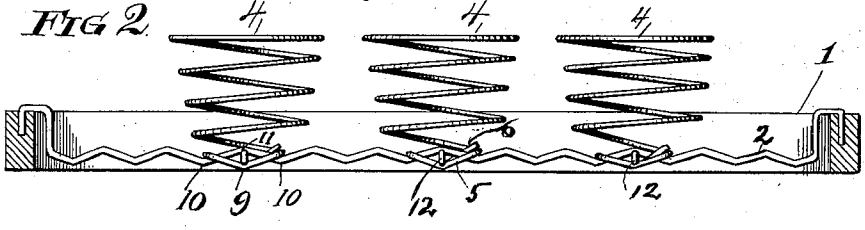
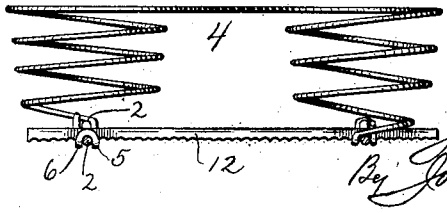


FIG. 4.



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NO MODEL. 3 SHEETS—SHEET 2

FIG. 5.

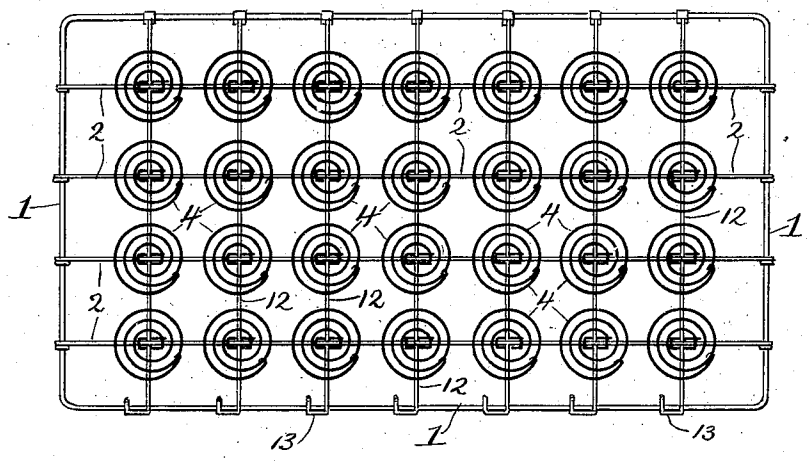


FIG. 6.

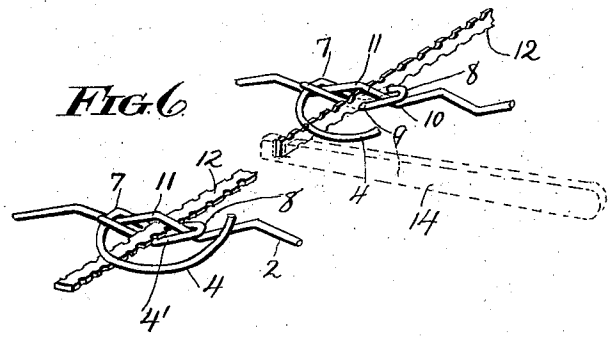


FIG. 7.

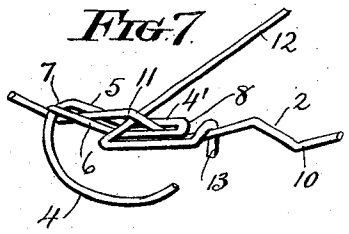


FIG. 8.

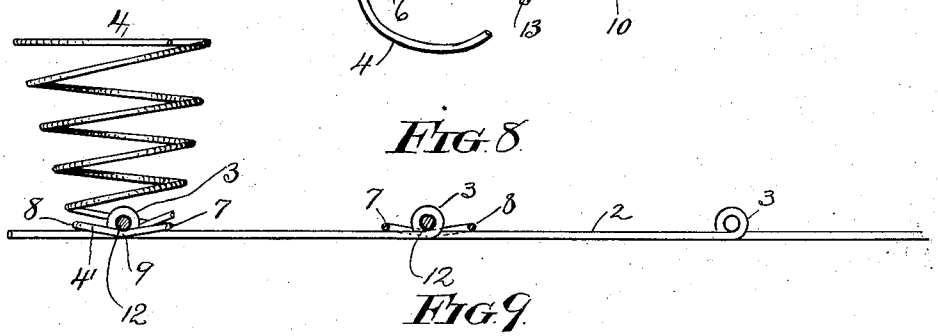
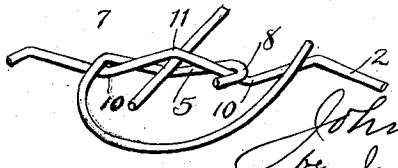


FIG. 9.



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No. 742,251. PATENTED OCT. 27, 1903.

J. A. STAPLES.

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APPLICATION FILED OCT. 6, 1900.

NO MODEL. 3 SHEETS—SHEET 3.

FIG. 10.

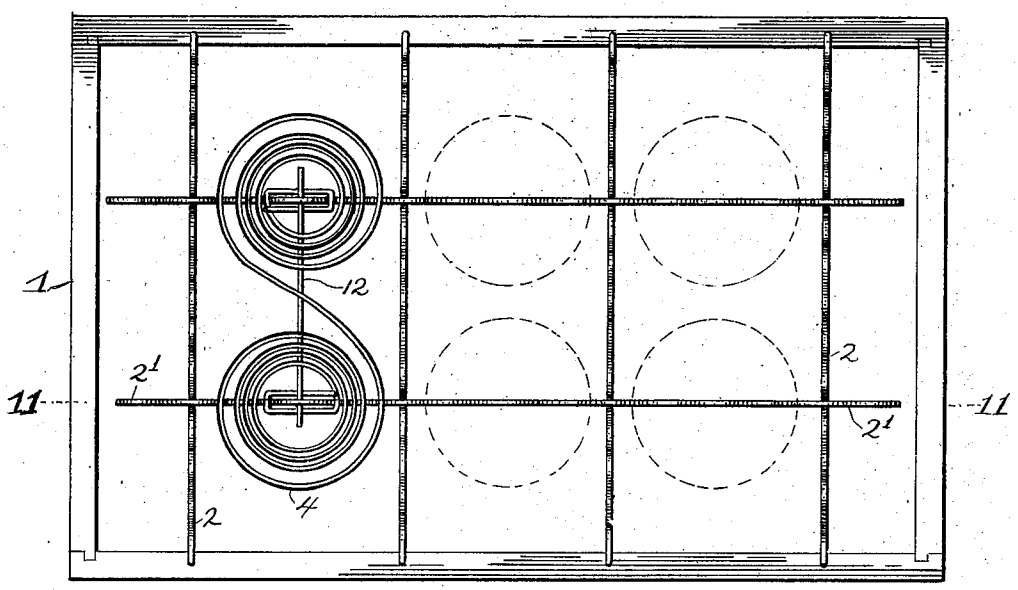
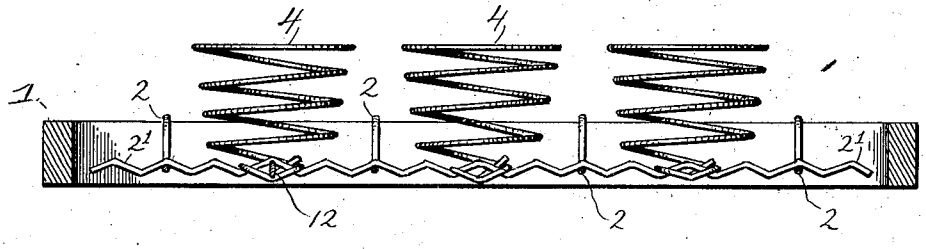


FIG. 11.



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No. 742,251. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

JOHN A. STAPLES, OF NEWBURGH, NEW YORK, ASSIGNOR TO STAPLES & HANFORD COMPANY, OF NEWBURGH, NEW YORK, A CORPORATION OF NEW JERSEY.

SPRINGWORK.

SPECIFICATION forming part of Letters Patent No. 742,251, dated October 27, 1903.

Application filed October 6, 1900. Serial No. 32,242. (No model.)

To all whom it may concern:

Be it known that I, JOHN ATKINSON STAPLES, a citizen of the United States, residing at Newburgh, in the county of Orange and State of New York, have invented certain new and useful Improvements in Springwork, of which the following is a specification.

This invention relates to springwork for spring-beds, sofas, chairs, and all similar articles of furniture in which springs are employed; and the main object of the invention is to provide a novel and effective springwork intended for such purposes, and especially adapted for carriage-cushion work.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings and afterward point out the novelty with more particularity in the annexed claims.

In the accompanying drawings, Figure 1 is a top plan view of springwork embodying the principles of my invention. Fig. 2 is a sectional view of the same on the line 2 2 of Fig. 1. Fig. 3 is a detail view showing a method of assembling springs upon the base-wire embraced by my invention. Fig. 4 is a side view illustrating a method of assembling a twin spring upon two parallel base-wires and embodying one exemplification of my invention. Fig. 5 is a top plan view exemplifying the embodiment of my invention in a spring-bed structure. Fig. 6 illustrates the method of inserting one of the keys that may be employed. Fig. 7 illustrates other forms of keys that may be employed. Figs. 8 and 9 show details hereinafter described, and Figs. 10 and 11 illustrate a form of springwork embodying my invention.

Springwork constructed in accordance with the principles of the present invention may be employed in the manufacture of spring-beds, chairs, sofas, carriage-cushions, and similar articles of furniture, and is especially adapted for carriage-cushion work, and in this specification the term "frame" is employed to designate that part of the structure to which the base or supporting wires are attached, it meaning a seat-frame in the case of a chair or sofa or the base-edge-wire support in the case of a bed-spring structure.

For purposes of illustration I have shown in the drawings my improved construction applied to spring-bed and chair structures, and it will be understood that while it is preferably to be used for chair and sofa construction it is also adapted for use in various other forms and that the terms herein employed are intended to mean and comprehend all of the specific applications to which this improvement may be adapted.

In some of the figures of the drawings a less number of springs is shown than is usually employed for greater clearness of illustration of the wires and their arrangements, it being understood that for carriage-cushion work fifteen springs are usually employed in each frame, five in each of three longitudinal rows.

In the drawings the same reference-numerals are employed to designate the same or corresponding parts in the various views.

The frame 1 is of any suitable size and shape, according to the character of the work to be accomplished. In Fig. 1 it is shown as the frame of an ordinary chair-seat, and it is obvious that for sofas, box-couches, and like structures the frame or support will likewise be constituted of the seat portion, which in such cases will be enlarged to the required size and form. In Fig. 5 the frame or support 1 is composed of the base edge wire of the spring-bed structure. In any case the supporting-wires 2 are suitably attached to the frame. They are connected to the edge wires of the bed structure by any suitable clips, and in the case of chairs, sofas, &c., the form shown in Fig. 2 is preferred, wherein the horizontal portions are approximately the measurement of the opening of the seat-frame, with the end portions extending upwardly and laterally to rest upon the upper surface of the seat-frame and terminating with eyes or with downturned ends to secure the wires to the frame, after the manner now generally in use under my Patent No. 474,536, dated March 10, 1892.

The supporting-wires 2 may be of any shape or form suitable to the special use for which they are intended. For spring-bed work they may have bends or may be plain, the upper ends of the springs in such cases being secured together by a suitable top edge wire and by interior connecting or brace wires, as

is well understood in the art. For chairs and sofas, however, it is preferred to provide these supporting-wires with suitable bends, which coact with the springs to prevent their lateral displacement. Of course it is to be understood that these bends may be in any form that will accomplish the general purpose. It has been found by experience that corrugations such as shown in Figs. 1 and 2 are entirely satisfactory for this purpose, and as they constitute the simplest form and provide for the greatest number of adjustments of the springs upon a given length of wire they are preferred. However, my invention is to be understood as contemplating and embracing any suitable bend—for example, the bends may be in the form of eyes 3, as in Fig. 8, or any other configuration that may be employed. The term "bend" is herein employed and is to be understood to mean and include any and all modifications in the configuration or shape of the spring-supporting portion of these wires.

The coil-springs 4 are supported upon the wires 2. These springs are provided at the base with seats 4', whereby they are adapted to be securely held in place upon the supporting-wires. The seats may be of any form adapted for this purpose; but preferably they are in the form shown in Fig. 3, wherein they are constituted by bending the lower end at the termination of the bottom coil into two parallel legs 5 and 6, they being made by bending the wire at 7 at preferably about a right angle or so as to be substantially parallel to the line of the supporting-wire 2 when the parts are assembled, and then bending it back upon itself at 8, each leg having a depression or notch 9 at about its center. When this form of seat is used in connection with the corrugated supporting-wire, the relation of the various parts and their formation preferably will be such that the seat or base of the spring will rest in two of the lower notches 10 of the supporting-rod 2 at approximately the bend 7 and the return-bend 8, while the intermediate upper bend or notch 11 of the wire 2 will rest between the bends 7 and 8 of the spring. By this construction the notches 9 and 11 form a passage for the reception of a key 12, which will preferably be of such size as to slightly force the legs of the spring and the supporting-wire apart to more firmly bind the various parts in position.

It is obvious that the form of the seat may be varied. The legs need not necessarily be made parallel, as the wire may be formed more in a circle at this point, if desired, or the leg 6 may be omitted and the wire terminate in a hook constituted by the bend 8, as in Fig. 9. Also the depressions 9 in the legs may be omitted—as, for example, if the upper notches 11 of the rods 2 are enlarged or when the bends are in the form of eyes 3. Other changes may be made in the formation of the seat without departing from the spirit of my invention. The seats are preferably constituted of reduced portions of the wires of the springs and preferably extend transversely of the bodies of the springs or in the central vertical plane thereof.

The keys 12 may be in any suitable form, any construction thereof that produces a pressure or binding action between the supporting-wires and the seats of the springs being within my invention. The preferred form is illustrated in Fig. 6, wherein it is shown as composed of a slightly-flattened rod provided with notches or serrations on its edges corresponding to the location of the base strands or legs 5 and 6, constituting the base or seat of the spring, and the supporting-wire 2 when the parts are assembled, so that the leg or legs of the seat will enter notches on its lower edge and the supporting-wire will enter an intermediate notch on its upper edge, thereby preventing any accidental displacement of any of the parts. Another advantage of this flattened form of key is that it may be inserted flatwise and then turned up on edge by any suitable tool, as at 14 in Fig. 6, whereby it will increase the pressure between the base or seat of the springs and the supporting-wires.

At the left hand of Fig. 6 the key is shown in its flattened position as it is inserted to position between the coacting parts, and at the right of this figure it is shown with a tool applied thereto for the purpose of turning it up into the position there indicated for the purposes described.

Instead of the form above described a plain wire may be used of sufficient size to bind the parts, and instead of serrating the edges of the key it may be provided with a hooked portion 13 on one end adapted to catch over one of the supporting-wires when the key is turned after being driven into place, as shown in Fig. 7, it being obvious that various forms of keys and of snaps or catches for holding them in place may be provided.

The principle of this invention is especially applicable to springwork in which twin springs are employed. In spring structures where the springs are attached to the supporting devices by rotating the spring to interlock or interweave its base with the support—as, for example, where intersecting rods are employed—it is impossible to use the twin-spring construction, as it is obvious that it cannot be rotated to secure the base to the support. By employing the present invention the bases of the springs, whether of the single or twin spring type, are secured to the supporting-wires in a manner equally as effective as when the base of the spring is rotated upon its support. As shown in and at the left in Fig. 1, the springs 4 are integral or of the twin-spring type, the base of each being provided with a seat for the supporting-wire, these seats preferably being of the same form as in Figs. 1 and 3.

The twin-spring structure is especially desirable in chairwork, and when it is to be employed two supporting wires or rods pref-

erably of the drop form and having bends or corrugations in their horizontal portions, as shown in Fig. 1, are applied to the seat-frame. The twin springs 4 are then set directly on the rods, as many being employed as the character of the work requires, and suitable keys are then inserted crosswise of the supporting-rods 2, passing between the rods and the legs or strands of the seats of the springs in the manner above described. This arrangement enables the parts to be very rapidly assembled and results in a very effective construction, as the springs are connected and secured to their supporting-wires and to the keys after the manner of a spring that is coiled upon two supporting-wires at their intersection. The bases of the springs are wedged tightly above and below the supporting-wires and key, respectively.

The application of the present invention to spring-bed construction is clearly shown in Fig. 5. The supporting rods or wires 2 are attached to the base edge wire or frame 1, and the springs are seated thereon, preferably by means of the construction shown in this figure and above described. The keys, of any suitable form, are then inserted, and each may act for a whole row or range of springs and be connected, if desired, to the base edge wire, interlocking the parts in the manner described. The springs may be secured at their tops by any suitable arrangement of upper edge wire and by interior connecting or brace wires in any of the several ways now fully understood, (not shown,) the entire structure thus comprising and providing a unitary device.

In Figs. 10 and 11 of the drawings I have illustrated a form of springwork which embodies the principles of my invention in a construction analogous to that heretofore described. In this form the supporting-wires 2 are placed crosswise of the frame instead of lengthwise, as before, and lengthwise pieces 2′, of corrugated wire, are then placed in the notches or depressions of the supporting or hanging wires 2, whereby the lengthwise wires are held against displacement upon the supporting-wires, the connection forming a lock between the two. The twin springs are then directly attached to the corrugated lengthwise wires, upon which they may be held by any suitable fastenings or in any suitable manner, preferably, however, by means of the key, as heretofore described.

It is obvious that the term "support" or "spring-support" or "supporting-wire" refers to either the form shown in Figs. 1 and 2, for example, or to the form shown in Figs. 10 and 11, as in the former case the lengthwise wires 2 are the direct support of the spring, while in the latter case the wires 2′ constitute this direct support.

I claim as my invention—

1. The combination with a frame and a spring-support formed of wire, of springs having central reduced seats resting on the wires, and an independent insertible key between the wire and seat to bind the parts together.

2. The combination with a frame and a spring-support formed of wire having bends, of springs centrally seated on the wire embracing an upward bend therein, an independent insertible key adapted to the bend to bind the parts together.

3. The combination with a frame and a spring-support formed of corrugated wire, of springs having seats to receive the corrugations of the wire, and independent insertible keys between the wire and springs to bind the parts together.

4. The combination with a frame and a spring-support formed of corrugated wire, of springs having seats formed of parallel strands to receive the notches of the wire and a key adapted to pass between the strands and the wire support.

5. The combination with a frame and parallel spring-supports formed of corrugated wire, of a range of springs supported by each wire and an independent insertible key between corresponding springs of the different ranges and the parallel supports.

6. The combination with a frame and parallel spring-supports formed of corrugated wire, of a range of springs supported by each wire, each spring having a strand below the plane of the support, and an insertible cross-key common to several springs of different ranges.

7. The combination with a frame and parallel supports formed of wire, of twin springs supported by said wires each having a reduced central seat and an insertible key between the seats of each twin spring and their respective wires.

8. The combination with a frame and parallel spring-supports formed of corrugated wire, of springs each having a seat formed of parallel strands provided with a notch, alternating corrugations in the wire forming receptacles for the spring-seats and the intermediate corrugation of the wire being opposite the notches of the strands, and a key having serrations adapted to receive the strands and the wire.

9. The combination with a frame and a spring-support, of a spring having a central reduced seat adapted to set directly on the support, and an insertible key between the support and spring.

10. The combination with a frame and a corrugated spring-support, of a spring having a central reduced seat adapted to rest within corrugations of the support, and an insertible key in an intermediate corrugation of the support to bind the spring and support together.

11. The combination with a frame and a wire support, of a spring having a seat formed of parallel strands, and adapted to rest within corrugations of the support, and a key having notches in its edges to engage the strands of the seat and the wire of the support.

12. The combination with a wire spring having a seat at its smaller end, formed by a transverse portion of the wire, of a corrugated supporting-wire on which the seat of the spring rests, and an insertible key to wedge tightly above the seat and below the wire and bind the spring into the corrugations of the wire.

13. The combination with a supporting-wire corrugated upon its horizontal portion, of an insertible cross-key having notches in its edge interlocking with a corrugation of the wire, and a wire spring having a seat at the smaller end thereof and extending below the key and adapted to take into notches of the same to wedge the parts tightly together.

14. The combination with upholstery-springs, of supporting-wires having corrugations, the corrugations in the wires being adapted to receive the strands of the springs at their lower ends, and an independent insertible key having notched edges to receive the wire and strands.

15. The combination with upholstery-springs, of supporting-wires having corrugations to allow the disposition of the springs to be varied, the corrugations forming receptacles for the strands at the ends of the springs, and an independent insertible key having notched edges.

16. The combination of supporting-wires having corrugations, of springs having seats formed of parallel strands, and an independent insertible key rectangular in cross-section and having notches in its edges to receive the wires and seats.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN A. STAPLES.

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JAMES J. FLANAGAN.