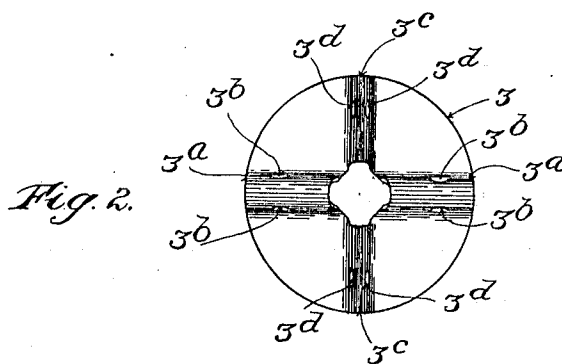
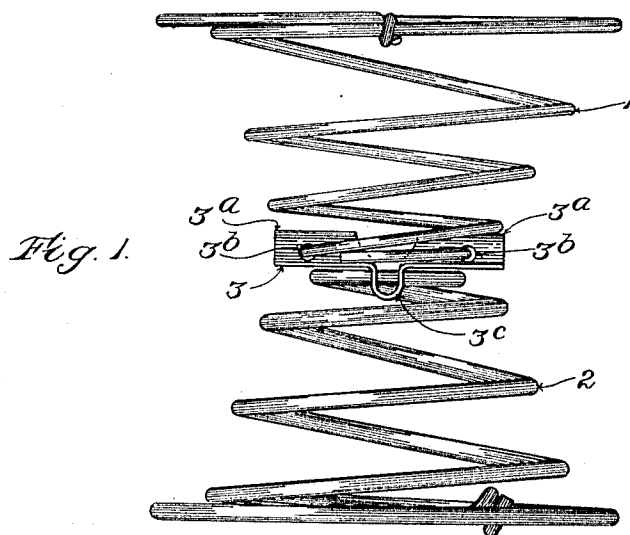


W. W. HAWKES.
 SPRING.
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1,020,350.

Patented Mar. 12, 1912.



Witnesses:
 Oscar F. Hill
 Edith A. Freeman.

Inventor:
 William W. Hawkes
 by *Chas. F. Randall*
 Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM W. HAWKES, OF AMESBURY, MASSACHUSETTS, ASSIGNOR TO THE CHARLES WING COMPANY, OF AMESBURY, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SPRING.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM W. HAWKES, a citizen of the United States, residing at Amesbury, in the county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Springs, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to springs of the class, used to a considerable extent in the manufacture of cushions, mattresses, and the like, comprising in the construction of a spring a top member of wire in the form of a helical coil, a bottom member of similar form, and means for securing such members together in working relations with respect to each other.

The invention consists in a spring of the said class, characterized by a novel coupling device which is interposed between and engages with the proximate portions of the two spring members, uniting the said members together, end to end. Briefly stated, the said coupling device consists of a sheet-metal plate having pressed therein upwardly-formed crimps located in line with each other, and also downwardly-formed crimps located at opposite sides of said opening in line diametrically of the plate but at right angles with respect to the first pair of crimps. The respective crimps, therefore, are a quadrant's distance apart. Transverse holes made through the opposite side-walls of each crimp and registering with each other receive the inner ends of the wires of the respective coil-members, that of the wire composing the upper coil-member occupying the holes of both of the upwardly-formed crimps, and the free extremity thereof being bent so as to prevent accidental retraction, and that of the wire composing the lower coil-member occupying the holes of both of the downwardly-formed crimps, and its free extremity being bent to prevent retraction.

An embodiment of the invention is shown in the drawings, in which latter,—

Figure 1 is an elevation of a spring containing such embodiment. Fig. 2 is a plan view of the coupling device, shown separately.

Having reference to the drawings,—the two coil-members of which the spring is composed are marked 1 and 2, respectively, and 3 is the coupling. The coil-mem-

bers are shown of usual tapering form, with their small ends together and united by means of the coupling. The two coil-members also are represented as composed, respectively, of wire of different gages, that of the upper member being smaller than that of the lower member in order thereby to produce a spring having a soft top and a stiff bottom, as termed in the trade. The invention is particularly serviceable in the construction of a spring of the latter description, but is not limited in its application to such a spring. Nor it is essential that the spring members 1 and 2 should be of the tapering form shown, although such form will usually be adopted in practice in order that the spring in its entirety may have the customary approved hour-glass shape which is shown in the drawings.

Having reference to the coupling 3, the upwardly-formed crimps are designated 3^a, 3^a, and the holes which are made in the opposite side-walls of such crimps are marked 3^b, 3^b, the two holes in the opposite side-walls of each crimp registering with each other, as previously referred to, in order that the free extremity of the wire composing the top spring member 1 may pass readily through the said holes in threading the said extremity therethrough, in combining such spring member with the coupling in the manner shown in Fig. 1. The downwardly-formed crimps are designated 3^c, 3^c, and the holes which are formed in the opposite side-walls of each of such crimps are marked 3^d, 3^d.

As shown clearly in Fig. 2, the two upwardly-formed crimps 3^a, 3^a, are in line with each other diametrically of the plate of which the coupling is formed, at opposite sides of the center of the said plate, and the two downwardly-formed crimps 3^c, 3^c, are in like manner in line with each other diametrically of the plate at opposite sides of the said center. This arrangement of the crimps is preferred in practice, inasmuch as it simplifies the construction of the dies employed in making the coupling, and facilitates the manufacture of the coupling. By reason of the disposition of the two pairs of crimps in lines at right angles to each other, four equi-distant symmetrically-disposed points of attachment and support are provided. Thereby a more evenly balanced support of the coupling upon the upper

portion of the lower spring-member is secured, and a more evenly balanced mounting of the upper spring member upon the coupling. Tendency of the upper portion of the spring to bend over and crush down sidewise is eliminated.

I prefer to form the crimps 3^a, 3^a, and 3^b, 3^b, by simply bending the plate upon itself on the respective lines of such crimps. To render this practicable I cut away the central portion of the plate prior to the bending, thereby producing a central opening as shown in Fig. 2. This opening is important in two respects. It will be obvious that if the central portion of the plate were not removed it would be difficult to produce an upward bend or crimp across the plate in one direction and a downward bend across the plate in a different direction so that the two bends would cross each other at right angles. Again, the formation of the crimps 3^b, 3^b, reduces the plate in diameter in one direction, while the formation of the crimps 3^b, 3^b, reduced the plate in diameter in a direction at right angles to the first. To enable the plate to contract in the two directions at right angles to each other, I remove the central portion of the plate, prior to the bending operations, by producing the central hole or opening aforesaid.

What is claimed as the invention is,—

1. In a spring, in combination, upper and lower coil-spring members, and the coupling device consisting of a sheet-metal plate having pressed therein opposite upwardly-formed crimps located in line oppo-

site each other, and also opposite downwardly-formed crimps in a line at right angles with respect to the first pair of crimps, each of such crimps having transverse holes through the opposite side-walls thereof registering with each other, a portion of the wire composing the upper coil-member occupying the holes of both of the upwardly-formed crimps, and a portion of the wire composing the lower coil-member occupying the holes of both of the downwardly-formed crimps.

2. In a spring, in combination, upper and lower coil-spring members, and the coupling device consisting of a sheet-metal plate having a central opening and having upwardly-formed crimps located in line at opposite sides of the opening, and also downwardly-formed crimps located in line at opposite sides of the opening and at right angles with respect to the first pair of crimps, each of such crimps having transverse holes through the opposite side-walls thereof registering with each other, a portion of the wire composing the upper coil-member occupying the holes of both of the upwardly-formed crimps, and a portion of the wire composing the lower coil-member occupying the holes of both of the downwardly-formed crimps.

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

WILLIAM W. HAWKES.

Witnesses:

CHAS. F. RANDALL,
NATHAN B. DAY.