

No. 647,498.

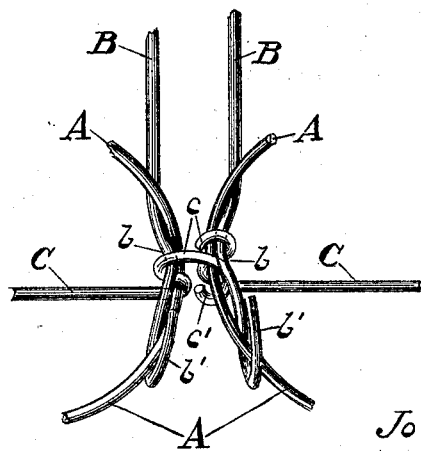
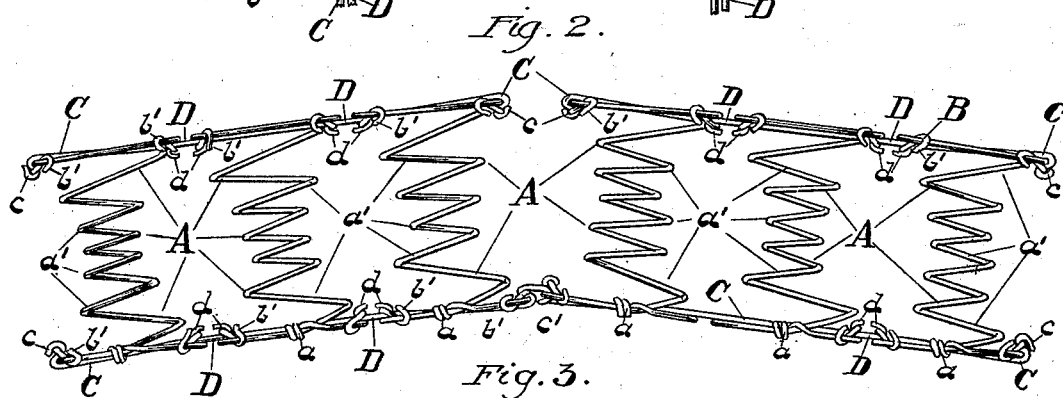
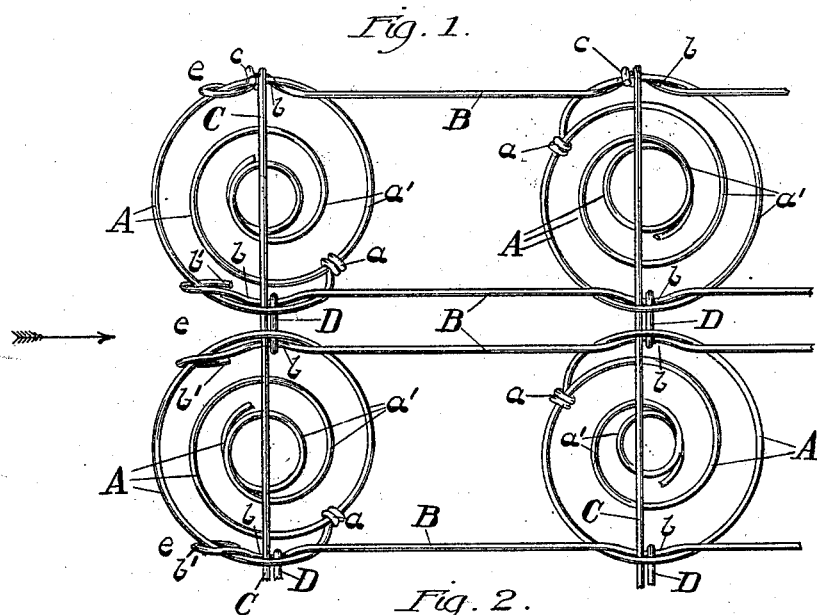
Patented Apr. 17, 1900.

J. E. JOHNSON.

FASTENING FOR SPRING STRUCTURES OF WIRE.

(Application filed Dec. 16, 1898.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN E. JOHNSON, OF ANDERSON, INDIANA.

## FASTENING FOR SPRING STRUCTURES OF WIRE.

SPECIFICATION forming part of Letters Patent No. 647,498, dated April 17, 1900.

Application filed December 16, 1898. Serial No. 699,484. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. JOHNSON, a citizen of the United States, residing in the city of Anderson, in the county of Madison and State of Indiana, have invented a new and useful Improvement in Fastenings for Spring Structures of Wire, of which the following is a specification.

My invention relates to improvements in fastenings for spring structures of wire; and the objects of my invention are to provide a spring structure built of coiled springs so fastened or tied together as that a substantially-smooth surface is provided, the springs are securely held relative to one another and cannot become displaced in use, and yet their elasticity is not impaired or in any way affected by the fastenings used. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a top view of a portion of a spring-mattress containing my invention, showing the method of finishing the edges and weaving the fastening-braces thereof. Fig. 2 is a side view looking in the direction of the arrow, Fig. 1, of the whole mattress partially turned upon its hinges. Fig. 3 is a top detail view of one of the hinges.

Similar letters refer to similar parts throughout the several views.

The springs A consist of double helical coils of wire. The extremities *a* of the wires *a* are attached to the end turns of said coils, thus forming closed coil-springs. The top and bottom of the mattress are the same in formation of weave and fastening of the braces. The tangential braces B extend across the top faces of the springs A, passing over the top of the upper coil, immediately inside of the outer turn thereof, where said tangential braces B have the downward offsets *b*. Said braces B terminate in the hooks *b'*, which engage the upper and outer turns of the springs A at the boundaries *c* of the mattress, and thus provide a finished edge thereto. The extremities of the hooks *b'* are turned downward to avoid the danger of being caught in bedding placed upon the mattress.

Passing diametrically across the ends of the springs A, under the top turns thereof, and over the offsets *b* in the tangential braces B

and at right angles to said braces B are the braces C, which are rectilinear, except at their extremities *c*. The extremity *c* of each of the diametrical braces C passes over the upper turn of the spring A, partially encircling it, then passes under the brace B at its offset *b*, and returns upon said brace B, inclosing it and securely fastening the several adjacent parts together. Said braces C are of sufficient strength to act as struts or exert a spreading tendency between the edges of the mattress where said braces C attach thereto and may be of any desired form of cross-section.

At the bottom of the mattress, where the springs A of two adjacent sections mutually approach, hinges are formed by the portions *c'* of braces C which extend beyond the springs A and tangential braces B, interweaving with them, as above described, and then forming hooks or loops which inclose the adjacent portions of springs A belonging to the other section of the mattress.

Parallel to the diametrical braces C are the ties D, which pass under the upper turns of the springs A and over the offset portions *b* of the braces B. Said ties D consist of straight pieces, preferably of round wire, bent at their extremities to form hooks *d d'*, inclosing the tangential braces B, which are thus held tightly against the outer turns of the coils A and create a tensional strain therein.

In case the springs A mutually approach, the ties D cannot come detached, as they are held in place upon the braces B by the superimposed turns of the springs A. It is thus seen that all of the braces employed are rectilinear, except at their extremities and except at the offsets *b* in braces B. This construction furnishes an extremely-simple method of weaving, and the braces can be easily and quickly attached.

By removing a tie D and withdrawing the diametrical brace C any spring may be removed, except such outside springs as are engaged by the hooks *b'*, in which latter instance it is necessary in addition to disengage said hooks *b'*. It will be observed that the springs A are held in their proper positions in one direction by the tension of the upper turns of said springs A. It will also be observed that the surfaces of the mattress are unusually

smooth, for in no part is there any projection beyond the end turns of the springs greater than a single diameter of a brace, and except at the extreme edges of the mattress the diametral braces C and the ties D are below the end turns of said springs A.

So far as I am aware no previous spring structures show so great simplicity of construction combined with so great advantages in regard to the positive fastening of the springs, the smoothness of the surfaces, the freedom from liability to catch in adjacent fabrics, and the facility for removing and renewing springs as does my device herein described.

What I claim as new, and desire to secure by Letters Patent, is—

In a structure consisting of closed coil-springs, the combination of rectilinear braces extending diametrically across said springs, contiguously to the under portion of the up-

per convolutions or rings thereof; substantially-straight transverse tangential braces passing over the upper coils of said springs and underneath said diametrical braces, said transverse braces being contiguous to the said upper coils at the inner portion thereof, and tie-pieces lying parallel with and adjacent to said diametrical braces and wholly under the upper convolutions or rings of said springs, said tie-pieces having hooked extremities, being rectilinear except at their said hooked extremities, and engaging pairs of said transverse braces lying adjacent but on different springs, thereby causing said transverse braces to exert a tensional strain on said springs.

JOHN E. JOHNSON.

Witnesses:

TOM BEDDAE,  
EUGENE COLLINS.