

No. 840,522.

PATENTED JAN. 8, 1907.

E. O. STOTTS.
SPRING STRUCTURE.
APPLICATION FILED MAR. 3, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

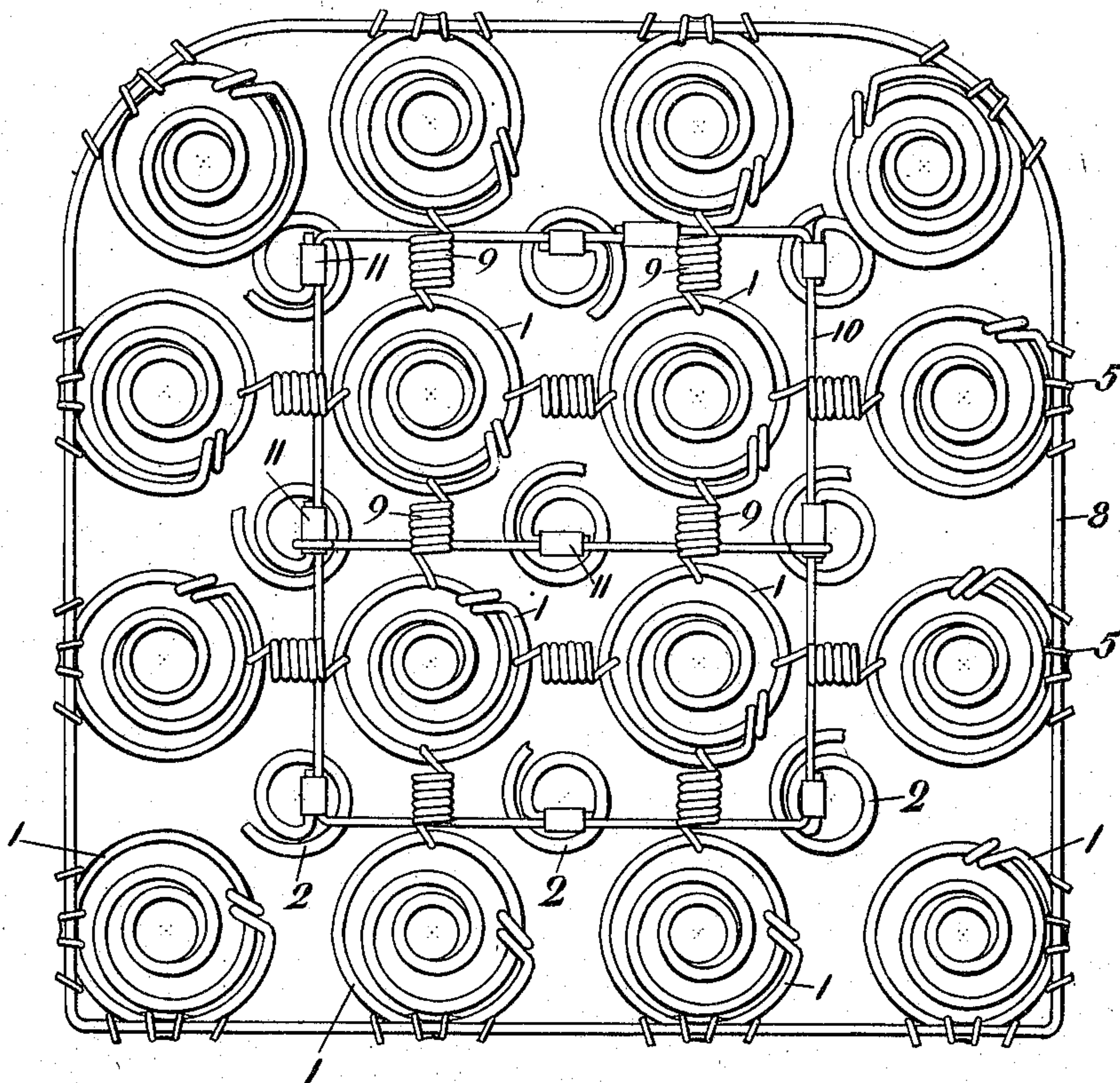
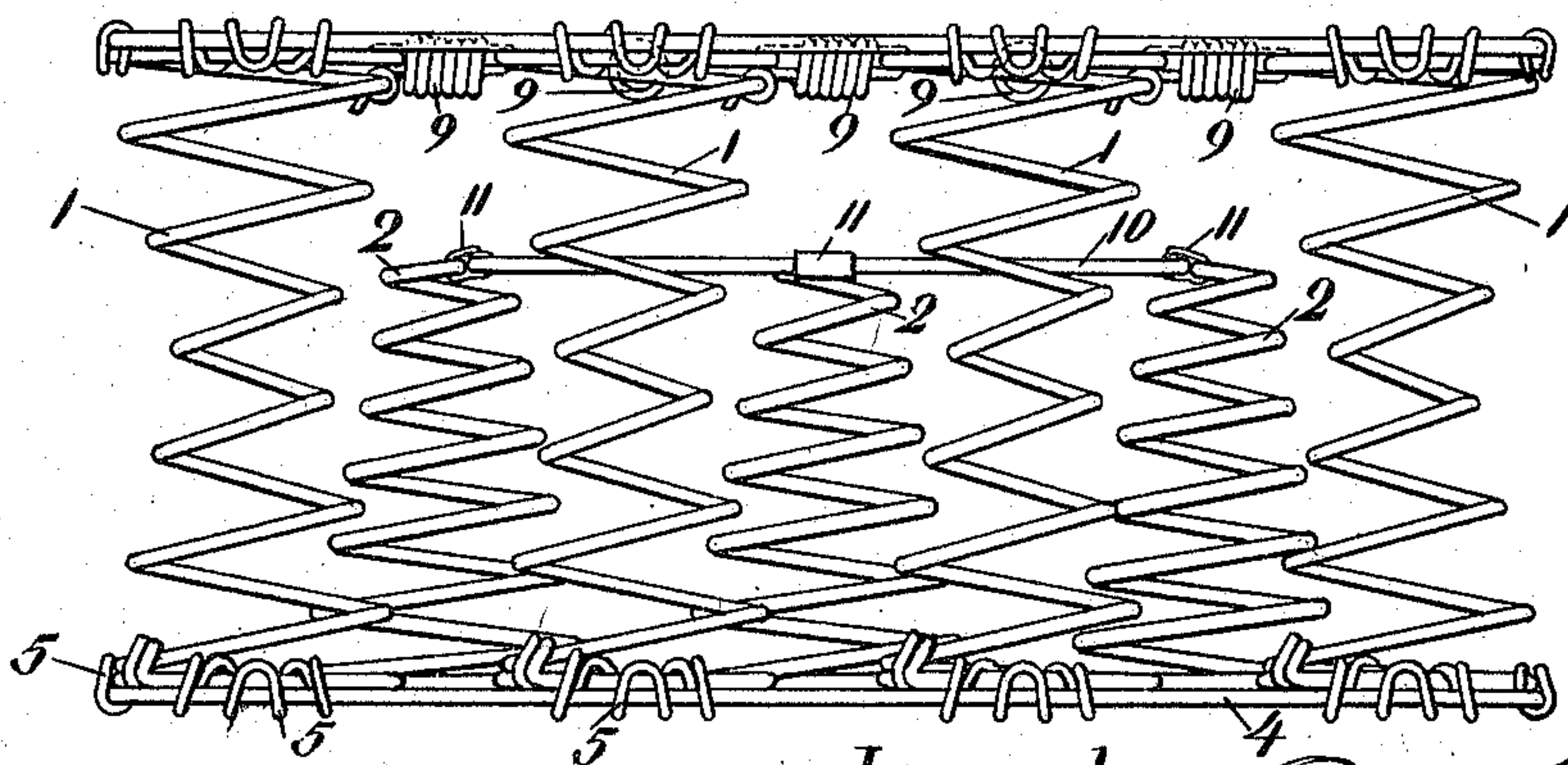


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 4.

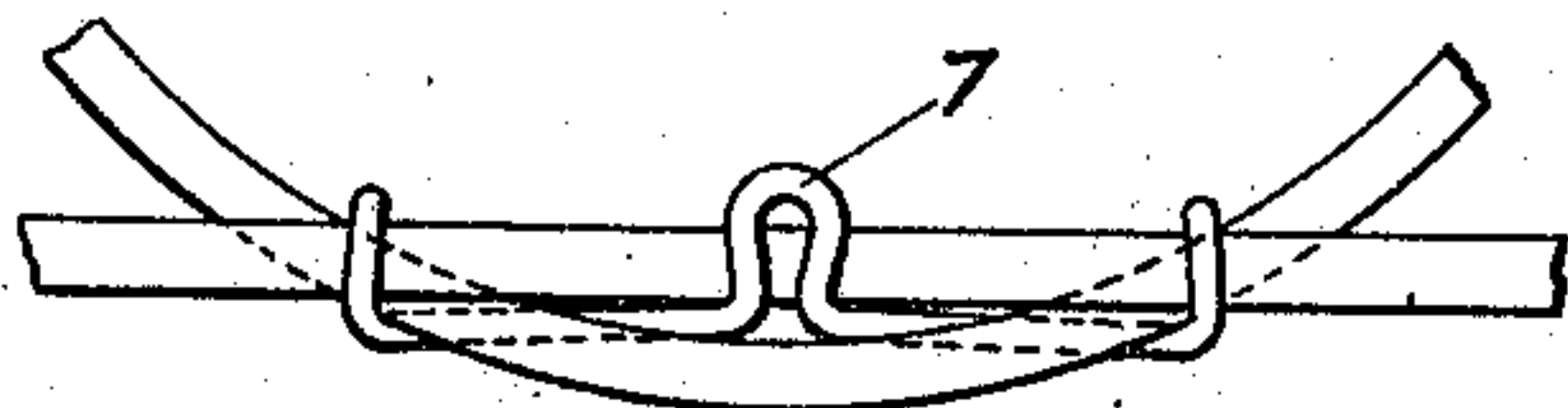


Fig. 5.

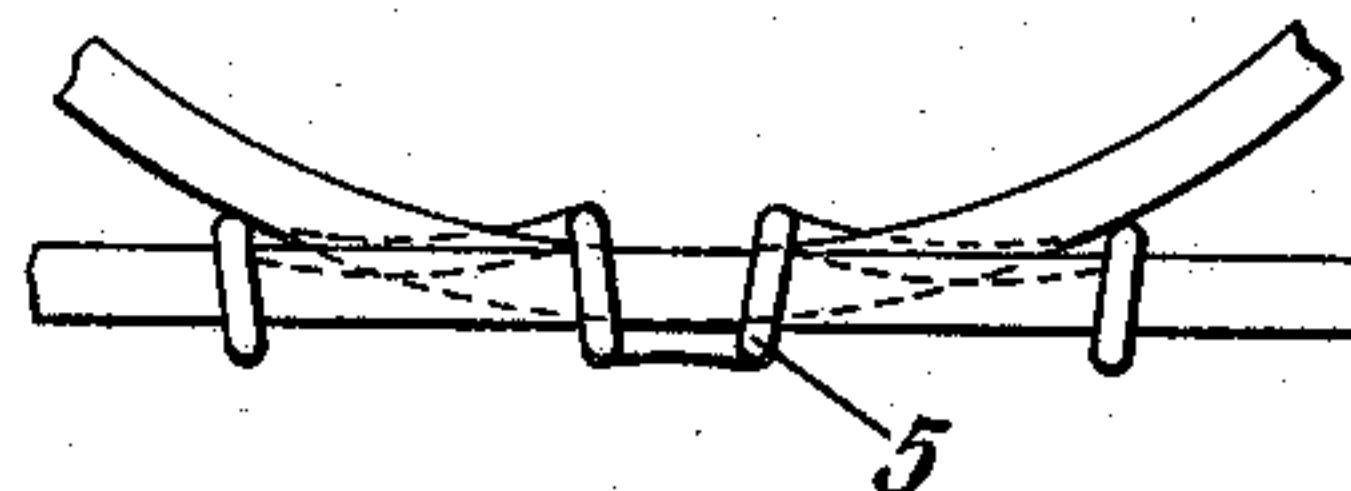
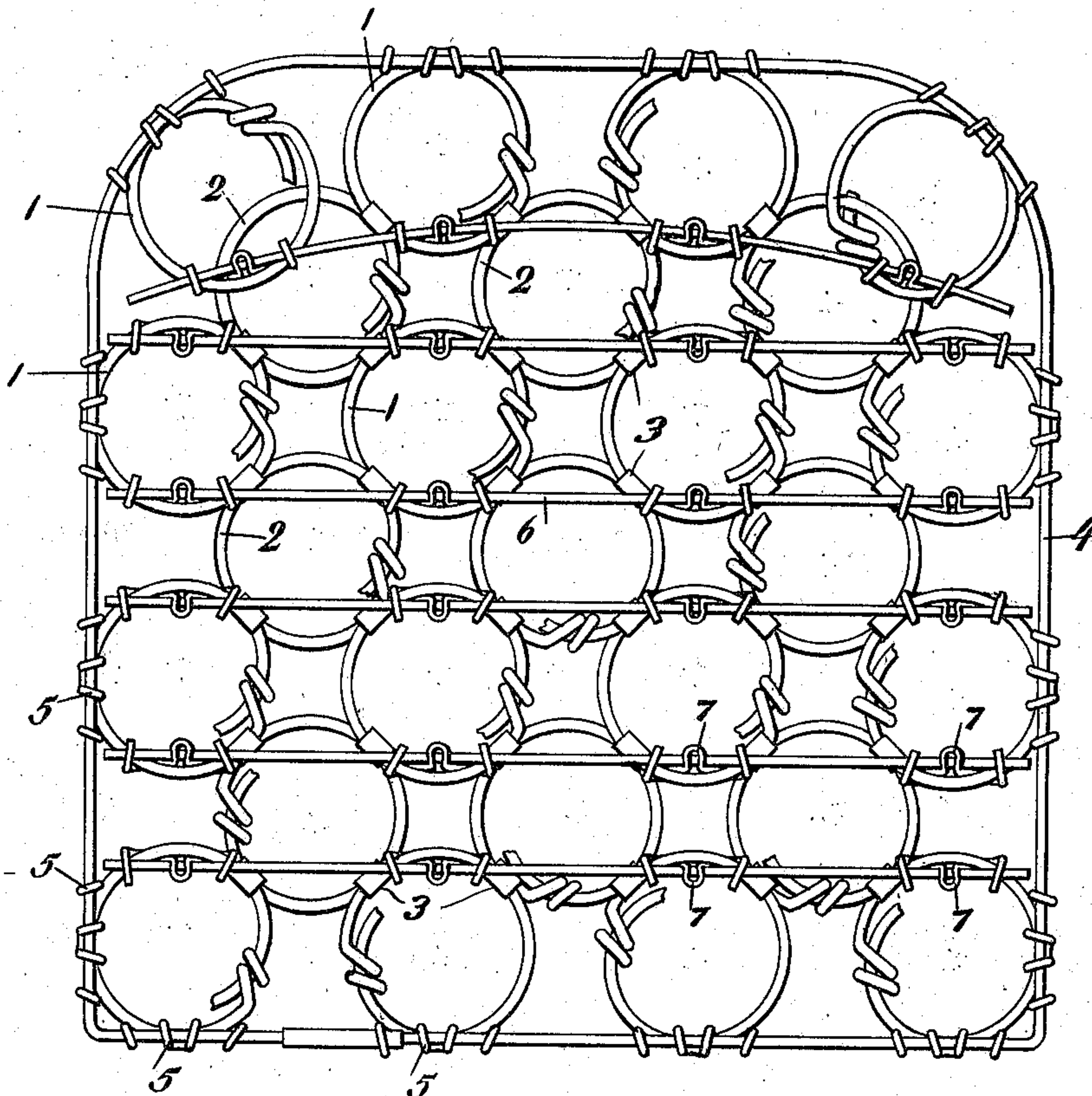


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD O. STOTTS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO VENTILATED CUSHION AND SPRING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION.

SPRING STRUCTURE.

No. 840,522.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed March 3, 1906. Serial No. 304,125.

To all whom it may concern:

Be it known that I, EDWARD O. STOTTS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring Structures, of which the following is a specification.

The main objects of this invention are to provide an improved spring structure particularly adapted for the cushions in seats of automobiles and other cars or carriages where the springs are likely to be subjected to sudden and violent jarring, to provide an improved arrangement for connecting together the component parts of such structure, and to provide a cushion structure in which the resistance of one set of springs is reinforced by a second set after the first set has yielded to a certain extent, thus adapting the device to use for persons of either heavy or light weight. These objects are accomplished by the device shown in the accompanying drawings, in which—

Figure 1 is a top plan of a cushion-spring constructed according to this invention. Fig. 2 is an end elevation of the same. Fig. 3 is a plan showing the structure of the bottom of the same, some of the parts which would appear in the background being omitted for the sake of clearness. Figs. 4 and 5 show a form of attaching-clip which is used for connecting adjacent wires of the structure, the two views showing different applications of the same clip.

In the construction shown in the drawings two sets of furniture-springs of respectively different height are used. The first set consists of long springs 1, spaced apart and arranged in intersecting rows and columns. The springs 2 of the second set are arranged in staggered relation with the springs 1 of the first set and occupy the spaces between adjacent springs of the first set. The end of the bottom convolution of each of said springs is twisted about the adjacent part of such convolution to form a substantially circular base for the spring to rest upon, and the bases of adjacent springs are fastened together by means of a wrapping 3, of sheet metal. The springs are so spaced that the base of each of the springs of the second set touches and is

secured to those of the four adjacent springs of the first set.

A border-frame 4, of wire, extends around the outside of the first set of springs 1 and is fastened to the base of each of the outer springs by means of a wire-clip 5. These clips are applied as shown in Fig. 5. The border-wire is arranged to lie directly under the adjacent part of the base of the spring, so as to give support to the same. A plurality of parallel cross-wires 6 extend along each of the rows of joints between the springs 1 and 2, so as to support both sets of springs. These cross-wires are fastened to each of the springs 1 by means of wire-clips 7. The clips 5 and 7 are substantially alike, but are applied in a slightly different manner, as will be seen from Figs. 4 and 5. It will be seen that the base convolutions of the springs, the base-frame 4, and the cross-wire 6, together with the fastenings of each to the other, form a rigid base for the cushion. This base is, however, all constructed of resilient wire and is therefore capable of yielding to a certain extent.

The tops of the outer springs 1 of the first set are connected together by a border-wire 8, similar to the border-wire 4 of the base and which is secured to the springs by clips 5 in a similar manner. The top convolution of each of the inner springs of the first set is connected to each of the adjacent springs of said first set by means of short helical springs 9, thus forming a connected yielding top for supporting the top of the cushion.

The tops of the shorter springs 2 are connected together by a wire frame 10, which in the present instance consists of a border-wire and one cross-wire. The top frame 10 of the set of short springs 2 is connected to the upper end of each spring of said set by means of a sheet-metal clip 11. The top frame 10 of the set of short springs 2 is considerably below the top of the set of long springs 1.

In operation, when used by a person of average weight, the springs 1 ordinarily support the weight upon the cushion; but in case of a jar, as when the vehicle passes over a rough road, the yielding of the springs 1 is at times sufficient to bring the weight of the passenger upon the short springs 2, which then assist the long springs in resisting the jar, thereby greatly relieving the springing of

the cushion and adding to the comfort of the passenger. When used by a heavy person, the weight is to a considerable extent supported by and distributed over the inner cushion formed by the connected structure of the shorter springs. The longer springs, which aid in such support, also provide an upper part of the cushion suitable for comfortably supporting a person of light weight without bringing into use the stiffer structure of the short springs.

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

1. In a spring-cushion, the combination of a plurality of spiral springs arranged in a plurality of rows, a second set of spiral springs of less height than those of the first set, and located in the spaces between the springs of the first set, the bottom convolutions of the springs of the first set being in contact with and secured to the bottom convolutions of adjacent springs of the second set, and coöperating to form a wire-network base.
2. In a spring-cushion, the combination of a plurality of spiral springs arranged in a plurality of rows, a second set of spiral springs of less height than those of the first set, and located in the spaces between the springs of the first set, the bottom convolutions of the springs of the first set being in contact with and secured to the bottom convolutions of adjacent springs of the second set, and a plurality of braces extending along said rows and fastened to said bottom convolutions to form a supporting-base for said springs.
3. A spring-cushion comprising a bottom frame, a set of springs mounted thereon, a top yieldingly supported by said springs, a second set of springs mounted on the bottom frame and being shorter than the first set, and a third frame of stiff material connecting said second set and being movable relatively of the other frames, said springs and frames being so disposed as to permit the top to be depressed a considerable distance without resistance by said second set and to cause such resistance when said top is further depressed.
4. In a spring-cushion, the combination of a wire bottom frame, a set of spiral metal springs mounted on said frame, a second set of springs shorter than the first and mounted on said bottom frame in staggered relation to the springs in the first set, a wire border-frame connecting the tops of the outer springs of the first set, a plurality of helical springs extending transversely between the tops of adjacent springs in the first set, and a wire frame connecting the tops of the springs in the second set and bracing each from the others, the springs in the second set being considerably shorter than those of the first set and the top frame of the springs in the second set being disposed below and in parallel relation to the tops of the springs of the first set.

5. In a spring-cushion, the combination of a plurality of spiral furniture-springs having substantially circular bases and being arranged in a plurality of rows, and alternate springs being of less height than the others, the bottom coils of the springs in each row being in contact with each other and with those in the adjacent rows, clips connecting the bottom coil of each spring with those of the adjacent springs, and a plurality of braces extending along said rows and fastened to said coils to form a supporting-base frame for said springs.

6. The combination of a set of spiral furniture-springs, spaced apart and arranged in rows, a second set of furniture-springs of less height than those of the first set, and located in the spaces between the springs of said first set, the bottom convolution of each of said springs being rigidly fastened to the bottom convolution of each of the adjacent springs of the other set, and a system of wire bracing extending across said bottom convolutions secured thereto and coöperating therewith to form a stiff supporting-base of wire network.

7. The combination of a set of spiral furniture-springs spaced apart and arranged in rows and columns, a second set of furniture-springs of less height than those of the first set, arranged in staggered relation therewith, and located in the spaces between the springs of said first set, the bottom convolution of each of said springs being rigidly fastened to the bottom convolution of each of the adjacent springs of the other set, a system of wire bracing extending across said bottom convolutions and secured thereto to form a supporting-base for the structure, and a stiff frame of wire connecting the tops of the springs in said second set and adapted to engage and support the top on said first set when the springs in said first set have been compressed.

8. In a spring-cushion, the combination of a wire bottom frame, a set of furniture-springs mounted on said frame, being spaced apart and arranged in intersecting rows and columns, a second set of springs shorter than the first and mounted on said bottom in staggered relation to the springs in said first set, a wire border-frame connecting the tops of the outer springs of said first set, a plurality of helical springs extending transversely between the tops of adjacent springs in said first set, and a wire frame connecting the tops of the springs in said second set and bracing each from the others, the springs in said second set being considerably shorter than those of the first set and the top frame of the springs in said second set being disposed below and in parallel relation to the tops of the springs of the first set.

9. In a spring-cushion, the combination of a plurality of spiral springs arranged in a plu-

ality of rows, a second set of spiral springs of less height than those of the first set, and located in the spaces between the springs of the first set, the springs of said second set being of frusto-conical shape with their bases downward and secured to and in contact with the bottom convolutions of adjacent springs of the second set, and cooperating to form a wire-network base.

10 10. In a spring-cushion, the combination of a plurality of spiral springs, a top frame yieldingly supported thereby, a plurality of spiral springs of less height than those of the first set, and each having its bottom convolution extending into the space bounded by the periphery of the bottom convolution of one of the springs of the first set, the bottom convolutions of both sets being secured together and cooperating to form a wire-network base, 15 said springs and top being so disposed as to permit the top to be depressed a considerable distance without resistance by the second set and to cause such resistance when said top is further depressed.

25 11. A spring-cushion comprising a bottom frame, a set of springs mounted thereon, a top yieldingly supported by said springs, a second set of springs mounted on the bot-

tom frame and being shorter than the first set, and a frame mounted on the upper ends 30 of said second set and located below and free from said top, and being free from any restraining connection with the bottom frame except through its connection with said short springs.

12. A spring-cushion comprising a bottom frame, a set of springs mounted thereon, a top yieldingly supported by said springs, a second set of springs mounted on the bottom frame and being shorter than the first set, 35 and an intermediate frame of stiff material connecting the upper ends of said second set, said springs and frames being so disposed as to permit the upper frame to be depressed a considerable distance without resistance by 40 said second set and to cause such resistance through contact between said upper and intermediate frames when said upper frame is further depressed.

Signed at Chicago this 17th day of February, 1906. 50

EDW. O. STOTTS.

Witnesses:

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P. W. HOOD.