

F. KARR.
SPRING MATTRESS.
APPLICATION FILED MAY 17, 1919.

1,337,320.

Patented Apr. 20, 1920.
2 SHEETS—SHEET 1.

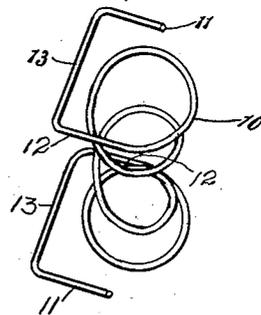
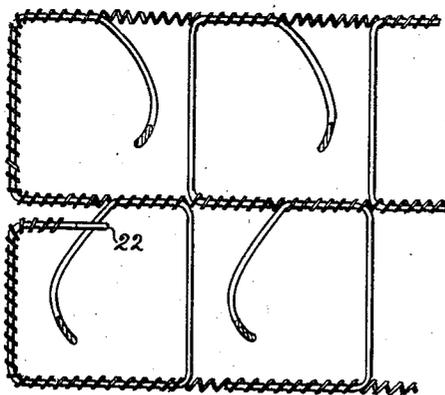
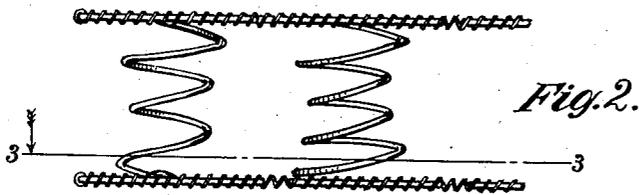
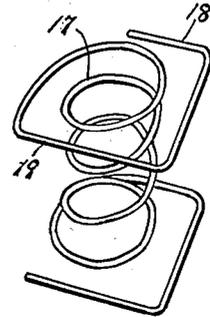
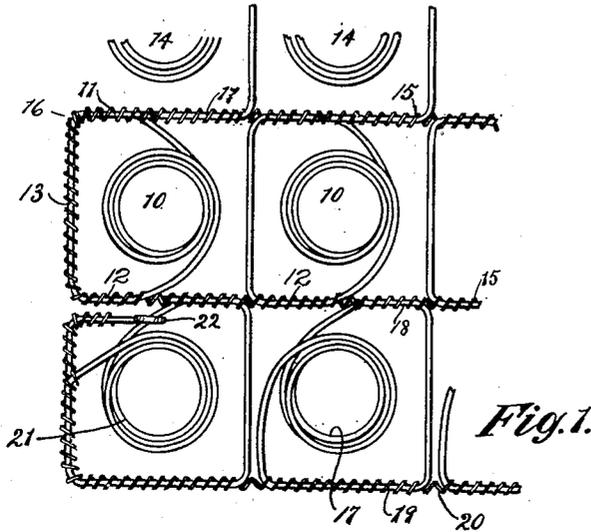


Fig. 3.

Fig. 5.

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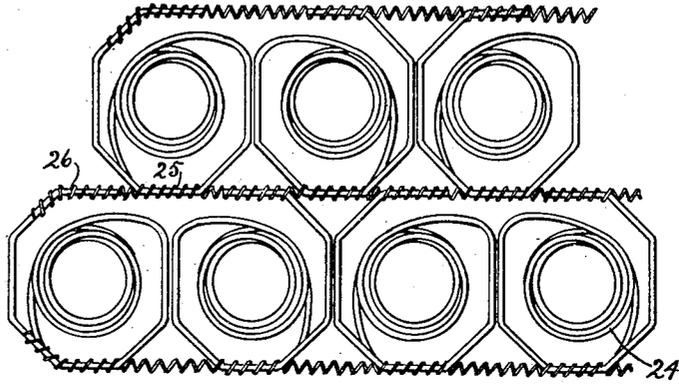


Fig. 6.

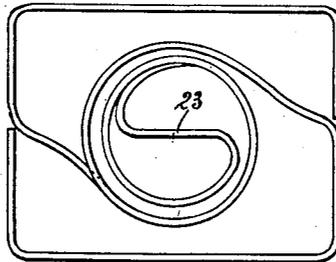


Fig. 7.

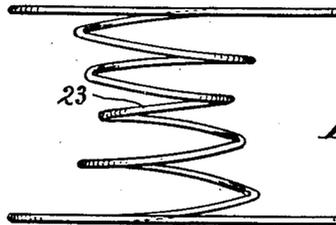


Fig. 8.

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UNITED STATES PATENT OFFICE.

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SPRING-MATRESS.

1,337,320.

Specification of Letters Patent.

Patented Apr. 20, 1920.

Application filed May 17, 1919. Serial No. 297,862.

To all whom it may concern:

Be it known that I, FRANCIS KARR, a citizen of the United States, and resident of Holland, county of Ottawa, State of Michigan, have invented certain new and useful improvements in Spring-Matresses, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to mattresses formed of a plurality of vertical helical springs.

Its object is to provide a mattress simple and inexpensive of manufacture, durable, convenient of transportation, comfortable to the user, and substantially noiseless.

The invention consists of a structure such as hereinafter described and as illustrated in the accompanying drawings, in which—

Figure 1 is a detail plan view of the mattress;

Fig. 2 is a detail side elevation;

Fig. 3 is a detail section on the line 3—3 of Fig. 2;

Figs. 4 and 5 are views in perspective of two slightly differing forms of helicals;

Fig. 6 is a detail plan view of the mattress showing a modified form of construction;

Fig. 7 is a view in perspective of one of the helicals of a modified form; and

Fig. 8 is an elevation of the helical of Fig. 7.

The mattress is formed of a plurality of helicals each having its terminal convolutions wrought into polygonal form, or at least into the form of a portion of polygon and having a pair of straight and parallel portions. The helicals are arranged in rows, with straight portions of contiguous helicals of adjacent rows in alinement and inclosed in a spiral binding coil. Inasmuch as the portions of the helicals inclosed within the binder coil are alined, as distinguished from the known practice of placing them side by side, a small coil may be used and ridges in the mattress surface avoided. The ends of the wire of which the coils are formed are inclosed within the binder coil, thereby avoiding the presence of objectionable prongs or spurs incident to the usual practice of looping these ends over an adjacent coil of the helical.

In the preferred form of construction illustrated in Figs. 1 to 5, the terminal convolutions of the helicals, as 10, are formed as portions of a square figure having two

parallel sides 11, 12, which are approximately but one-half the length of the side of the figure, and a third portion 13 uniting such short sides.

The helicals, in the preferred form of construction, are arranged in straight longitudinal and transverse rows with their shorter sides lengthwise of the mattress. The helicals, as 10, 14, of adjacent longitudinal rows nest together, with their shorter sides 11, 12, in alinement. The coils 14 are coils 10 turned about the axis of the helical, one-half of one revolution. A spiral binding coil 15, which preferably extends throughout the entire length of the mattress, incloses the alined sides, and adjacent coils may be prolonged and continued across the member 13 of end helicals and intertwined, as indicated at 16, for the purpose of avoiding loose and protruding ends.

The helicals thus far described are employed in the intermediate longitudinal rows of the mattress. The helicals, as 17, of the marginal rows differ slightly from the helicals 10 in that their terminal convolutions have but one relatively short side 18, which is adapted to mate with one of the short sides of the adjacent helical of the next longitudinal row. Inasmuch as the side 19 parallel to the side 18 lies along the margin of the mattress, it is preferably of full length in order that no substantial portion of the spiral binder coil 20 uniting the various helicals of the outer row may be without support. The corner helical 21 has its terminal convolutions slightly modified from the construction heretofore described, particularly in that one of their ends may be looped over the adjacent convolution, as shown at 22.

By the construction described several advantages are secured. The helicals may be placed close together, leaving comparatively small open spaces, and hence giving a substantially continuous support for the entire face of the upper mattress. This close spacing of the various helicals is made possible in part by the interfitting of their adjacent sides, due to the alining of the short side sections which are secured together, and by the open side of the geometrical figure into which the terminal convolutions are formed.

The placing of side members of adjacent helicals side by side and in close contact is avoided, thereby eliminating much of the

noise due to such parts striking or rubbing together as the mattress is flexed in service. The uniting of the adjacent helicals by means of a small spiral coil inclosing straight parallel portions thereof not only contributes to simplicity of manufacture and compactness of structure, but it provides for a pivotal action of the helicals, in effect adjacent helicals being hinged together on a common center. This pivotal relation not only contributes to the flexibility of the mattress in service, but permits it to be rolled to cylindrical form for transportation, either in shipment or about the house.

In the construction thus far described the helicals of adjacent longitudinal rows are reversely coiled. In practice compressive action in a loosely coiled helical, such as are used in mattresses, results in its distortion in that there is a tendency of the helical to compress unequally at different sides, in consequence of which its axis is thrown out of the vertical. By the coiling of the helicals of adjacent rows oppositely this tendency is obviated, that of the helicals of one row counteracting that of the helicals of the adjacent row.

In the modified form of construction illustrated in Fig. 7, this tendency to lateral distortion is provided against in each helical, the two end portions being reversely coiled from the middle portion 23. This form of helical, coupled with the arrangement by which the various helicals are united as described, produces a most satisfactory mattress.

While the reverse coiling of helicals of adjacent rows, or of the two end portions of each helical, is greatly to be preferred, the construction of the terminal convolutions and the manner of assembling and binding the helicals together, as described, are of advantage even though this expedient of preventing lateral distortion may not be associated therewith.

The square configuration of the final convolutions of the various helicals and the arrangement of the helicals in straight longitudinal and transverse rows, perpendicular each to the other, are, so far as I am now advised, the most desirable form and arrangement, but other forms and arrangements may be employed without departing from the scope of the invention.

For example, in Fig. 6 I have shown the helicals 24 as having their terminal convolutions wrought to the form of portions of octagons, adjacent helicals of transverse rows being somewhat offset from the axis of the row. The contiguous sides 25, 26, of adjacent helicals of the transverse rows are, nevertheless, alined and inclosed by a spiral

binding coil, thus securing the pivotal action hereinbefore referred to and avoiding the close contact of parallel sides while securing a substantially continuous surface and the avoidance of open areas of any substantial size between the helicals.

While preferably the extreme end of the terminal convolution of each helical is inclosed within the binder coil, as shown, it may be desirable, in some instances, to extend it beyond the inclosed portion, bending it inwardly and backwardly upon itself and terminating it below the body portion of this convolution. By this arrangement such loop will serve as a support for the upper mattress.

I claim as my invention—

1. In a mattress, in combination, a plurality of vertical helical springs arranged in transverse rows, each helical having an enlarged convolution made up of straight portions and included angles, adjacent helicals in each row having straight portions of contiguous enlarged convolutions in alinement, and binding spirals fitting on such alined straight portions.

2. In a mattress, in combination, a plurality of vertical helical springs arranged in longitudinal and transverse rows, adjacent helicals of the transverse rows having alined straight portions, and binding spirals crossing a plurality of transverse rows and inclosing the alined portions of the helicals of the several rows.

3. In a mattress, in combination, a plurality of vertical helicals arranged in transverse rows, each helical having its terminal convolutions formed into parallel straight portions, a straight portion of adjacent helicals of each row being alined, and spiral binder coils inclosing the alined portions of both terminals of the helicals.

4. In a mattress, in combination, a plurality of vertical helical springs arranged in longitudinal rows, the terminal convolutions of contiguous helicals of adjacent rows being intersected by a common transverse vertical plane and having alined straight portions, and binding spirals inclosing such alined portions of helicals of adjacent rows.

5. In a mattress, in combination, a plurality of vertical helical springs, such springs having their terminal convolutions expanded and given the form of portions of a polygon having parallel sides, two of such parallel sides being shorter than the side of the figure, such springs being assembled in juxtaposition with short sides of adjacent springs mating in alinement, and a spiral binding coil inclosing such mating sides.

FRANCIS KARR.