Dec. 22, 1931. G. I. NEWMAN ET AL 1,837,328

SPRING CONSTRUCTION

Filed March 12, 1928 2 Sheets-Sheet 1

Fig. 1

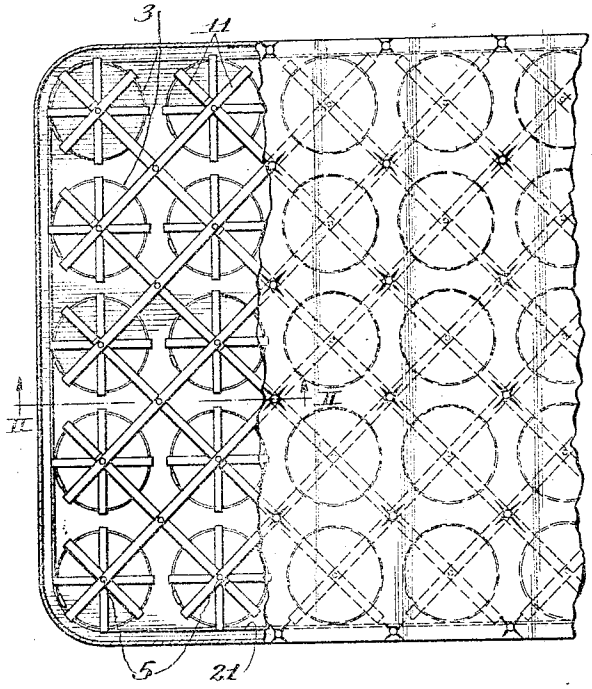


Fig. 2

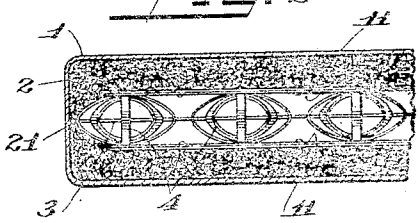


Fig. 3

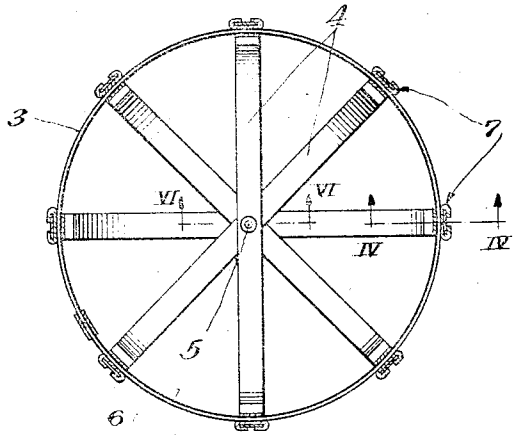
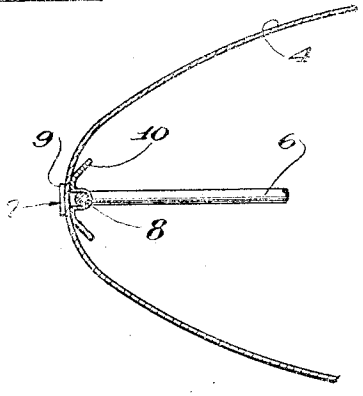


Fig. 4



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SPRING CONSTRUCTION

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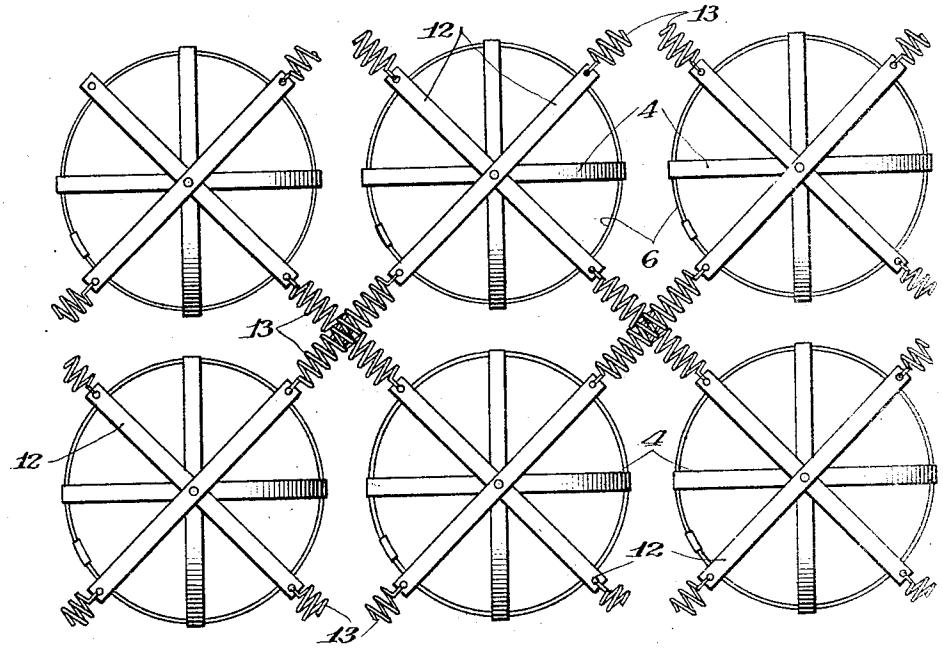


Fig. 8

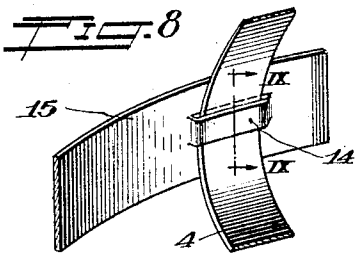


Fig. 7

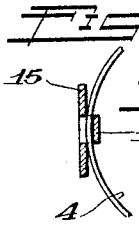


Fig. 9

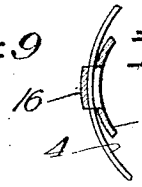


Fig. 11

Fig. 10

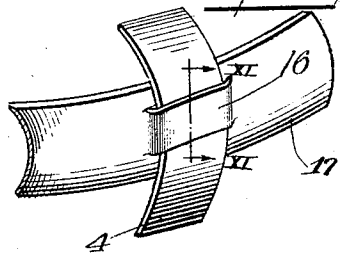


Fig. 5

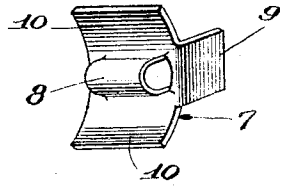


Fig. 12

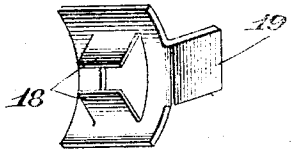




Fig. 6

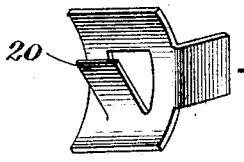


Fig. 13

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1,837,828

UNITED STATES PATENT OFFICE

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SPRING CONSTRUCTION

Application filed March 12, 1928. Serial No. 260,927.

This invention relates to mattress and upholstery springs, more particularly of the type in which the spring units are of a general oblate spheroidal form. It has been proposed to construct spring units of this shape from a series of elliptical wires or clock spring steel springs symmetrically arranged about a central axis and provided with a restraining ring secured to the peripheral portions of such wires or strips so that downward pressure on such units cannot extend such peripheral portions laterally. This construction gives the unit resilience over substantially its whole area. When, however, the various units are arranged in rows to form a complete mattress there are spaces between the units where there is no support for the ticking and filler. Usually the units are arranged at each corner of a square so that even if the units contact at their peripheries, there is a space at the center of the square.

The principal object, therefore, of the present invention is to provide support for the ticking and filler at the points furthest from the centers of the spring units.

A further object of the present invention is to provide improved means for connecting together the spring units to each other.

Other and further important objects of this invention will be apparent from the disclosures in the accompanying drawings and the following specification.

The invention (in a preferred form) is illustrated on the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a plan view of a mattress with parts cut away, constructed in accordance with the present invention.

Figure 2 is a section on the line II—II of Figure 1.

Figure 3 is a horizontal central section through one of the spring units.

Figure 4 is a section on the line IV—IV of Figure 3.

Figure 5 is a perspective view of the connector between the elliptical spring strips and the peripheral wire.

Figure 6 is a section on the line VI—VI of Figure 3.

Figure 7 is a plan view illustrating a modified method of connecting the spring units.

Figure 8 is a perspective view of a modified form of peripheral retaining ring for the spring units.

Figure 9 is a section on the line IX—IX of Figure 8.

Figure 10 is a perspective view of a further modified form of peripheral retaining ring.

Figure 11 is a section on the line XI—XI of Figure 10.

Figures 12 and 13 are perspective views of alternative forms of connectors for clamping the elliptical spring strips to a peripheral retaining strip.

As shown on the drawings:

The mattress comprises layers of ticking 1 and filler 2 with series of rows of spring units 3 arranged between the layers of ticking and filler.

The spring units are each formed of four strips of clock spring steel 4 bent into circular form so that their ends overlap. The overlapping ends of all the four strips are riveted together at 5 as are also the diametrically opposite portions of the strips where they cross each other. These clock spring circles are arranged at about 45° from each other so that they are symmetrically arranged with respect to the vertical axis of the unit passing through the upper and lower rivets.

The flattened or oblate spheroidal form is produced by spreading the spring circles laterally by means of a peripherally arranged wire ring 6 which is clamped to the strips 4 by connectors 7 (Figure 5). These connectors are stamped out of sheet metal and consist of a centrally located loop 8 through which the wire ring 6 passes, laterally extending wings 9 adapted to be bent around the margins of the adjacent spring strip 4, and upwardly and downwardly extending wings 10. The latter are curved inwardly somewhat and are provided for the purpose of preventing the spring strips 4 being bent beyond their elastic limit at their point of

greatest flexure, viz, where they contact with the peripheral wire 6.

The spring units are preferably arranged in equally spaced rows parallel both to the sides and also the ends of the mattress, as shown in Figure 1. Along the center line of each row, either longitudinally or transversely, the ticking and filler are reasonably well supported at all points. Along the diagonals at 45° to the edges of the mattress, there are, of necessity, spaces of considerable area where there is no adequate support for the ticking and filler.

For the purpose of transmitting pressure on the ticking and filler over such areas to the spring units, spring strips 11 are provided extending diagonally across the spring units in both directions and connected to the spring units by the rivets 5. These spring strips 11 extend over the units down around the outside unit and then under the units and the ends overlapped and riveted together. A wire 21 extends around the entire spring structure, this wire being connected to the peripheral portions of the outside spring units and to the strips 11 at the four corners of the mattress. With this construction, the spring strips serve a double purpose, first transmitting pressure on the ticking and filler to the springs, and second, maintaining the proper spaced relation between the various spring units.

In the form of construction shown in Figures 1 and 2, the diagonal members consist of single lengths of clock spring steel. This is not essential as short lengths of steel strip 12 connected by helical springs 13 may be used, as shown for example in Figure 7.

While in Figures 1 to 4 I have shown spring units with a wire retaining ring, a retaining ring of strip steel may be used as shown in Figures 8 to 13 inclusive. Using strip steel, the connection between the ring and the elliptical strips may be accomplished by forming a loop 14 on the inner face of the ring 15 of strip steel as shown in Figures 8 and 9 or preferably on the outer face, as shown at 16 on Figures 10 and 11. This latter construction is preferred since the ring 17 serves the same purpose as the wings 10 of the connector of Figure 5, viz; prevents the spring strips 4 being bent beyond their elastic limit at their point of greatest flexure.

Alternatively connectors such as those shown in Figures 12 and 13 may be employed. The first of these has inwardly extending wings 18 adapted to be folded over the steel strip ring while the wings 19 are bent around the adjacent elliptical steel strip. In the second form of connector, a single inwardly extending wing 20 is provided instead of two such parts, otherwise the construction and operation is the same.

We are aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and we therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

We claim as our invention:

1. A rectangular mattress comprising a plurality of oblate spheroidal spring units restrained at their periphery against lateral deflection, a continuous hoop connecting a plurality of such units into a row, a plurality of rows arranged in parallelism and another plurality of rows arranged in parallelism but at right angles to said first plurality of rows, the hoops of the several rows extending in one direction lying within the hoops of the several rows extending transversely thereof, said hoops being connected together at the points of junction away from the centers of adjacent spring units, and a loop about the rows so assembled attached to the peripheral spring units between the top and the bottom thereof to restrain spreading, the portion of the hoops bridging the space between adjacent spring units serving to support the mattress between the several spring units.

2. A rectangular mattress having, in combination, a plurality of spaced spring units, each of said units formed of a plurality of clock spring bands positioned at an angle to one another, a flanged member secured to each of the bands and provided with an aperture, the flanges forming stops to limit bending of the bands at points adjacent said members, a hoop in each spring unit passing through the apertures of the members therein, and resilient diagonally arranged spring metal members secured to the tops and bottoms of the spring units for supporting the mattress in the space between the various units.

3. A rectangular mattress having, in combination, a plurality of spaced spring units, each of said units formed of a plurality of clock spring bands positioned at an angle to one another, a flanged member secured to each of the bands and provided with an aperture, the flanges forming stops to limit bending of the bands at points adjacent said members, a hoop in each spring unit passing through the apertures of the members therein, and resilient diagonally arranged spring metal members secured to the tops of the spring units for supporting the mattress in the spaces between the various units and for normally holding said units in spaced relationship.

4. A rectangular mattress having, in combination, a plurality of spaced spring units, each of said units formed of a plurality of clock spring bands positioned at an angle to one another, a flanged member secured to each of the bands and provided with an aperture, the flanges forming stops to limit bend-

ing of the bands at points adjacent said members, a hoop in each spring unit passing through the apertures of the members therein, a peripheral member surrounding said units and secured directly to the outermost of said units, and diagonally arranged resilient members secured to the tops and bottoms of said spring units for supporting the mattress in the space between the various units.

In testimony whereof, we have hereunto subscribed our names.

LAWRENCE A. NEW.
GEORGE I. NEWMAN.