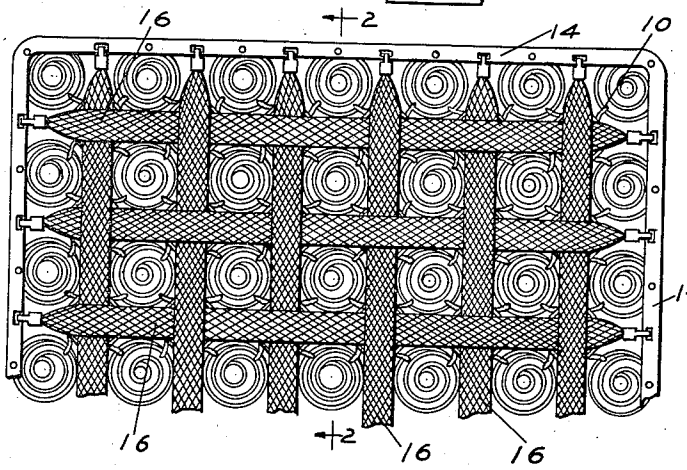
Nov. 30, 1937. L. H. HAMILTON 2,100,393

BEDSPRING

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Fig. 1



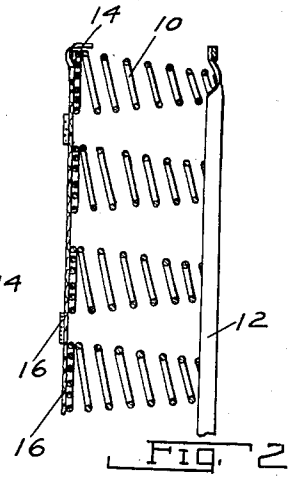


Fig. 2

Fig. 3

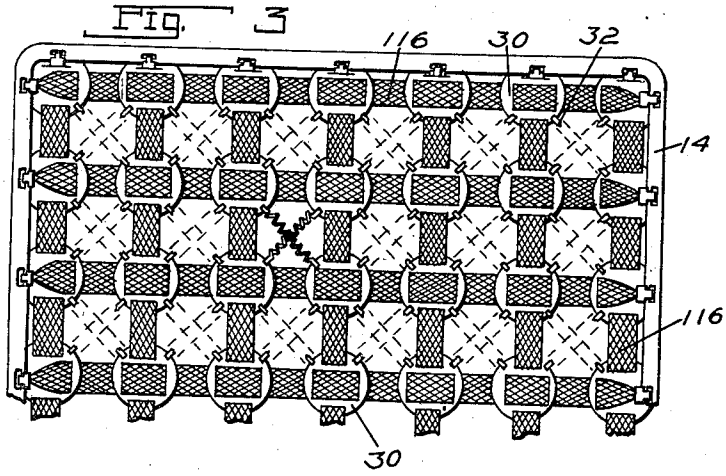
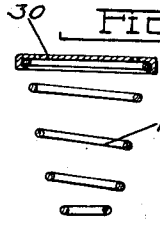


Fig. 4



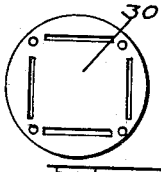


Fig. 5

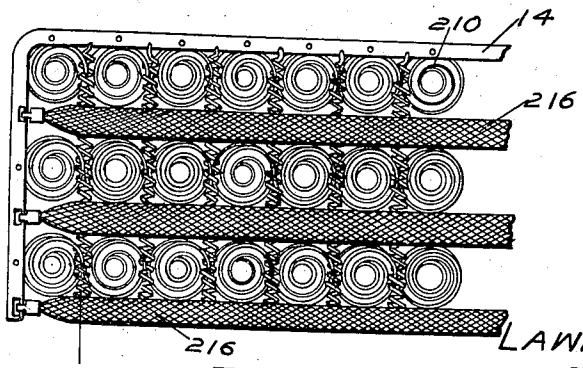


Fig. 6

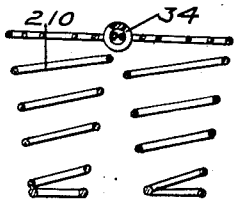


Fig. 7

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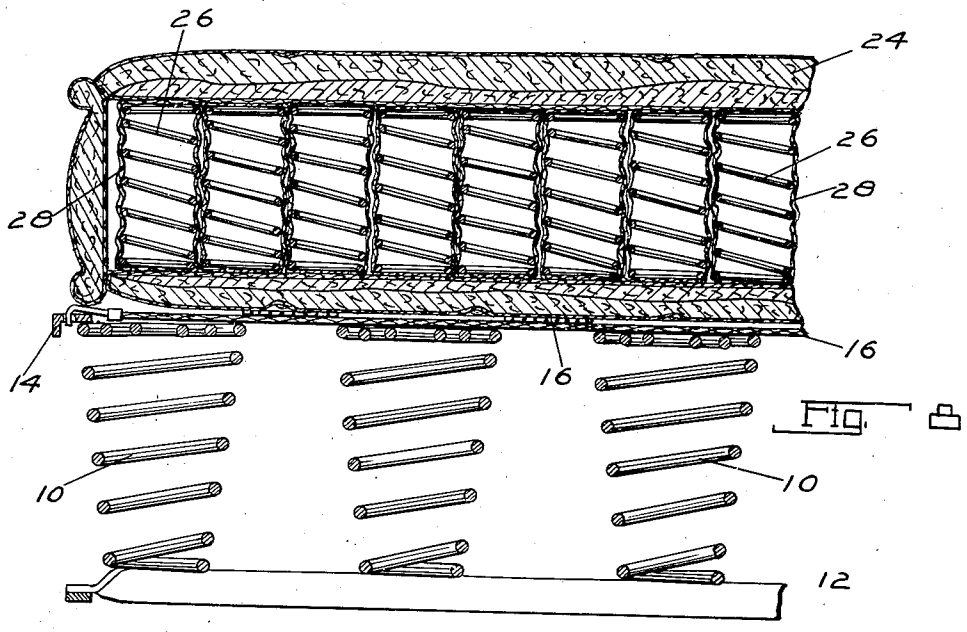


Fig. 8

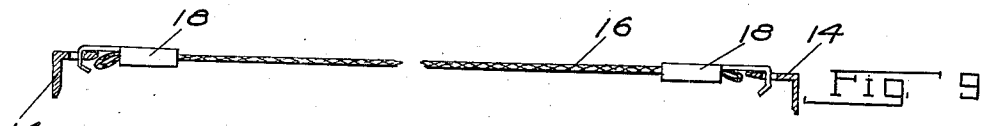


Fig. 9

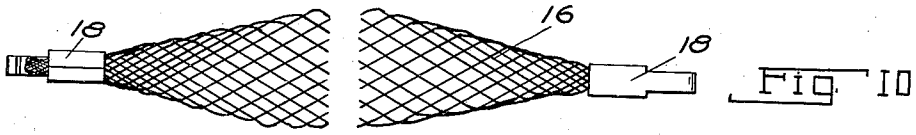


Fig. 10

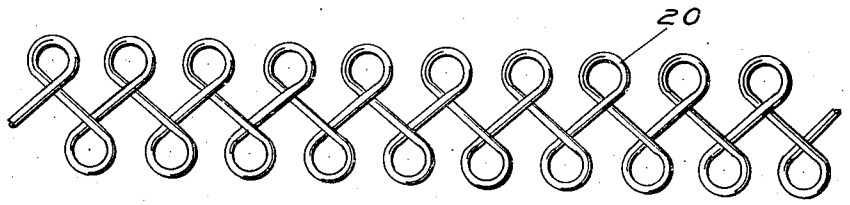


Fig. 11

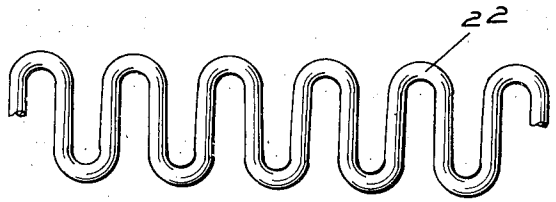


Fig. 12

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UNITED STATES PATENT OFFICE

2,100,393

BEDSPRING

Lawrence H. Hamilton, Niles, Mich., assignor to National Standard Company, Niles, Mich., a corporation of Michigan

Application March 9, 1936, Serial No. 67,833

1 Claim. (Cl. 5—230)

This invention relates to springs, and is illustrated as embodied in a novel bed spring or the like intended to support a mattress, and which is especially useful in supporting an "inner-spring" mattress which itself includes a set of coil springs.

One difficulty of supporting an inner-spring mattress is that the springs used therein are relatively small in diameter, and if the mattress is supported on a bed spring having relatively wide spaces in its surface (as for example between the upper ends of the coil springs) there is danger that the springs in the mattress may tend to be pushed down through the mattress into the underlying spaces. On the other hand, if a wire or other fabric is placed over the upper ends of the coil springs of the bed springs, the ability of the bed spring to adjust itself to and support individually different weights, or weights differently placed, is greatly diminished.

An object of the present invention is to provide a bed spring or the like having the greater part of its upper surface arranged yieldingly to support loads, with no spaces of substantial area in which the loads are unsupported, and without interfering with the individual action of the several coil springs. Various constructions for achieving this object are described below, which constructions include (associated with the usual rows of coil springs) yielding bands or tapes of wire arranged substantially in the plane of the upper ends of the coil springs.

I prefer to use, for these yielding bands, open-mesh spring wire braids, each comprising wires extending the full length of the braid and passed alternately over and under the other wires, and which are compressed at the bends along the edges of the braid beyond the elastic limit of the steel, to "set" the braid in a series of spring loops, whereby the entire braid becomes an elastic flat supporting band adapted to be tensioned between the sides of the usual frame surrounding the coil springs. However, some of the advantages of the invention can be attained with other forms of yielding bands.

The above-described yielding bands may be arranged between the rows of coil springs, or overlying the rows of coil springs, and preferably are somewhat softer than the coil springs so that the latter carry the major part of the load. These and other constructions, and various other objects and features of the invention, will be apparent from the following description of the illustrative embodiments shown in the accompanying drawings, in which:

Figure 1 is a top plan view of part of a bed spring embodying one form of the invention;

Figure 2 is a partial section therethrough on the line 2—2 of Figure 1;

Figure 3 is a top plan view of part of a bed spring embodying a second form of the invention;

Figure 4 is a section vertically through one of the coil springs in Figure 3;

Figure 5 is a top plan view of a supporting disk mounted on the upper end of the coil spring of Figure 3;

Figure 6 is a top plan view of part of a bed spring embodying a third form of the invention;

Figure 7 is a partial section showing two of the coil springs of Figure 6, with the means for tying them together;

Figure 8 is a partial vertical section, on an enlarged scale, through a spring of the form of Figure 1, with an inner-spring mattress supported thereon;

Figure 9 is a sectional view showing in side elevation one of the yielding wire braids;

Figure 10 is a top plan view thereof; and

Figures 11 and 12 are partial top plan views of other forms of yielding wire bands which can be used.

The novel bed spring shown in Figures 1 and 2 includes the usual series of coil springs 10, arranged in rows with each row supported by suitable transverse stampings or other lower supports 12, and with a suitable upper frame 14 (for example of steel stampings riveted together) surrounding them substantially in the plane of their upper ends.

The illustrated springs 10 have their upper ends formed in a spiral substantially in that plane, so that there is no substantial open space inside the periphery of each spring at its upper end. The springs 10 may be tied together in any desired manner, for example as described below in connection with Figures 3 and 6.

According to an important feature of the present invention, the space between the rows of springs 10, at their upper ends, is occupied by spring wire tapes or bands 16 tensioned between the opposite sides of frame 14, and which are arranged substantially in the plane of the upper ends of the coil springs 10. The flat spring bands 16 are preferably somewhat more yielding than the coil springs 10, so that the latter carry the major part of the load. These bands 16 are arranged both lengthwise and crosswise of the bed spring, being shown woven alternately over and under each other.

I prefer to use the form of yielding spring wire

tapes or bands shown in Figures 9 and 10, consisting of braids of spring steel wire expanded widthwise (except at their ends) to spread the wires apart and give a considerable width. The ends are provided with clips 18 for attaching the ends of the braid to the sides of the frame 14.

Each braid consists of a series of wires, each extending for the full length of the braid, and which extend alternately over and under the other wires. The braid, formed with an open mesh, or expanded widthwise, may be made of spring steel wire heavily compressed so that the return bends of the wires at the opposite edges of the braid are compressed beyond the elastic limit of the steel, to "set" the wire in a series of interbraided spring loops, so that the braid is elastic lengthwise like a rubber band. Elongation of the braid under load of course temporarily contracts the braid widthwise, but not sufficiently to interfere with its cooperative load-supporting function. Alternatively the expanded or open-mesh braid may be made of high-carbon wire drawn while soft, and tempered after the braid is formed.

Some of the advantages of the invention can be obtained with other types of spring steel bands or tapes, for example one formed by a single spring steel wire 20 waved crosswise of the band and formed at the sides of the band with closed eyes or loops as shown in Figure 11, or a similar wire 22 formed with open loops as shown in Figure 12. The braid 16 has the advantages, however, of increasing in effective tensile strength as it yields under load, so that it is in effect stiffer under a heavy load than under a light load.

Figure 8 illustrates how the above-described bed spring fully supports all parts of an innerspring mattress 24, made up with inner coil springs 26. Usually each spring 26 is in a cloth cell 28, and all of them are held together by the enveloping mattress material.

In the arrangement of Figures 3, 4, and 5, each coil spring 110 of the bed spring supports a disk or stamping 30 slotted to have the braids 116 threaded therethrough in opposite directions. In this case the braids 116 overlie the rows of coil springs 110 instead of being between them. The coil springs 110 are shown tied together by small tensioned coil springs 32 in a manner well known in this art.

In the arrangement of Figures 6 and 7, the spring braids 216 are shown arranged crosswise of the bed spring only, and the upper ends of the coil springs 210 are tied together by helical springs 34 threaded through them so as to encircle the adjacent portions of the top coils of each adjacent pair of coil springs 210, as shown in Figure 7.

While several illustrative embodiments have been described in detail, it is not my intention to limit the scope of the invention to those particular embodiments, or otherwise than by the terms of the appended claim. Part of the subject matter disclosed above, and not herein claimed, is claimed in my application No. 109,841, filed November 9, 1936, as a continuation in part hereof.

I claim:

A spring structure comprising a plurality of rows of coil springs, means interconnecting said springs, upper and lower frames surrounding said springs and the lower of which is provided with means supporting the lower ends of said springs, and lengthwise-yieldable supports at right angles to each other between said rows and carried over and under each other and which are attached at their ends to said upper frame substantially in the plane of the upper ends of said coil springs and otherwise freely movable relative to said springs and each of which comprises a braid made up of spring steel wires each extending the full length of the support and carried alternately over and under each other diagonally of the braid and which are spread apart to form a relatively wide mesh and which bend back across the braid at the edges thereof and are permanently set beyond the elastic limit of the steel at said edges to form in effect a large number of small springs yieldable in the plane of the braid.

LAWRENCE H. HAMILTON.