Dec. 9, 1947. R. WINTERS 2,432,361

SLAT TYPE SPRING UNIT

Filed April 23, 1943 2 Sheets-Sheet 1

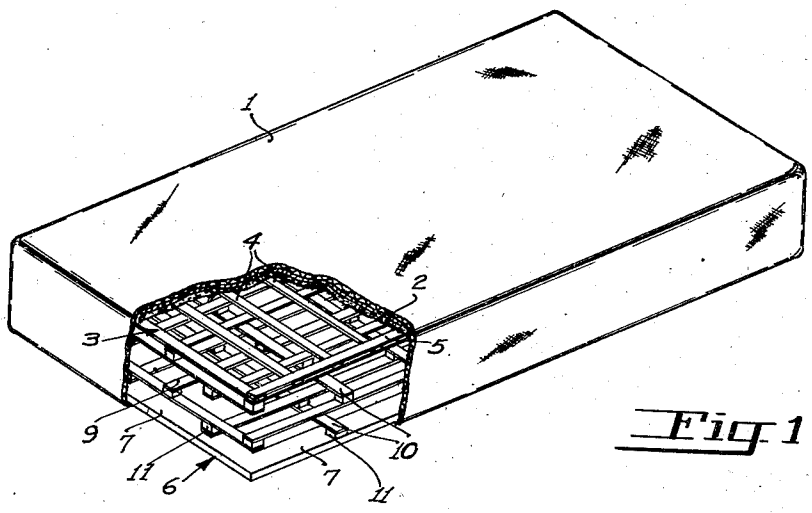


Fig. 1

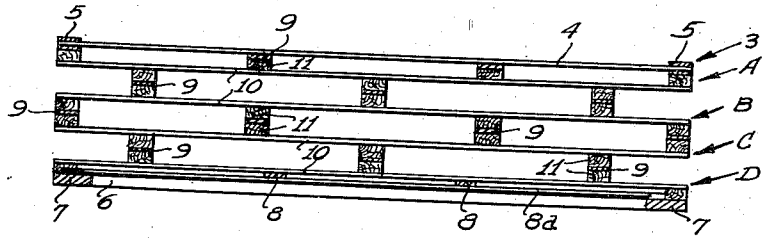


Fig. 2

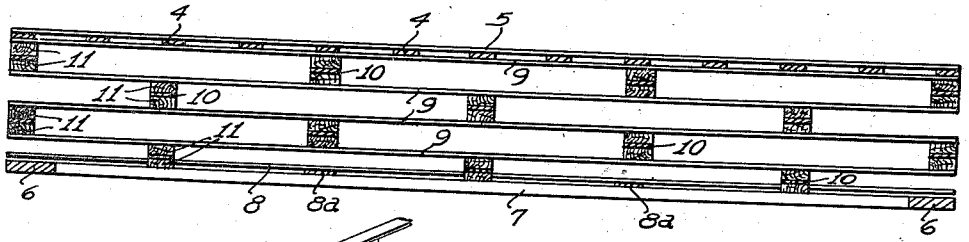


Fig. 3

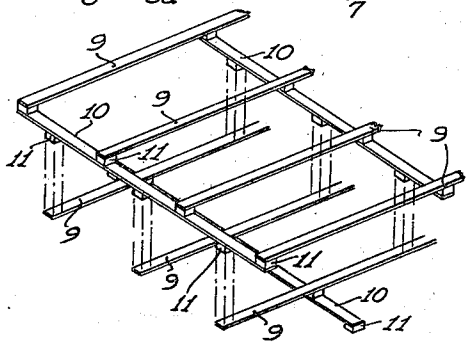


Fig. 4

INVENTOR

Raymond Winters

BY

ATTORNEY

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SLAT TYPE SPRING UNIT

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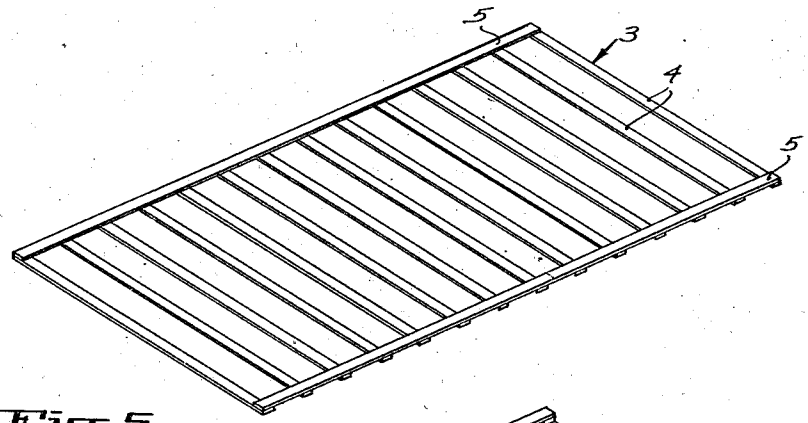


Fig. 5

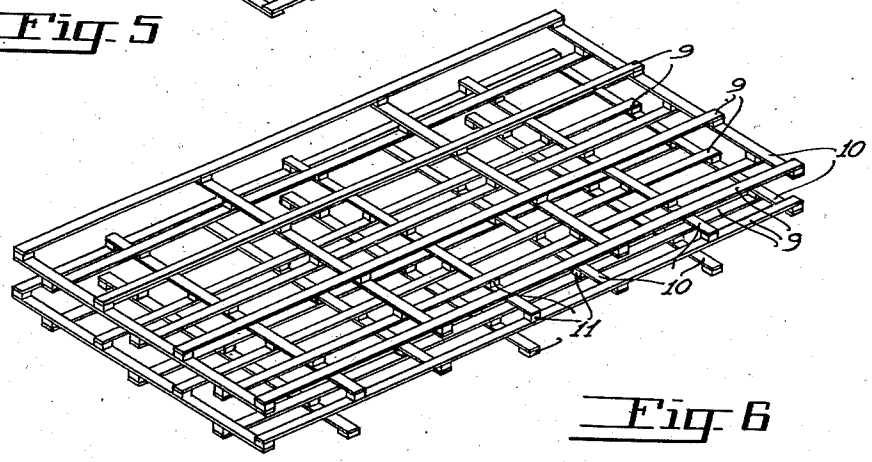


Fig. 6

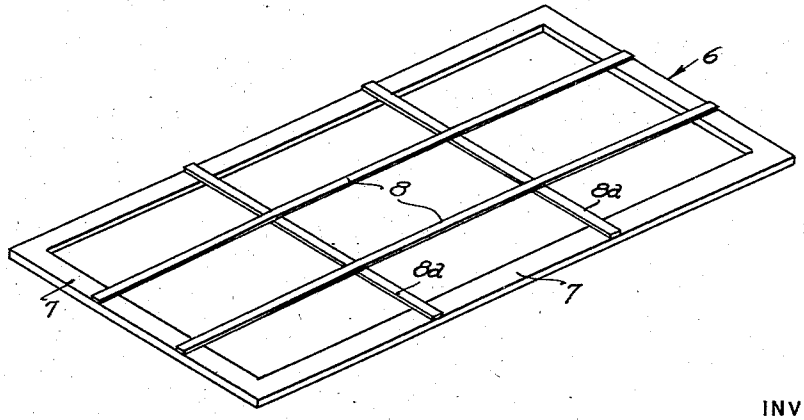


Fig. 7

INVENTOR

Raymond Winters

BY

ATTORNEY

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SLAT TYPE SPRING UNIT

Raymond Winters, Portland, Oreg.

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2 Claims. (Cl. 5—239)

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My invention relates to improvements in spring units and has particularly to do with the improvement of bed spring units. In periods of national emergency, materials and particularly steel have been declared to be critical materials and the manufacture of bed springs and spring units has been restricted to such an extent that metal springs are not available for the purpose of construction of spring units sufficient to satisfy the demand at such times.

The object of my invention is to construct a spring unit which may be made substantially in its entirety of wood and fabric or similar materials which are usually not so critical. It is essential to construct a unit of this character so that it has substantial resiliency without exceeding the structural strength of the members. Said unit must be relatively light and the cost has to be maintained at a low level so as to approach somewhat the comparable price of steel springs. This involves a rather difficult problem.

I have attained this object by making a spring unit of a series of slats of material, preferably of wood, in which said slats are mounted upon blocks or spacers so that their elasticity may be utilized resiliently to support a load. Each of the slats is disposed, with regard to an underlying slat, so as to present a span of substantial length and the spans are supported one upon the other so that the supports are resiliently supported upon an underlying span rather than in alignment. Thus, the resiliency of each of said slats is supplemented by the resiliency of each of the underlying slats to provide a substantial factor of resiliency. I preferably arrange said slats so they are arranged in courses, and the slats in successive courses are arranged normal to each other, because such arrangement provides a relatively simple structure in which the yielding spans may be staggered vertically to provide the cumulative elastic yield which is to be desired.

The details of my invention are hereinafter described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a spring unit embodying my invention shown enclosed within a fabric covering, a portion of said fabric covering being shown broken away to disclose details of construction of spring unit;

Fig. 2 is a cross-sectional view through said spring unit with said covering removed;

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Fig. 3 is a longitudinal sectional view;

Fig. 4 is a fragmentary perspective view of two overlying tiers of slats shown spaced apart to illustrate the manner in which each tier is resiliently supported upon an underlying one;

Fig. 5 is a perspective view of the deck member of said spring unit;

Fig. 6 is a perspective view of the slats making up the central elastic unit; and

Fig. 7 is a perspective view of the base unit which supports in turn the elastic unit upon which the deck unit is supported.

My invention is shown as incorporated in a bed spring unit, although it is to be understood that I do not wish my invention limited to such specific use because it is adapted for use with any type of spring unit such, for example, as automobile cushions, sections of upholstered furniture and the like. A bed spring unit embodying my invention preferably is contained within a fabric cover 1 having a pad 2 overlying a deck section 3. The fabric covering serves not only to envelop the unit but also serves virtually as a tensioning covering for holding the elastic unit in restricted bounds. A pad and deck section is deemed essential in most spring coverings to provide comfort and to provide a continuous surface for such spring unit. I show such deck section as being constructed of a plurality of slats 4 nailed or otherwise secured to longitudinal members 5. Said slats should be relatively thin so as to yield readily and should be arranged quite closely together so as to provide a more or less continuous surface for supporting the pad 2.

I preferably provide a base section 6 comprising marginal members 7 having some substantial strength and only limited yield of resiliency. I preferably arrange one or more longitudinal and transverse members 8 and 8a, respectively, to provide an effective base for the resilient spring unit supported thereby and which in turn supports the deck section 3. The details of the foregoing are relatively unimportant and a great deal of latitude may be allowed therein.

I deem my invention to be incorporated in the elastic unit which will hereinafter be described. Said elastic member is preferably made up of a plurality of vertically stacked courses of slats comprising longitudinal and transverse members. As they are viewed in Fig. 6 said elastic unit appears to resemble only a stack of slats mounted

one upon the other. I wish to refer, however, to Fig. 4. It will be noted that said elastic unit is made up of four tiers, for example, two tiers being shown in said figure. Each tier comprises two courses, one course made up of longitudinal members 9 and another of transverse members 10. Said longitudinal members are secured to the transverse members which underlie them through blocks or spacers 11. The members 9 and 10 are preferably made of wooden strips which are commonly referred to in the trade as lattice strips and may be strips approximately five-sixteenths of an inch thick and one and one-half inches wide and the longitudinal strips in a bed spring are usually seventy-four inches long and the lateral strips are as wide as the bed. In a full size bed they, of course, are longer than in a twin size bed. Preferably the strips are spaced apart fourteen or fifteen inches and the blocks preferably are several times thicker than the thickness of the longitudinal and transverse members 9 and 10, respectively. I preferably select a type of wood which has substantial resiliency and some structural strength. Each lattice strip is required to bend only slightly between blocks or spacers, say for example, something approximating the thickness of the blocks. The blocks or spacers serve as supports or buttresses for the ends of each span. Thus, for example, the blocks spaced along the longitudinal members in tier A are four in number and likewise there are four longitudinal strips. If a single tier were provided, then the resiliency afforded would only be the spring of the slats making up said tier. The tier B arranged beneath it, however, is provided with three longitudinal slats, for example, and three transverse slats arranged in alignment with the intervals between the members 9 and 10 in tier A. Thus the spacers therein are supported at the centers of the spans of those in tier A and the spacers or buttresses are resiliently supported on said spans. Thus, a factor of resiliency is provided not only through the spans between the spacers in each member, but also because the spacers themselves are resiliently supported by underlying spans. I preferably provide four tiers, each comprising two courses, one course comprising longitudinal members and the other transverse members. Tier A may be duplicated as tier C, and tier B can be duplicated as tier D. Thus, the cumulative spring of said tiers tends to hold the deck spaced from the frame substantially over the entire area of the deck and frame and any load applied to the deck will be transmitted throughout said staggered spans over a substantial area so as to apply no concentrated load upon any single span or the supports therefor.

It might be considered that each member in any course is provided with a plurality of spaced feet or supports each of which bears upon an unsupported span in the immediately underlying course members. Each spring unit might be considered to comprise, besides the covering therefor, a frame unit and a deck unit and an intermediate elastic unit comprising four tiers of normally arranged members arranged in staggered relationship. The first and third tiers can be alike and the second and fourth tiers can be alike. It is desirable, if not essential, that all of the tiers be joined together by nailing, glueing or otherwise. Of course, it is possible also to hold them in place by means of covering or by looped sections of fabric, which is a common expedient and is therefore not illustrated and will be a modification apparent to those skilled in the art. It is

essential only that each of said tiers have feet or supports which bear upon spans in underlying tiers so that the resiliency of each tier contribute to the total elasticity of the unit. If the longitudinal and lateral members are secured to each other, then the various members constitutes a unit which is laterally stable.

It is apparent that a unit of this character, when supporting a load, will yield only beneath the load and the remainder will not tend to be tipped up because the covering or other fastening devices will retain it in substantially its original form. Thus, if my invention is incorporated in a bed spring, two people will not tend to roll toward the middle thereof or the lighter to roll toward the heavier person. I have also found it desirable to make some of the upper slats slightly thinner and thus more resilient than lower slats so that the upper portion yields more readily than the lower portion and thus the spring unit provides comfort for a light person as well as for a heavier person. Because of the fact that no single slat is required to support a concentrated load, said slats may be made of soft wood, such as, for example, Douglas fir, spruce, pine, larch and similar woods which normally might not be thought to have sufficient structural strength for this purpose. Although I have illustrated a spring unit comprising four tiers, each made up of two courses of normally disposed slats, I do not wish to be limited to said number, merely selecting this arrangement because it has proved adequate in practice in the construction of bed spring units.

I claim:

1. A spring unit comprising a base element, a decking element and an elastic element lying between them, and in contact therewith, said elastic element comprising a plurality of relatively springy, non-compressible slats arranged in courses stacked one upon the other, said slats being spaced relatively widely apart and the slats in each of said courses being arranged normal to those in adjacent ones, the slats in alternate overlying courses being arranged in staggered relation and in substantial parallelism, spacer blocks between the slats at the points of intersection of each slat with the slots in the course immediately therebelow and means securing said slats and said spacer blocks together into a unitary spring structure, said spacer blocks serving to space the courses apart and to give increased flexibility to the spring unit.

2. A spring unit comprising a base element, a decking element and an elastic element lying between them, and in contact therewith, said elastic element comprising a plurality of relatively springy, non-compressible slats arranged in courses stacked one upon the other, said slats being spaced relatively widely apart and the slats in each of said courses being arranged normal to those in adjacent ones, the slats in alternate overlying courses being arranged in staggered relation and in substantial parallelism, spacer blocks between the slats at the points of intersection of each slat with the slats in the course immediately there below and means securing said slats and said spacer blocks together into a unitary spring structure, said spacer blocks serving to space the courses apart and to give increased flexibility to the spring unit, said spacer blocks being substantially thicker than said slats to accommodate flexure of the latter.

RAYMOND WINTERS.

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