Sept. 6, 1932. M. THUM 1,876,101

SPRING STRUCTURE FOR FURNITURE

Filed Oct. 6, 1930 2 Sheets-Sheet 1

Fig. 1

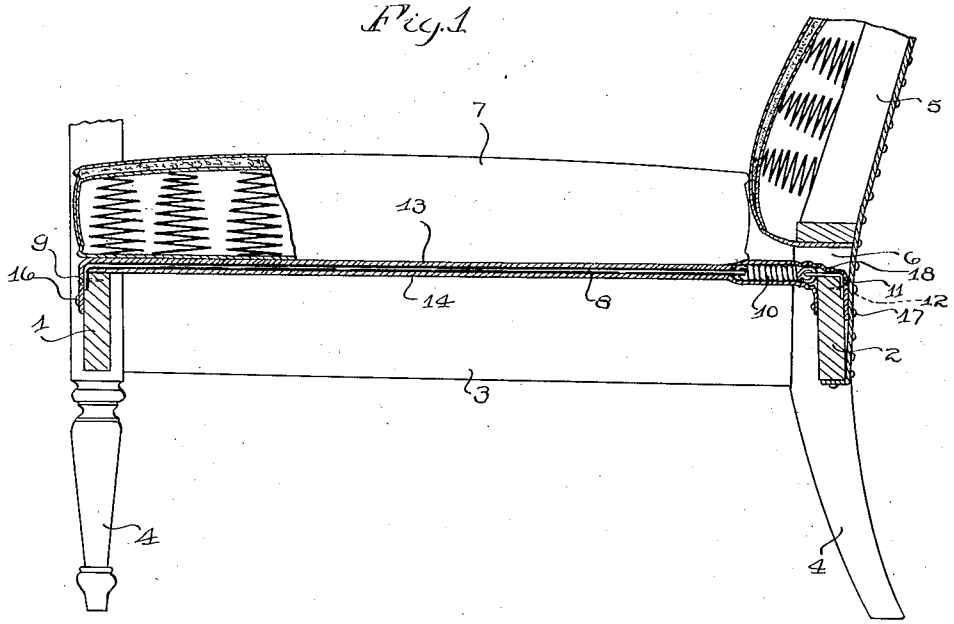
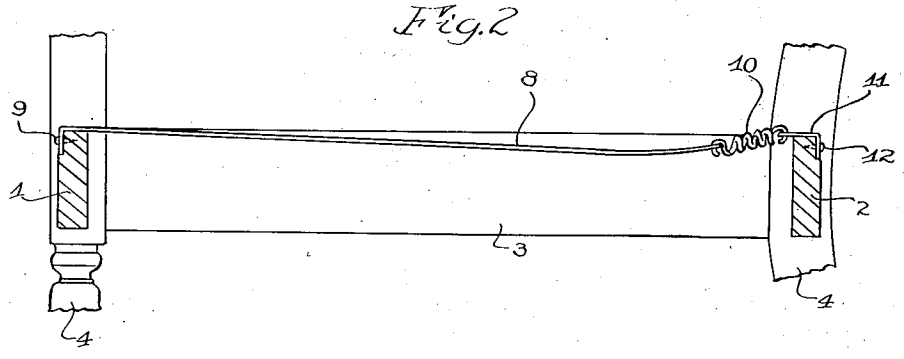


Fig. 2



INVENTOR
Martin Thum
BY
his ATTORNEY

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Filed Oct. 6, 1930 2 Sheets-Sheet 2

Fig. 3

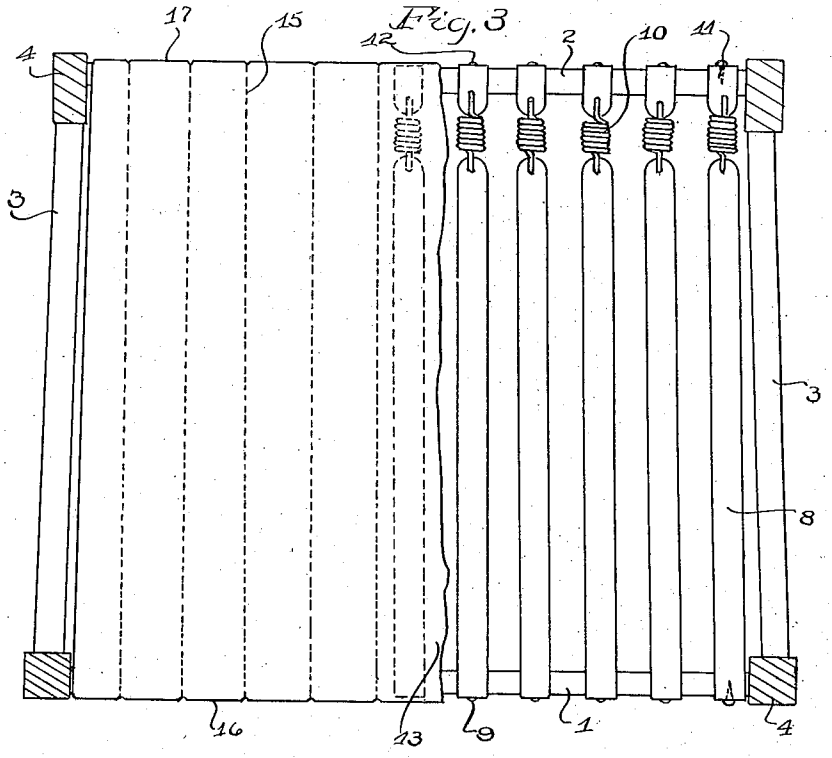
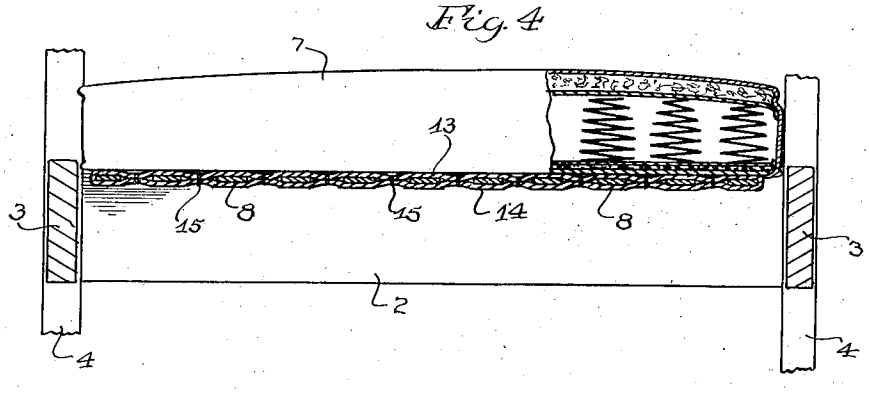


Fig. 4



INVENTOR
Martin Thum
BY
his ATTORNEY

Patented Sept. 6, 1932 1,876,101

UNITED STATES PATENT OFFICE

MARTIN THUM, OF ROCHESTER, NEW YORK

SPRING STRUCTURE FOR FURNITURE

Application filed October 6, 1930. Serial No. 486,551.

The present invention relates to spring structures for furniture. An object of the invention is to improve that type of spring structure in which the spring bottom is formed of a plurality of parallel elastic members extending from one side of a frame to another. Another object of the invention is to provide a novel mounting for a plurality of parallel members in a spring structure designed to be employed as a seat. A further object of the invention is to provide a spring bottom for seats designed to give an inelastic forward portion extending substantially throughout the seat. Still another object of the invention is to so connect a plurality of elastic parallel members in a bottom of a spring structure that the members may partake of relative longitudinal expansion and contraction and at the same time are subjected to expansion to a lesser degree upon the expansion of a proximate elastic member in order that pressure on any one elastic member is transmitted to adjacent members.

To these and other ends, the invention consists of certain parts and combinations of parts all of which will be hereinafter described: the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 is a fragmentary sectional view of a chair embodying the present invention;

Fig. 2 is a fragmentary sectional view through the spring bottom;

Fig. 3 is a fragmentary plan view of the spring bottom; and

Fig. 4 is a fragmentary vertical transverse section.

In the illustrated embodiment the invention is shown illustrated in a chair or seat, but it is apparent that it is capable of use in furniture of various types where spring structures are employed. In the illustrated form of the invention the spring frame embodies the front cross piece 1, the back cross piece 2 and the side rails 3 of a chair, the frame being supported by legs 4 and having an upholstered back 5 projecting upwardly above the rear frame piece 2, being spaced from the latter at 6 and having its front face projected in advance of the inner or front face of the rear piece 2.

The spring bottom, in this instance, has a series of spaced parallel flexible straps extending from the front cross piece 1 to the back or rear cross piece 2 of for example the chair seat and each of these straps has an inelastic forward portion in the form of a thin, flat, flexible, inelastic member rigidly or inflexibly secured to the front frame or cross piece 1 and extending toward the back substantially through the bottom to an elastic portion which connects the rear portion of the inelastic portion with the rear piece 2 of the frame, this elastic portion being positioned mainly beneath the forwardly projecting back 5, so that a seat cushion 7 is substantially entirely supported particularly as to its front or forward section by the inelastic portion of the spring bottom. In the present instance, the spring bottom is formed of a plurality of elastic parallel members each preferably having its forward inelastic portion in the form of a metallic strap 8 rigidly secured at 9 to the front piece 1 and connected at its rear end to an elastic portion in the form of a helical coil 10 which is anchored in a clip 11 secured at 12 to the rear piece 2 of the frame.

With the end in view of preventing undue strain being imposed on any one of the parallel elastic members of a spring structure of this type, a strain transmitting web is used in connection with such parallel members. In this instance, this web comprises two layers 13 and 14 of pliable or flexible material such as a woven fabric and forms an envelope for the spaced parallel straps. These layers while united at the outer side edges so as to form the envelope are stitched together at 15 midway between adjacent par-

allel straps in parallel lines to form parallel tubes, pockets or passages through which the parallel elastic members loosely extend and within which the parallel members have a certain but limited amount of lateral freedom. The web is formed of substantially inelastic material and is secured at 16 to the front piece 1 and at 17 to the back piece so as to provide longitudinal fullness while its sides are free from the sides 3 of the frame. The rear portion of the web over the elastic springs 10 is crimped at 18 so as to give sufficient material to permit the sagging of the web when pressure is placed on the same, viz., to provide longitudinal fullness. The web acts to transversely transmit strain imposed upon any one elastic parallel member to the adjacent parallel members to a lesser degree and in this way undue strain on any one parallel member is prevented.

When the spring structure is embodied in a seat such as a chair, lounge or davenport, the front portion of the bottom yields downwardly but does not stretch, all the stretching taking place adjacent the rear of the seat and preferably behind the cushion. This gives a natural depression of the seat and no great sagging or depression occurs adjacent the knees of the user, thus causing the legs to have a natural position on the seat.

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

1. A spring structure comprising a frame, a plurality of inelastic members extending across the frame in parallel relation and rigidly connected at one end to a frame member and having its other end terminating a short distance from the opposite frame member, a spring connection between the last mentioned frame member and the adjacent end of the respective inelastic members, and a pliable covering attached to the same frame members to which the inelastic members and their spring connections are attached, and having the portion over the inelastic members approximately taut and the portion over the spring connections crimped, said covering including portions which embrace the inelastic members and are connected midway the spaces formed therebetween.

2. A spring structure comprising a frame, a plurality of inelastic members extending across the frame in parallel relation and rigidly connected at one end to a frame member and having its other end terminating a short distance from the opposite frame member, a spring connection between the last mentioned frame member and the adjacent end of the respective inelastic members, and a web of pliable and inelastic material comprising layers with said inelastic members and their spring connections therebetween, said layers being connected by lines of stitching medially of the spaces formed between the said inelastic members and their spring connections, said web being connected to opposite frame members and having the portion over the inelastic members approximately taut and the portion over the spring connections crimped.

3. The combination with a seat frame and a back rising therefrom and having the portion adjacent the seat project forwardly, of metal straps extending across the seat frame in spaced and parallel relation, each of which straps is composed of a thin, flexible, inelastic strip of metal rigidly and inelastically connected at its front end to the front cross piece of the seat frame and at its rear end by means of a spring to the rear cross piece of the seat frame, an envelope of woven fabric providing upper and lower layers with the straps located between the layers, the envelope being free at the sides and being attached to the front and rear cross pieces of the seat frame but in a manner to leave longitudinal looseness between the ends thus attached, said upper and lower layers being connected by lines of stitching medially located in the spaces between the straps and a seat cushion abutting the forwardly extending portion of the back and supported entirely particularly as to its forward section on the inelastic metal strips.

4. A spring structure comprising a frame, a plurality of spaced inelastic, flexible, parallel members each directly mounted upon the front cross piece of the frame and having a connection to the rear cross piece of the frame, each of said parallel members being mounted so as to provide for independent depression, and an enveloping cover for the members formed of relatively inelastic woven material and having spaced longitudinally disposed pockets, one pocket for each inelastic member, the width of each pocket being greater than the width of the respective inelastic member to permit relative but limited transverse movement of the cover and the members, whereby upon depression of an inelastic member beyond a certain degree the degree of depression is restrained by another inelastic member engaging a side of the pocket enclosing such other inelastic member.

5. A spring structure comprising a frame, a plurality of spaced inelastic, flexible, parallel strips, the front end of each of which is inelastically connected to the front cross piece of the frame and the rear end of each of which has suitable connection to a rear cross piece of the frame, each of said parallel strips being mounted so as to provide for independent depression, and a cover for the members formed of relatively inelastic woven material and having spaced longitudinally disposed pockets, there being one pocket for each strip, the width of each pocket being wider than the width of the respective inelastic member therein, the cover

being free of the frame along opposite sides thereof so as to permit a creeping movement of the cover transversely of said members as the latter are depressed, and a yieldable cushion supported on said spring structure, the arrangement being such that the major portion of the cushion is substantially entirely supported by the inelastic portions of the spaced, flexible, parallel strips.

MARTIN THUM.