

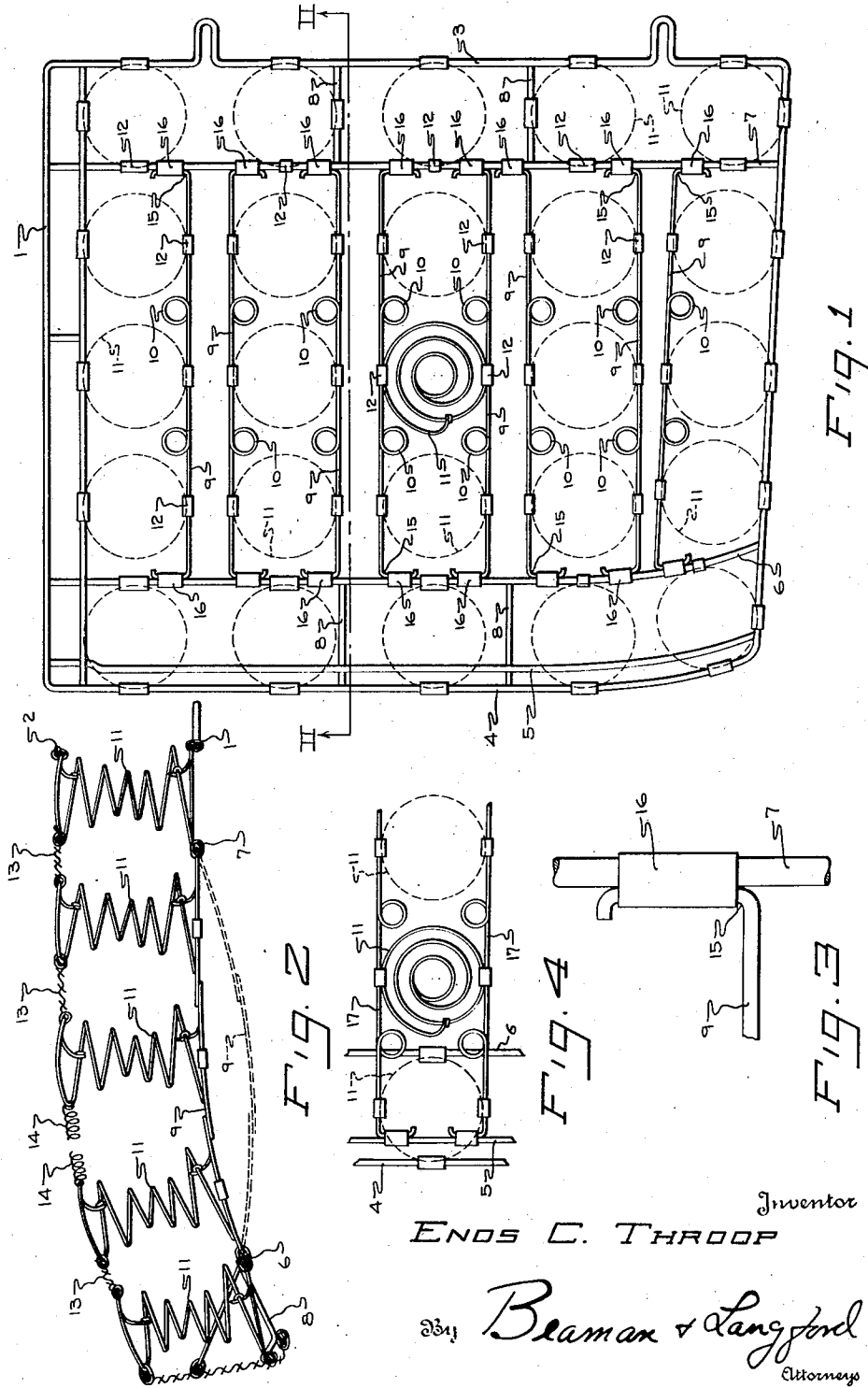
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SPRING STRUCTURE

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SPRING STRUCTURE

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The present invention relates to cushion spring structures and more particularly to the backs thereof.

The usual cushion spring structure consists of front and rear portions having disposed therebetween a plurality of helical springs, the front being covered with padding and the entire structure being covered with upholstery. Such constructions must be so designed that under all conditions of ordinary operation the forces to which the structures are subjected will not cause the front of the structure to strike the rear of the structure, a condition commonly known as "hitting bottom." Heretofore, "hitting bottom" has been avoided by providing helical springs of sufficient depth. The present invention is for the purpose of providing a spring cushion structure in which not only is "hitting bottom" impossible, but also the overall depth of the cushion structure is materially decreased, from the corresponding depth of prior art structures. One place in which the present invention finds particular application is in the construction of the back cushion of the front seat of five-passenger automobile coupes wherein in the saving in depth results in increasing the length of the small sized rear passenger compartment.

An object of the invention is to provide a spring structure, the rear of which is yieldable.

Another object of the invention is to provide a spring structure, having a plurality of bowed longitudinally extensible members bridging a rear section thereof and supporting at least a substantial portion of the load resisting part of the structure.

Still another object of the invention is to provide a spring cushion structure having at the rear thereof a pair of spaced elongated members, bridged by longitudinally yieldable resilient members for absorbing thrust against the front of the structure.

These and other objects residing in the arrangement, combination and construction of the parts will be apparent from the following specification when taken with the accompanying drawing in which:

Fig. 1 is a rear elevation of a spring structure according to the present invention,

Fig. 2 is a section on the line II—II of Fig. 1, Fig. 3 is an enlarged elevation of the detail, and

Fig. 4 is a partial view of another embodiment of the invention.

Referring particularly to the drawing, the reference character 1 indicates the rear frame of a

spring cushion structure having a front frame 2, shown particularly in Fig. 2. The frame 1, as disclosed in Fig. 1, is lying on its side, having a bottom portion 3, and a top portion 4. The frame 1 is provided with a supplementary top member 5 and intermediate transverse members 6 and 7. In addition, short reinforcing members 8 are provided. The intersecting members of the bottom frame 1 are joined together by spot welding.

Bridging the spaced members 6 and 7 are spanning springs 9, which are substantially straight members of wire, each having a plurality of loops for rendering the spanning springs 9 longitudinally expansible and contractible. As shown particularly in Fig. 2, the springs 9 are bowed inwardly of the spring structure, but as shown in dotted outline in Fig. 2, may be bowed outwardly of the spring structure under stress.

Supported on the portions of the frame 1, including the spanning springs 9, are a plurality of helical springs 11 of the hour glass type. The springs 11 are secured to the parts of the frame 1 by suitable clips 12. The springs 11 at the front ends thereof are suitably clipped to the frame 2, and tied together in any suitable manner such as by fabric strips 13 and springs 14 in a known manner.

As shown particularly in Fig. 1, the spanning springs 9 are spaced with respect to the frame 1 and with respect to each other so as to be substantially tangent to bottom coils of the springs 11. Also, each of the spanning springs 9 is provided at the ends thereof with an angular portion 15, as shown particularly in Fig. 3, by means of which each spanning spring 9 is hinged, through a sleeve 16, to the members 6 and 7. The strength of the springs 11 with respect to the strength of the spanning springs 9 is such that for all normal forces exerted on the front of the spring structure, the force is absorbed by the springs 11 with no substantial yielding of the spanning springs 9. However, should an unusually large force be directed against the front of the spring structure, so as to substantially completely collapse the springs 11, such a force is absorbed by the spanning springs 9 which will then yield and if a sufficiently large force is exerted against the front of the spring structure, the spanning springs 9 will yield to the extent disclosed in dotted outline in Fig. 2.

In Fig. 4 is shown another embodiment of the invention wherein the spanning springs 9 are replaced by spanning springs 17, similar in form to the spanning springs 9 but being anchored at

the top side of the cushion structure to the frame member 5 rather than to the frame member 6. It will be understood, however, that in this form of the invention the spanning springs 17 function in the same manner as the spanning springs 9 in the form of the invention disclosed in Figs. 1 and 2.

While the spanning springs 9 and 17 have been disclosed as provided with a plurality of loops, it will be understood that these springs may take other forms and still be longitudinally expansible and contractible. Accordingly, I do not wish to be limited except by the scope of the following claims.

I claim:

1. In a spring structure of the character described, front and rear structures, and a plurality of helical springs between said front and rear structures, said springs being arranged in rows and being connected together to provide a unit, said rear structure having a pair of elongated spaced members, and a plurality of spanning elongated springs arranged in separate pairs bridging said members, said spanning springs having longitudinally spaced means rendering them longitudinally expansible and contractible, said helical springs having their rear portions supported by said spanning springs at portions between said means, the helical springs of each row bridging a different pair of bridging springs.

2. In a spring structure of the character described, front and rear structures, and a plurality of helical springs between said front and rear structures, connected together to provide a unit, said rear structure having a pair of elongated spaced members, and having a plurality of resilient longitudinally extending wires bridging said members, said wires arranged in separate pairs having along their respective lengths a plurality of spaced bends to render said wires longitudinally expansible and contractible, said wires having a supporting connection with said helical springs at points between said bends to resist resiliently thrust imparted to said intermediate structure during use, each helical spring bridging one of said pairs of wires.

3. In a spring structure of the character described, front and rear structures, and a plural-

ity of helical springs between said front and rear structures, connected together to provide a unit, said rear structure having a pair of elongated spaced members, and having a plurality of resilient longitudinally extending wires bridging said members, said wires arranged in separate pairs having along the respective lengths thereof a plurality of spaced coiled loops to render said wires longitudinally expansible and contractible, said wires having a supporting connection with said helical springs at points between said loops to resist resiliently thrust imparted to said intermediate structure during use, each helical spring bridging one of said pairs of wires.

4. In a spring structure of the character described, front and rear structures, and a plurality of helical springs between said front and rear structures, connected together to provide a unit, said rear structure having a pair of elongated spaced members, and having a plurality of resilient longitudinally extending wires arranged in separate pairs, bowed inwardly of said spring structure, said wires having along the respective lengths thereof a plurality of spaced bends to render said wires longitudinally expansible and contractible, said wires having a supporting connection with said helical springs at points between said bends to resist resiliently thrust imparted to said intermediate structure during use, each helical spring bridging one of said pairs of wires.

5. In a spring structure of the character described, a rear structure, a plurality of helical springs supported from said rear structure, said rear structure and springs being connected together to provide a unit, said rear structure having a pair of elongated spaced members and a plurality of resilient longitudinally extending wires arranged in separate pairs bridging said members, said wires having along their respective lengths a plurality of spaced bends to render said wires longitudinally expansible and contractible, said wires being arranged in pairs, said helical springs having their rear portions supported by said wires on portions between said bends, said helical springs bridging the members of said pairs.

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