Feb. 28, 1939. J. PLEET 2,148,961

SPRING STRUCTURE

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Fig. 1.

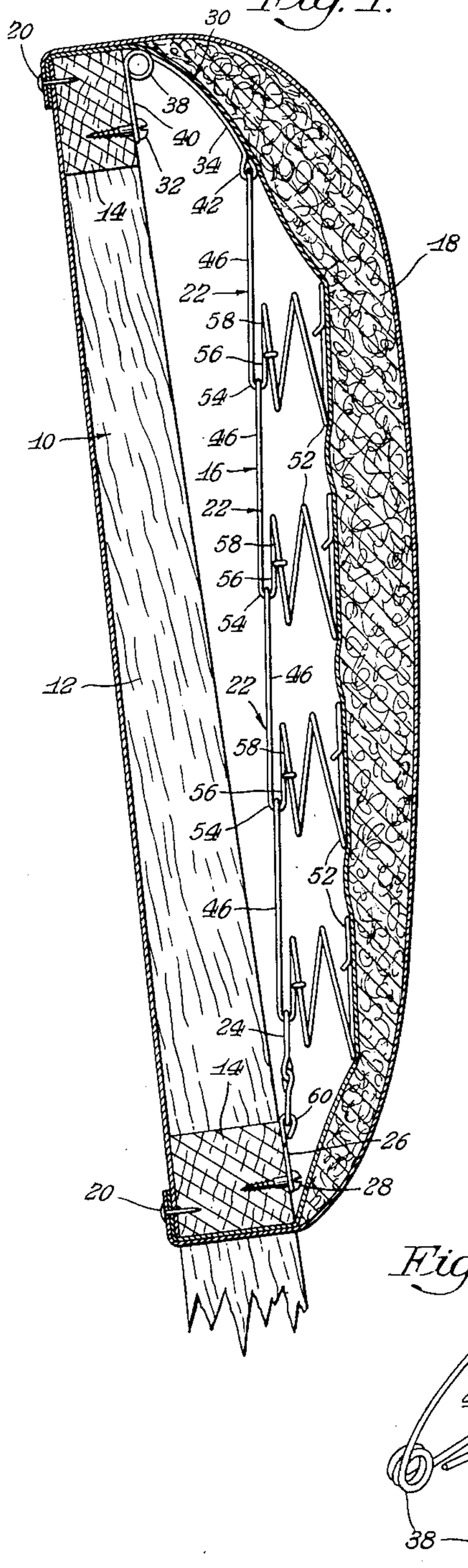

Fig. 2.

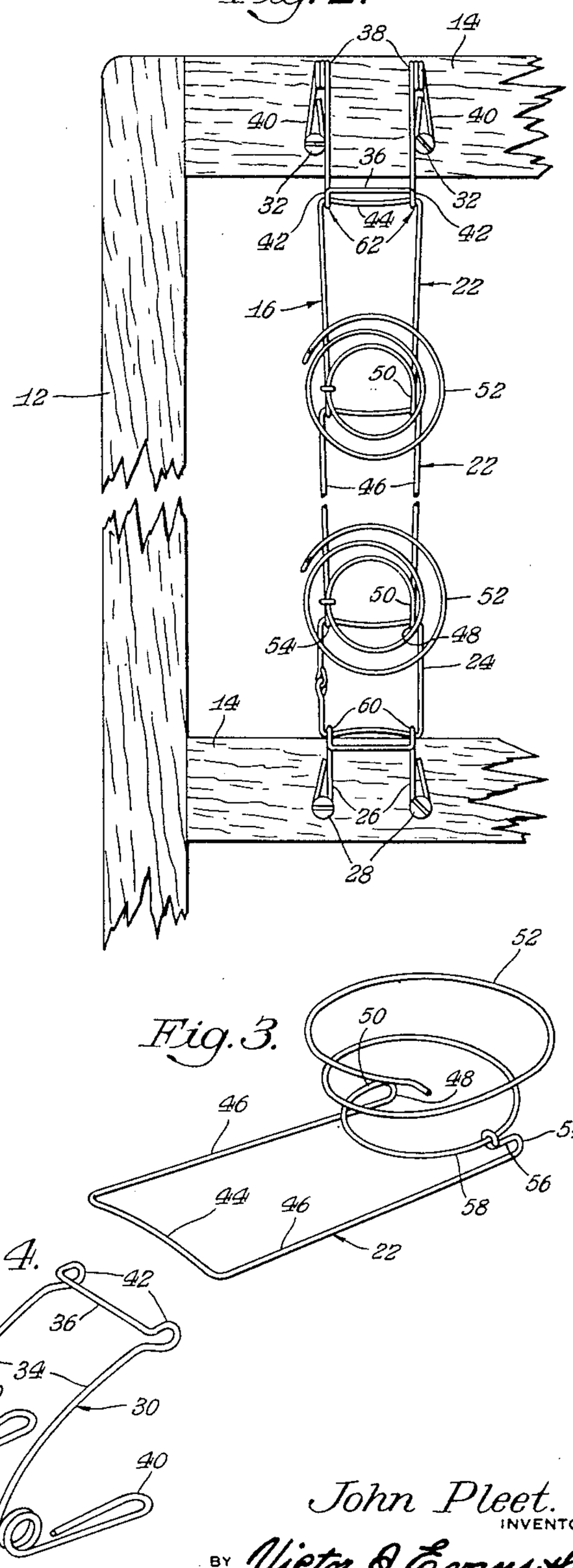

Fig. 3.

Fig. 4.

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Fig. 5.

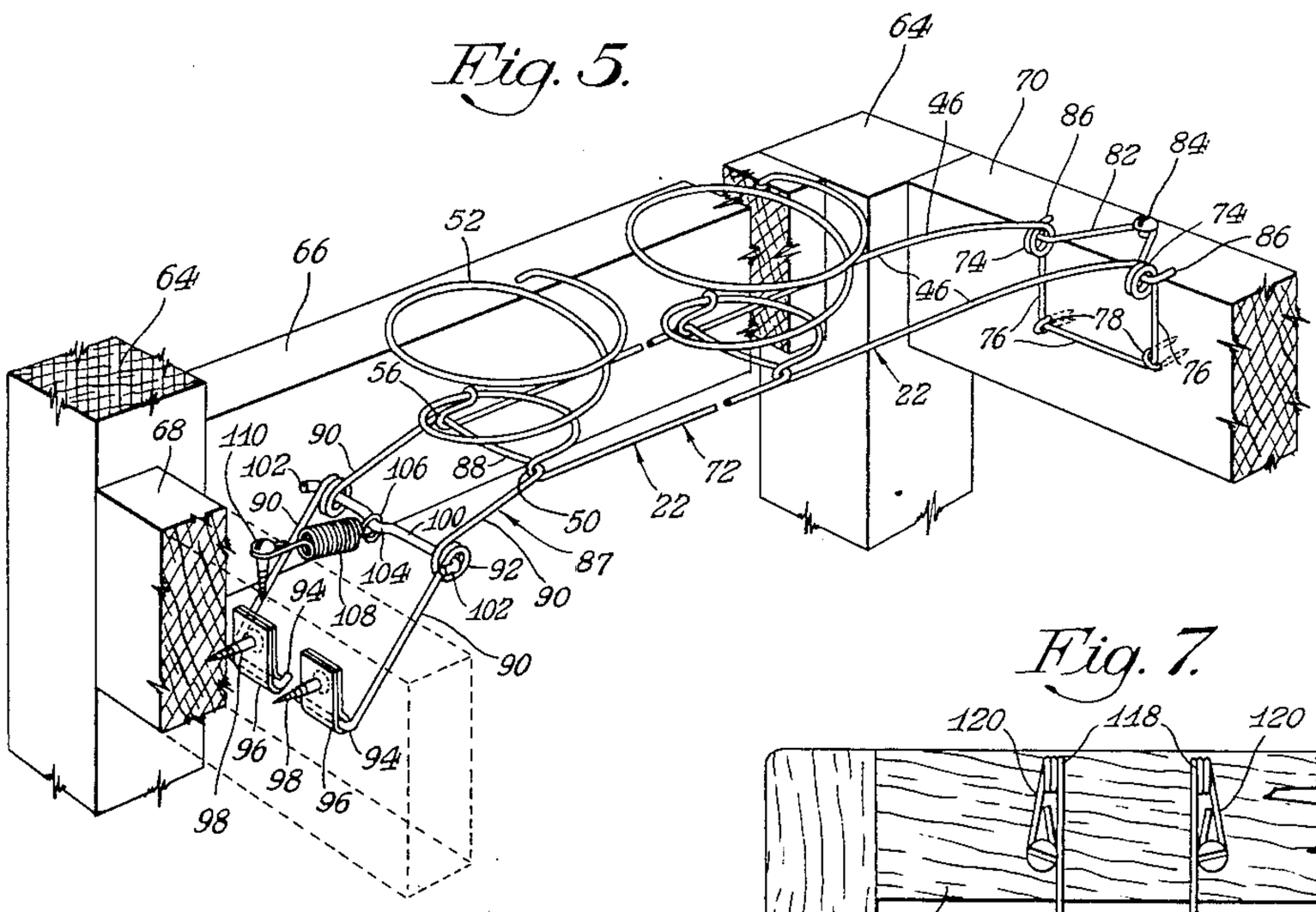


Fig. 6.

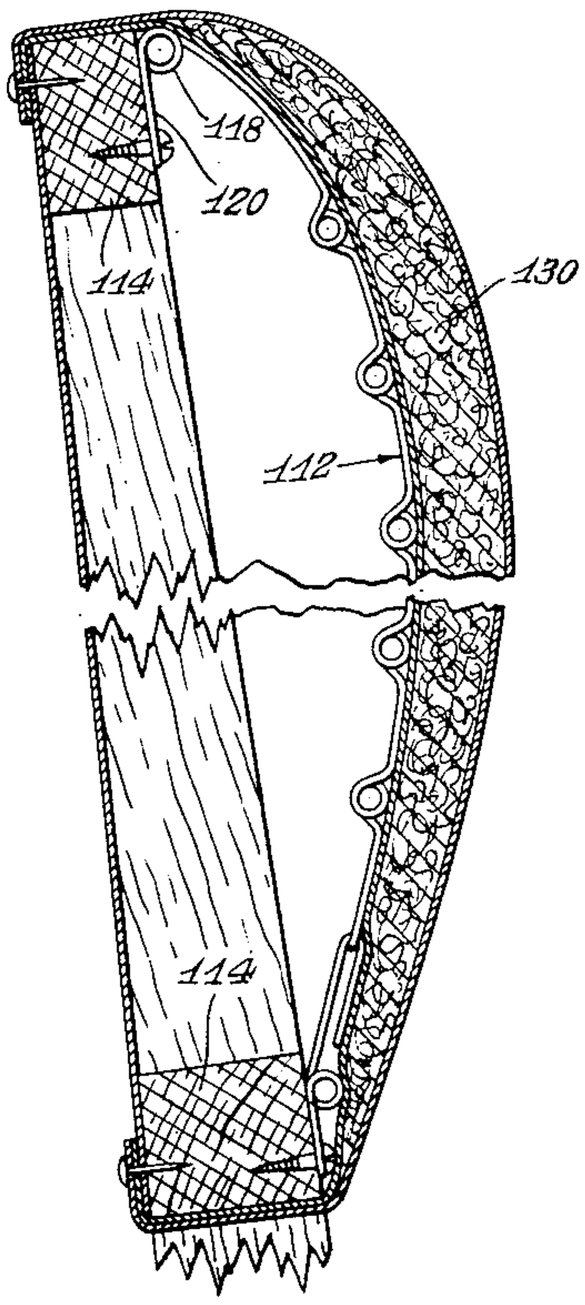
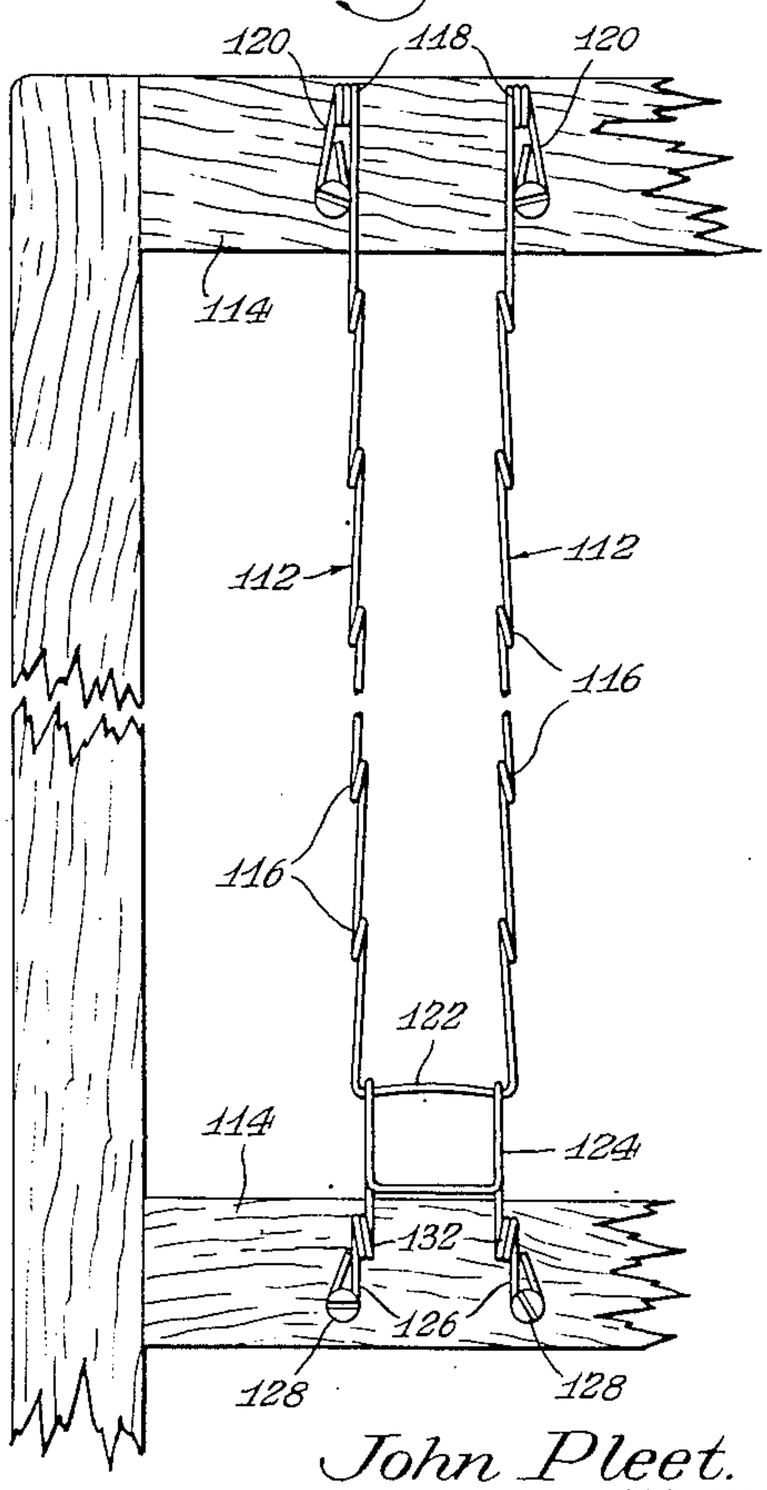


Fig. 7.



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UNITED STATES PATENT OFFICE

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SPRING STRUCTURE

John Pleet, Chicago, Ill.

Application February 8, 1937, Serial No. 124,744

3 Claims. (Cl. 155—179)

My invention relates to furniture, and seat and back structures of vehicles, and includes among its objects and advantages the provision of an improved spring structure.

In the accompanying drawings:

Fig. 1 is a longitudinal sectional view of a seat back embodying my invention;

Fig. 2 is a fragmentary view of the back frame illustrating the spring;

Fig. 3 is a perspective view of one of the spring elements;

Fig. 4 is a perspective view of the spring anchoring element;

Fig. 5 is a perspective view of a different form of spring mounting for a chair seat;

Fig. 6 is a sectional view of a seat back illustrating a different form of spring; and

Fig. 7 is a fragmentary elevational view of the frame structure illustrated in Fig. 6 with the upholstery removed for the sake of clearness.

In the embodiment selected to illustrate my invention I make use of a back frame 10 which may comprise vertical reaches 12 and horizontal reaches 14. To the reaches 14 I connect resilient runners 16, only one of which is illustrated in Figs. 1 and 2. All the runners are identical in construction. Suitable padding and upholstery 18 may be associated with the runners and attached to the frame of the back in any suitable manner as by tacks 20.

The runner 16 comprises a plurality of spring units 22, the lower of which is connected with a link 24 which in turn is connected with an anchoring element 26 fixedly connected with the lower reach 14 by screws 28. The upper spring unit 22 is connected with a resilient anchoring element 30 fastened to the upper reach 14 by screws 32.

Fig. 4 illustrates the specific construction of the resilient element 30. This element comprises a single piece of wire bent to provide spaced parallel reaches 34 and a bight 36. The reaches 34 are bent to provide convolutions 38 and loops 40 for the reception of the screws 32. I bend the reaches 34 to provide hooks 42 which are pivotally connected with the transverse reach 44 of the adjacent spring unit 22. The hooks 42 fit snugly inside the reaches 46 of the spring unit 22.

Referring to Fig. 3, one of the reaches 46 is bent back upon itself at 48 to provide a hook 50 and the remaining portion of that end of the wire is bent to provide a coil 52. The other reach 46 is bent back upon itself at 54 to provide a hook 56 and the end of the wire is bent about the lower convolution 58 of the coil 52. Hooks 50 and 56 are pivotally connected with the transverse reach 44 of the adjacent spring unit 22.

The link 24 is pivotally connected with the hooks 50 and 56 of the lower spring unit 22 and is also pivotally connected with the hooks 60 of the anchoring element 26. It will thus be seen that the spring units 22 are pivotally connected together and that the runners 16 may be made up in various lengths by adding or removing spring units 22.

Because of the shape of the resilient anchoring element 30 the cushioned seat back embodies resiliency up to the convolutions 38, while the reaches 34 are so shaped as to permit the padding to be easily applied thereto and supported in a curved and ornamental configuration.

Fig. 2 illustrates the hooks 50 and 56 as being positioned inside the reaches 46 of the associated spring units 22, while the transverse reach 44 of each spring unit 22 is bowed inwardly so as to provide recesses 62. The hooks lie within the recesses and are restrained from relative shifting inwardly of the associated reach 44.

In a coil spring construction it is essential that the coils be so balanced as to resist tilting. A coil constructed as illustrated in Fig. 3 is supported at its bottom at two diametrically opposed points so as to be effectively balanced. The hooks 50 and 56 are so located with respect to their respective coil 52 as to bring the pivotal connection between two connected units 22 directly underneath the coil 52. In this way, the runner 16 will tend to bend at the joints between the units 22 for accommodating distortion of the cushioned seat back. At the same time, the coils 52 embody resiliency and cooperate with the jointed structure for accommodating pressure forces applied to the seat back.

The reaches 46 of one spring unit 22 are so related to the same reaches of the adjacent spring unit as to constitute two spaced reaches substantially coextensive in length with the runner 16. The anchoring means at the ends of the connected spring units 22 are similarly constructed so that the runner is in the nature of two spaced reaches interconnected to provide a jointed structure. This specific arrangement of the parts provides a balanced construction, one in which the coils 52 are effectively supported against tilting in all directions. The reaches 46 are spaced sufficiently far to lend good bracing to the coils 52.

Fig. 5 illustrates the manner in which the spring units 22 may be embodied in a seat structure. A portion of a chair is illustrated, which portion comprises legs 64 and interconnecting

brace members 66, 68 and 70. The units 22 are interconnected as a runner 72 which has its ends anchored to the braces 68 and 70. One of the units 22 has its reaches 46 terminating in convolutions 74 and extended therebeyond to provide reaches 76 which lie against the vertical face of the brace 70. The reaches 76 are anchored to the brace 70 by stapels 78. A V-shaped element 82 has its bight hooked over a pin 84 anchored in the brace 70, and its ends are bent to provide hooks 86 which are hooked through the convolutions 74.

Because of the element 82, the reaches 76 are held firmly against the brace 70 while the convolutions 74 embody a desirable degree of resiliency responsive to loads placed on the runner.

The spring unit 22 at the opposite end of the runner is connected with a resilient anchoring element 87 which includes a transverse reach 88 having pivotal connection with the hooks 50 and 56 of the adjacent spring unit 22. The reaches 90 of the anchoring element 87 are provided with convoluted joints 92 and the ends of the reaches opposite the transverse reach 88 are bent to provide hooks 94 which are pivotally connected within metallic loops 96 anchored to the inner face of the brace 68 by screws 98.

A cross bar 100 is provided with ends 102 which hook through the convoluted joints 92 and is bowed at 104 for connection with the hook 106 carried by one end of a tension spring 108. The other end of the tension spring is hooked over a screw 110 anchored in the upper face of the brace 68. The spring 108 yields upon the application of a rod to the spring runner, but the bar 100 tends to brace the convoluted joints 92 in such a manner as to prevent rotation of the anchoring element 87 about its longitudinal axis. The element 87 embodies a high degree of resiliency because of the convoluted joints 92 and also because of the fact that its ends are pivotally connected with the loop 96.

Figs. 6 and 7 illustrate a further modification in the spring runner structure. The runner in this form comprises a single piece of spring wire shaped to provide parallel reaches 112 substantially co-extensive in length with the distance between the back structural members 114 of the seat back. The reaches 112 are bent to provide spaced convolutions 116 and the reaches are bowed outwardly, as illustrated in Fig. 6. The upper ends of the reaches 112 terminate in convolutions 118 and anchoring reaches 120 made secure by screws 121.

The lower ends of the reaches 112 terminate in a transverse reach 122 connected with a hook 124 having its ends looped at 126 for connection with the lower structural member 114 by screws 128. The hook 124 is of sufficient length to provide a guide for the reach 122 as it is shifted downwardly when pressure is applied to the cushion structure 130. I provide the hook 124 with convolutions 132 which lend resiliency to the hook. The reaches 118 and 122 are bowed inwardly in the same manner as the reaches 44, which is also true of the reach 88 of Fig. 5. A spring structure according to Figs. 6 and 7 embodies a high degree of resiliency and the runner comprises relatively few parts in which one end of the runner is so anchored to its supporting structure as to provide accommodation for shifting incident to flexing of the runner. The upper end of the runner is arranged with the convolutions 118 arranged in close relation with the upper structural member 114, whereby the spring configuration takes the shape of a structure illustrated in Fig. 1 because of the anchoring element 30.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. In a spring structure, a plurality of units each comprising a single piece of wire bent to provide spaced reaches and an interconnecting transverse reach, the spaced reaches of each unit being shaped to provide hooks for the reception of the transverse reach of an adjacent unit, one hook in each unit being extended and bent to provide a coil, the other hook in each spring unit being connected with a lower convolution in its respective coil.

2. In a spring structure, a plurality of units each comprising a single piece of wire bent to provide spaced reaches and an interconnecting transverse reach, the spaced reaches of each unit being shaped to provide hooks for the reception of the transverse reach of an adjacent unit, one hook in each unit being extended and bent to provide a coil, the other hook in each spring unit being connected with a lower convolution in its respective coil, and anchoring elements movably connected with the hooks of one spring unit and with the transverse reach of another spring unit.

3. In a furniture structure, two spaced supporting members, a spring runner comprising a plurality of pivotally connected units each including a coil, an anchoring element fastened to one of said spaced supports and movably connected with one end of the runner, said anchoring element including convoluted joints, a tie wire anchored to its associated support and connected with the convoluted joints, an anchoring element for connecting the other end of the runner with the other of said supports, said anchoring element comprising a link having convoluted joints and one end pivotally connected with the other of said supports, and a spring element connected with the said last named support and the convoluted joints associated with the anchoring element connected with the support.

JOHN PLEET.