June 9, 1953 F. A. BIELAK ET AL 2,641,432

WIRE BRACKET FOR TUBULAR RAILS

Filed March 24, 1951 3 Sheets-Sheet 1

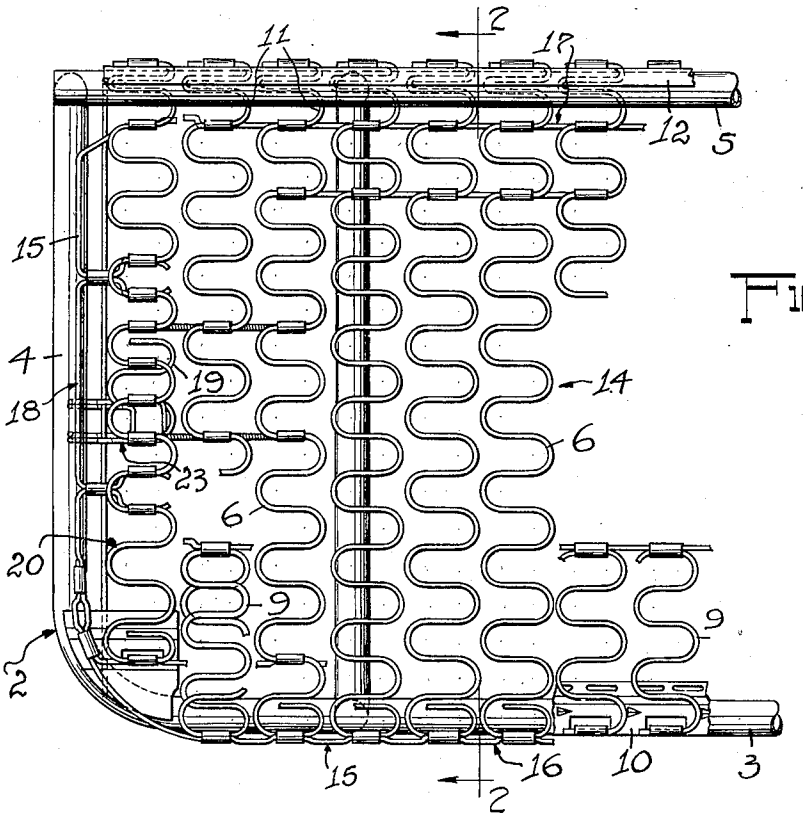


FIG. 1

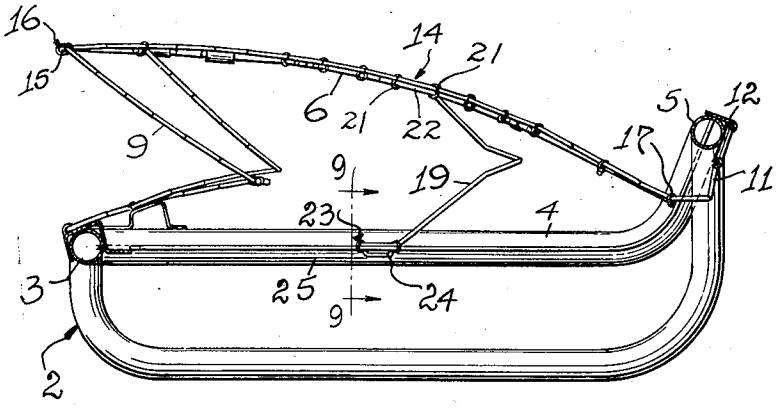


FIG. 2

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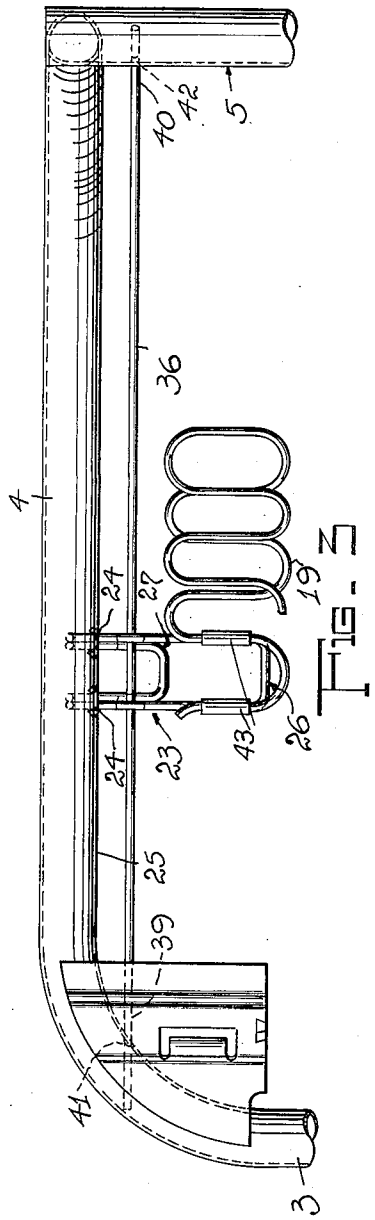


FIG. 3

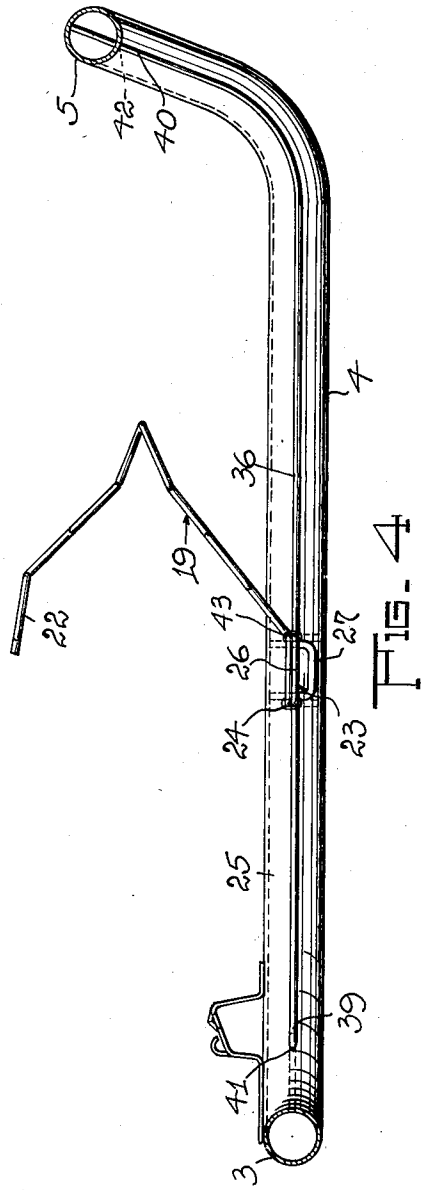


FIG. 4

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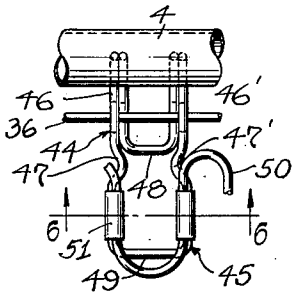


FIG. 5

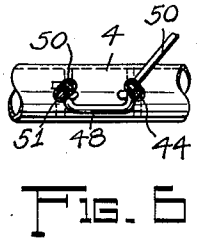


FIG. 6

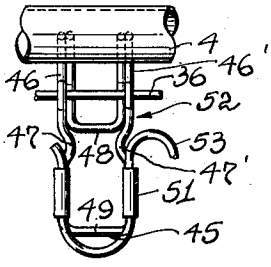


FIG. 7

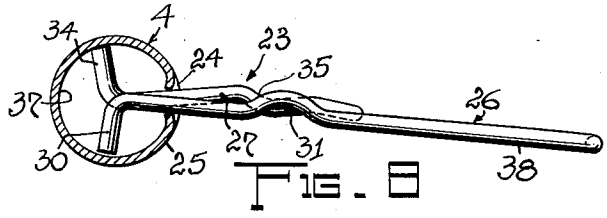


FIG. 8

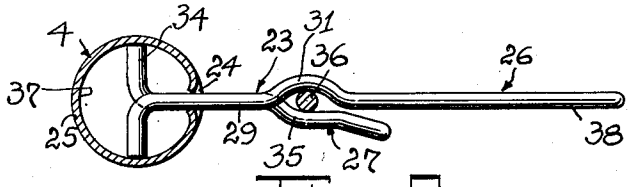


FIG 9

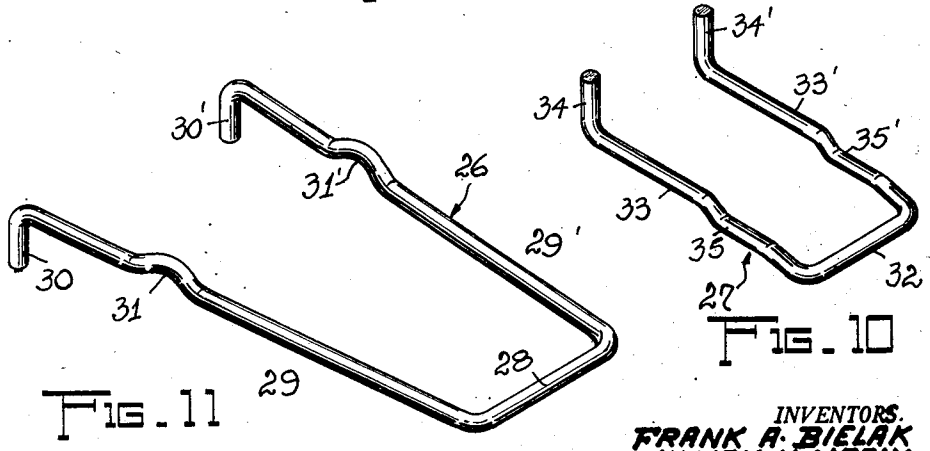


FIG. 10

FIG. 11

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WIRE BRACKET FOR TUBULAR RAILS

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Application March 24, 1951, Serial No. 217,386

9 Claims. (Cl. 248—223)

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This invention relates in general to spring supporting means for wire spring constructions such as used in upholstered furniture, automobile seats and the like, and, more particularly to spring wire supporting brackets for wire spring constructions embodying sinuously corrugated wire springs mounted on open tubular frame structures crosswise thereof.

Spring constructions of this type are generally assembled from corrugated wire spring elements having yielding resting portions supported on yielding front and rear supporting arms which are secured to front and rear rails of an open frame structure and arranged to yieldingly support the resting portions of the springs in elevated position above the frame structure. The resting portions of the wire springs of these spring constructions are connected by edge wires and connecting wires to form the spring construction with a unitary resilient resting member.

In a thus constructed resilient resting member of a spring construction the front and rear edges of the resting members are generally supported by the yielding front and rear supporting arms of the individual springs, whereas, the side edges of the resting member are supported by supplemental wire springs which are mounted either directly on the side rails of the open frame structures or on brackets secured thereto, an often difficut and always costly arrangement in labor and material, particularly when the rails of the open frame structure are made of tubular material.

The primary object of this invention is the provision of an improved, simple and economic wire supporting device, particularly suited for use with tubular frame structures, the device embodying cooperating wire members adapted to be extended into a tubular rail through a perforated wall thereof and to be removably secured to such tubular rail, the device being shaped to properly seat and support sinuously corrugated wire springs and the device having cooperating wire members constructed similar to each other, sized to fit one within the other, and provided with hook-shaped legs which are jointly extended into a tubular rail when the wire members are nested so that the ends of the hook-shaped legs contact opposed wall areas of such tubular rail to permit forcible engagement of these ends with the wall areas and locking of the wire members to these areas when these members are tilted in opposite directions with respect to each other toward said wall areas and ready release of the

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wire members when tilted in directions opposite to the directions first mentioned.

Another object of the invention is the provision of a wire spring supporting device of the type described above which embodies two U-shaped wire members differentiating in width to permit their nesting and differentiating in overall length to form said device by the longer one of its wire members with a loop-shaped extension adapted to seat an end coil of a sinuously corrugated wire spring and permit attachment of such end coil to said extension by standard clips.

A further object of the invention is the provision of a wire spring supporting device of the type described above in which the U-shaped wire members have their legs shaped to a hook by offsetting the ends of said legs at right angles to the planes of the U-shaped wire members and in which the wire members are nested in inverted position to extend the offset ends of their legs in opposite directions.

Still another object of the invention is the combination of a wire spring supporting device of the type described above with an elongated locking member inserted between said wire members and adapted to lock same in properly tilted position with respect to a perforated tubular rail when the wire members of the device are extended into such rail through the perforated wall thereof and tilted in opposite directions to predetermined positions.

With the above and other incidental objects in view the invention has still other marked improvements and superiorities which radically distinguish it from presently known structures. These improvements or superior characteristics embodying certain novel features of design and construction are clearly set forth in the appended claims, and several preferred embodiments of the invention are hereinafter shown with reference to the accompanying drawings forming part of this specification.

In the drawings:

Fig. 1 is a fragmentary plan view of an automobile spring seat construction embodying the invention;

Fig. 2 is a cross-sectional view on line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary plan view showing the side rail of a seat construction such as shown in Fig. 1, the side rail mounting a spring supporting device constructed in accordance with the invention;

Fig. 4 is an end view of Fig. 3;

Fig. 5 is a fragmentary plan view of a somewhat modified form of a spring supporting device constructed in accordance with the invention;

Fig. 6 is a sectional view on line 6—6 of Fig. 5;

Fig. 7 is a fragmentary plan view of another modified form of a spring supporting device;

Figs. 8 and 9 show sectional views through a tubular rail during its connection with a spring supporting device inserted thereinto, thus:

Fig. 8 showing the spring supporting device prior to its interlocking with the inner wall of the tubular rail, and

Fig. 9 shows the device in locked position with the tubular rail; and

Figs. 10 and 11 are perspective views of the U-shaped symmetrically constructed two wire members of the spring supporting device.

Referring now more particularly to Figs. 1 through 4 of the drawings, the automobile spring seat construction disclosed therein embodies a tubular open frame structure 2 which embodies a tubular front rail 3, tubular side rails 4 and a tubular rear rail 5. This frame structure supports a plurality of flat, sinously corrugated springs 6 arranged crosswise of the frame structure and secured to the front and rear rails 3 and 5 thereof. The springs 6, which are made of steel wire, bent to sinuous shape, so that the loops thereof extend substantially parallel to each other, have their front ends formed with V-shaped supporting arms 9 secured to an elongated front sheet metal bracket 10 mounted on front rail 3 and their rear ends bent upwardly to form rear suspending arms 11 secured to an elongated rear sheet metal bracket 12 mounted on rear rail 5. Springs 6 are assembled to form a unitary, elevated resilient seating member 14 by an edge wire 15.

In the automobile spring seat construction in which seating member 14 has its front and rear edges 16 and 17 supported by the V-shaped supporting arms 9 and the rear suspending arms 11, the side edges 18 of seating member 14 are supported by V-shaped supporting springs 19. These springs engage the bottom faces of the outer springs 20 of the seat construction and are secured to said outer springs by clips 21 connecting the offset end loops 22 of supporting springs 19 with the outer springs 20. V-shaped supporting springs 19 are mounted on wire supporting devices 23 removably connected with tubular side rails 4 by extending these devices through perforations 24 in the wall 25 of tubular side rails 4 as will be presently described.

The supporting devices 23 each embody a pair of similarly constructed, U-shaped wire members 26, 27, respectively, which differentiate in width and length. Wire member 26, the larger one of the two wire members has extended from opposite ends of its straight web portion 28 elongated arms 29, 29' which slightly diverge from each other and are shaped to form hooks by bending their end portions 30, 30' to extend in parallel relation with respect to each other, at right angles to the plane of the wire member. The elongated arms 29, 29' include curved locking portions 31, 31' extended in a direction opposite to the direction of offset end portions 30, 30', the purpose of which locking portions will be described later. Wire member 27, the smaller one of the two wire members, is dimensioned to nest within the larger wire member 26. This wire member 27 has extended from opposite ends of its straight web portion 32 arms 33, 33' which are shorter than the arms 29, 29' of wire member 26. Arms 33, 33' are also shaped to form hooks by bending their end portions 34, 34' so as to extend in parallel relation with respect to each other at right angles to the plane of wire member 27. These arms 33, 33' include curved locking portions 35, 35' extended in a direction opposite to the direction of the offset end portions 34, 34', which locking portions 35, 35' cooperate with the locking portions 31, 31' on arms 29, 29' in seating an elongated locking member 36 interposed between the wire members 26 and 27 to hold such members in predetermined position with respect to each other when mounted on a tubular rod as will hereinafter be described.

To mount a supporting device of the type described on a perforated tubular rod, such as tubular side rail 4, wire members 26 and 27 are inverted with respect to each other so as to extend their end portions 30, 30' and 34, 34' in opposite directions and then pair-wise threaded through the perforations 24 in the wall 25 of tubular rail 4 until the end portions 30, 30' and 34, 34' contact the inner face 37 of such wall (see Fig. 8). In this position wire member 27 nests in wire member 26 and the web portion 28 of wire member 26 is extended a substantial distance beyond the web portion 32 of wire member 27 and forms by its extended portion 38 a seat adapted to support V-shaped spring 19. To effect a rigid coupling of wire members 26 and 27 with each other and the tubular rail 4, wire members 26 and 27 are forcibly tilted in opposite directions with respect to each other in a manner to force the end faces of their end portions 30, 30' and 34, 34' toward the inner face 37 of wall 25 for frictional engagement with said wall and a slight digging thereinto and thereafter are locked in the tilted positions by elongated straight wire locking member 36 which is extended between the wire members and seated in curved locking portions 31, 31' and 35, 35' thereof. The straight wire locking member 36 preferably extends parallel to tubular side rail 4 and has its ends 39 and 40 extended into bores 41 and 42 in front rail 3 and back rail 5.

The supporting device 23 in assembled form provides tubular side rail 4 with a laterally extended yielding supporting bracket which can readily be removed and is adapted to properly support any primary or secondary spring means used in springing up wire spring construction for all types of seat structures embodying tubular frame members, and which permits quick and proper attachment of springs and spring members thereto by clips 43 of standard design. The length of the offset end portions 30, 30' and 34, 34' of wire members 26 and 27, respectively, is, of course, determined by the inner diameter of the tubular rail member to which the supporting device 23 is to be attached and should be approximately equal to the radius of such tubular rail member to properly extend the supporting device therefrom.

The modified form of supporting device 44 shown in Figs. 5 and 6 is substantially similar to the supporting device 23 previously described with the exception that outer wire member 45 has arms 46, 46' provided with curved portions 47, 47' arranged in the plane of the outer wire member. These curved portions locate inner wire member 48 in outer wire member 45 and simplify positioning of members 45 and 48 with respect to each other. Furthermore, web portion 49 of outer wire member 45 is slightly longer than the width

of spring member 50 to be seated thereon to permit proper positioning and more rigid mounting of spring member 50 on the arms 46, 46' of the outer wire member by clips 51 of standard design, as will readily be seen from inspection of Fig. 6.

The modified form of supporting device 52 shown in Fig. 7 is similar to supporting device 44 shown in Figs. 5 and 6 with the exception that the width of outer wire member 45 is the same as the width of the wire spring 53 seated thereon and attached thereto by clips 51.

Having thus described our invention what we claim is:

1. The combination of a tubular, perforated rail member with a wire bracket structure including cooperating, symmetrically shaped wire members, said wire members having hook-shaped arm means and the hook-shaped arm means of one wire member being arranged in inverted position with respect to the arm means of the other hook-shaped member, said hook-shaped arm means being extended through the perforations of said rail member thereinto and tilted into forcible contact with the wall of said rail member to secure the wire bracket structure to said rail member when the wire members are extended into said rail tilted to predetermined positions and locked in such positions to permit free removal of the wire bracket structure from the rail member when the wire members are unlocked and tilted to other positions.

2. The combination described in claim 1, wherein the wire members of the wire bracket structure are of similar construction and have the hook-shaped arm means arranged in pairs.

3. The combination described in claim 1, wherein the wire members of the wire bracket structure are of similar construction and differentiate in overall length to provide a wire bracket structure assembled from wire members, one of which extends a substantial distance from the rail member to which the wire bracket structure is secured.

4. The combination described in claim 1, wherein the wire members of the wire bracket structure are of similar construction, wherein the hook-shaped arm means are arranged in pairs and wherein the wire members differentiate in width to permit their nesting.

5. The combination described in claim 1, wherein the wire members of the wire bracket structure are of similar construction, wherein the hook-shaped arm means are arranged in pairs cooperating with each other, wherein the wire members differentiate in width to permit their nesting, and wherein elongated wire means between the outwardly exposed portions of said wire members lock same in predetermined position with respect to each other.

6. The combination of a perforated rail member having opposed wall portions with a wire bracket structure including cooperating, similarly constructed, U-shaped wire members constructed and dimensioned to permit their nesting in inverted positions, said wire members having hook-shaped arms extended through the perforations of said rail member thereinto, and said wire members being tilted in opposite directions to bring the ends of their hook-shaped arms into forcible contact with the opposed wall portions of said rail member to secure the wire bracket structure to said rail member when the wire members are tilted to predetermined positions and locked in such positions and permit removal of the wire bracket structure from the rail member when the wire members are unlocked and tilted to other positions.

7. The combination described in claim 6 wherein the perforated rail member is tubular and has circular cross section, wherein the hook-shaped arms of said wire members extend with their hook-forming end portions at right angles to the plane of the U-shaped members, and wherein the length of said hook forming end portions approximately equals the radius of said tubular rail member to extend the wire bracket structure radially from said tubular rail member.

8. The combination described in claim 6, wherein the U-shaped wire members differentiate in width to permit their nesting and wherein the wider one of said U-shaped wire members has its arms formed with inwardly extended deflections adapted to locate the narrower wire member for nesting in the wider one.

9. The combination described in claim 6, wherein the width of the wider one of the U-shaped wire members exceeds the width of the loops of a sinuously corrugated wire member to be supported thereby somewhat less than twice the gage of the wire of such sinuously corrugated wire member to facilitate seating and mounting of the sinuously corrugated wire member on the wider U-shaped member.

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