Dec. 5, 1944. N. WOLOFSKI 2,364,499

SPRING CONSTRUCTION

Filed June 13, 1942 2 Sheets-Sheet 1

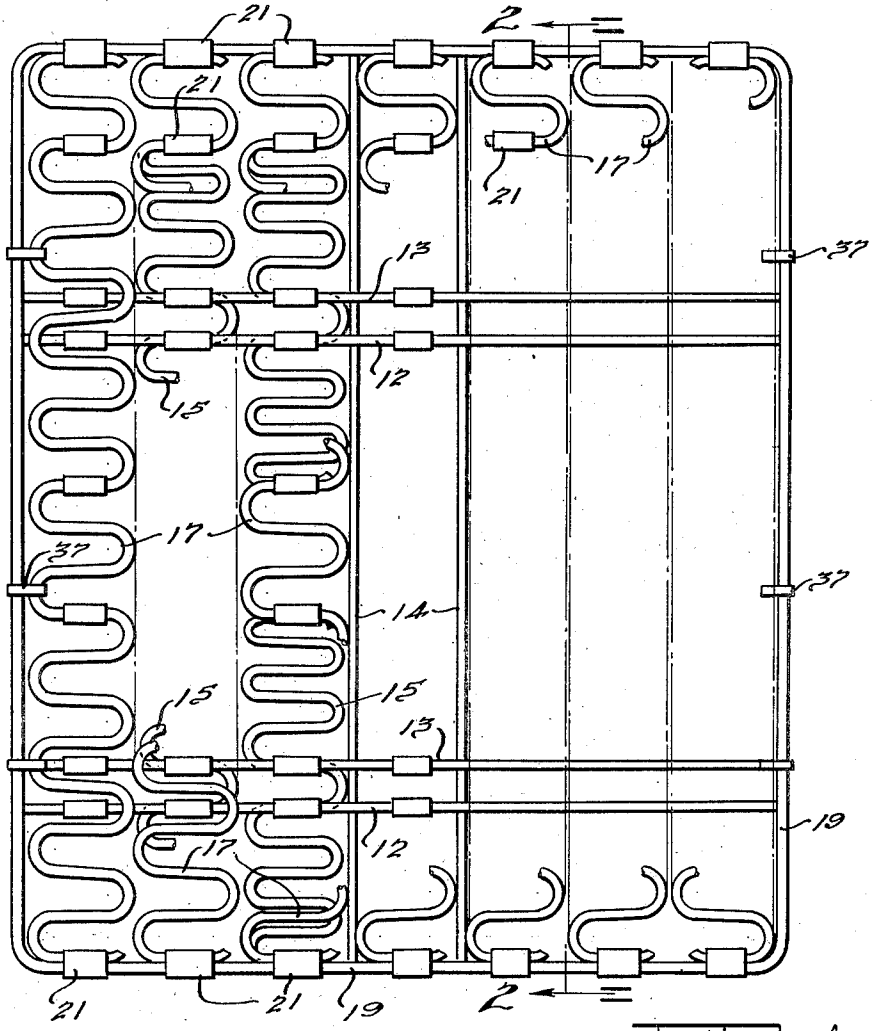


FIG. 1.

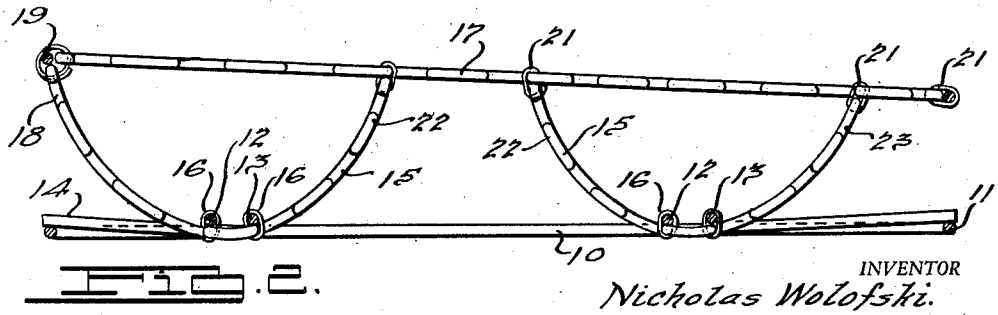


FIG. 2.

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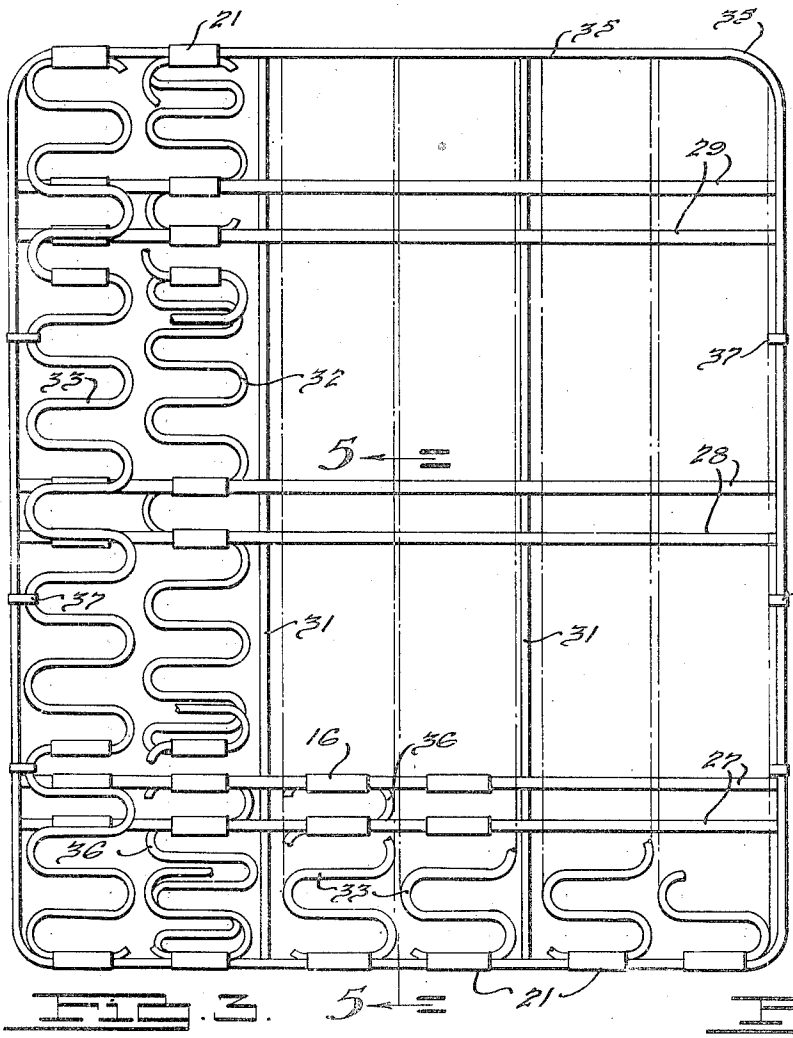


FIG. 3.

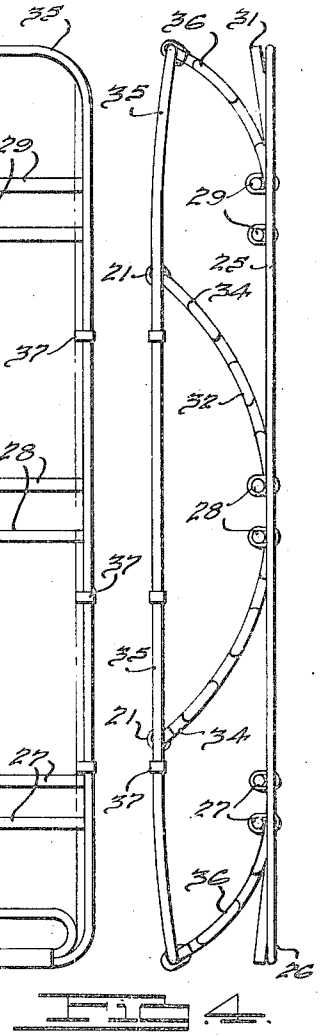


FIG. 4.

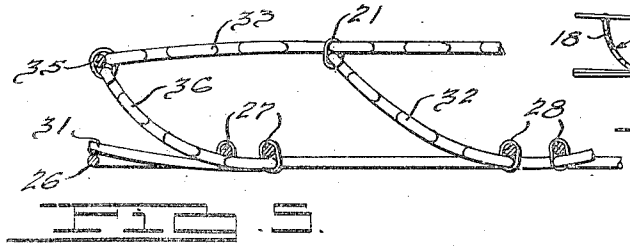


FIG. 5.

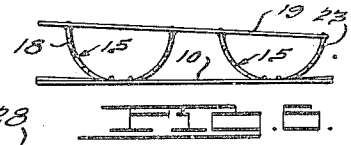


FIG. 6.

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2,364,499

SPRING CONSTRUCTION

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Application June 13, 1942, Serial No. 446,869

11 Claims. (Cl. 155—179)

My invention relates to spring constructions, and particularly to a spring frame structure for a seat and back cushion which is extremely light and durable while providing the proper resiliency.

A wire frame forms the base of the spring structure which supports arcuate strips of wire bent in zig-zag formation. The upwardly projecting ends of these arcuate strips support a plurality of additional zig-zag strips and an end frame which forms a border for the top spring surface. When the arcuate strips are employed for forming the seat cushion frame the upwardly projecting ends thereof support the top strips near the ends and the medial portion. When the structure is employed for the back cushion a central row of arcuate spring strips is employed, with the two upwardly projecting arms spaced each side of the center to have a soft central portion for the seat back. Additional arcuate strips form separate arms which project upwardly into engagement with the top edge of the frame and the ends of the top strips and join thereto.

Accordingly, the main objects of my invention are: to form a back and seat cushion frame from wires which form the border edge of the top and bottom frame and which extend across the bottom frame to form the supports for the spring strips having upwardly projecting end portions which support spring strips which form the top spring surface; to interconnect a top and base frame by arcuate spring strips, the upwardly projecting end portions of which are spaced near the central part of the spring strips, the upstanding ends of which are joined respectively to the front end of the frame and strips and to the spring strips inwardly of the rear edge of the frame; to form a back cushion spring structure by interconnecting the top and bottom frame elements by centrally disposed arcuate strips having the upwardly projecting end portions engaging the spring strips of the top frame at points spaced from the center and having the end supported by portions of the arcuately disposed strips, the lower ends of which are attached to the base frame inwardly of the edge thereof; and in general, to support the spring strips for seat and back cushions which provides the proper resiliency and durability by a simple construction which is economical of manufacture.

Other objects and features of novelty of my invention will become apparent when referring, for a better understanding of my invention, to the following description taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a broken plan view of a seat frame embodying features of my invention;

Fig. 2 is a sectional view of the structure illustrated in Fig. 1, taken on the line 2—2 thereof;

Fig. 3 is a broken plan view of a back frame embodying features of my invention;

Fig. 4 is a view in side elevation of structure illustrated in Fig. 3;

Fig. 5 is a broken sectional view of structure illustrated in Fig. 3, taken on the line 5—5 thereof; and

Fig. 6 is a reduced view of structure similar to that illustrated in Fig. 5, showing a further form which my invention may assume.

In Figure 1, I have illustrated a base frame 10 comprising a rectangular frame 11 made of wire, having pairs of wires 12 and 13 extending laterally thereacross. These laterally extending wires 12 and 13 are braced by a pair of spaced wires 14 which extend longitudinally of the spring structure. Upon the pairs of wires 12 and 13 spring strips 15, made of wire bent in zig-zag formation, are supported by bands 16. The strips 15 are of arcuate shape along their longitudinal dimension and are so mounted as to have the ends project upwardly in position to engage and support a zig-zag spring strip 17 which is aligned therewith. The ends 18 of the strips 15 at the front edge of the structure are joined to the top border frame 19 which is made of wire and which is substantially of the size of the base frame 11. A metal band 21 secures the ends 18 of the strips 15 to the border element 19 and to the end of the spring strips 17. The ends 22 are spaced apart and joined to the mid-portion of the spring strip 17 while the ends 23 of the rear strips 15 are joined to the strips 17 inwardly of the rear portion of the border strip 19. In this manner the proper resiliency is provided to the plurality of strips 17 which are disposed in parallel relation across the top of the spring structure within the confines of the top border wire 19.

The portions 22 of the strips 15 provide material strength for supporting the load in the central portion of the structure while the ends 18 provide proper support for the front end of the strips. The rear ends of the strips 17 are supported inwardly of the edge by the ends 23 of the rear strips 15 and provide the proper support for the springs 17. The portions of the strips 17 extending rearwardly of the end 23 are aligned with the back frame which is not directly loaded when the seat is occupied. It will be noted further that the strips 15 at the front of the frame are

longer, or the ends are secured closer together than the strips 15 at the rear portion of the frame to have the end portions 18 and 22 extend upwardly a greater amount to provide a rearward slope to the spring strips 17 and to the borderframe 19.

Referring to Figs. 3 to 5, I have illustrated the spring structure for the back cushion wherein a base 25 is formed of a border wire 26 of rectangular shape having pairs of wires 27, 28, and 29 disposed transversely of the frame. A plurality of wires 31 extend longitudinally of the frame under the pairs of wires 27, 28, and 29 and over the top of the border wire 26, as illustrated in Figs. 4 and 5. Beneath the pairs of wires 28 a plurality of arcuate spring strips 32 are secured by the bands 21. The strips 32 are similar to the strips 15, with the exception that they are disposed on an arc of greater radius to offer less resistance to deflection when supporting a plurality of spring strips 33 which are secured thereto by bands 21. It will be noted that the ends 34 of the strip are spaced a considerable distance apart and engage the strips 33 between the center and ends. This leaves the central portion of the strip 33 unsupported at the point where the back of the occupant first contacts the cushion and the proper resiliency is provided when the spring structure is deflected. The ends of the strips 33 and the border frame 35 are supported on the short arcuate strips 36, the lower ends of which are secured to the pairs of wires 27 and 29 by the bands 21.

Each of the strips 33 is supported in this manner upon a central arcuate spring strip 32 and the short strips 36 which provide a cantilever support for the ends of the strips and the border frame 35 which encompasses the plurality of spring strips 33. The spring strips may be secured to the side edges of the border frame by the hog rings 37. The spring structures are upholstered in the conventional manner and the back cushion rests upon the rear edge of the seat cushion over the unsupported end of the top spring surface. Resistance against downward deflection is provided by the arms of the strips 15 which support the front frame end, the central portion of the strips 17 and the rear portion of the strips inwardly of the rear ends thereof. The back cushion, subjected to a lighter load than the seat cushion, employs only a single row of centrally disposed arcuate strips which support the spring strips at spaced points, leaving the central portion unsupported. The ends of the strips 33 are supported by short spring strips 36 which are mounted in cantilever suspension and permit the proper deflection of the spring surface when an occupant of the seat leans back against the back cushion.

In Fig. 6, I have illustrated a modified form of spring seat construction, that which provides a soft front edge thereto. In this arrangement, the ends 18 of the front spring strips 15 are secured inwardly of the border frame 19 which is free to deflect downwardly independently of the ends 18. The ends 23 of the rear strips 15 may be secured to the strips 17 and the border frame 19, as illustrated.

What I claim is:

1. A spring construction including a base border element made of wire, pairs of wires spanning said element at spaced points, upwardly presenting arcuate spring strips having their mid-sections secured to said pairs of wires in spaced rows, said strips on one pair of wires being aligned with corresponding strips of the other pair, and additional spring strips secured to the ends of said aligned strips inwardly of one end thereof.

2. A spring construction including a base border element made of wire, pairs of wires spanning said element at spaced points, upwardly presenting arcuate spring strips having their mid-sections secured to said pairs of wires in spaced rows, said strips on one pair of wires being aligned with corresponding strips of the other pair, additional spring strips secured to the ends of said aligned strips inwardly of one end thereof, and a border wire surrounding said additional strips and secured to the ends thereof.

3. A spring construction including, a base formed of a border wire spanned by pairs of parallel wires, arcuately shaped zig-zag spring strips secured to said pairs of wires with the ends projecting upwardly and with the strip on one pair of wires aligned with a strip on the other pair of wires, and additional zig-zag spring strips supported on the ends of said aligned arcuate spring strips in such manner as to be in sloping relation to said base.

4. A spring construction including, a base formed of a border wire spanned by pairs of parallel wires, arcuately shaped zig-zag spring strips secured to said pairs of wires with the ends projecting upwardly and with the strip on one pair of wires aligned with a strip on the other pair of wires, additional zig-zag spring strips supported on the ends of said aligned arcuate spring strips in such manner as to be in sloping relation to said base, and a border wire about said additional strips and secured to the ends thereof.

5. A spring construction including, a base formed of a border wire spanned by pairs of parallel wires, arcuately shaped zig-zag spring strips secured to said pairs of wires with the ends projecting upwardly and with the strip on one pair of wires aligned with a strip on the other pair of wires, additional zig-zag spring strips supported on the ends of said aligned arcuate spring strips, and a border wire about said additional strips and secured to the ends thereof, one end of the arcuate strips being secured to the end of said additional strips and to the border wire, the opposite end of said strips being secured to the additional strips near the medial portion thereof, the adjacent edge of said aligned arcuate strips being secured to the additional strips near the medial portion thereof while the opposite end of said aligned strips is secured to said additional strips inwardly of the end thereof.

6. In a spring construction, a base frame embodying a border wire spanned by pairs of parallel wires, arcuate zig-zag strips secured to said pairs of wires near their medial portion with the ends projecting upwardly a progressively greater amount from one to the other edge of the frame, the arcuate strips on one pair of wires being aligned with corresponding strips of the other pair, and additional spring strips secured to the ends of said pairs of arcuate strips in angular relation to said base frame.

7. In a spring construction, a base frame including a border frame spanned by pairs of parallel wires, a central pair of wires having a plurality of arcuate zig-zag spring strips secured thereto with the ends projecting upwardly, additional arcuate strips having one end secured to the pairs of wires spaced from said central pair with the opposite ends projecting upwardly in aligned relation to the arcuate strips on said central pairs of wires, and additional zig-zag

spring strips secured near the ends to the projecting ends of said central strip and at the ends to the ends of said additional arcuate strips.

8. In a spring construction, a base frame including a border frame spanned by pairs of parallel wires, a central pair of wires having a plurality of arcuate zig-zag spring strips secured thereto with the ends projecting upwardly, additional arcuate strips having one end secured to the pairs of wires spaced from said central pair with the opposite ends projecting upwardly in aligned relation to the arcuate strips on said central pairs of wires, additional zig-zag spring strips secured near the ends to the projecting ends of said central strip and at the ends to the ends of said additional arcuate strips, and a border wire extending around said additional strips and secured thereto and to the additional arcuate strips.

9. In a spring construction, a base embodying a border frame upon which a pair of centrally disposed spaced wires are secured, with pairs of additional wires secured to the frame between the central pair and the frame ends, additional wires joining said frame ends to the pairs of wires, arcuately disposed zig-zag spring strips secured to the central pair of wires with their ends projecting upwardly, and additional arcuate strips secured at one end to the end pairs of wires with the other ends projecting upwardly in alignment with the central arcuate strips, and a top frame member supported on the ends of said strips.

10. In a spring construction, a base embodying a border frame upon which a pair of centrally disposed spaced wires are secured, with pairs of additional wires secured to the frame between the central pair and the frame ends, additional wires joining said frame ends to the pairs of wires, arcuately disposed zig-zag spring strips secured to the central pair of wires with their ends projecting upwardly, additional arcuate strips secured at one end to the end pairs of wires with the other ends projecting upwardly in alignment with the central arcuate strips, and additional spring strips secured to the ends of the central arcuate strips and to the ends of the arcuate strips aligned therewith.

11. In a spring construction, a base embodying a border frame upon which a pair of centrally disposed spaced wires are secured, with pairs of additional wires secured to the frame between the central pair and the frame ends, additional wires joining said frame ends to the pairs of wires, arcuately disposed zig-zag spring strips secured to the central pair of wires with their ends projecting upwardly, additional arcuate strips secured at one end to the end pairs of wires with the other ends projecting upwardly in alignment with the central arcuate strips, additional spring strips secured to the ends of the central arcuate strips and to the ends of the arcuate strips aligned therewith, and a border wire extending around said additional strips and secured thereto and to said additional arcuate strips.

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