

May 20, 1958

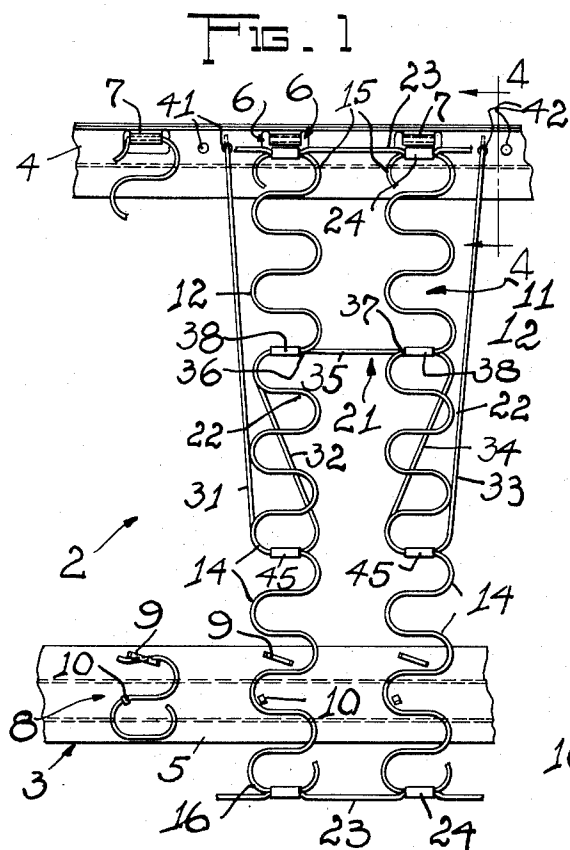
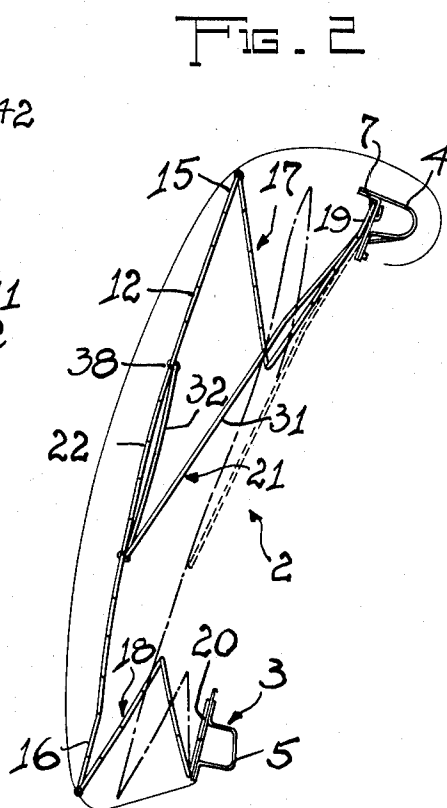
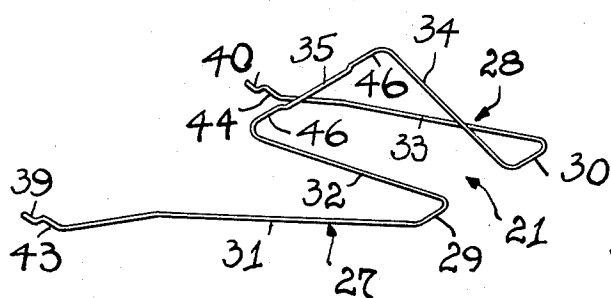
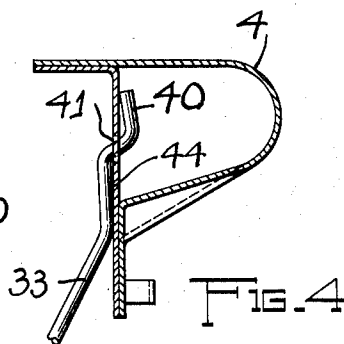
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2,835,314

WIRE SPRING STRUCTURE

Filed April 23, 1956

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 5

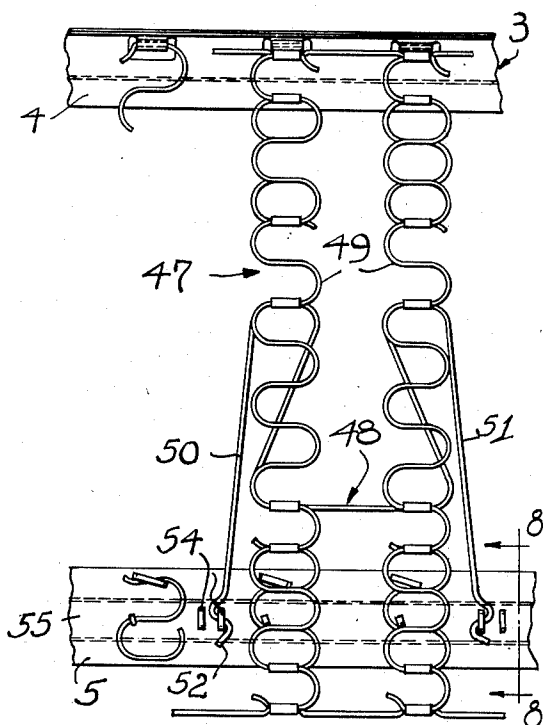


FIG. 6

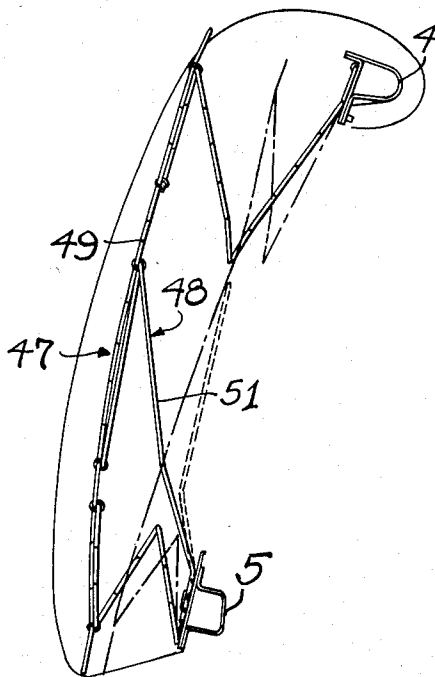


FIG. 7

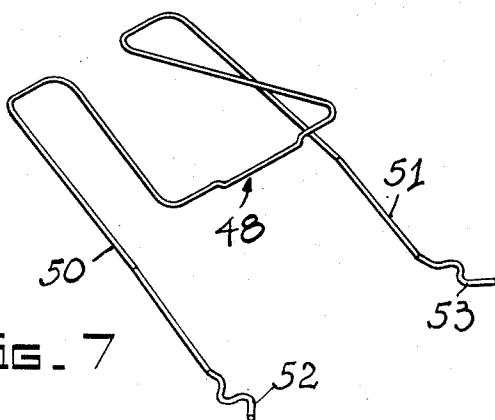
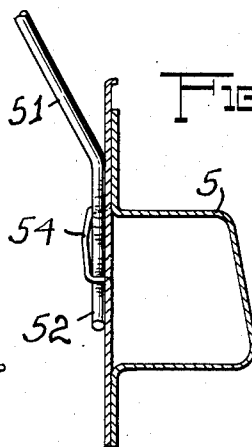


FIG. 8



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1

2,835,314

WIRE SPRING STRUCTURE

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3 Claims. (Cl. 155—179)

This invention relates in general to improvements in wire spring structures for seat and back spring constructions of automobiles, davenport, chairs, and the like, and, more particularly, refers to improvements in wire spring structures of the type in which elongated zigzag seating or resting portions are supported by accordion-fold zigzag elements.

Seating or resting portions of wire spring structures of this type comprise a sinuously corrugated or zigzag-shaped spring strip which is supported at its opposite ends on accordion-fold zigzag supporting elements and between its opposite ends on intermediate supporting elements necessitating the use of specifically constructed frames generally limiting the available passenger foot and knee room in the rear seating compartments of motor vehicles.

The supporting elements of these wire spring structures generally consist of accordion-fold elements which are shaped from zigzag spring strips by twisting predetermined cross members thereof. However, in these supporting elements twisting results in winding up the fibres of the twisted members which increases the size of minimum angles obtainable between adjacent angularly related spring strip portions of the supporting elements even when thus shaped accordion-fold elements are stress-relieved in fully compressed condition. Thus constructed wire spring structures retain an extensibility and contractibility which is substantially of the same degree as the extensibility and contractibility of the seating and resting portions of the wire spring structures.

With the foregoing in view, the primary object of the present invention is the provision of a wire spring structure of the general type referred to above, which includes two parallelly arranged sinuously corrugated resting and supporting portions supported between their opposite ends by a single accordion-fold wire supporting element engaged at localized areas with the bottom faces of these two resting and supporting portions and non-shiftable connected therewith.

Another object of the invention is the provision of a wire spring structure having two parallelly arranged sinuously corrugated resting and supporting portions which include at their opposite ends accordion fold-shaped supporting and attaching means and a single V-shaped wire supporting element for the central portions of the two resting and supporting portions, the single wire supporting element being arranged to extend under the bottom faces of the two resting and supporting portions between their supporting and attaching means for coupling the resting and supporting portions in parallel co-operative relation to each other.

A further object of the invention is the provision of a wire spring structure having two elongated sinuously corrugated wire spring members which include supporting and attaching means at their ends, and a single V-shaped wire supporting element arranged to extend between the supporting and attaching means, and including an elongated cross member secured to the bottom faces of the two sinuously corrugated wire spring members, said V-shaped wire supporting element including laterally spaced supporting and attaching arms arranged in laterally spaced relation with respect to the sinuously corrugated wire spring members and their supporting and attaching means.

2

Further objects of the invention include the provision of a wire spring structure of the type referred to above embodying offsets arranged in the elongated cross member of the single V-shaped wire supporting element for proper contact of the elongated cross member of the two sinuously corrugated wire springs, bends in the supporting arms of the single V-shaped wire supporting element extending in a direction away from the bottom surfaces of the two sinuously corrugated wire springs and offsets in the free end portions of the supporting and attaching arms of the V-shaped wire supporting element to facilitate attachment of the V-shaped wire supporting elements to rails of frames mounting wire spring structures of the type described.

Additional objects and novel features of construction, combination and relations of parts by which the objects in view have been attained, will appear and are set forth in detail in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate certain practical embodiments of the invention, but it will be apparent as the specification proceeds that the structure may be modified and changed in various ways without departure from the true spirit and broad scope of the invention.

In the drawings:

Fig. 1 is a fragmentary plan view of a seat back spring construction mounted on a frame, the spring construction being assembled from wire spring structures embodying the features of the present invention.

Fig. 2 is a side view of the spring construction shown in Fig. 1.

Fig. 3 is a perspective view of the V-shaped wire supporting element shown in Figs. 1 and 2.

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary plan view similar to that shown in Fig. 1, with the exception that the V-shaped wire supporting element of the wire spring structure is somewhat modified and arranged in another relation with respect to the wire spring members of the seat back spring structure.

Fig. 6 is a side view of Fig. 5.

Fig. 7 is a perspective view of the V-shaped wire supporting element shown in Figs. 5 and 6; and

Fig. 8 is an enlarged sectional view taken on line 8—8 of Fig. 5.

In the exemplified forms of the invention shown in the drawings, the figures cover two different seat back spring constructions, each embodying a frame having attachment means and wire spring structures mounted on the frame crosswise thereof to provide a seat back spring construction adapted to be upholstered as customary.

Referring now in detail to these drawings, the seat back spring structure 2 illustrated in Figs. 1 through 4, inclusive, embodies an open frame 3 with top and bottom rails 4 and 5. Frame 3 embodies on its top rail 4 a socket arrangement 6 including an upwardly extended hook-shaped integral extension 7 and on its bottom rail 5 a coupling arrangement 8 including an upwardly extended strip-shaped extension 9 inclined with respect to the longitudinal axis of bottom rail 5 and a hook-shaped extension 10 co-operating with strip-shaped extension 9 in mounting a wire spring on bottom rail 5 in the manner disclosed in my co-pending patent application Serial

Number 423,652 filed April 16, 1954 now U. S. Patent Number 2,796,921. The thus constructed frame mounts crosswise thereof a plurality of wire spring structures 11 which are secured to said frame by extension 7 and coupling arrangement 8.

Each wire spring structure 11 embodies two identically constructed elongated corrugated wire springs 12 of steel wire bent to sinuous shape so that their loops 14 extend substantially parallel to each other. These wire springs 12 have each integrally extended from their top and bottom ends 15 and 16 V-shaped supporting and attaching members 17 and 18 formed with sharp apexes by axially twisting respective cross members of such wire members, which supporting and attaching members 17 and 18 are seated with their free arms 19 and 20 on top and bottom rails 4 and 5 and securely mounted thereon when engaged with hook-shaped extensions 7 on top rail 4 and coupling arrangements 8 on bottom rail 5. Each wire spring structure 11 furthermore includes a cantilever-like supporting member 21 arranged to support the two substantially centrally positioned areas 22 of the two elongated sinuously corrugated wire springs 12, as will be later described. The thus constructed wire spring structures 11 are encircled, as customary, by a border wire 23 coupled by clips 24 with the top and bottom ends 15 and 16 of wire springs 12.

The single cantilever-like supporting member 21 of each wire spring structure 11 is attached to the bottom faces of centrally positioned areas 22 of wire springs 12. This supporting member 21 is bent to its shape from straight wire and includes two symmetrically arranged V-sections 27, 28, each of which embodies a single short wire cross member 29, 30 respectively connecting two substantially straight upper and lower elongated wire levers 31, 32 and 33, 34 respectively. These wire levers are inclined with respect to each other, and the upper straight wire levers 32, 34 blend into opposite ends of a single wire cross member 35 of substantial length, which in assembled wire spring structure 11 is extended over the bottom faces of wire springs 12 crosswise thereof and secured to aligned cross members 36, 37 of the wire springs 12 by clips 38. The lower straight wire levers 31, 33 slightly diverge with respect to each other and are substantially longer than straight wire levers 32, 34 to permit engagement of cantilever-like supporting element 21 with top rail 4 of frame 3 by inserting offset end portions 39 and 40 of wire levers 31, 33 through openings 41, 42 in said top rail 4 and seating offset portions 43, 44 of said wire levers 31, 33 upon the front face of the top rail 4, all for the purpose of extending supporting member 21 in cantilever-like fashion from frame 3.

Wire spring structure 11, in which short wire cross members 29 and 30 of cantilever-like supporting member 21 are secured to wire spring members 12 by clips 45, has the upper straight levers 32, 34 of said supporting member 21 curved to permit local deformation of the central areas of the wire springs 12 without interference by the wire levers (see Fig. 2), and in addition has wire cross member 35 provided with offsets 46 to locate clips 45.

In the modified form of invention shown in Figs. 5 through 8 wire spring structure 47 includes a cantilever-like supporting member 48 identical in construction to cantilever-like supporting member 21 previously described and two wire springs 49 identical in construction to wire springs 12 previously described. In this case cantilever-like supporting member 48 has its lower straight wire levers 50, 51 secured to lower rail 5 by extending the S-shaped ends 52, 53 of said levers 50, 51 through strip-shaped extensions 54 in front wall 55 of bottom rail 5.

Having thus described my invention, what I claim is:

1. A wire spring structure embodying two laterally spaced zigzag wire springs with resting portions and supporting arms, and a single V-shaped wire element secured at longitudinally spaced areas to the bottom face of the resting portion of each of said zigzag wire springs to non-shiftably connect said two wire springs to each other and reinforce a longitudinally extended portion of the resting portion of each of said wire springs, said V-shaped wire element including two elongated supporting arms extended in symmetrical, laterally spaced relation to said wire springs toward supporting arms thereof.

2. A wire spring structure comprising a frame, pairs of laterally spaced zigzag wire springs with resting portions and supporting arms arranged crosswise of the frame and attached thereto, and a single V-shaped wire supporting element for each pair of zigzag wire springs, each of said V-shaped wire supporting elements including a central cross member abutting the bottom faces of a pair of wire springs crosswise thereof and two V-shaped lever arms with lever arm portions extended from the central cross member and other lever arm portions extended from the first lever arm portions, said second lever arm portions attached in cantilever-like fashion to the frame and said central cross member and said first lever arm portions secured to the bottom faces of the resting portions of the pair of wire springs in longitudinally spaced places to support the resting portions of the pair of wire springs in longitudinally spaced areas.

3. A wire spring structure embodying a pair of laterally spaced zigzag wire springs having resting portions and supporting arms formed with oppositely extended loops successively connected by cross wires, and a single V-shaped wire element secured to two laterally spaced cross wires of the resting portion of each wire spring, said V-shaped wire element including a central cross member connected to the resting portions of the pair of wire springs to laterally space same and V-shaped lever arms having lever arm portions extended from said central cross member and secured to the resting portions in longitudinally spaced relation with respect to the central cross member and other lever arm portions extended from the first lever arm portions in laterally spaced relation with respect thereto.

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