April 16, 1963 W. C. SANDOR 3,085,259

BED SPRING CONSTRUCTION

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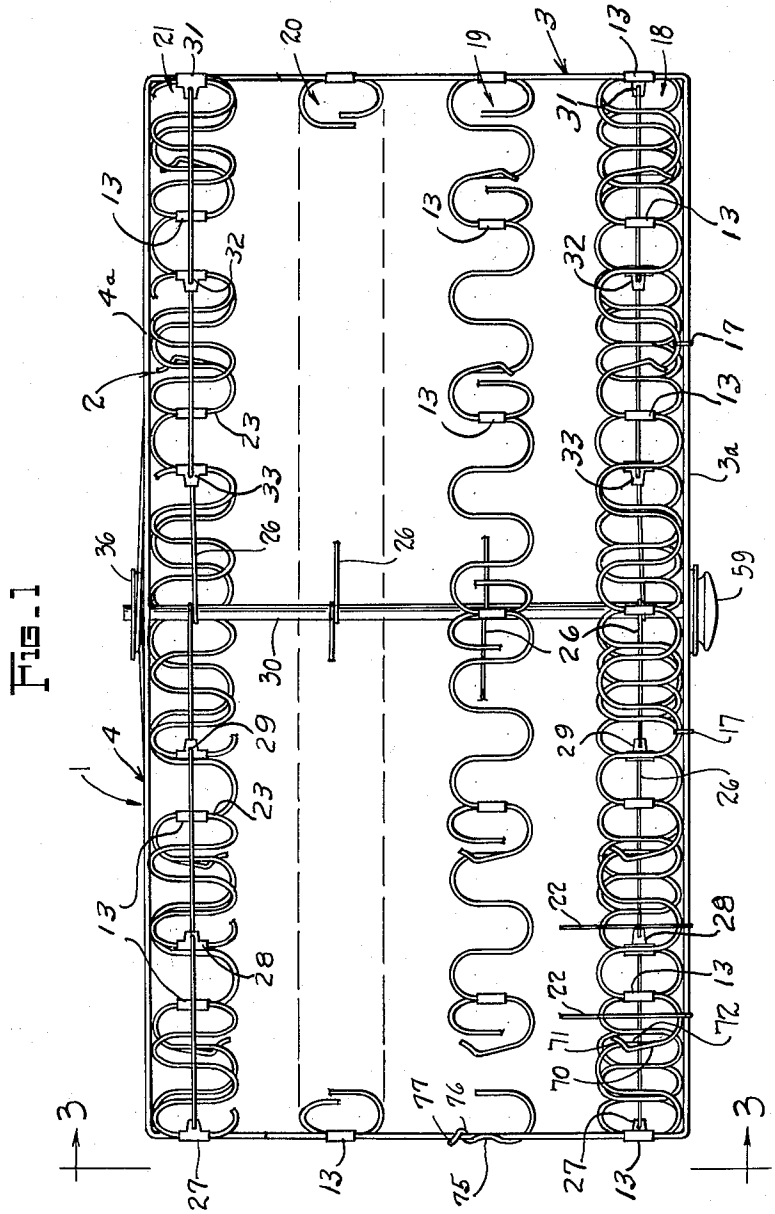


FIG. 1

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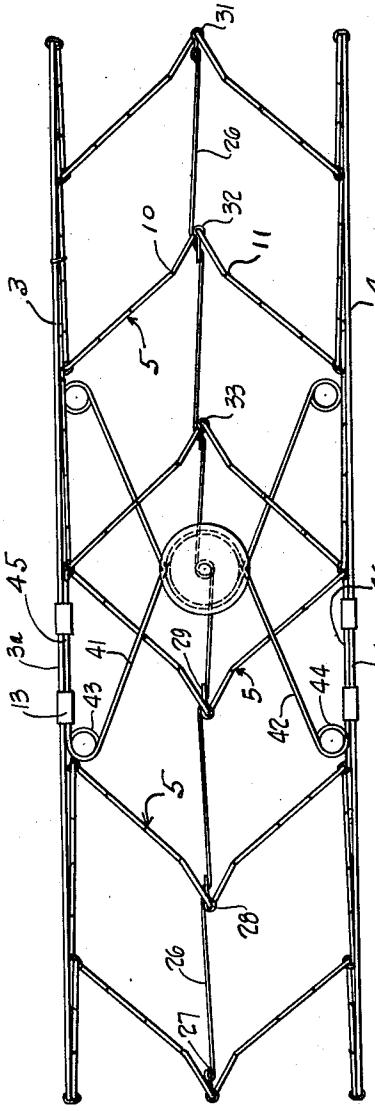


FIG. 2

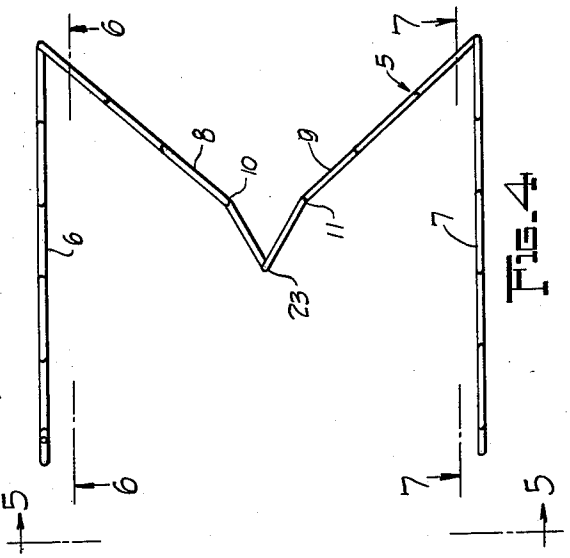


FIG. 4

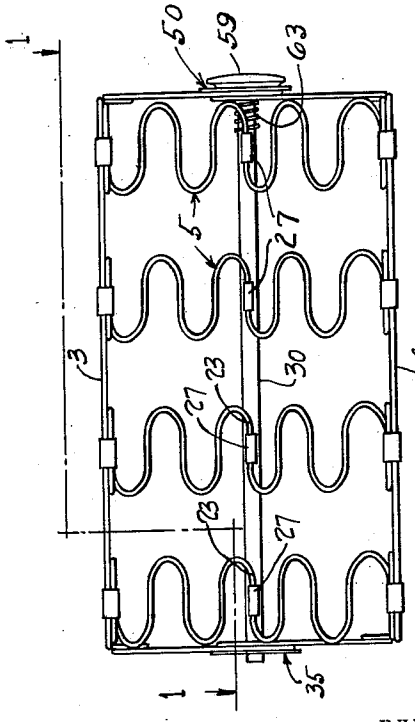


FIG. 3

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BED SPRING CONSTRUCTION

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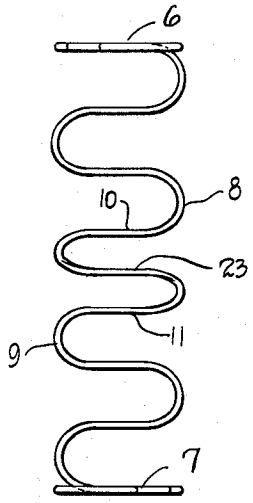


FIG. 5

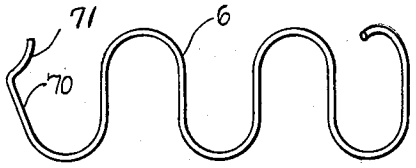


FIG. 6

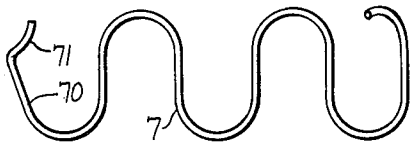


FIG. 7

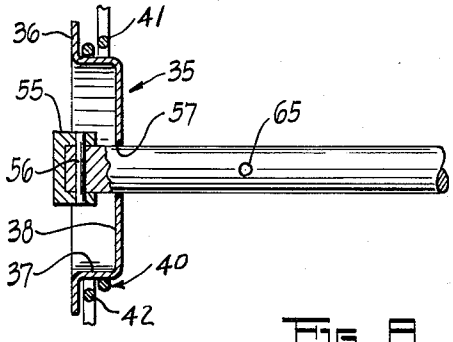
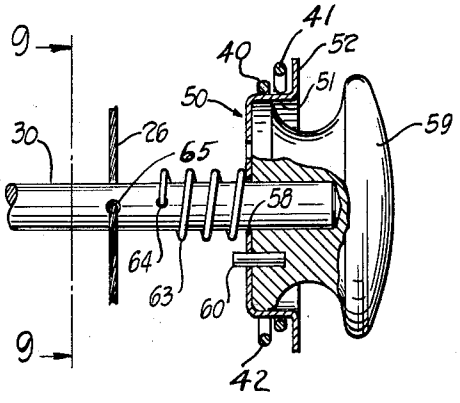


FIG. 8



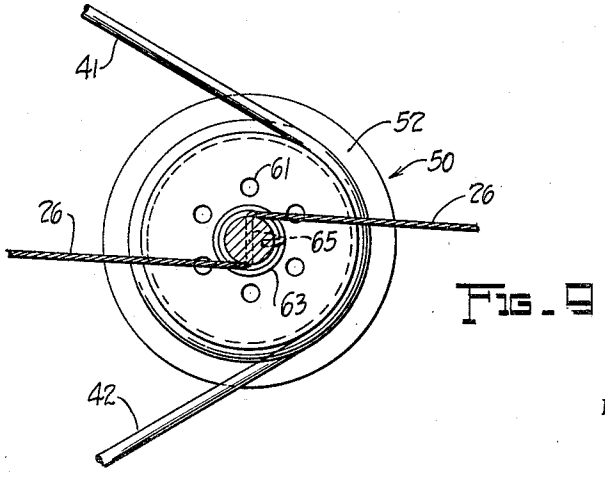


FIG. 9

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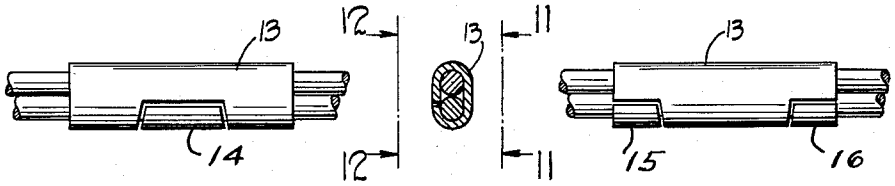


Fig. 12 Fig. 10 Fig. 11

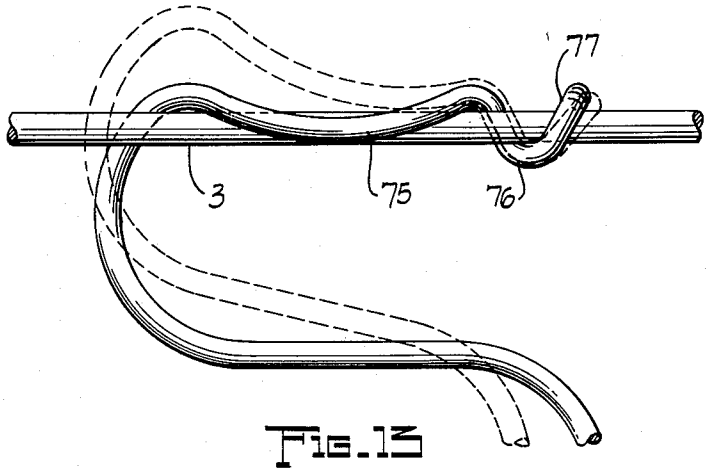


Fig. 13

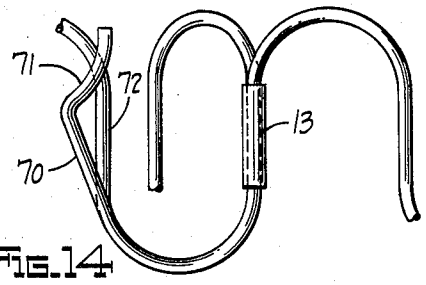


Fig. 14

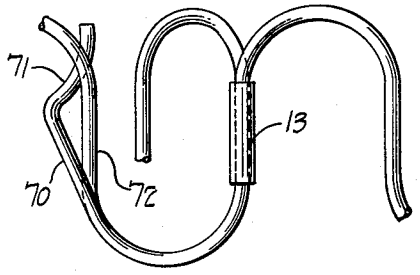


Fig. 15

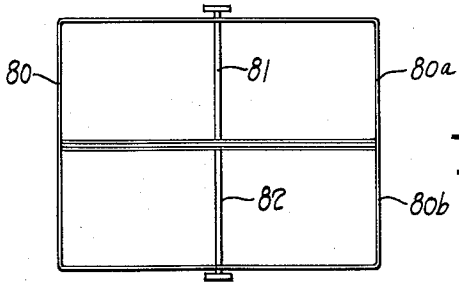


Fig. 16

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United States Patent Office 3,085,259 Patented Apr. 16, 1963

3,085,259

BED SPRING CONSTRUCTION

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Filed May 20, 1960, Ser. No. 30,475
5 Claims. (Cl. 5—247)

This invention relates to spring construction, and specifically to such construction as is most suitably arranged for use in bed springs or for similar purposes.

One of the primary problems in present types of bed spring construction, is the necessity to provide many different springs, to accommodate the requirements of persons who use the same, among these problems being that heavier persons need a bed spring with greater stiffness or for certain medical reasons, a bed spring is desirably much more resistant to deflection in certain areas than in others in order to provide support demanded by the circumstances, and so far as is known, no single bed spring can accommodate for all of the varying conditions which must be met.

As before stated, the usual procedure in providing bed springs which afford different degrees of support, is to make the bed spring to specifications involving such different degrees, and thus a large number of different bed springs is required.

Another phase of the bed spring problem which is noted, is the existence of the common type of bed spring involving a series of coils or coil units which are connected to one another and are not susceptible of providing adjustment which is one way of avoiding the construction of a series of different bed springs to accommodate the various conditions of support which may be demanded.

Another phase of the problem herein being discussed, is that the use of coil springs, necessarily limits the construction of the spring so that in order to make a spring less expensive than other types of springs, fewer coils are provided and thus in effect a poorer bed spring is available than if the same number of spring units is provided in each bed spring but the temper or resilience of the individual coils is varied in accordance with the demands to be encountered thereby.

In view of the relatively great expense of using a large number of coil spring elements in the construction of a bed spring, it is desirable to in some way provide for economizing in the manufacture of a bed spring without at the same time actually decreasing the amount of support provided by such spring or in the final analysis of either decreasing the effective life of the spring or making the same so expensive as to decrease the demand therefor.

A still further phase of the problem of bed spring construction which involves the use of coil springs, is the fact that where the spring construction is of the finest type, the coils are necessarily connected together in a series which results in movement of remote springs when pressure is applied upon a certain spring and thus in effect decreasing the supporting ability of springs in an unfavorable manner.

With the foregoing background of the problems involved in known bed spring construction, it is a principal object of this invention to provide a bed spring construction of entirely new type and of radically improved form, in which the supporting ability of the spring, or the resilience as the same may be termed, may be varied within wide limits from what would be classed as a very hard spring to a relatively soft quite resilient type.

It is a further object of this invention to provide a bed spring of the class described, which incorporates therewithin spring elements or members, which may be of substantially cheaper construction than the conventional coil type and yet which afford substantial advantage in other aspects

as well as the ability to connect the spring parts together for the purposes of a spring construction in general.

Still another object of the invention is to provide bed spring construction which involves the use of a series of resilient members together with means to vary the resilience of such members and thereby to in effect create a different bed spring without actually changing the constituent parts thereof.

Yet another object of this invention is to provide a bed spring, which includes spaced resilient panels, separated by members which are themselves resilient, and which members have a peculiar movement during the operative phases thereof, which movement is subject to control by suitable instrumentalities provided therefor and thus results in the provision of widely varying resilient conditions of the panel upon which a person may be supported when using the said spring.

A still further object of this invention, is to provide a bed spring construction in which a series of spring members is provided, of substantially identical nature individually, and these members are connected together in such a manner as to provide resilient support, and in turn make possible variation of that support within wide limits and in accordance with the demands of the person using the bed spring.

Yet another object of this invention is to provide a bed spring in which a spring unit is provided having upper and lower panels, which may be of resilient construction if so desired, and said panels are connected by resilient vertically movable members, which latter members have horizontally moving elements, and such elements are connected together in such a manner that variation in the resilience of the entire unit is effected, suitable control means being provided therefor.

Another object of this invention is to provide a bed spring construction which may be effected by combining a series of relatively simple elements, and efficiently fastening the same together with simple fastening means, providing ability to vary the resilience inherently built into the various spring parts and at the same time further provide means to vary the resilience over a wide range.

Other and further objects of the invention will be understood from a consideration of the specification appended hereto and disclosed in the drawings wherein:

FIGURE 1 is a plan view, partly in section and fragmentary in some aspects, of a bed spring incorporating the novel features of this invention.

FIGURE 2 is a side elevation of the bed spring shown in FIGURE 1, it being borne in mind that the bed spring as shown is of course not provided with any covering.

FIGURE 3 is an end view of the bed spring, taken about on the line 3—3 of FIGURE 1 looking in the direction of the arrows.

FIGURE 4 is a side view of one of the spring members, a series of which are used to construct the bed spring as a unit.

FIGURE 5 is an end view of the spring member shown in FIGURE 4 and taken about from the position 5—5 of said figure looking in the direction of the arrows.

FIGURE 6 is a fragmentary view taken about on the line 6—6 of FIGURE 4 looking in the direction of the arrows.

FIGURE 7 is a fragmentary sectional view taken about on the line 7—7 of FIGURE 4 looking in the direction of the arrows.

FIGURE 8 is a greatly enlarged sectional view, of the control instrumentalities, largely removed from the position in the spring unit and showing the adjustable features of said control instrumentalities.

FIGURE 9 is a sectional view, fragmentary in nature, taken about on the line 9—9 of FIGURE 8 looking in the direction of the arrows.

FIGURE 10 is a fragmentary sectional view to show the means for fastening the spring members together.

FIGURE 11 is a view taken about from the position 11—11 of FIGURE 10 looking in the direction of the arrows.

FIGURE 12 is a view taken about from the position indicated by the line 12—12 of FIGURE 10 looking in the direction of the arrows.

FIGURE 13 is a greatly enlarged view indicating a somewhat different means for fastening certain parts of the spring unit together.

FIGURE 14 is a fragmentary view, greatly enlarged, indicating the position of certain portions of the spring elements where a particular amount of resilience is required.

FIGURE 15 is a view like FIGURE 14, indicating another position of certain of the spring elements to increase the stiffness of the unit.

FIGURE 16 is a diagrammatic view of a modified arrangement of certain of the elements as when they are used for a double bed.

Referring now to the drawings, and particularly initially FIGURE 1, I note that the bed spring unit illustrated as a basis for describing this invention, is a generally conventional rectangular unit, in this case illustrated on a very smal scale and including for the sake of descriptive purposes, the sections generally denoted 1 and 2 which are complementary in their construction, in a manner to be subsequently set forth, the spring unit as a whole being applied with a border or frame part formed of heavy wire denoted 3, this member being rectangular and preferably integral in nature although it may be formed with a connecting portion along one of the sides, such border member 3 being the upper border member and a similar border member 4 or frame part being provided at the lower portion of the spring, said frame parts forming planes for descriptive purposes and these planes being defined as panels of resilient construction, the actual construction to be subsequently explained in detail.

This spring unit is constructed of a series of generally vertically disposed adjustable means comprising resilient members in the form of M-springs or M-spring members as illustrated in FIGURE 4 and generally denoted 5. The reason for calling these members M-spring members is of course the fact that when viewed as by turning FIGURE 4 counterclockwise, the legs 6 and 7 would assume an upright position, and the intermediate portions 8 and 9 would of course assume a position similar to a V. In this particular instance of course the M-spring members 5 are used in the condition of FIGURE 4 in the section 1 as disposed with the member 5 about in the condition shown and the M-spring members 5 for the section 2 would assume an opposite position on the other hand from that of FIGURE 4, this being illustrated in FIGURE 2.

The disclosure of only three M-spring members 5 in side view in FIGURE 2, is primarily for illustrative purposes, and only on a miniature scale the fact being that where a large spring unit is constructed, a larger number of M-spring members would be availed of.

As will be understood from a further consideration of the other views including FIGURES 3 to 7 inclusive, these M-spring members 5 are comprised of a sinuous or continuously formed member of serpentine nature in plan when laid out flat, and then formed into the M-shape member of FIGURE 4 by conventional machinery in a manner readily apparent to those skilled in the art. FIGURE 5 illustrates the nature and form of the connecting or intermediate portions 8 and 9, it being noted that in this particular instance these portions include the bend at the loop junctures 10 and 11 so that the resilience of the individual member 5 may be varied in accordance with the amount of bend or twist incorporated at this point. It is of course apparent that other types of bends or twists may be incorporated in such members as will provide whatever degree of resilience is desired in accordance with manufacturing practice.

With the foregoing description of the invidual M-spring members 5 having been set forth, it will be noted that as disclosed in FIGURE 1, the legs 6 of the members for example which are in the upper panel or panel area or portion, are connected together by clips in a manner such as is more particularly disclosed in FIGURES 14 or 15. The legs 6 of directly adjoining spring members 5 are overlapped and connected by the clip 13 illustrated in FIGURE 14 and shown in enlarged detail in FIGURES 10, 11 and 12. These clips 13 include a tongue portion 14 and ears 15 and 16 which are brought into generally adjacent positions by any suitable tool, this not comprising a part of this invention since it is well known but the clips are availed of to effect the fastening desired.

When the series of M-spring members 5 as to the legs 6 thereof are arranged about in the position as shown in FIGURE 2, the legs 6 will thus form a continuous line as indicated in FIGURE 1 and they are joined at the central portion or between the sections 1 and 2 with the adjoining series of M-spring members similarly connected but of the opposite hand, the clips in all cases being identical and arranged so that they engage loop portions in a manner to retain the same in connected relationship.

The line of M-spring members thus fastened together, is in turn fastened at its ends by other clips 13 to the border or frame part such as 3 and this line of M-spring members is in turn fastened by wire loop parts 17 at intervals to the longitudinal portion of the frame or border part 3.

The lower legs 7 of a series of M-spring members comprising the row generally denoted 18 are similarly fastened together, and in turn fastened to the panel or frame part 4 so that the legs 7 occupy the plane or lie in the plane provided by such border or frame part 4.

It will be understood that somewhat spaced from but otherwise substantially identical to the row of M-spring member 18, is a further row of members 19 and similarly a row at 20 with the row indicated at 21 occupying the corresponding position to the row 18 at the opposite longitudinal side of the frame or border part 3. It should be emphasized that the spring here disclosed is of course only a very small spring but the series or rows such as 18 to 21 inclusive could be in any multiples and preferably the same are connected together along the lines indicated.

It will also be desirable to provide transverse ties to connect loops of the M-spring members as they lie in the panels provided by the border or frame parts 3, such ties being indicated at 22 and formed of any preferred material in accordance with desirable bed spring construction.

Referring now primarily to FIGURE 2, the portions which are at the juncture of the portions 8 and 9, are elements 23, FIGURE 3 showing these elements in somewhat greater detail and with greater clarity, such elements being arranged to move in what may be termed a horizontal manner when the M-spring members 5 are compressed vertically. This is a sort of elongating effect, to cause a horizontal movement of such elements 23. The vertical disposition of the M-spring members 5 as disclosed permits such action to result and it is desired to provide for controlling the amount of deflection or compression of the M-spring member 5. The horizontally disposed elements 23 are interconnected by instrumentalities of the nature of flexible wire such as 26, which wire 26 is fastened at one end to a swivel part 27 engaged with an element 23 as viewed in FIGURE 2. The M-spring member 5 next adjacent the M-spring 5 first referred to is likewise provided with a swivel member 28 to which the flexible wire 26 is connected and fixed so that there

can be no relative movement of the wire and the part 28. Subsequent connection of the wire 26 with a swivel part 29 of the next adjoining M-spring member 5 is likewise provided, the wire 26 in turn engaging the control member 30 in any preferred manner so that by manipulation of the member 30 in a manner to be subsequently described tension may be in turn imparted to the flexible means 26 connecting the various horizontally movable elements 23.

The M-spring members in the section 2 are similarly connected to swivel parts 31, 32 and 33, and likewise to the part 30.

The control means for the variation of the resilience in accordance with this invention, is arranged about centrally of the spring unit including the part 30 which may preferably be a round rod-like part extending transversely between the sections 1 and 2, the same being illustrated in greater detail in FIGURE 8 and being supported in a bearing member 35, which in this instance is a round cup part with a flange 36 engaging a skirt portion 37, the latter extending from the body 38.

The skirt 37 provides for engagement of a wire support 40, which is looped thereabout, and in turn includes the upwardly extending section 41 and a downwardly extending section 42 these diverging toward their extremities as illustrated in FIGURE 2 including loops 43 and 44 respectively, said loops 43 and 44 in turn having the longitudinally disposed continuations 45 and 46 respectively, in alignment with the corresponding longitudinal portion of the border of frame part 3 such part being denoted 3*a*. In order to maintain the part 45 in engagement with the part 3*a*, clips described in detail previously and denoted 13 are likewise availed of.

The longitudinally extending part 46 of the support 40 is engaged with the lower longitudinal part which is denoted 4*a* of the loop or frame part 4 by means of clips 13 likewise.

The same identical construction of supporting member is provided for the other end of the part 30 comprising a cup member 50 having a skirt 51 arranged peripherally thereof and a flange 52 connected to the skirt. A member 40 is similarly wound about the part 50 and the arms 41 and 42 extend upwardly and downwardly thereform respectively terminating in the loops 43 and 44, the latter including the parts 45 and 46 extending thereform and fastened to the longitudinally extending frame parts 3*a* and 4*a* respectively by means of the clips 13 previously mentioned.

It will be seen therefore that the part 30 is supported for rotation transversely of the spring unit, and at one end a suitable cap 55 is fastened by means of a pin 56 extending therethrough that end of the member 30 being supported in the opening 57. The other end of the member 30 is supported in a similar opening to the opening 57, denoted in this case 58 and a knob 59 is securely fastened on the end of said rod 30.

The knob 59 is equipped with a finger 60 extending thereform so as to engage a series of openings 61 arranged in the part 50 whereby rotation of the knob 59 and manipulation thereof will facilitate the positioning of such finger 60 in one of the openings 61. In order to provide for maintaining the finger 60 in position as fixed, a suitable spring 63 is engaged at 64 with the rod 30 and pressing against the outer surface of the cup part 50 whereby the finger 60 is maintained as stated.

Referring now to FIGURE 1, it will be seen that the wire parts 26 are engaged with the rod 30 by passing through the same, openings such as 65 being provided for this purpose.

In order to avail of the construction herein, the instrumentalities to vary the resilience of the unit are thus provided, in the form of the rod 30 and associated connected parts. Manipulation of the knob 59 by pulling outwardly thereon so that the finger 60 is disengaged from an opening 61 in which it may be positioned and

rotation of said knob after the aforesaid manipulation, will wind the wire parts 26 around the rod 30 on rotation in one direction. Similarly rotation of the knob 59 in the other direction after manipulation as before described, will relieve the tensiong effect imparted to the wires 26, to thereby permit the horizontal movement so to speak of the portions 23 of the M-spring members previously described in detail.

The desirability of arranging the M-spring members in the manner shown in FIGURE 2, will now be readily understood, since the horizontal movement of the M-spring members in the section 1, as to the horizontally movable parts 23 thereof, will be opposite the movement of the parts 23 of the corresponding spring members in section 2. Thus by placing the wires 26 under tension centrally, controlled movement of these parts 23 and consequently of the springs in which these parts are formed, will stiffen the action of such springs in a manner now readily understood.

In lieu of providing the wire members 26 and the construction illustration, it will be apparent that if stiff rods connect the respective portions 23 of the M-spring members 5, and suitable centrally arranged control means are provided, the same effect will be forthcoming to vary the amount of resilience as will suit the circumstances under which the spring unit is to be used.

As a further means for varying the resilience of the respective panels comprised in the upper and lower portions of the spring unit, the illustrations of FIGURES 14 and 15 are referred to, the terminal portions of the individual M-spring being denoted at 70 in both these figures and in FIGURES 6 and 7 for purposes of illustration, with an extension 71 being provided on each, said extension being susceptible of manipulation when desired to place the same under the adjoining loop part 72 of the adjoining M-spring member and thereby increasing the tension or resistance to deflection which may be encountered thereby. This is also illustrated in FIGURE 1 on a somewhat smaller scale where these extensions 71 are not placed under the corresponding loop part 72 but may be so placed if desired. This of course will facilitate changing the resilience of the panel in which the parts are incorporated in a manner readily apparent from the foregoing.

In FIGURE 13 there is illustrated a novel means for connecting either the extremity of the leg such as 6 of a part or M-spring member 5 to a border part 3, residing in provision of an open loop section 75 in combination with a twisted portion 76, the latter being arranged to extend around the border part 3 and terminate in a short offset element 77, whereby manipulation into the position shown in dotted lines in the said figure, will cause the part 75 to be able to be moved downwardly away from the part 3 and the element 77 thus in turn be subsequently disengaged along with the part 76 from the border part 3. It is apparent that this type of connection can be effected between any adjoining similarly situated parts in the spring unit and thus a substantial number of clips may be saved or not used, these clips 13 obviously having some effect upon the entire cost of the unit.

It should be explained that in lieu of having a single such unit as is shown here, along the lines of FIGURE 16, a further unit could be placed alongside, either including a separate unit having its own border or frame parts or the entire spring thus formed could include a single border or frame part such as 80 extending around the entire unit. In this particular instance separate control members are indicated diagrammatically at 81 and 82 so that the M-spring members of the sections denoted at 80*a* and 80*b* may be separately tensioned or the resilience thereof separately controlled by manipulation of the control members 81 or 82.

Thus a double bed spring may be provided with separate control instrumentalities whereby one section or one side of the bed spring may have a very harsh or hard quality whereas the other side of the bed spring may

be made softer in accordance with the demands of the individual who uses the same.

The symmetrical arrangement of the various parts herein, of course still further provides advantage, in that the bed spring may thus be turned either side up and used that way or in any other way in which a conventional bed spring of ordinary construction is used.

While the spring construction has been particularly related to and has been devised initially for the purpose of use in bed spring construction, it should be understood that the comparable construction, availing of the identical elements arranged as stated, is likewise very suitable for incorporation in seat construction for automobiles or the like, where it is desired to change the degree of softness or hardness as the case may be of such seat or cushion arrangement.

Likewise any other spring construction which could desirably avail of the advantages provided hereby, is likewise contemplated hereunder as suitable for having incorporated therein the various elements in cooperative relationships.

I claim:

1. A composite construction for a bed spring or the like, comprising a plurality of M-shaped spring units of resilient material, each unit having side sections forming the legs of an M-shaped unit and corresponding side sections of said units forming the top or bottom face of said bed spring, said side sections being maintained resiliently disposed with respect to each other by converging inner sections secured to corresponding ends of said side sections and having juncture therebetween, frame means and means securing said spring units thereto to effect a composite array thereof forming said bed spring, including stress means connected to a series of aligned junctures of said units, and actuating means for effecting adjustability of said stress means to vary the spacing of said side sections with respect to each other for effecting a change of resiliency of said bed spring.

2. A composite construction for a bed spring or the like, comprising a plurality of M-shaped spring units of resilient material, each unit having side sections forming the legs of an M-shaped unit and corresponding side sections of said units forming the top or bottom face of said bed spring, said side sections being maintained resiliently disposed with respect to each other by converging inner sections secured to corresponding ends of said side sections and having juncture therebetween, frame means and means securing said spring units thereto to effect a composite array thereof forming said bed spring, including movable means connected to a series of aligned junctures of said units, and actuating means for effecting adjustability of said latter means to vary the spacing of said side sections with respect to each other for effecting a change of resiliency of said bed spring, certain of said units being disposed with respect to others of said units so that corresponding inner sections of said certain of said units are reversely sloped with respect to corresponding sections of others of said units, said movable means having elements movable in opposite directions to effect simultaneous expansion or contraction of the spacing intermediate said side sections of said spring units and said spring units being interconnected, whereby opposite forces are effected for balancing stress on said certain of said units against stress on said others of said units.

3. A composite construction for a bed spring or the like, comprising a plurality of M-shaped spring units of resilient material, each unit having side sections forming the legs of an M-shaped unit and corresponding side sections of said units forming the top or bottom face of said bed spring, said side sections being maintained resiliently disposed with respect to each other by converging inner sections secured to corresponding ends of said side sections and having juncture therebetween, frame means and means securing said spring units thereto to effect a composite array thereof forming said bed spring, wherein said junctures are V-shaped, and a flexible wire extending through said spring units and connected to a plurality of said junctures, and actuating means for actuating said wire to cause said inner sections to diverge or converge for effecting adjustable resiliency of said bed spring by changing the spacing between said side sections.

4. In a bed spring as set forth in claim 3, including shaft means and means for rotatively mounting said shaft means transversely of said wire, said wire being secured to said shaft means whereby rotation of said shaft means effects divergence or convergence of said spring units depending on direction of rotation and means for locking said shaft means in a plurality of selective rotated positions.

5. A composite construction for a bed spring or the like, comprising a plurality of M-shaped spring units of resilient material, each unit having side sections forming the legs of an M-shaped unit and corresponding side sections of said units forming the top or bottom face of said bed spring, said side sections being maintained resiliently disposed with respect to each other by converging inner sections secured to corresponding ends of said side sections and having juncture therebetween, frame means and means securing said spring units thereto to effect a composite array thereof forming said bed spring, including movable means connected to a series of aligned junctures of said units, and actuating means for effecting adjustability of said latter means to vary the spacing of said side sections with respect to each other for effecting a change of resiliency of said bed spring, certain of said units being disposed with respect to others of said units so that corresponding inner sections of said certain of said units are reversely sloped with respect to corresponding sections of others of said units, said movable means having elements movable in opposite directions to effect simultaneous expansion or contraction of the spacing intermediate said side sections of said spring units and said spring units being interconnected, whereby opposite forces are effected for balancing stress on said certain of said units against stress on said other of said units, the elements of said movable means comprising flexible wires, a rotatively mounted shaft secured to said frame, said wires being connected to said shaft from opposite directions so that rotation of said shaft effects motion in said opposite directions and means for locking said shaft in a predetermined rotated position.

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