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COILED SPRING STRUCTURE

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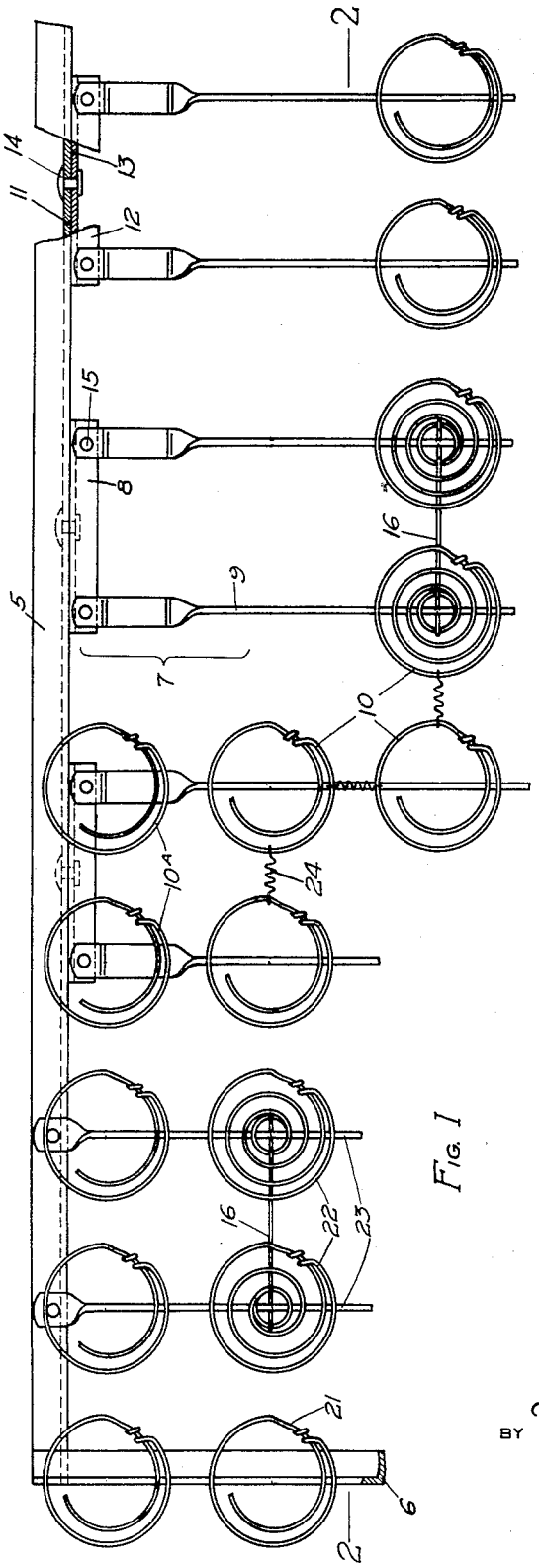


FIG. 1

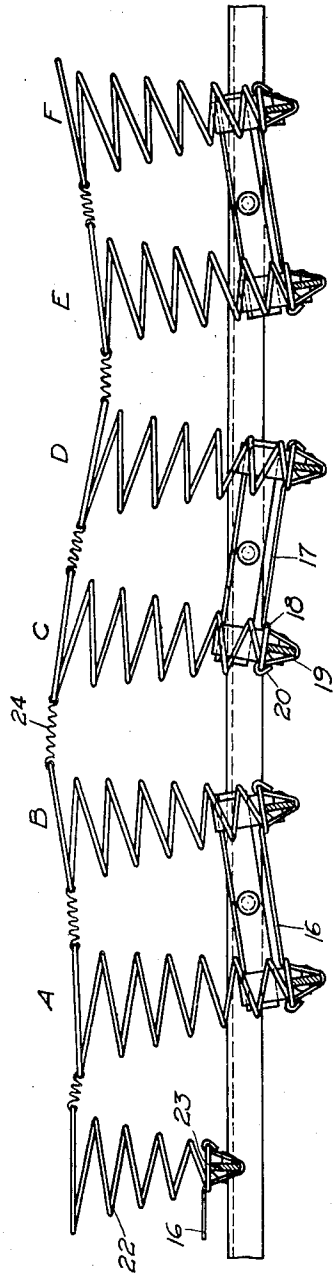


FIG. 2

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COILED SPRING STRUCTURE

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3 Claims. (Cl. 5—248)

My present invention relates to a coiled spring structure and particularly to the means in such a structure for yieldingly or equalizingly supporting the coiled springs.

The purpose of my invention is to provide a new and improved coiled spring structure and particularly one wherein the coiled springs instead of having their lower ends fixedly supported are carried upon tilting or movable frames or equalizing frames so that the upper surface of the spring structure may more equally conform to the outline of a person's body and still distribute the weight of the body more nearly over the whole supporting surface of the structure.

Further purposes and advantages of my invention will appear from the specification and claims herein.

Fig. 1 is a top view of a portion of a coiled bed spring or similar structure embodying my invention, the coiled springs on certain of the cross bars being removed and parts of the frame and of one of the tilting plates being cut away to more clearly show the construction.

Fig. 2 is a vertical longitudinal sectional view on line 2—2 of Fig. 1, but with the tilting frames and their supported coiled springs being tilted or moved to the position they would occupy assuming a person was lying upon the bed.

Referring to the drawing in a more particular description, it will be seen that the coiled spring bed or similar spring structure is composed of a suitable rigid spring frame having two spaced side rails 5 rigidly connected to and spaced apart by end rails 6 and that between the opposite side rails 5 there are tiltingly supported a plurality of tilting frames 7 each composed of a tilting plate 8 and two or more cross bars 9 with each of said cross bars carrying the desired number of vertically arranged coiled springs 10.

Conveniently, the side rails 5 are formed of angle iron with each such side rail having the vertical web 11 of its angle iron towards the inside of the frame or towards the inside of said rail. At the desired places as hereinafter pointed out there are pivotally attached to and supported upon the side rail 5 the desired number of tilting plates 8. Preferably and conveniently these plates are in the form of short lengths of angle iron with the horizontal web 12 at the top of the plate and with the vertical web 13 at the outside of the plate or adjacent to and parallel with the vertical web 11 of the side rail 5. Rivets 14 piercing the two vertical webs, that is the web 11 of the side rail 5 and the web 13 of the plate serve to pivotally support each tiling bed 8 upon its side rail.

Each tilting plate 8 is a little longer than the distance between the centers of two adjacent rows of coiled springs 10. In this way by having the ends of two adjacent cross bars 9 rigidly fastened as by rivets 15 to the opposite ends of an oppositely disposed pair of the tilting plates 8, a tilting frame 7 is formed. The tilting frame so formed and pivoted at its opposite ends to the side rails 5 will tilt or swing as a unit upon said two aligned rivets 14 or sufficiently as a unit to perform the function intended.

Spaced along each cross bar 9 are arranged the vertically disposed coiled springs 10 having their lower ends resting upon and securely attached to said cross bars. Such fastening of the lower ends of the coiled springs may be made by any suitable means. In the drawing the bottom end of the coiled springs upon the tilting frame except the end springs are shown as held to the said cross bars by means of a strip 16 of wire or narrow band of metal. As indicated in the drawing, the cross bars 9 forming parts of the several tilting frames 7 have their ends horizontal so as to rest upon the tilting plates 8. These horizontal portions extend inwardly from the tilting plates a short distance so as to provide a seat for the lower end of a short coiled spring 10^a such as is commonly used at the "raised" ends of the spring-supporting cross bars in such structures. After providing this flat support for the foot of one coiled spring 10^a adjacent the side rail 5 the cross bars 9 are bent downwardly and then inwardly and then given the usual one-quarter twist so as to have the central portion and much the greater length of said cross bars in the form of a vertically arranged bar so as to support the regular central coiled springs 10 without the cross bars sagging under the strain of use.

The strip 16 of wire or of a narrow band of metal used to fasten the coiled springs 10 to the dropped centers of said cross bars 9 may conveniently be formed in pieces long enough to fasten to the cross bars of a tilting frame two oppositely arranged springs upon the pair of cross bars of such frame. This strip 16 accordingly has a central portion 17 bridging from one spring to the other. At the end of this central portion the strip passes over the top of the lower coil 18 of the spring 10 and then is formed as a V 19, one leg of which extends downwardly from the central portion 17 to the bottom edge of the here vertically arranged cross bar 9 while the other leg of the V extends upwardly from said lower edge of the cross bar and passes inwardly of the lower coil 18 of said spring. From here

the strip is turned sharply down over this portion of the lower coil 18 and extends downwardly as a hook 20 which may conveniently be turned back sharply against its leg of the V 19. It will be seen that these strips 16 of wire or other metal thus form not only means for fastening the feet of the coiled springs to the tilting frame but to a considerable extent also tie the opposite cross bars of a frame together so as to make the two or more cross bars fastened to one pair of tilting plates move in unity or in unison according to the pressure placed upon the tops of the coiled spring. This fastening or tying of the cross bars together overcomes most of the tendency of a tilting frame to twist or to have its two ends not move in unison.

Preferably the tilting frames will not extend completely to the head or foot ends of a bed spring as there is not the need for supporting adjacent rows of springs on movable supports such as these tilting frames at the head or foot portions of a bed. The number of rows of springs that may be provided with rigid supports for their lower ends may vary according to the size of the spring structure being made and according to the size of the coiled springs being used and somewhat according to the individual requirements of different types of such spring structures. In the drawing I have shown the head end of a spring structure and a considerable portion of the central part of a spring structure. In this structure I have shown three rows of coiled springs having their foot ends rigidly supported. The row of coiled springs 21 at the extreme head end of the bed have their lower ends mounted upon and rigidly fastened to the end rail 6 at the head of the bed. Springs 21 are of less height than the springs 10 which are placed upon the drop centers of the cross bars 9 for the reason that all of the springs 21 are mounted directly upon the horizontal end rail 6 which extends in a straight line across the spring structure. Preferably similar relatively short coiled springs 22 are used for the next two rows of coiled springs and have their lower ends resting upon the upper edge of a cross bar 23. These cross bars 23 extend generally in a straight line across the spring structure and have their long central portions vertically arranged so as to support the springs 22 without sagging. Opposite pairs of springs 22 upon the adjacent cross bars 23 may have their lower end secured to the cross bars 23, by tie wires 16 similar in construction to those already mentioned as used upon the tilting frame springs 10.

In the spring bed bottom illustrated in the drawing I have shown the tilting frames 7 as beginning with the fourth and fifth rows of coiled springs counting from the left hand end of the drawing or from what I have called the head end of the spring structure. The next two rows of springs or the sixth and seventh rows counting to the right are mounted on another tilting frame and the eighth and ninth rows of springs are mounted upon another tilting frame. Thereafter there may be one or more pairs of tilting frames or one, two or three rows of rigidly supported springs similar to those already referred to at and near the head end of the structure.

For definiteness of illustration and description it will be assumed that the tilting frames have been moved until they are arranged about as shown in the drawing and so that the tilting frame nearest the head end will tip towards the head end of the structure while the next following tilting frame will tilt towards the foot of the structure, resulting in the right hand row as B of the springs 10 and 10^a of the first tilting frame rising a short distance above the general level of the upper or supporting surface of the bed spring while the left row as C of springs 10 and 10^a upon the second tilting frame will be slightly above the general level of the top surface of the bed spring. The left hand row as A of the first tilting frame from the head end will be a little below the level of the general upper surface of the bed spring while the right hand row as D of the second tilting frame will be appreciably below the general level of the upper surface of the said bed spring. Similarly the left hand row as E of the third tilting frame will be appreciably below the said general level of the top surface of the bed spring and the right hand row of the third tilting frame will be somewhat above the said general level of the top surface of the bed spring. This tilting of the tilting frame is caused by the hips of a person reclining either on his back or upon his side upon the bed spring coming opposite and above the rows D and E. As this part of the body with a person of ordinary build or contour projects appreciably below the adjacent parts of the body when the person is lying down, a greater pressure will be obviously placed upon the rows of springs D and E than upon the other rows of these two frames, namely C and E. Accordingly, the second and third rows will be tilted more or less to the position shown in Fig. 2. In the ordinary coil spring bed this results in greater pressure being placed upon the coiled springs beneath the hips of a person than upon adjacent rows of coiled springs and forces the coiled springs down opposite the hips and so a proportionately greater amount of the weight of the person is carried upon the two rows opposite the hips and very little weight of the person is carried by the row or rows below the hips or by the row or rows above the hips. This unequal division of weight of a person upon a bed is not conducive to comfort necessary to relaxation of the whole body. In a bed spring embodying my invention the tilting frames can move more or less to the position shown in Fig. 2 and causes an equalization of the pressure from the body upon the springs and so distributes the weight of the body very much more evenly over a greater portion of the bed spring. In other words, less weight of the body is carried by the springs D and E opposite the hips because the springs D and E settle down bodily by their sides of the third and fourth tilting frames swinging downwardly. The corresponding upward movement of the frames of the springs in row C carries upwardly the springs in row B due to the tension transmitted from the springs in row C to the springs in row B through the connecting wires or clips 24. The downwardly swinging of the springs A in the right hand half of the first tilting frame is caused also to some extent through the shoulders of an ordinary person extending down below the general level of the person's back or below the line of the small of the back. It will be seen that the high sides of springs B and C project up into the small or hollow of a person's back and so carry a proper amount of weight of the person at that point rather than leaving so much pressure upon the hips and shoulder of the person using the bed.

Similarly the downward movement of the row E upon the third tilting frame has carried upwardly the right hand row F upon that frame.

What I claim as new and desire to secure by Letters Patent is:

1. In a coiled spring bed, the combination of a main rigid frame having two spaced side rails, vertically disposed coiled springs arranged in transverse rows and forming at their upper ends a mattress-supporting surface, rigid tilting plates extending lengthwise of said side rails and pivoted thereto intermediate their ends to swing in a vertical plane, a spring-supporting cross bar for each row of coiled springs, the opposite ends of adjacent pairs of certain of said cross bars being rigidly secured to the opposite ends of corresponding tilting plates and forming a plurality of four-sided, independent frames and means loosely connecting the top coils of adjacent springs.

2. In a coiled spring bed, the combination of a main rigid frame having two spaced side rails, vertically disposed coiled springs arranged in transverse rows and forming at their upper ends a mattress-supporting surface, rigid tilting plates extending lengthwise of said side rails and pivoted thereto intermediate their ends to swing in a vertical plane, a spring-supporting cross bar for each row of coiled springs, the opposite ends of an adjoining plurality of said cross bars being rigidly secured to corresponding parts of an oppositely located pair of tilting plates and forming a plurality of four-sided independent frames and means loosely connecting the top coils of adjacent springs.

3. In a coiled spring bed, the combination of a main rigid frame having two spaced side rails and a plurality of four-sided, independent, rigid tilting frames each having its opposite ends pivotally mounted in the said opposite side rails and each having a plurality of cross bars, coiled springs mounted in transverse rows upon said cross bars and forming at their upper ends a mattress-supporting surface, common means for connecting together the cross bars of each frame between the ends of the frame and for fastening the foot ends of the coiled springs to the cross bars and flexible means connecting the top coils of adjacent springs throughout the structure.

WILLIAM B. FOSTER.