This invention relates to springs for beds and other furniture wherein springs of the spiral type are vertically positioned in or on a frame, and in particular the invention includes means for adjusting the tension of the springs either individually or collectively.

The purpose of this invention is to provide means particularly in a bed spring for adjusting the tension of the springs wherein the resiliency may be equalized over the entire area of the spring or the tension may be increased or decreased at certain points or over certain areas of the spring.

In the usual spring a plurality of spiral or helical spring units are mounted on a base frame and the units are tied together so that they are held in substantially vertical positions and although the individual units are formed of wire of uniform size some usually have more compressive strength than others so that some will yield more than others and for this reason some springs are uncomfortable. Also when springs are used in hospitals and particularly for orthopedic ailments it is desired to have some sections of the spring yield more than others.

With this thought in mind this invention contemplates a spring including a plurality of spiral spring units mounted on a frame wherein each unit is provided with an adjusting screw for regulating the tension therein.

The object of this invention is, therefore, to provide means for mounting a plurality of spiral springs in a frame so that each spring may be adjusted individually or as a group to increase or decrease the tension therein.

Another object of the invention is to provide a spring having a plurality of units mounted on a frame wherein the distance of the outer end of each unit from the frame may readily be adjusted.

A further object of the invention is to provide a spring formed with a plurality of individual spring units wherein the tension of each unit may readily be adjusted, which is of a simple and economical construction.

With these and other objects and advantages in view the invention consists of the new and novel combination, construction and arrangement of parts as hereinafter more fully described, set forth in the claims appended hereto, and disclosed in the accompanying drawings, forming part hereof, wherein:

Figure 1 is a plan view looking downward upon the upper surface of the complete spring unit.

Figure 2 is a detail on an enlarged scale showing a section through the spring illustrating two of the spring units on an enlarged scale, and with parts broken away.

Figure 3 is a sectional plan taken on line 3—3 of Figure 2 showing the sprockets and chain for adjusting the spring units, and also with part broken away.

Figure 4 is a section similar to that shown in Figure 2 with parts omitted and parts broken away showing a crank and actuating the chain by which the units are adjusted.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved spring of this invention includes a base frame formed with side bars 10 and 11, ends 12 and 13, and cross bars 14, and spiral spring units 15 held in compression between cup-shaped caps 16 and similarly shaped washers 17 forming spring seats.

The washers 17 are rotatably mounted on pins 18 at the upper ends of adjusting screws 19, as shown in Figure 4, with the washers resting on shoulders 20 and held by pins 21. The caps 16 are mounted on the upper ends of the springs and these are suspended at predetermined distances from the frame by chains 22 and 23 with the upper ends of the chains held in ears 24 and 25 on the sides of the caps, and the lower ends held in slots 26 in the bars of the frame. The slots 26 are provided with enlarged ends 27 through which the chains may pass to adjust the positions of the caps.

The adjusting screws 19 are threaded in hubs 28 of sprockets 29 which are rotatably mounted in openings 30 in the bars of the frame, and an endless chain 31 is trained around the sprockets and also around an operating sprocket 32 which is rotatably mounted in an opening 33 in the frame through a hub 34 and the sprocket is provided with a crank 35 by which it may be turned by hand to move the chain. The crank 35 is provided with a collar 36 having notches 37 in the periphery thereof and a spring latch 38 is provided to lock the crank when the springs are set to the desired tension. The adjusting screws 19 are provided with heads 39 which have notches 40 therein, and ratchet ears 41 are pivotally mounted in bearings 42 on the bars of the spring frame with pins 43, as shown in Figure 2.

The caps 16 may also be provided with ears 44 at the sides so that the upper ends of the springs may be tied together both laterally and longitudinally in order to retain the springs in spaced upright positions.

With the chains 31 trained around the
sprockets as illustrated in Figure 1 the adjusting screws 13 by which the springs below the caps 16 are adjusted are provided with right hand threads whereas the adjusting screws positioned below the caps 6 are provided with left hand threads, and by this means all screws will be rotated by the endless chain to increase tension in the spring when the crank 22 is turned in one direction, and to reduce tension in the spring when the crank is turned in the opposite direction.

With the parts arranged in this manner all of the springs may be adjusted simultaneously by the crank 22 or each spring may be adjusted independently by turning the adjusting screws manually in the sprockets by the heads 39.

It will also be understood that modifications may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. In an adjustable tension spring assembly, the combination which comprises a substantially flat frame with spaced openings therethrough, sprockets with internally threaded hubs journaled in said openings of the frame, adjusting screws threaded in the hubs of the sprockets, spring seats carried by the adjusting screws, springs positioned on said spring seats, caps carried by the springs, means adjustably connecting the caps to the frame independently, a crank actuated sprocket journaled in the frame, and a chain trained over the sprockets on the adjusting screws and crank actuated sprocket for adjusting the tension of the springs.

2. In an adjustable tension spring assembly, the combination which comprises a substantially flat frame with spaced sockets therein and with openings through the sockets, sprockets with internally threaded hubs journaled in said sockets, adjusting screws with heads having notches therein threaded in the hubs of the sprockets, spring seats carried by the adjusting screws, springs positioned on said spring seats, caps carried by the springs, said frame having key-hole shaped openings therein adjacent the sockets, chains depending from the caps of the springs and extended through the said keyhole openings for adjusting the extended ends of the springs in relation to the frame, a crank actuated sprocket journaled in the frame, a chain trained over the sprockets of the adjusting screws and crank actuated sprocket for turning the sprockets to adjust the tension on the springs, and latches with vertically disposed arms pivotally mounted on the frame and positioned to engage the notches of the heads of the adjusting screws for holding the adjusting screws as the sprockets are rotated, said latches adapted to be actuated to withdraw the arms from the notches for independent adjustment of the screws.

3. In a spring structure for beds and the like, a base frame, a plurality of spiral springs extended perpendicularly from the frame, means adjustably retaining the ends of the springs extended away from the frame in spaced relation to the frame, sprockets journaled in sockets positioned in the frame and aligned with the springs, adjusting screws having spring seats on the ends also aligned with the springs and threaded in the sprockets, a continuous chain trained over the sprockets, means holding the adjusting screws for preventing rotation of the screws as the screws are vertically adjusted by rotation of the sprockets, and means actuating the chain to rotate the sprockets.

4. In a spring structure for beds and the like, the combination which comprises a base frame, a plurality of spiral springs extended perpendicularly from the frame, caps positioned on the ends of the springs extended away from the frame, chains extended from the caps and adjustably connected to the frame for holding the springs in spaced relation to the frame, sprockets rotatably mounted in the frame below the springs, adjusting screws threaded in the sprockets, and having cup-shape washers mounted thereon for holding the ends of the springs adjacent the frame, a crank actuated sprocket rotatably mounted in the frame, a chain trained over the sprockets on the adjusting screws and crank, latches engaging the adjusting screws preventing rotation of the screws as the screws are vertically adjusted by rotation of the sprockets thereon, and means locking the crank actuated sprocket.

VICTOR H. GOTTSCHALK.

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