June 26, 1951 C. BACKUS 2,558,288

ADJUSTABLE SPRING TENSIONING OF BED SPRINGS

Filed March 6, 1947 4 Sheets-Sheet 1

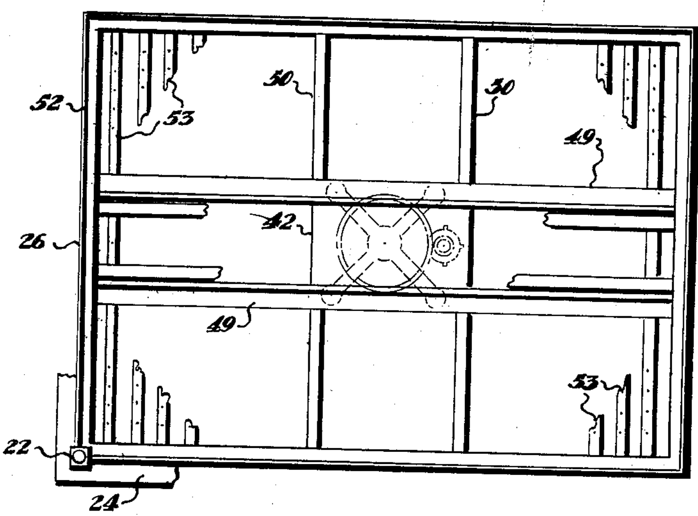

Fig. 2

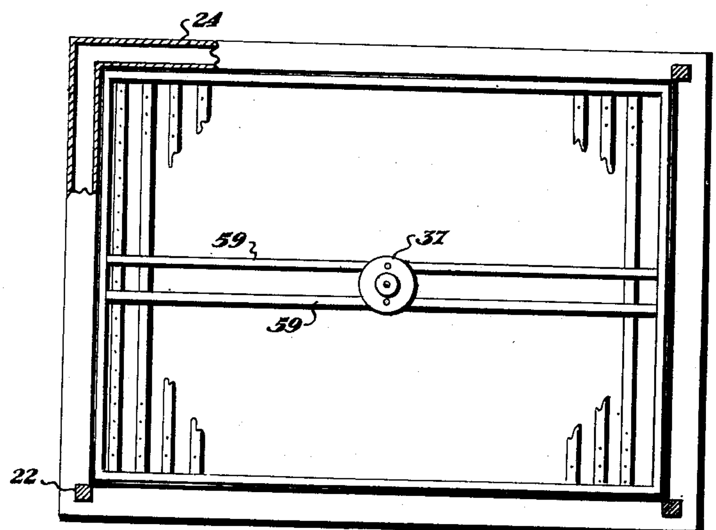

Fig. 3

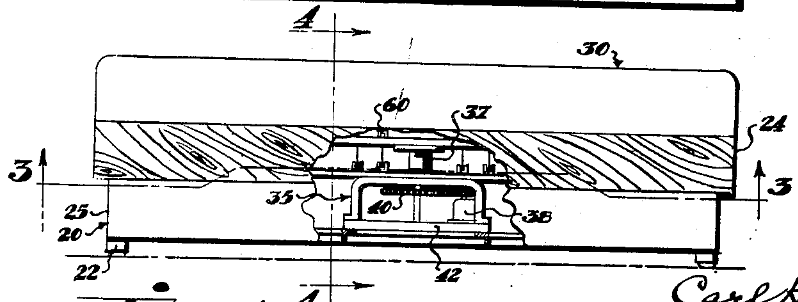

Fig. 1

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ADJUSTABLE SPRING TENSIONING OF BED SPRINGS

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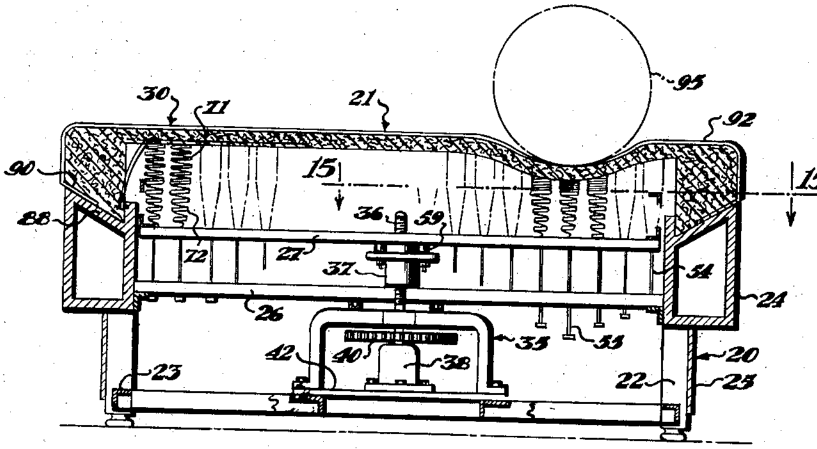

Fig. 4

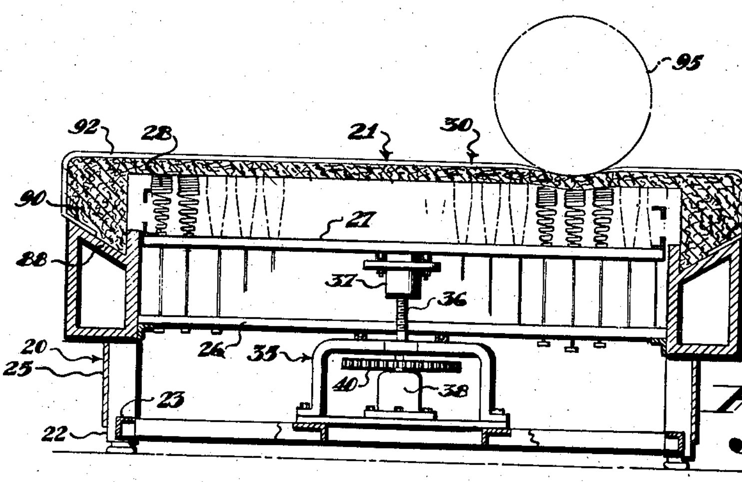

Fig. 5

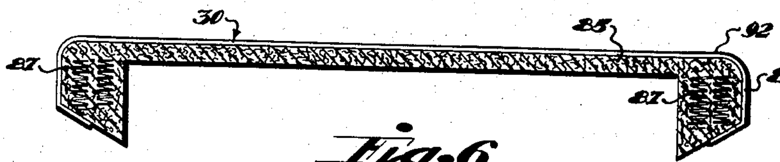

Fig. 6

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ADJUSTABLE SPRING TENSIONING OF BED SPRINGS

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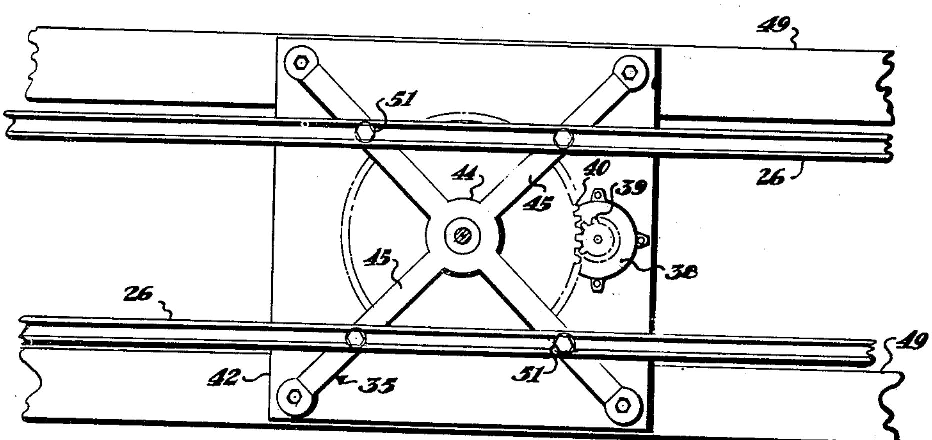

Fig. 8

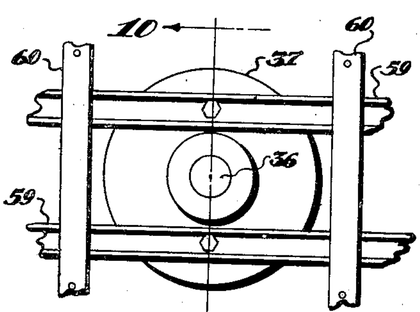

Fig. 9

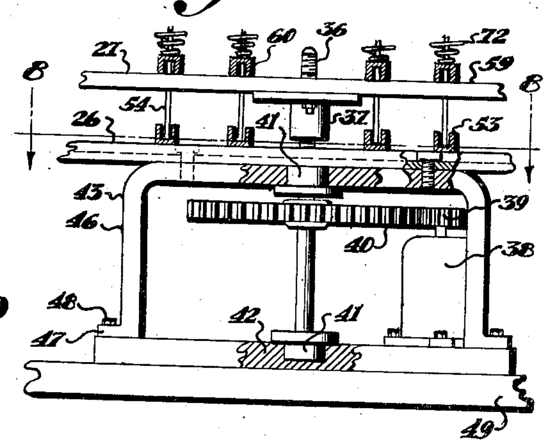

Fig. 7

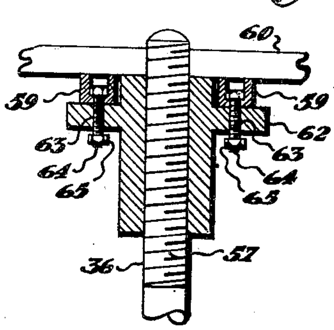

Fig. 10

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ADJUSTABLE SPRING TENSIONING OF BED SPRINGS

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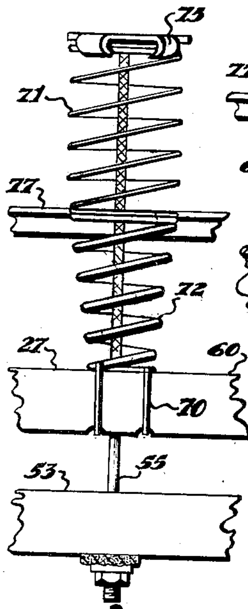

Fig. 11

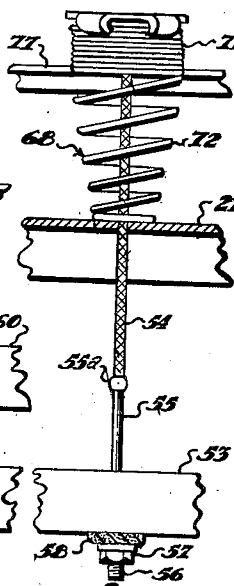

Fig. 12

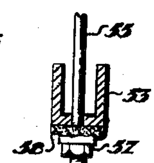

Fig. 13

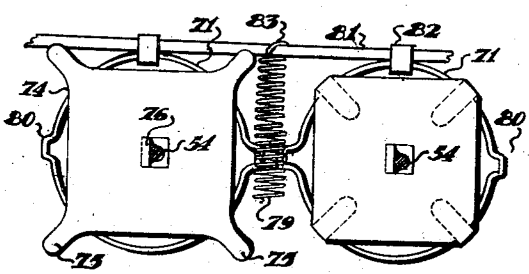

Fig. 14

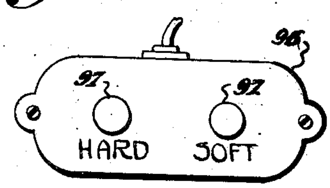

Fig. 17

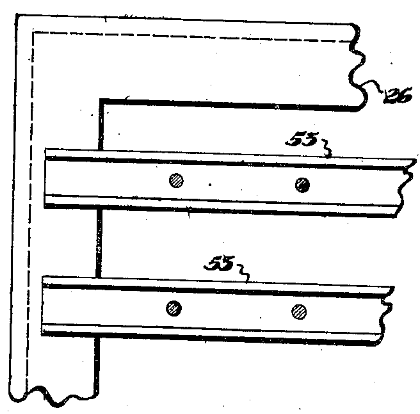

Fig. 16

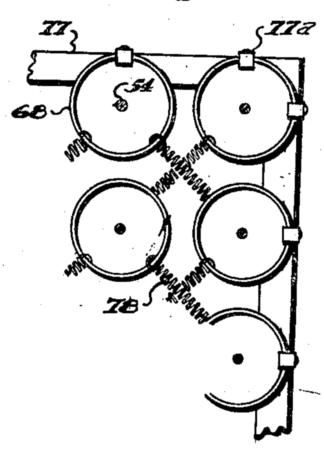

Fig. 15

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2,558,288

UNITED STATES PATENT OFFICE

2,558,288

ADJUSTABLE SPRING TENSIONING OF BED SPRINGS

Carl Backus, Cincinnati, Ohio

Application March 6, 1947, Serial No. 732,753

14 Claims. (Cl. 5—248)

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This invention relates to improvements in beds, couches and the like and is specifically directed to a bedspring and mattress structure which is capable of being selectively adjusted in varying degrees of hardness or softness as desired by the occupant.

It is well known that preferences among individuals vary widely as to the degree of softness most conducive to relaxation and sleep. Also, in many instances physical disturbances require that the body be supported in a relatively flat position, requiring the use of a somewhat firm or hard mattress.

The improved structure is intended primarily for use in hotels and similar establishments where there is a change of guests from day to day. The apparatus is particularly adapted for such transient use because the guest is able to adjust the bedspring so as to enjoy the type of bed to which he or she is accustomed. As applied to hotel use, the apparatus preferably includes an automatic regulating mechanism operated by a push button or the like for maximum convenience.

It is likewise contemplated to adapt the improved construction for home use. Since the adjustment in this instance would be more or less permanent, a simplified mechanical regulating mechanism may be substituted for the automatic regulating mechanism utilized in the instance of hotel installations.

Briefly, it is a concept of the present inventor to provide a bedspring structure incorporating a set of springs, the tops of which are maintained in a level plane by a series of anchored cables extending through each spring individually, the lower ends of the springs being seated upon a vertically movable frame including an actuating mechanism, so as to cause the springs to be compressed or relaxed when the movable frame is raised or lowered. In other words, the tops of the springs are tied down by individual cables to prevent any change in elevation, and the resiliency of the springs is regulated by compressing or relaxing the coils from the bottom. In this manner the bedspring may be regulated from a condition of maximum softness to maximum hardness or firmness or to any degree of softness between the two extremes to suit the taste of the individual.

It has therefore been a principal object of the inventor to provide a bedspring assembly and mattress structure which is capable of being adjusted for various degrees of softness by a simple, automatically operated regulating device.

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It has been another object to provide a bedstead incorporating a variable bedspring unit and having an improved mattress cooperating with the bedspring and bedstead to provide an organization having increased utility and providing a maximum degree of comfort and convenience.

A further object has been to provide a variable bedspring incorporating coil springs which are maintained in a fixed plane which remains unchanged when pressure is applied to the coils from below, in order to change the resiliency of the coil.

A further object has been to provide an adjustable bedspring including a movable regulating frame having a centralized actuating and support unit which permits the spring frame to tilt within predetermined limits to avoid stress and strain due to unequal weight distribution on the bedspring.

Still another object has been to provide an adjustable bedspring having coil springs formed of light gauge wire at the upper portion and a relatively heavier gauge wire at the lower portion in order to provide a maximum range of hardness or softness.

Further objects and advantages of the invention will be more fully set forth in a description of the drawings forming a part of this specification in which:

Figure 1 is a general side elevation of a complete bedstead, spring and mattress unit incorporating the present adjustment apparatus.

Figure 2 is a bottom plan view of the assembly illustrating the general construction and arrangement of the several parts.

Figure 3 is a sectional view taken on line **3—3**, Figure 1 illustrating the construction and mounting of the bedspring frame.

Figure 4 is a sectional view taken on line **4—4**, Figure 1 showing the apparatus adjusted to a position of maximum softness.

Figure 5 is a sectional view similar to Figure 4, showing the apparatus adjusted to a position of maximum hardness.

Figure 6 is a sectional view showing the mattress pad removed from the bedspring assembly.

Figure 7 is an enlarged fragmentary view detailing the construction of the actuating unit which regulates the softness of the springs as viewed in Figure 1.

Figure 8 is a fragmentary top plan view taken on line **8—8** Figure 7 detailing the actuating unit and the manner of mounting the same.

Figure 9 is a fragmentary top plan view detailing the elevating screw and mounting nut of the spring frame.

Figure 10 is a sectional view taken on line 10—10, Figure 9.

Figure 11 is an enlarged fragmentary view detailing one of the coil springs in a condition of maximum softness corresponding to the position shown in Figure 4.

Figure 12 is a view similar to Figure 11 showing the spring in its position of maximum hardness.

Figure 13 is a sectional view detailing the manner of anchoring the lower end of the spring cables.

Figure 14 is a fragmentary view of a portion of the upper spring frame detailing the manner of attachment of the upper portions of the individual coil springs.

Figure 15 is a fragmentary view of a portion of the spring frame taken through the intermediate frame as indicated on line 15—15 Figure 4.

Figure 16 is a fragmentary view of a portion of the stationary cable anchorage frame.

Figure 17 is a front view illustrating the push button control unit for regulating the spring softness.

In the preferred embodiment of the invention as disclosed in the drawings the organization includes a power operated adjusting apparatus. It has been contemplated by the inventor to utilize this arrangement primarily for use in hotels, hospitals and similar establishments wherein the bed is utilized by transients. Therefore it is desirable to provide an adjustment mechanism which is capable of speedy and convenient regulation by the individual.

However, as applied to use in the home, a simplified hand operated adjustment apparatus may be utilized. In this case the bed may be adjusted only on rare occasions since the bed usually is used by the same person. It will be apparent, therefore, that the essential features of the invention may be adapted to hand or power operation as the case may require.

Referring to Figure 5 of the drawings, showing a preferred embodiment of the invention as applied to a bed for use in hotels and the like, the bedstead is indicated generally at 20 and the bedspring unit at 21. As shown, the bedstead is rectangular in form and includes legs 22 at the respective corners thereof. The legs are joined together by angle iron framing members 23 near their lower ends and are joined to an overhanging marginal framing member 24 at their upper ends. The bed frame further includes panels 25 secured to the legs and enclosing the lower portion of the bedstead.

The bedspring unit 21 includes a movable spring mounting frame 27 upon which is mounted a series of springs 28. A mattress or pad indicated generally at 30 is applied across the top of the spring unit 21 as shown in Figures 4 and 5.

The spring hardness is regulated by varying the elevation of the movable frame 27 with respect to a fixed anchorage frame 26. This is accomplished in the present instance by means of a power driven elevating unit indicated generally at 35 which is mounted beneath the fixed frame 26. The elevating mechanism incorporates a screw-threaded shaft 36 having a nut 37 in screw-threaded engagement thereon. Nut 37 is secured to spring frame 27 and supports the spring frame upon the screw-threaded shaft. Rotation of screw shaft 36 therefore causes the spring frame to be raised or lowered depending on the direction of rotation.

In the present disclosure the actuating mechanism 35 is powered by means of a reversible electric motor 38 having a pinion 39 meshing with a large drive gear 40 non-rotatably keyed to the screw shaft 36. Screw shaft 36 is mounted in a perpendicular position, journalled in suitable thrust bearings 41—41 at the upper and lower ends thereof. The lower bearing is mounted in a bore formed in a base plate 42 and the upper bearing is similarly mounted in a bore formed in a spider 43 which serves to sustain the shaft securely in a vertical position.

Spider 43 includes a central hub portion 44 in which the upper bearing 41 is mounted and, in the present instance, is provided with four radially extending arms 45. Each of the arms 45 includes a vertical portion 46 to support the hub 44 at a proper elevation above the base plate 42. The lower ends of the vertical portions 46 include mounting lugs 47 seated upon the base plate 42. The lugs are secured to the base plate by means of screws 48 extending through the lugs and in screw-threaded engagement with the base plate 42.

Base plate 42 is carried upon a pair of longitudinal angle irons 49—49 extending lengthwise of the bedstead 20 and preferably welded to angle iron frame members 23 as shown in Figures 2 and 4. Angle members 49—49 are stabilized in a lateral direction by a pair of lateral channel irons 50—50 which intersect with the members 49—49 and are secured thereto preferably by welding. The base plate 42 of actuating unit 35 may be secured to the channel irons 49, either by welding or by means of screws passing through base plate 42 into the channel irons to anchor the unit 35 securely in position.

The cable anchorage frame 26 is disposed immediately above the spider 43 and may be anchored thereto by means of screws 51 as shown in Figure 8. This frame preferably comprises a marginal angle iron frame 52 to which is secured, such as by welding, a series of transverse channel iron members 53. The channel members 53 are located immediately beneath the rows of coil springs as hereinafter disclosed, and each includes a series of apertures to accommodate the respective anchorage cables 54. Each of the coil springs is provided with a respective cable 54 which depends downwardly from the top of the spring and has its lower end anchored to one of the lateral members 53.

As shown in Figures 11 to 13, each cable 54 terminates in a screw-threaded rod 55 welded or otherwise secured as at 55a. These rods slidably pass through respective apertures in the transverse channel members 53. The lower end of each rod is screw-threaded as at 56 and includes a nut and washer 57 seated against a resilient pad or washer 58. The pad 58 thus is compressed between the channel member 53 and washer 57 and serves to prevent clicking noises which otherwise may be caused by the nut and washers striking against the channel members 53. The use of the nuts 57 permits adjustment of the cable length to permit the height of the individual springs to be regulated at assembly or after sustained use. In this manner the tops of the springs can be adjusted uniformly so as to form collectively a smooth, level plane upon which the mattress is placed.

As shown in Figures 2 to 5, the movable spring mounting frame 27 follows substantially the same construction as the anchorage frame 26, having an identical marginal frame and lateral channel members. The lateral channel members of the movable and fixed frames 26 and 27 are located in corresponding positions so as to be in vertical alignment with each other. Similar to the anchorage frame, the movable spring mounting frame is provided with a series of apertures which match or register with the apertures of the anchorage frame. Therefore, the cables 54 pass in a straight vertical line through both sets of apertures.

The coil spring mounting frame 27 is carried upon the nut 37 in screw-threaded engagement with the upper end of shaft 36 as shown in Figure 10. For this purpose shaft 36 includes a screw-threaded upper portion 57, the thread profile being preferably of the buttress type. It will be apparent that operation of motor 38 causes rotation of shaft 36 through the medium of gears 39 and 40. Rotation of shaft 36, therefore, will cause the movable spring mounting frame to be raised or lowered according to the direction of motor operation.

The spring mounting frame 27 is mounted upon nut 37 by means of a pair of longitudinal channel irons 59—59 as shown in Figure 3. Channel irons 59 have their opposite ends secured to the marginal angle irons of the spring mounting frame 27, preferably by welding. It will be noted that the lateral spring mounting channels 60 are disposed on top of the longitudinal channels 59—59. Therefore, the weight of the entire bedspring assembly is carried by the members 59. It will be noted also that screw shaft 36 is located at the center of the bedspring assembly 27. Consequently the entire assembly is supported by nut 37 in a balanced condition, the load being imposed directly upon the screw shaft 36.

In order to permit a limited amount of angular movement laterally, a universal joint is established between nut 37 and frame 27 as shown in Figure 10. For this purpose nut 37 includes a radial flange 62 near its upper end which is provided with a pair of apertures 63. The channel members 59—59 include apertures matching the apertures 63. Bolts 64—64 are projected through the respective members 59 and flange 62 to fasten the channels to the flange. In order to permit a limited amount of tilting, the nuts 65 of bolts 64 are not drawn up completely tight. This arrangement permits the spring frame 27 to tilt slightly with respect to the nut 37 when the spring frame is unequally weighted, as shown in Figures 4 and 5. In this manner lateral stress, which would tend to spring the screw shaft angularly of its vertical axis, is eliminated and instead is absorbed by the cables 54, as hereinafter described.

Described in detail, the spring frame 27 is provided with a series of coil springs generally indicated at 68. These springs are arranged in longitudinal and transverse rows appropriately spaced. The lower end of each spring is seated upon and secured to the respective lateral channels 60 of the spring mounting frame by means of fastening elements 70. These elements are formed preferably of a pair of continuous parallel heavy gauge wires woven through the lower coil of each spring and passing around the lower edge of the channels 60.

Each coil spring 68 preferably is comprised of a soft upper portion 71 and a relatively firm lower portion 72. For this purpose the upper portion is made of a light gauge wire while the lower portion 72 is made of a relatively heavy gauge wire. As shown in Figures 11 and 12, the upper and lower terminal coils of springs 72 and 71 respectively may be arranged to provide a flat seat one with the other secured together in their full circumference by spot welding. Alternatively the spring may be formed of a continuous length of wire, the length forming the upper portion being drawn finer than that of the lower portion. This may be accomplished by redrawing the individual lengths of heavy wire after they are initially drawn. If desired, however, the spring also may be constructed by butt welding the lower end of the light gauge coil directly to the upper end of the heavy gauge coil.

The purpose of this construction is to provide maximum softness when the bedspring is in its soft adjustment. Thus, when the weight of an occupant is imposed on the coil spring, the soft upper portion collapses first and creates a deep softness similar to the innerspring type of mattress. In other words, if the entire spring were made of the heavy gauge wire, a sensation of stiffness may result.

In the present instance the maximum softness and hardness are obtainable in a greater degree than if the coil were made uniformly of the same gauge wire for its entire length. As shown in Figure 11, showing the maximum softness adjustment, the full length of the soft upper spring is available to support the occupant. In Figure 12, showing the adjustment for maximum stiffness or hardness, the soft spring has been collapsed to its solid length. Thus, in the position shown in Figure 12, the weight of the occupant is imposed upon the relatively firm lower portion of the spring.

As shown in Figure 14 the upper end of each spring includes a plate 74 preferably formed of sheet metal. Each plate is approximately square in outline and includes a diagonal tab 75 formed at each corner. These tabs are doubled under to engage the upper coil of spring 71, thereby securing the plate to the spring. Each plate 74 further includes at its center, a tab 76 bent downwardly and providing an anchorage for the upper end of cable 54. The cable 54, being formed of woven or stranded wire, may be welded or soldered to the tab 76 as shown. If desired, the tab may be provided with a hole to receive the end of the cable and the cable anchored by looping it or by forming a knot or protrudence at its end to fasten it to the tab.

An intermediate floating angle iron border 77 preferably is utilized to provide rigid protective edging for the springs 68 intermediate their length. Frame 77, as shown in Figures 11 and 15, is formed of a continuous angle iron conforming in outline to the spring mounting frame 27. The marginal spring units 68 may be attached to the floating angle iron border 77 in any well known manner for example by cleats 77*a* to aid in stabilizing the bed spring assembly. The frame is free to move up or down as determined by the compression of the springs 68. As shown in Figures 11 and 12, the frame unit 77 is in a lowered position when the spring is adjusted for a soft condition and is forced upwardly to an elevated position when the bedspring is adjusted to a hard condition. The intermediate portions of the springs 68 are joined together by means of crossed helical springs 78 having their respective opposite ends connected to diagonally adjacent springs.

Following generally the prevailing practice the upper ends of the several coil springs 68 are joined together by means of an interlocking helical spring 79 which extends laterally between each row of springs as shown in Figure 14. For this purpose each of the soft coil springs 71 includes a laterally extending loop U-shaped 80 which is engaged by several turns of the spring 79. This construction provides a hinged connection between each adjacent row of springs.

Also following the general prevailing practice the upper ends of the springs additionally are joined by a marginal border-frame 81 of rectangular outline. This frame is formed preferably of a heavy gauge wire or rod and the edges of the individual coils are attached thereto by means of the clips 82. These clips, as shown are formed preferably from sheet metal and provide a hinged connection between the border-frame and the individual coils. The helical springs 79 likewise are hinged to frame 81 as indicated at 83. It will be apparent that the frame 81 maintains the individual springs 71 properly in grouped relationship and maintains the rectangular contour of the bedspring unit.

As shown in Figures 4, 5, and 6, the mattress or pad 30 is applied over the top of the spring unit to absorb the minor irregularities formed by the individual coil springs 28. Mattress 30 may be fabricated in the usual manner from any desired tough padding such as sisal, laminated textile, plastic sheeting, or combinations thereof Or, if desired, it may be formed, in part, of foam rubber. In addition to the relatively thin top pad 85, the mattress is provided with an overhanging marginal portion 86 on all four sides. This portion may be formed of foam rubber and may include a dual set of soft coil springs 87, as shown in Figure 6. The lower edge of the overhanging margin, seated upon the angular framing member 24 of the bed frame, stabilizes the mattress and bedspring unit relative to the bedstead. Furthermore, it provides a margin about the mattress which is sufficiently firm to permit a person to sit upon the edge of the bed. As shown in Figures 4 and 5, the edge of the bed sheet 92 is tucked in between the inclined edge 90 and the bed frame 88 to hold the sheet securely in position. This arrangement constitutes a hygienic measure in that the entire mattress is covered to a depth similar to standard mattresses.

From the foregoing, it will be apparent that when the spring frame 27 is in its lowered position as shown in Figures 4 and 11, the bedspring is in its softest condition. In this adjustment the soft coil spring 71 provides the maximum deep softness to support the weight of the occupant. This function is illustrated in Figure 4, the weight of an occupant being indicated diagrammatically by the circle 95. It will be noted that in this adjustment the weight sinks into the bedspring for a maximum distance. As shown in Figure 5, the bedspring is illustrated in adjustment of maximum hardness in which condition the weight sinks a lesser degree.

When the coil springs are compressed by the weight of an occupant, the rods 55 are free to slide through their respective apertures a distance depending upon the degree of spring compression, as shown in Figures 4 and 5. It will be apparent that if the rods were not free to slide relative to the anchorage frame, the cable would buckle when the springs are compressed. Constant and repeated buckling of the cables due to the shifting of the occupant may tend to weaken the cable and cause it eventually to fail. However, since the lower end of the cable is free to slide, buckling is substantially avoided.

As shown in Figure 17 a control switch 96 is provided for adjusting the bedspring to the desired condition. This switch may follow any preferred design and is provided with push buttons 97—97 for hard and soft regulation respectively. This switch is appropriately connected to the motor 38. Since the motor is reversible, depressing one or the other of these buttons causes motor operation in the direction appropriate to raise or lower the spring mounting frame 27. By virtue of the elevating screw and nut 37, the actuating mechanism is selflocking. In other words, the occupant energizes the motor for a sufficient period of time to permit the bed spring to reach its desired condition of hardness or softness. The push button is then released and the bedspring retains its adjustment until it is readjusted.

As applied to hotels and similar institutions where there is a frequent change of guests, each guest may enjoy the approximate type of bed to which he or she is accustomed. The mechanical arrangement permits the adjustment to be made very quickly and without previous experience. It is contemplated with double beds to incorporate two of these units, operating separately.

Since each of the springs individually is anchored by an individual adjustable cable 54, all the springs may be adjusted to a uniform height at assembly. This provides a level surface across the top of the bedspring. Should the bedspring later require adjustment because of irregularities, due to wear or the like, the cable length may be readjusted to compensate for such irregularities.

Since all of the individual springs are seated upon the movable frame 27, actuation of the elevating unit 35 to increase the hardness of the bed causes all of the springs to be compressed uniformly. When frame 27 is elevated, the frame, in effect, pushes upwardly against the bottom of the springs collectively. The frames 26 and 27 are suitably reinforced to prevent springing of the frames under heavy loads. Since the tops of the springs are anchored by means of the cables 54 to the fixed frame 26, elevation of frame 27 merely compresses the springs without changing the height of the top of the bed. Therefore, there is no change in the height of the bed when the adjustment is changed.

It will be apparent that the anchorage of the cables in fixed frame 26 stabilizes the movable spring frame 27. In other words when the weight is disposed to one side of the bed as illustrated in Figures 4 and 5 the cables 54 on the opposite side prevent the bed from tilting excessively upon its central mounting nut 37.

It will be apparent that other means of adjustment may be provided between the fixed and the movable frames 26 and 27. For this purpose it is desired in some instances to utilize suitable crank operated cam or lever arrangements and also to utilize hydraulic means to actuate the movable frame.

Having described my invention, I claim:

1. An adjustable bed comprising; a bed frame, a bedspring mounted in said bed frame, said bedspring including a plurality of springs seated thereon, an inelastic connector element for each of said springs, each of said connector elements connected to the upper ends of said springs re-

spectively and extending downwardly through the interior of the springs, an anchorage frame for said connector elements, said anchorage frame disposed beneath said bedspring, and a non-yieldable element for adjusting said bedspring relative to said anchorage frame to compress said springs and thereby regulate the resiliency of said springs.

2. An adjustable bed comprising; a bed frame, a movable bedspring frame, a plurality of coil springs mounted on said bedspring frame, pliable regulating means connected to the top of each of said coil springs and extending downwardly therethrough, a fixed anchorage frame for said regulating means, and a rigid element for adjusting said bedspring frame relative to said anchorage frame whereby said coil springs are compressed between the upper end of said regulator means and said movable frame to vary the softness of said bedspring without changing the level of the upper surface of the bedspring unit.

3. An adjustable bed comprising; a bed frame, a bedspring mounted in said bed frame, said bedspring including a plurality of coil springs seated thereon, a metal top plate with tabs secured to the upper end of each of said springs, a flexible connector element for each of said springs, each of said connector elements connected to said top plates respectively and extending downwardly through the interior of the springs, an anchorage frame for the opposite ends of said connector elements, said anchorage frame disposed beneath said bedspring, and a non-yieldable element for adjusting said bedspring relative to said anchorage frame to compress said coil springs and thereby regulate the resiliency of said coil springs.

4. An adjustable bed unit comprising; a bedspring, said bedspring having a frame, a plurality of coil springs mounted on said frame, each of said coil springs being divided into an upper and lower section, the upper section of each spring constituting a variable soft portion and the lower portion constituting a variable firm portion, a connector element associated with each of said coil springs, an anchorage frame for said connector elements, said frame disposed beneath said bedspring, and actuating means for moving said bedspring frame relative to said anchorage frame to control the compression of said coil springs and thereby provide a maximum range of softness and firmness for said bedspring.

5. An adjustable bed unit comprising; a bedspring, said bedspring having a frame, a plurality of coil springs mounted on said frame, each of said coil springs being divided into an upper and lower section, said sections having a differential resiliency, a regulator element associated with each of said coil springs, and actuating means for said regulator elements to control the resiliency of said coil springs collectively and thereby regulate the softness of said bedspring.

6. An adjustable bed unit comprising; a bed frame, an adjustable bedspring unit, a frame for said bedspring unit, a plurality of coil springs mounted upon said bedspring frame, a connector element for each of said coil springs, a fixed anchorage frame for each of said connector elements, a rotatable screw-threaded shaft in engagement with a nut adapted to move said bedspring frame vertically relative to said anchorage frame, said nut having a universal connection at the center of said movable bedspring frame to support the same and to permit said bedspring frame to tilt angularly relative to said screw-threaded shaft and thereby eliminate the transmission of angular stress to said screw shaft due to unequal weight distribution on said bed spring unit.

7. An adjustable bed comprising; a bed frame, an adjustable bedspring unit, a plurality of coil springs mounted upon said bedspring unit, a connector element for each of said coil springs, an anchorage frame for each of said connector elements, a rotatable screw-shaft rigidly seated in said bed frame and adapted to move said bedspring unit vertically relative to said anchorage frame, an elevating nut engaged on said screw shaft, and a universal connection between said elevating nut and said movable bedspring unit to permit said unit to tilt angularly relative to said screw-shaft and thereby eliminate the transmission of angular stress to said screw shaft due to unequal weight distribution on said bedspring unit.

8. An adjustable bed unit comprising; a bed frame, a bedspring frame movably disposed within said bed frame, a plurality of coil springs mounted on said bedspring frame, a plurality of connectors, one for each of said coil springs, said connectors secured to said coil springs and extending downwardly therethrough, an anchorage frame mounted in said bed frame, said connectors being connected to said anchorage frame, a control unit for regulating the position of said movable bedspring frame relative to said anchorage frame, said control unit including a screw-threaded shaft, said bedspring frame having an elevating nut mounted thereon and engaged on said screw-threaded shaft, and means for rotating said screw-threaded shaft to raise or lower said bedspring frame relative to said anchorage frame to increase or decrease the compression of said coil springs and thereby regulate the softness of said bedspring.

9. An adjustable bed unit comprising; a bed frame, a bedspring movably disposed within said bed frame, a plurality of coil springs mounted on said bedspring, a plurality of connectors, one for each of said coil springs, said connectors secured to said coil springs and extending downwardly therethrough, an anchorage frame, each of said connectors being connected to said anchorage frame, a control unit for regulating the position of said movable bedspring frame relative to said anchorage frame, said control unit including a screw-threaded shaft, said bedspring frame having an elevating nut mounted thereon and engaged on said screw-threaded shaft, power means for rotating said screw-threaded shaft and control means for said power means adapted to raise or lower said bedspring frame relative to said anchorage frame to increase or decrease the compression of said coil springs.

10. An adjustable bed unit comprising; a bed frame, a bedspring unit, a spring frame mounted within said bedspring unit, a plurality of coil springs mounted upon said spring frame, connector means associated with each of said coil springs and extending downwardly therethrough, means for actuating said spring frame to regulate the compression of said springs collectively, a mattress for said bedspring unit, said mattress having a relatively thin central portion and a thick overhanging margin arranged to cover the marginal edges of said bedspring unit, means on said bed frame to receive the lower edge of said overhanging margin and adapted to receive a

bed sheet between the edge of said mattress and said bed frame.

11. An adjustable bed unit comprising; a bed frame, a bedspring mounted upon said bed frame, a plurality of coil springs mounted upon said bedspring, connector means associated with each of said coil springs and extending downwardly therethrough, an anchorage frame disposed beneath said bedspring, means to regulate the compression of said springs collectively, a mattress for said bedspring, said mattress having a relatively thin central portion and a thick overhanging margin arranged to cover the marginal edges of said bedspring, means on said bed frame to receive the lower edge of said overhanging margin to support the same, and a series of coil springs disposed within the overhanging margin of said mattress to increase the resiliency of the mattress around the marginal edge thereof.

12. An adjustable bed unit comprising; a bedstead, a bedspring unit mounted for vertical movement in said bedstead, said bedspring unit having a plurality of coil springs mounted thereon, a plurality of connector elements, one for each of said coil springs, each of said connector elements joined to the upper end of the respective coil springs and extending downwardly through the springs, an anchorage unit, said unit having a series of apertures one for each of said connector elements, said apertures located in alignment with said respective coil springs, said connector elements respectively slidably extending through said apertures, an adjustment nut on the lower end of each of said connector elements, a cushioning element between said adjustment nut and said anchorage unit, and means for moving said bedspring unit relative to said anchorage unit to control the compression of said coil springs collectively and thereby regulate the softness of said bedspring unit.

13. An adjustable bedspring assembly comprising a plurality of upright springs, a frame for mounting the lower end of each of said springs, an anchor frame under said frame, a plurality of vertically disposed connectors for said springs, said connectors respectively secured to the upper ends of said springs, and having an end secured to said anchor frame, and a locking element for adjusting the position of said frames relative to each other to provide a selective range of softness and hardness for said springs collectively.

14. A bedspring assembly comprising a fixed frame, a movable spring-mounting frame disposed above said fixed frame, means for adjusting said spring-mounting frame relative to said fixed frame, a plurality of springs seated upon said spring-mounting frame, and inelastic elements associated with the tops of said springs, each of said elements extending downwardly past and free of said spring-mounting frame and each having its lower end anchored upon said fixed frame.

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