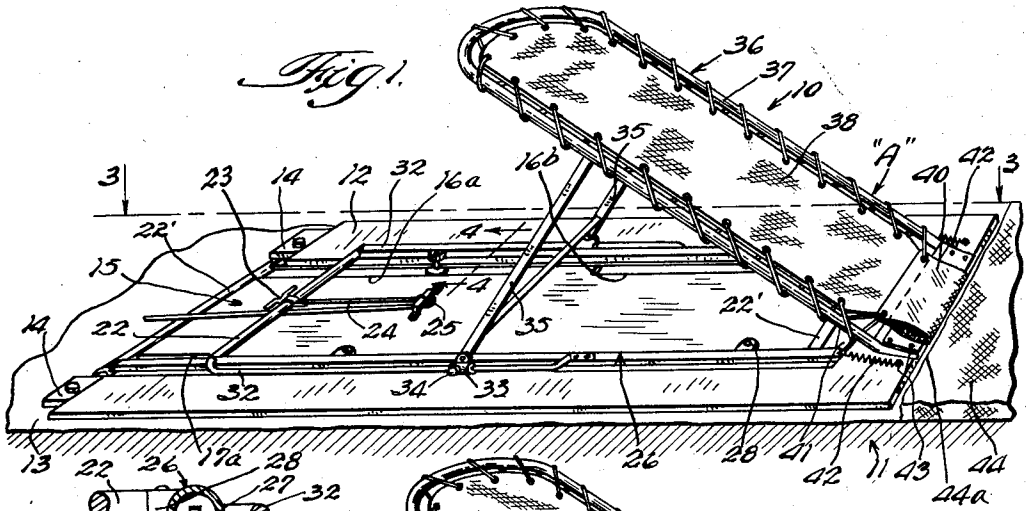
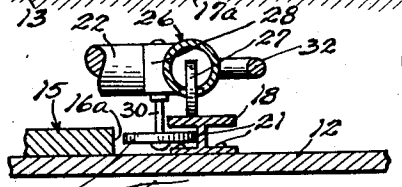
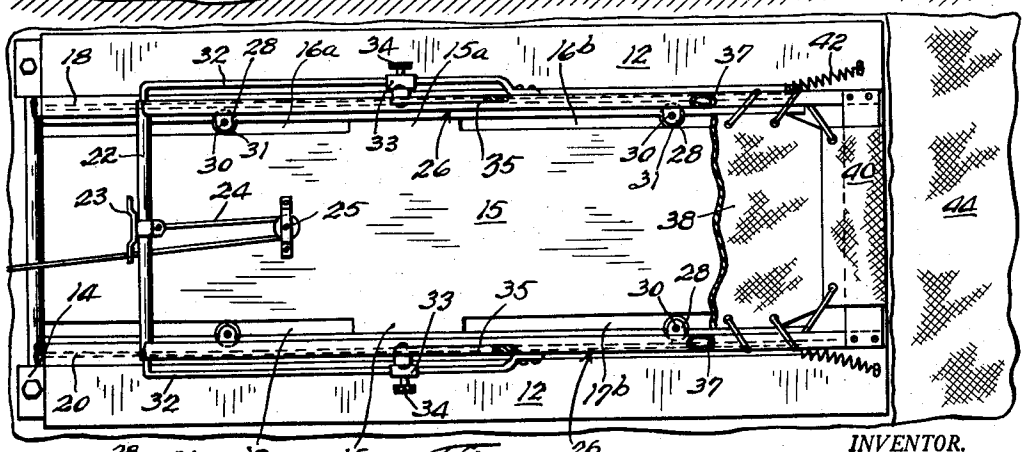
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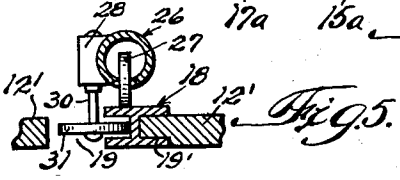
BACK-SUPPORTING AND STRETCHING APPARATUS

Filed Oct. 5, 1953 2 Sheets-Sheet 1









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BACK-SUPPORTING AND STRETCHING APPARATUS

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Fig. 9.

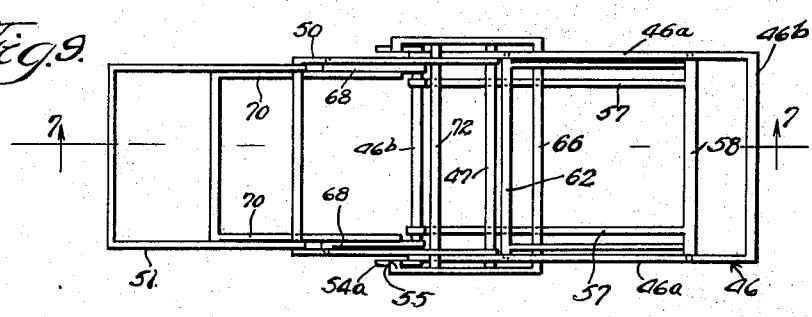


Fig. 10.

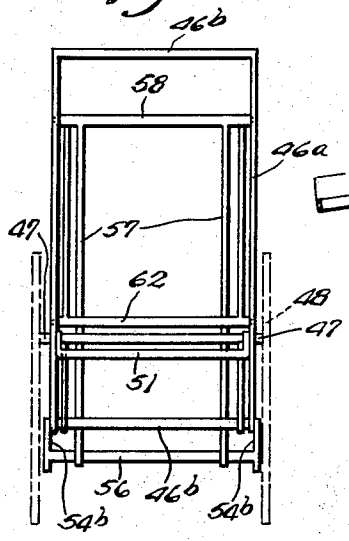


Fig. 7.

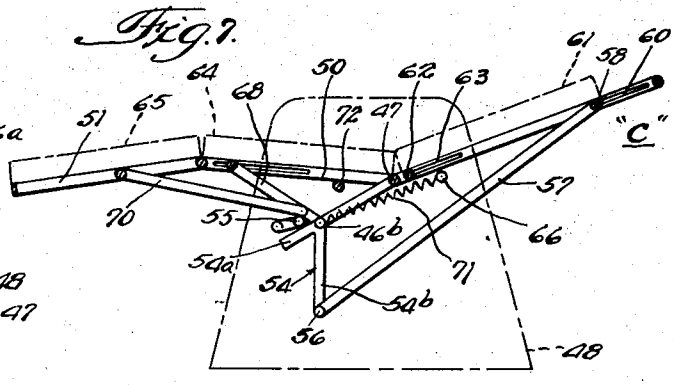


Fig. 8.

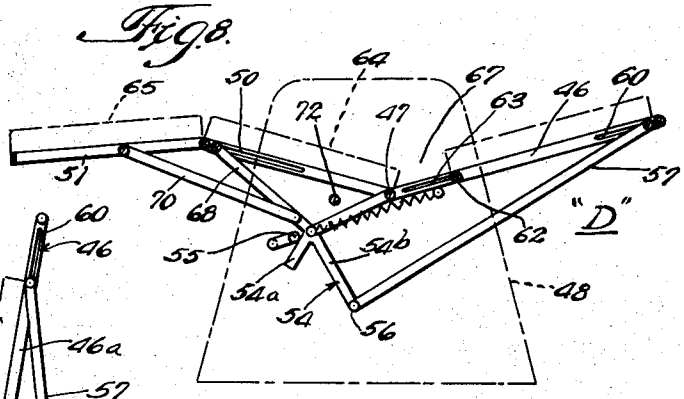
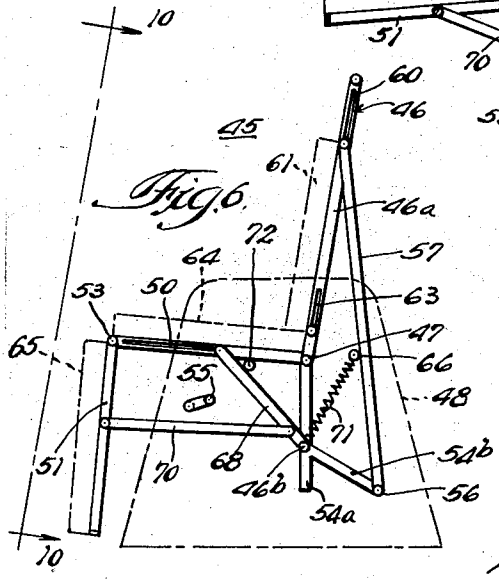


Fig. 6.



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2,904,039

BACK-SUPPORTING AND STRETCHING APPARATUS

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Application October 5, 1953, Serial No. 384,043

6 Claims. (Cl. 128—69)

This invention relates to a body-supporting apparatus and more particularly to an apparatus which effects stretching of the spine of a person when the latter assumes a reclined position while being supported by such an apparatus.

Aches and pains of the back are a common complaint often voiced by a person who has either been confined to a bed or for a prolonged period or is in a state of nervous tension brought on by excessive work or play. In either case the source of the pain can frequently be localized in the lumbar spinal or lower back region of a person.

Heretofore, where such aches and pains were of a pathological nature requiring hospitalization of the person, it was a common practice to place the person in a traction device to effect stretching of the spine and thereby give relief to this particular area of the body. However, in the various types of traction devices used, little or no stretching of the spine occurred in the lumbar spinal (or low back) region, thereby affording unsatisfactory relief to the person wherein the discomfort was localized in this particular region.

In instances where these aches and pains are caused by reason of nervous tension, it is important that the distressed person relax physically, if possible, in such a way that the weight of the upper body carried by the lumbar spine, which is the cause of discomfort, be diminished and thus effect distribution of such weight over other areas of the body. One method of producing this desired relaxation and effecting proper weight support throughout the body would be to cause the person to be immersed in a tank or vessel filled with water. However, because of physical and environmental limitations, it is often not possible for a person to pursue this form of relief.

Thus, it is one of the objects of this invention to provide an apparatus which will simulate the effect, as to pressure distribution, experienced by a person when immersed in a tank of water.

It is a further object of this invention to provide an apparatus which effectively stretches the spine of a person in the lumbar spinal region while the person is reclining on the apparatus.

It is a further object of this invention to provide an apparatus by which a stretching of the lumbar region alone is provided while the remaining parts of the spine are in a relaxed state.

It is a further object of this invention to provide back-stretching means which may be effectively used by a person whether bedridden or sitting in a chair.

It is a still further object of this invention to provide a back-stretching device which does not interfere with the free movement of the extremities or neck of the person using the device and does not require the use of uncomfortable straps and braces to retain the person in proper position on the device.

It is a still further object of this invention to provide an apparatus which is adapted for home, office, or hospital use.

It is a still further object of this invention to provide

an apparatus which is simple in construction, effective in operation, and inexpensive to produce.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of this invention, a back-stretching device is provided comprising a base for disposition in a substantially horizontal position, and a back-contacting member slidably mounted on the base for movement therewith and independently thereof; said member being adapted to normally assume a predetermined rest position with respect to said base. The back-contacting member is adapted to move independently away from its normal rest position carrying with it the back of a person reclining thereagainst, while the person's pelvis and legs remain in place. Thus a beneficial stretching of the lumbar region of the spine is effected. Means is provided on the apparatus for automatically returning the back-contacting member to its normal rest position when the back of the person, using the apparatus is out of contact with the member.

For a more complete understanding of this invention, reference should be made to the drawings wherein:

Figures 1 and 2 are fragmentary perspective views of one form of the invention showing the apparatus in two changed positions of slidable movement with respect to the base;

Fig. 3 is a top plan view partially in section of Fig. 1;

Fig. 4 is an enlarged fragmentary sectional view taken along line 4—4 of Fig. 1;

Fig. 5 is similar to Fig. 4 but showing a modified form of base construction;

Fig. 6 is a fragmentary sectional view of a second form of the invention;

Figs. 7 and 8 are similar to Fig. 6 but showing the apparatus in two tilted positions;

Fig. 9 is a top plan view of the second form of apparatus shown in Fig. 7; and

Fig. 10 is a left side elevational view of the second form of the apparatus taken along line 10—10 of Fig. 6.

Referring now to the drawings and more particularly to Figs. 1 through 4, one form of the invention is shown incorporated in a portable back-stretching apparatus **10** adapted for use in combination with a support **11** having a substantially flat surface **13** disposed in either a horizontal plane or one inclined downwardly a slight amount. For the purpose of describing apparatus **10**, in this instance, the support **11** will be considered as a table, used by the doctor when examining patients. The apparatus **10** comprises a planar base **12** formed of plywood or any other suitable material, which is adapted to rest on the planar surface **13** of the table **11** and may, if desired, be prevented from slidably moving in one direction relative thereto (to the left, as viewed in Fig. 1) by a pair of stop blocks **14** mounted on surface **13** and abutting the left-hand edge of base **12**. The base **12** is provided with an elongated relatively narrow center plateau or raised portion **15** which extends across a substantial portion of the exposed surface of the base **12**. The elongated sides of the plateau portion **15** are provided with longitudinally spaced elongated recesses **16***a*, **16***b* and **17***a*, **17***b*.

Mounted on base **12** and in juxtaposed relation with respect to the recesses formed in the plateau portion **15** is a pair of spaced, parallel tracks **18** and **20**. The track **18** cooperates with recesses **16***a* and **16***b*, and track **20** cooperates with recesses **17***a* and **17***b* to form pockets, the purpose of which will be more fully discussed hereinafter. The tracks, in this instance, are of I-beam construction and have the lower flange thereof secured to base **12** by bolts **21** or any other suitable means. To retain the tracks in a fixed relative relation with respect

to one another, a pair of cross members **22'** are provided which extend transversely from the tracks and are secured to or adjacent to the corresponding ends thereof.

A modified form of base construction is shown in Fig. 5 wherein no plateau portion is provided but in place thereof elongated slots **19**, only one being shown, are formed in the base **12'** itself. The slots **19** function in the same manner as the recesses **16***a–b* and **17***a–b* heretofore described for base **12**. A track **18** is then positioned within each of said slots and disposed to one side of the slot and is secured thereto by bolts or the like. To accommodate the lower flange of the track, so as to make it flush with the bottom side of the base, a recess **19'** is formed in the bottom side. The carriage **26**, to be hereinafter described, is the same for either type of base construction.

Mounted on the tracks for slidable movement relative thereto is a carriage **26**. The carriage **26** is provided with a cross member **22** having a centrally disposed cleat **23** mounted thereon. Extending from and embracing cleat **23** is a wire strand or cord **24** which is adapted to be wound about a pulley **25**, the latter being secured to the plateau portion **15**, as seen in Figs. 1, 2, and 3. While a wire or cord is shown and hereinafter described, other means, such as a peg and the like, may be utilized to retain the carriage **26** in a fixed position while the person is positioning himself or herself on the device. The free end of the wire or cord **24** is adapted to be secured to some stationary object so that when the patient is getting into position for reclining on the apparatus **10**, the carriage **26** will be held in a relatively fixed position with respect to the tracks **18** and **20**. Once the patient is in position, the free end of the wire or cord **24** is loosened and the carriage **26** is adapted to move to the left, as viewed in Fig. 1, an amount determined by the degree of elasticity, mobility, or slidability of the part of the lumbar spine which becomes unsupported as the carriage moves away from its original position "A." The carriage **26** is provided with a plurality of wheels **27** rotatably mounted on the underside thereof and adapted to engage and roll along the upper flange of the tracks **18** and **20**. Mounted on each of the side portions of the carriage, which are in superposed relation with respect to the tracks **18** and **20**, and extending in a direction toward each other, are a plurality of brackets **28**. The brackets **28** are adapted to carry a depending shaft **30** on which a roller or wheel **31** is rotatably mounted at the lower end thereof. The wheels **31** are disposed within the corresponding pockets formed by the recessed portions **16***a* and **16***b*, and **17***a* and **17***b* of the plateau portion and the tracks **18** and **20**. The peripheries of the wheels **31** contact the web or center portions of the tracks and prevent lateral movement of the carriage relative to the tracks. As noted in Fig. 3, the pockets of each set of pockets are in longitudinally spaced relation and the separating or intermediate portion **15***a* of the plateau serves as a stop to prevent the carriage from moving beyond a certain point and becoming disengaged from the tracks. Mounted on and spaced outwardly from the sides of the carriage are elongated rack bars **32** on which are slidably mounted positioning blocks **33**. Carried on each block **33** is a locking screw **34** which is adapted, when in a tightened position, to hold the block **33** in a fixed position of adjustment with respect to the rack bar **32**. Extending upwardly from each block **33** is an elongated brace **35**, the upper end of which is in contact with a frame **37** forming a part of the back-supporting portion **36** of the apparatus. The frame **37**, in this instance, is substantially U-shaped and has a pliable web portion **38** stretched between the legs of the U-shaped frame **37**. The free end portions of the frame legs are pivotally mounted at points **39** to the carriage **26**. The lower end of the web **38** is turned back to form a padded hem **40** which is adapted to engage the lumbar spinal region of the person reclining on the apparatus.

While the frame **37** is shown in this instance to be hingedly mounted on the carriage, it is to be understood, of course, that it is not to be so limited. For example, if desired, the frame may be swivelly mounted on the carriage in such a way that the back-supporting portion **36** if free to more readily conform to the contour of the back of the person using the apparatus, and permit the person and the supporting portion **36** to twist with respect to the carriage.

The carriage which carries the back-supporting frame is adapted to normally assume a position "A" with respect to the base **12**, as seen in Fig. 1 When in this position, the carriage is moved to its extreme right-hand position with respect to the tracks. This tendency to normally assume this position is caused by a pair of springs **42**, one end of which engages the corresponding end of the carriage and the other end of which is secured to the base **12** at a point beyond the end of the tracks.

In using the form of the apparatus as shown in Figs. 1 through 4, the patient positions himself or herself on a mattress or pad **44**, the latter resting on the top surface **13** of the table **11**, in such a manner that the pelvis and legs of the person rest on the mattress while the lower spinal portion of the person extends beyond the edge **44***a* of the mattress and contacts the padded hem portion **40** of the back-supporting portion **36** of the apparatus. The frame **37** is adjusted by means of the sliding blocks **33** to the correct position of inclination to provide comfort to the back of the person while the back of said person is being carried away by portion **36** and at the same time the legs of said person remain in a relatively fixed position due to frictional resistance. After the individual is comfortably positioned on the mattress and back-supporting apparatus, the cord or wire strand **24** holding the carriage in a fixed position with respect to the base is released, and by reason of a component of the force exerted on the web **38** due to the weight of the individual, the back-supporting portion **36** and carriage **26** on which it is mounted, moves to the left, as shown in Figs. 1 and 2 to a position such as "B," shown in Fig. 2. This movement from position "A" to "B" effects stretching of the lumbar spinal region of the person resting upon the apparatus and thereby relieves any discomfort which the person might have experienced in that region. To increase the stretching effect produced by the apparatus, the surface **13**, upon which the apparatus rests, may be inclined downwardly a slight amount from the horizontal and thereby increase the component of the force exerted on the back-supporting web **38** which causes movement of the carriage. The hip portion of the person reclining on the mattress may, if desired, be held in a fixed position thereon by having the hip portion embraced by a strap or the like. After relief of the discomfort has been experienced by the person, the hip portion strap may be released.

In Figures 6 through 10, another form of the improvide back-stretching apparatus is shown incorporated in a reclinable chair **45**. The chair comprises a back frame **46** which is pivotally connected at point **47** to the side or arm resting members **48** of the chair. Pivotally connected to the back frame **46** for movement about point or axis **47** is a seat frame **50**. Pivotally connected to the seat frame **50** for movement about axis **53** is a leg-supporting frame **51**. The back-supporting frame **46** is substantially rectangular in form and has the elongated side sections **46***a* thereof interconnected to one another at each end by smaller end sections **46***b*. Pivotally connected to the lower end section **46***b* for movement thereabout as an axis is a bell crank lever member **54** having one leg **54***a* thereof interconnected by an elongated cross member **54***b* which is adapted to engage an adjustable stop **55**, the latter being secured to

the side members 48. When the back, seat, and leg-supporting frames have been moved to the partially reclined position "C," shown in Fig. 7, by the person sitting in the chair, the bell crank member 54 will contact the stops 55 and will cause the bell crank member to remain in a fixed position, while the back frame 46 continues to pivot about point 47 in a clockwise direction until it reaches a fully reclined position, whereupon the sides 46*a* of the frame 46 contact a back stop 66 mounted on and extending transversely between the opposing surfaces of the side members 48. Pivotally connected to bell crank member 54 at point 56 is a pair of elongated arms 57 which are interconnected at their upper end by a cross member 58, the latter having the ends thereof adapted to be disposed within suitable elongated slots 60 formed in the side sections 46*a* of the frame 46. The cross member 58 is affixed to a back cushion 61 and causes the latter to slide relative to the frame 46 while the back-supporting frame 46 moves between positions "C" and "D," see Figs. 7 and 8. The front or lower end of the cushion 61 is connected to a cross member 62 which has the ends thereof slidably mounted within elongated slots 63 formed in the frame sides 46*a* and in longitudinally spaced relation with respect to slots 60. When the frame 46 pivots from position "C" to position "D," the arms 57 cause the cushion 61 to move away from the seat section 50, or in a direction to the right, as viewed in Figs. 7 and 8; the amount of stretching of the lumbar spinal or lower back region afforded the person sitting in the chair, is determined by the extent to which the cushion 61 slides to the right relative to the frame 46. The seat and leg-supporting frames 50 and 51 are provided with cushions 64 and 65, respectively, which are mounted in fixed relation thereon. When the back-supporting frame 46 moves from position "C" to position "D," the back and leg-supporting frames 50 and 51 are urged upwardly by arms 68 and 70, respectively, thereby providing greater comfort to the occupant of the chair by effecting change of the weight distribution of the occupant and thus relieving any pressure in the lower back region. To move the back-supporting frame 46 back to its normal upright or erect position, as seen in Fig. 6, a pair of return springs 71 are provided, one at each side of the chair, which are adapted to engage the lower cross member 46*b* at one end and a cross stop bar 66 at the other end. A third stop bar 72 is mounted on and extends between the side members 48 and is adapted to engage the underside of the seat-supporting frame 50 when the back, seat, and leg-supporting frames are in their normal position, as seen in Fig. 6.

While the back, seat, and leg-supporting frames are shown in this instance to be secured directly to the side members 48, it is to be understood, that, if desired, the first or primary axis 47 might be supported by auxiliary arms, not shown, which, in turn, are pivotally connected to the side members and thereby permit the frames to swing or slide relative to the members 48. Furthermore, it is within the contemplation of this invention that the members 48 be of such a design that they can be rocked by the person sitting in the chair.

Thus it will be seen that two forms of back-stretching apparatus are shown which are adapted to effect, particularly, stretching of the lumbar spinal region of a person. The device is simple in construction, effective in operation, and inexpensive to produce.

While several embodiments of this invention are shown above, it will be understood, of course, that the invention is not to be limited thereto, since many modifications may be made, and it is contemplated, therefore, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. Apparatus for effecting stretching of the spine of a person when the latter is in a reclined position, said apparatus comprising movable back-support means adapted to support that portion of the anatomy superposed above the pelvis of such person resting thereon, said support means being used in conjunction with a stationary support surface for supporting the pelvis and those portions of the anatomy disposed therebeneath of a person resting thereon, such stationary surface being predeterminately disposed adjacent said back-support means, said back-support means being angularly disposed to said stationary surface so as to define an obtuse angle therewith, whereby a force component effected by the portion of the anatomy supported by said support means moves said back-support means away from said stationary surface, means for regulating the angular disposition between said stationary surface means and said back-support means whereby varying portions of the body weight may be applied to the back support means, and means operatively connected to said back-support means for resiliently resisting the movement of said back-support means away from said stationary surface and automatically returning said back-support means to a relative position contiguous to such stationary surface when the portions of the anatomy are out of contact with said back-support means.

2. A combination for effecting stretching of the spine of a person in a reclined position comprising a stationary base for supporting the pelvis and that portion of the anatomy disposed below the pelvic region, movable back-contacting means for supporting that portion of the anatomy disposed above the pelvic region, said back-contacting means being inclined to the plane of said base, brace means for adjusting the angle of inclination of said back-contacting means, and resilient means anchored at one end limit to a fixed support and engaging said back-contacting member at its opposed end limit whereby said resilient means is expanded and compressed in the normal course of relative movement between said stationary base member and said back-contacting member.

3. The apparatus as recited in claim 2 in which said stationary base comprises a mattress member and said resilient means comprises a coil spring member.

4. A combination for effecting stretching of the spine of a person in a reclined position comprising a base fixedly positioned in a substantially horizontal plane and adapted to support a portion of the anatomy disposed below the pelvic region, back contacting means adapted to support a portion of the anatomy superposed above the pelvic region mounted for movement in said horizontal plane and being biased to assume a position contiguous to said base, said back-contacting means being angularly adjustable relative to said horizontal plane; bracing means carried by said back-contacting means for adjusting the angular disposition thereof; the movement of said back-contacting means way from said base being effected upon engagement of said back-contacting means by such a person reclining thereagainst.

5. Apparatus for effecting stretching of the spine of a person when the latter is in a reclined position comprising a base for disposition in a substantially horizontal plane, guide means mounted on said base, slidable carriage means mounted on said guide means, biasing means for normally positioning said slidable carriage in a position contiguous to said base, adjustable back-contacting means carried by said carriage, and adjustable brace means regulating the angular disposition of said back-contacting means on said carriage, said carriage and back-contacting member being horizontally slidable as a unit from said predetermined normal position when the back of such a person is reclining against said back-contacting means.

6. A combination for effecting stretching of the spine of a person in a reclined position comprising a stationary base for supporting the pelvis and that portion of the anatomy disposed below the pelvic region, movable back-contacting means for supporting that portion of the

anatomy disposed above the pelvic region, said back-contacting means being inclined to the plane of said base, brace means for adjusting the angle of inclination of said back-contacting means, and means operatively connected to said back-support means for resiliently resisting the movement of said back-support means away from said stationary surface and automatically returning said back-support means to a relative position contiguous to such stationary surface when the portions of the anatomy are out of contact with said back-support means.

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