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BODY SUPPORT FOR BEDS
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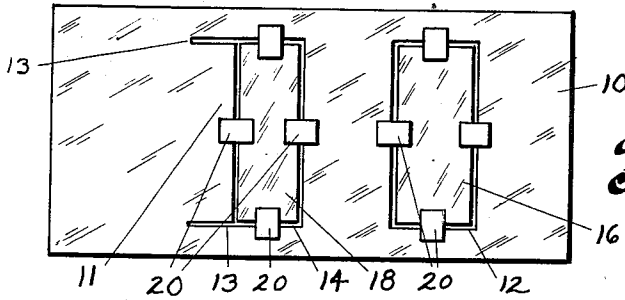


Fig. 1

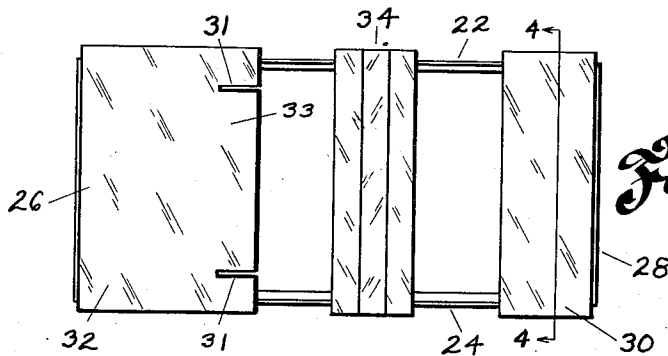


Fig. 2

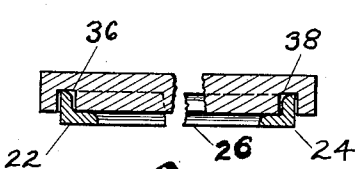


Fig. 4

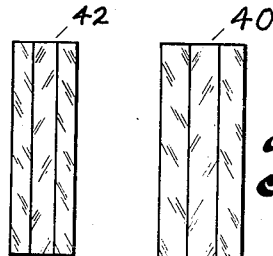


Fig. 3

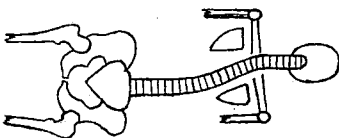


Fig. 5

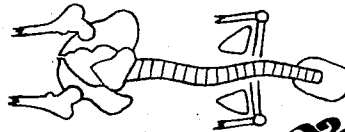


Fig. 7

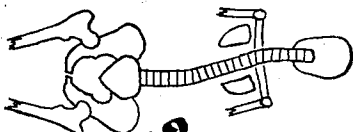


Fig. 6

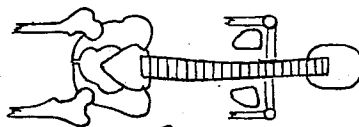


Fig. 8

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BODY SUPPORT FOR BEDS

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15 Claims. (Cl. 5—354)

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This invention relates to improvements in beds. More particularly, this invention relates to improvements in boards or frames that are insertable between the mattresses and the springs of beds.

It is, therefore, an object of the present invention to provide an improved board or frame that is insertable between the mattress and springs of a bed.

In the past several years, it has become the practice and custom in the mattress and bed-spring industry to create a demand for extremely soft beds. This demand has been created and stimulated by publishing drawings of attractive persons resting on the beds in comfortable positions, and by using descriptive matter that suggests comfort and rest for the purchasers and users of the beds. Once the demand has been created, the members of the mattress and bed industry make and supply the mattresses and beds. As a matter of fact, however, despite the teachings of the mattress and bed industry to the contrary, extremely soft beds do not improve the sleeping of the user; instead, the soft mattresses and springs impair the value of the sleep of the user by failing to give adequate support to the heavier portions of the body. In particular, the mattresses and springs fail to provide adequate support for the portions of the body adjacent to the pelvic regions of the body. As a result, those portions of the body tend to sag below the level of the rest of the body; and this causes a bending of the spine and the creation of strains adjacent the shoulders and the sacrum. As a result, the user's body does not receive the full rest and comfort from a night's sleep that it should. This is objectionable since it detracts materially from the value of sleep obtained by the user. The present invention obviates this objection by providing an improved board, insertable between the mattress and the springs of a bed, that will give the required support to the portions of the body adjacent the pelvic regions. It is, therefore, an object of the present invention to provide a board, insertable between the mattress and springs of a bed, that provides support for the portions of the body adjacent the pelvic regions.

The present invention does not provide a solid, unyielding board, insertable between the mattress and the springs, because such a board would not permit the mattress and springs to yield and provide evenly distributed support for the shoulders and hips of the user. Instead, such a board would cause the weight of the shoulders and hips to be concentrated on two small areas;

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thus causing discomfort for the user. Moreover, such a board could not provide adequate support for the portion of the body between the shoulders and the hips and could not keep the user's trunk from sagging. Such a board would not correct the evil but would merely trade one evil for another. The present invention, however, completely obviates the evil by providing spaced openings in a board, which is insertable between the mattress and springs, to permit certain relative movement between the trunk and the shoulders and hips. This board provides even distribution of the weight of the body while maintaining the spine in a relatively straight position, and thus enables the user to experience restful and comfortable sleep. It is, therefore, an object of the present invention to provide a board with spaced openings therein that are in register with the shoulders and hips of the sleeper.

The spaced openings of the present invention are dimensioned to receive the shoulders and hips of most persons. In some instances, the user of the bed may be so unusually tall or short that his shoulders and hips cannot register exactly with the spaced openings. For such instances, the present invention provides a board that includes a number of elements of variable width and position. By changing the width and position of the various elements, the present invention enables the board to provide proper rest for persons of varying heights. It is therefore an object of the present invention to provide a board which has portions of variable width and position.

Other objects and advantages of the present invention should become apparent from an examination of the drawing and accompanying description.

In the drawing and accompanying description two preferred embodiments of the present invention are shown and described but it is to be understood that the drawing and accompanying description are for the purposes of illustration only and do not limit the invention and that the invention will be defined by the appended claims.

In the drawing,

Fig. 1 is a bottom view of a board made in accordance with the principles of this invention,

Fig. 2 is a plan view of a modified form of said board,

Fig. 3 is a plan view of removable inserts usable with the board shown in Fig. 2,

Fig. 4 is a cross sectional end view of the board shown in Fig. 2 and it is taken along the plane indicated by the line 4—4 of Fig. 2,

Fig. 5 is a diagrammatic view of a portion of

the bone structure of a person resting on a bed which is equipped with springs and an inner spring mattress,

Fig. 6 is a diagrammatic view of a portion of the bone structure of a person resting on a bed wherein a solid, unyielding board has been inserted between the inner spring mattress and the bedsprings.

Fig. 7 is a diagrammatic view of a portion of the bone structure of a person resting on a two inch sponge rubber pad on top of a wooden table, and

Fig. 8 is a diagrammatic view of a portion of the bone structure of a person resting on a bed wherein the board of the present invention has been inserted between the inner spring mattress and the bedsprings.

The diagrammatic views of Figs. 5 to 8 were made directly from full-size X-ray photographs of the same person resting in near-identical positions on the variously-described surfaces.

Referring to the drawing in detail, the numeral 10 denotes a large rectangular board of relatively unyielding material such as plywood, heavy pressed paperboard, or solid wood. Formed in the board 10 are two spaced openings 12 and 14 and these may be formed in any suitable way; but one acceptable way is by sawing them out of the board. Positioned within the openings 12 and 14 of board 10 are two generally rectangular inserts 16 and 18. The inserts 16 and 18 should conform to the configuration of the openings 12 and 14 but the openings 12 and 14 should be large enough to permit the inserts 16 and 18 to move freely relative to the board 10. The inserts 16 and 18 can be made of the same material used in the board 10; and in fact the inserts 16 and 18 can be formed in the sawing operation by which the openings 12 and 14 are formed. Secured to the board 10 and to the inserts 16 and 18, as by nails or glue or other means, are strips 20 of flexible and resilient material such as rubber, elastic, or resilient fabric.

Adjacent the opening 14 is a cantilever section 11 of board 10 that is formed by spaced slots 13 in the board 10. The cantilever section 11 will be relatively stiff because of the stiffness of the material in the board 10, but it will possess a definite resilience. Thus, while the cantilever section 11 will normally lie in the plane of the board 10, it can be bent until its outer end is spaced from that plane.

The board 10 need not be exactly the same size as the bed with which it is used since the average person is not as large as the bed he uses; and the cost of the board can be reduced by reducing its size. Thus, a board that is forty-eight (48) inches wide and seventy-two (72) inches long has been found to be quite suitable for use with a double bed. Moreover, the size and spacing of the openings 12 and 14 and the size of the cantilever section 11 can be varied to suit the size and needs of various classes of users, but one particular board with an overall length of seventy-two (72) inches and an overall width of forty-eight (48) inches has been found to be very satisfactory for many persons of varying height. In that board the opening 12 is spaced from the right hand edge of the board a distance somewhat greater than the length of the user's head and the opening 12 is dimensioned so it will be in register with the shoulders of the various persons of different size who will lie on the bed. For example, a spacing of ten (10) inches between the opening 12 and the head end of the board 10,

and an opening 12 that is approximately thirteen (13) inches long and thirty-four (34) inches wide are very useful. Opening 14, which is to register with the hips of persons lying on the bed, can be spaced nine (9) inches from the opening 12 and it can be dimensioned to be eight (8) inches by thirty-four (34) inches. The slots 13 that extend along the sides of cantilever section 11 are approximately ten (10) inches long; and the distance from the free edge of the cantilever section 11 to the left hand edge of the board is approximately thirty-two (32) inches.

Where the board of these proportions and dimensions was inserted between the springs and the innerspring mattress of a bed, it provided a firm support for the head, trunk and legs of the person lying on the bed and simultaneously provided a yielding support for the shoulders and hips of the person lying on the bed. This yielding support was provided by the inserts 16 and 18 and by the cantilever section 11. The inserts 16 and 18 were enabled to provide the support because they are freely movable relative to the board 10, while the cantilever section 11 is capable of limited bending relative to the rest of the board 10. The insert 16 in the opening 12 will be in register with the shoulders of the person lying on the bed and will be pressed down, with concomitant compression of the portion of the bedspring under it, by the shoulders of the person lying on the bed. The insert 18 in the opening 14 will be in register with the large trochanter of the person lying on the bed and will be pressed down, with concomitant compression of the portion of the bedspring under it, by the large trochanter of the person lying on the bed. The pelvis of the person lying on the bed will not extend into the opening 14 but instead will be in register with the portion of the board 10 adjacent opening 14 and will be supported by that portion of the board. The thigh muscles of the person lying on the bed will be in register with the cantilever section 11 of the board and will cause a bending of that section and a concomitant compression of the portion of the bedspring under the section 11. As indicated in Figs. 5-8, the large trochanter, which is the protruding portion of the femur or leg bone, extends out beyond the pelvis. Moreover, as X-ray photographs have shown, the thigh muscles extend out beyond the large trochanter for a considerable distance along the thigh. Unless the pelvis receives firm support and the large trochanter receives the proper amount of yielding support, the pelvis will tilt and will create strains and points of tension in the spine. In addition, unless yielding support is provided for the thigh muscles, the person lying on the bed will not rest comfortably. All of this is accomplished by the board of the present invention since the pelvis obtains firm support from the portion of board 10 adjacent opening 14, the large trochanter obtains yielding support from insert 18 and the bedspring, and the thigh muscles receive yielding support from the cantilever section 11 and the bedspring.

The precise amount of downward movement of the inserts 16 and 18 and the precise amount of bending of section 11 will be determined by a number of factors including the weight and proportions of the person lying on the bed, the position and attitude of the person lying on the bed, the stiffness of the mattress, the stiffness of the bedsprings, the tightness of the resilient strips 20, and the stiffness of the board 10. However, in each individual case the inserts 16 and 18 will

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move down and the section 11 will bend until the support for all sections of the body is more or less uniform. At such times, if the person is lying on his side, his bone structure will assume the attitude shown in Fig. 8. It will be noted that the spine is almost straight, thus indicating the absence of tension points which are found when a person lies on his side on other beds or supports. For example, a person lying on his side in a bed equipped with the presently popular bed-spring and innerspring mattress combination will experience the points of tension indicated by the pronounced bending of the spine in Fig. 5. The hips are considerably below the shoulders and the spine sags badly. The severe bend in the spine adjacent the hips creates tension that definitely detracts from the value of the sleep obtained by the person using that bed. Moreover the pelvis itself is tilted, and this tilting further detracts from the rest and comfort of the person lying on the bed by adding to the tension in the spine.

Even where that bed is equipped with an imperforate, unyielding board between the mattress and the springs, the tendency of the spine to sag is checked but little, as indicated in Fig. 6. Here again, sagging of the spine and tilting of the pelvis is noted; and the points of tension in the spine are again present. These points of tension definitely detract from the rest and comfort of the person lying on the bed.

Fig. 7 shows that while it is possible to hold the hips on the same level as the shoulders by resting on a wooden table covered with a two inch sponge rubber mat; that action is only obtained by relative rotation of the bones of the pelvis and a sharp bending of the spine. Thus the effect obtained by using a hard surface covered by a thin rubber pad is far outweighed by the undesirable results accompanying that effect. Not only does a hard, rubber-coated surface fail to eliminate tilting of the pelvis and bending of the spine, but it also requires the person to lie on an uncomfortably hard surface.

However, with the board of the present invention, the reduction in tension and the minimization in the tilting of the pelvis are substantially complete and are attained without any discomfort to the user. The mattress absorbs and cushions the weight of the head, trunk and legs, and the portions of the bedsprings under the inserts 16 and 18 and the section 11 cooperate with the mattress to absorb and cushion the weight of the hips and shoulders. Rest and comfort, heretofore unattainable, have been found in this manner.

The strips 20 of resilient material that extend between inserts 16 and 18 and the board 10 are primarily intended to maintain the inserts in assembled relation with the board 10 during the time the board is being sold and shipped. After the board has been inserted between the bedsprings and the mattress the bedsprings will provide the primary support for the inserts 16 and 18. The resilient strips 20 can, however, assist the bedsprings in returning the inserts 16 and 18 to their position flush with the board 10, and they also act to prevent skewing of the inserts 16 and 18 relative to the openings 12 and 14.

By having the inserts 16 and 18, the present invention keeps the portions of the mattress that are in register with openings 12 and 14 from sagging into openings 12 and 14 when no force is being exerted on the mattress. In addition, the inserts avoid a situation where the trunk of the sleeper would be given firm support while an elbow or knee might sink deeply into the mattress

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as the person was getting onto or off of the bed. Any force that is exerted on the mattress will be distributed to some extent before it is exerted on the bedspring since the inserts will require several coils of the bedspring to move simultaneously. Thus a larger force can be applied in a small area to the mattress, as by an elbow or knee, but that force will be distributed over a large area of the bedspring by the inserts 16 and 18, and will permit easy and uniform absorption of that force.

The board 10 is usable for all persons except the unusually tall or the unusually short. For such persons, the board of Figs. 2, 3, and 4 is provided. This board includes a frame that is shown as having angle irons 22 and 24 for the sides thereof and as having two angle irons 26 and 28 for the ends thereof. Supported on this frame are three solid and unyielding sections 30, 32 and 34 which correspond to the three solid portions of board 10 that extend between and beyond the openings 12 and 14. The sections 30, 32 and 34 are provided with grooves 36 and 38 that receive and are supported by the upstanding portions of the angle irons 22 and 24.

As indicated in the drawing, the section 34 is not unitary in character but is formed from three individual elements. These individual elements can be secured together in any suitable manner, as by pins, pegs, bolts or tongues and grooves; or they may be independent of each other and held in place by the frictional engagement between the grooves 36 and 38 with angle irons 22 and 24, or by the frictional engagement between the mattress and the elements of section 34. The sections 30, 32 and 34 are dimensioned and spaced apart so the openings therebetween will be in register with the shoulders and hips of the person lying in bed. These openings will normally be occupied by the inserts 40 and 42. Each of these inserts, like the section 34, is shown as being made from three elements; and these various elements can be pinned, pegged or otherwise held in assembled relation. Where the board is to be used on the bed of a person of average height, the section 34 will have the approximate dimensions of the portion of board 10 between the spaced openings 12 and 14, sections 30 and 32 will have the approximate dimensions of the right and left hand portions of board 10, and the inserts 40 and 42 will have the approximate dimensions of inserts 16 and 18. Moreover the slots 31 will have the approximate length of the slots 13 and will form a cantilever section 33 that is similar to and performs the same function as the cantilever section 11. It will be noted that the inserts 40 and 42 are shorter than the distance between the inner edges of the angle irons 22 and 24; thus permitting up and down movement of the inserts 40 and 42 without hindrance from the angle irons 22 and 24.

Where the board of Figs. 2, 3 and 4 is to be used on the bed of an unusually tall person, the section 30, which is wider than section 34, can be substituted for section 34 and section 34 can be substituted for section 30. This will provide additional distance between the openings of the board, and this additional distance will permit full accommodation of the tall person's trunk. If that person has such a long trunk that an extra-length bed is required, the angle irons 22 and 24 can be made longer and additional elements, similar to the three elements of insert 34, can be added to the outer ends of sections 30 or 34 or both. By making the various sections 30, 32 and 34 adjustable relative to the angle irons 22 and

24, the present invention makes it possible for the bed board to accommodate all persons of unusual height.

Where the bed board is to be used on the bed of a person who is unusually short, one or more of the elements of section 34 can be moved adjacent section 30, thus providing an area of decreased length for the trunk of the person in the bed. In addition, if desired, one or more of the elements of the inserts 40 and 42 can be removed; and in that case the sections 30, 32 and 34 will have to be shifted to change the dimensions of the openings that receive the narrowed inserts. In this way the bed board of the present invention can accommodate a person of unusually short height.

The board shown in Figs. 2-4 will provide the same type of support as is provided by the board of Fig. 1. The shoulders of the person using the board will register with insert 40, his pelvis will register with the left hand side of section 34, his large trochanter will register with the insert 42, and his thigh muscles will register with the cantilever section 33.

The angle irons 22 and 24 are shown in the drawing as being solid pieces, but they can be made in a number of sections that can be hinged or separably secured to each other. This would make it possible to transport the bed board on vacations.

In Figs. 5 through 8, the bone structures of persons lying on their sides are shown. In that position, the hips and shoulders of the body project downwardly beyond the trunk. A similar downward projection of those portions of the body occurs when the persons are lying on their backs. The bedboard of the present invention compensates for this situation too and provides the required yielding support for those portions of the body.

The use of the bed board has been found to provide more rest and comfort than any known mattress and spring combination or any known mattress, spring and bed board combination. This improved rest and comfort is probably due to the elimination of tension points in the spine and to the elimination of tilting of the pelvis. That same elimination of tension and tilting will not only improve the rest and comfort of the person using the bed but will also improve that person's general tone and health.

The boards shown in the drawing are very effective and useful and can be dimensioned to fit single beds and three-quarters beds as well as double beds. With the narrower beds the board will be made narrower and the openings, inserts and cantilever sections will be made proportionately narrower. Ordinarily the bed board will be independent of the mattress and the springs but, if desired, it can be secured to the bottom of the mattress or the top of the springs. In addition, if less movement of the shoulders and hips is desired, cantilever sections similar to sections 11 and 33 can be formed in the board in confronting relation at or about the position of openings 12 and 14 to form two yieldable portions for the board. These yieldable portions will operate substantially in the same manner as the yieldable portions that are comprised of the openings 12 and 14 and the inserts 16 and 18. In each instance a precisely located and closely controlled yielding support is provided.

Whereas two preferred embodiments of the present invention have been shown and described, it should be obvious to those skilled in the art

that various changes can be made in the form of the invention without affecting its scope.

What I claim is:

1. A board that is usable with beds and has a plurality of openings therethrough, inserts that are normally positioned in but are freely movable relative to said openings, said openings being spaced to register with the shoulders and hips of persons lying on the bed with which said bed board is associated.

2. In an adjustable bed board, a frame, sections that are removably mounted on said frame, said sections being spaced apart to form a plurality of openings, and inserts that are normally positioned in said openings, said inserts being freely movable relative to said sections.

3. A board that is adapted to be inserted beneath the mattress of a bed equipped with a mattress and springs and that comprises a substantially flat surface that is substantially coextensive with said mattress, a pair of spaced openings in said board, inserts movably positioned in said openings, one of said openings being positioned to be in register with the shoulders of a person lying on said mattress, the other of said openings being positioned to be in register with the hips of said person.

4. A board that is adapted to provide support for the body and legs of a person disposed thereabove and deriving support therefrom and that comprises a generally flat surface, a pair of spaced openings therein, inserts that are positioned in said openings and are movable relative to said openings and are adapted to yieldably support the hips and shoulders of said person, one of said openings and one of said inserts being adapted to underlie the shoulders of said person, and the other of said openings and the other of said inserts being adapted to underlie the hips of said person.

5. A bed board having a plurality of openings therethrough, inserts positioned in but being freely movable relative to said openings, said openings being spaced to register with the shoulders and hips of persons using the bed with which said bed board is associated, said board being insertable between the mattress and springs of said bed, said board having resilient means normally holding said inserts in position in said openings.

6. A bed board having a plurality of openings therethrough, inserts positioned in but being freely movable relative to said openings in a direction perpendicular to the plane of said board, and restraining elements to limit movement of said inserts in the plane of said board, said openings being spaced in register with the shoulders and hips of persons using the bed with which said bed board is associated, said board resting on the springs of a bed, said springs and said restraining elements permitting limited downward movement of said inserts relative to said openings in the board but acting to urge said inserts back toward said board.

7. A bed board having a plurality of sections that are adjustable relative to each other, said sections being spaced apart to form openings between their confronting edges, inserts that are normally positioned in said openings but are movable relative to said board, one of said sections having a separable portion that is removable from said one section to change the body-supporting dimensions of said section.

8. A bed board having a plurality of sections that are adjustable relative to each other, said

sections being spaced apart to form openings between their confronting edges, inserts that are normally positioned in said openings but are movable relative to said board, one of said sections having a separable portion that is removable from said one section to change the body-supporting dimensions of said section, one of said inserts having a removable portion that is removable to permit said insert to fit into a smaller opening.

9. A board that is adapted to support a person lying on a bed where said board is disposed beneath the mattress for said bed and that comprises a generally flat surface and a plurality of slots in said surface, said slots being connected to form a cantilever section in said board and to space the end and sides of said cantilever section from the adjacent portions of said board, one of said slots being disposed between the end of said cantilever section and an edge of a yielding portion of said board, said cantilever section being bendable and being adapted to provide yielding support for one portion of the body of said person.

10. A board that is adapted to support the body and legs of a person disposed thereabove and deriving support therefrom and that comprises a generally flat surface and a pair of spaced openings therein adapted to register with the hips and shoulders of said person, one of said openings being adapted to underlie the shoulders of said person, and the other of said openings being adapted to underlie the hips of said person.

11. A board that is adapted to support a person lying on a bed with which said board is associated and that comprises a generally flat surface, an opening in said board, said opening being in register with a portion of the body of said person, a plurality of slots in said surface that are contiguous to said opening, said slots and said opening being arranged to form a cantilever section in said board and to space the sides of said cantilever section from the adjacent portions of the board, said cantilever section being bendable and being adapted to provide yielding support for another portion of the body of said person, said opening and said cantilever section cooperating with the mattress and springs of said bed to provide comfortable rest for said person.

12. A board that is adapted to support a person lying on a bed with which said board is associated and that comprises a generally flat unyielding surface and a plurality of yielding portions that are spaced apart and are adapted to register with and provide selective yielding sup-

port for various portions of the body of said person.

13. A board that is adapted to support a person lying on a bed with which said board is associated and that comprises a generally flat surface, an opening that is adapted to register with a portion of the body of said person, and an insert normally positioned in said opening but being movable downwardly from said opening in response to the weight of said portion of the body of said person, said opening and the insert therein cooperating to permit said portion of the body to assume a comfortable position.

14. A board that is adapted to support a person lying on a bed with which said board is associated and that comprises a generally flat surface and a yielding portion that is defined by cuts through said board, the edges of said yielding portion that is formed by said cuts being movable out of the plane of said surface, said cuts being spaced from the sides and ends of said boards to place said yielding portion in register with a portion of the body of said person, the movement of said edges of said yielding portion of said board providing comfortable rest for said person.

15. A board that is adapted to support a person lying on a bed with which said board is associated and that comprises a generally flat surface, an opening through said board, and a cantilever section in said board that confronts and is contiguous with said opening, said board being adapted to be supported by said bed and to underlie and support the mattress for said bed, said cantilever being adapted to bend when a portion of the mattress is pressed down into said opening by a portion of the body of said person.

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