

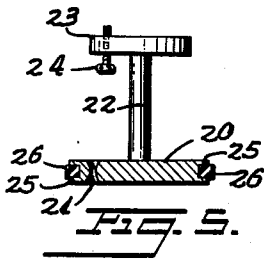
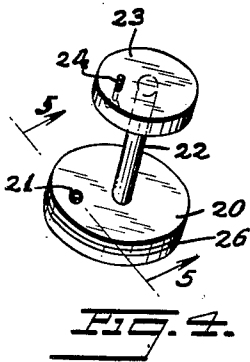
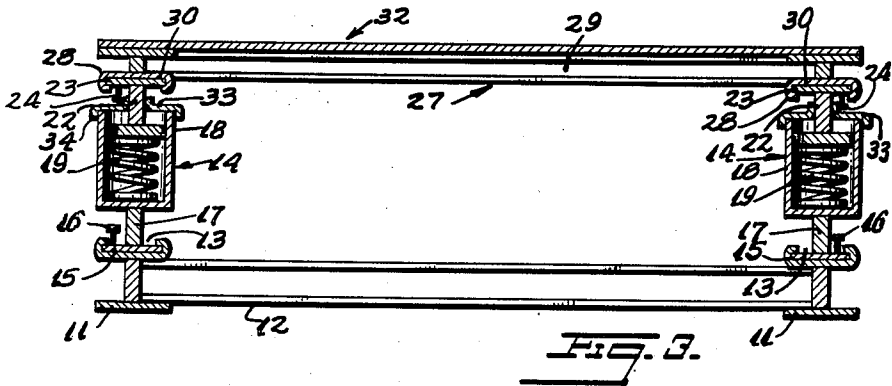
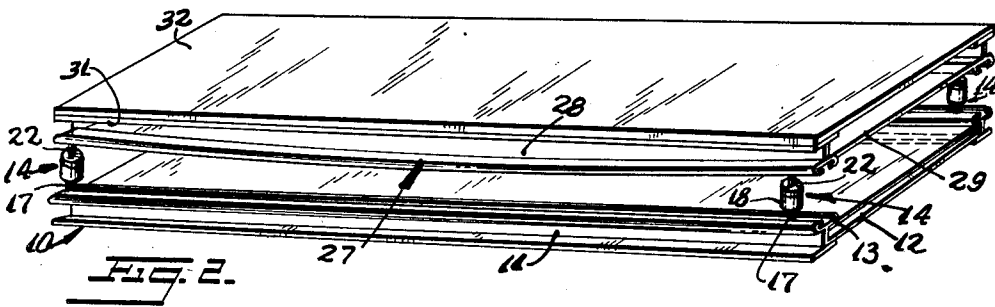
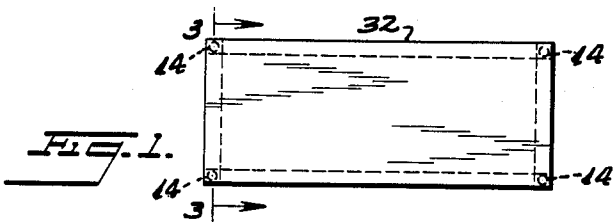
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BED SPRING

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BED SPRING

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This invention relates to new and useful improvements in a bed spring.

It has been found that conventional bed springs, of the coil spring type, for example, do not support a mattress level, but sag, causing the person's back lying on the mattress to take a similar sag. This incorrect sleeping posture is responsible for many aches and pains, back and spine deformities and troubles emanating therefrom. It is a well-known fact that many doctors prescribe placing thin sheets of rigid material, such as plywood, between the mattress and spring to try to correct this condition. However, the combination of a sheet of plywood on top of a coil spring destroys the function of the coil spring and such a spring becomes no more comfortable than sleeping on a solid wood plank.

According to the present invention, a bed spring is provided for supporting a mattress of any kind, such as an inner spring mattress or a cotton felt or hair mattress in such a way that the mattress is kept from sagging without loss of the spring effect.

A further object is to provide a bed spring characterized by having a top thin rigid sheet supported at its corners on flexible means such as spring and/or fluid mountings, the sheet being rigid in the sense that it cannot have depressions formed in it by the weight of the body.

Another object is to provide a bed spring of the aforesaid type in which the mountings utilize both springs and a fluid, the fluid having a compressible characteristic due to its ability to shift under changes in weight, movement or the like.

Still further it is proposed to provide a bed spring as aforesaid in which the mountings can be moved longitudinally of the bed spring to change the point and character of the support.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a plan view of a bed spring constructed in accordance with the present invention.

Fig. 2 is an enlarged perspective view of the bed spring.

Fig. 3 is an enlarged transverse vertical sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of a piston of one of the mountings.

Fig. 5 is a section on the line 5—5 of Fig. 4.

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The bed spring, according to this invention, includes a bottom frame 10 formed of two longitudinally extending I-beams 11 connected at their ends by cross plates 12. The longitudinal I-beams are unique in shape, the top web having an upwardly opening channel 13. The I-beams may be cast, rolled (hot or cold) or built up by welding. The cross plates fit in between the top and bottom webs of the longitudinal I-beams. Any suitable material may be utilized in manufacturing the I-beams, although a light metal such as aluminum or an alloy thereof is best suited. The cross plates and longitudinal beams are welded together.

Four flexible mountings 14, normally are disposed at the four corners of the bottom frame 10. Each mounting 14 includes a base 15 slidably disposed in the adjacent channel 13 and provided with a set screw 16 for securing it at any position in the channel. A rod 17 projects vertically from the base 15 and supports a cylinder 18, open at the top. A spring 19 is disposed in the cylinder 18 and a piston 20 mounted thereon. The piston 20 is provided with a Venturi port 21 and with an upstanding piston rod 22 having a head 23 at its top similar to the base 15 and similarly provided with a set screw 24.

While the piston 20 is rested on the spring 19, the cylinder 18 below the piston is filled with a fluid, such as air or oil, preferably the former. The piston 20 works with a close fit in the cylinder 18 and has a circumferential groove 25 filled with rubber packing ring 26.

The bed spring further has a top frame 27 including longitudinal I-beams 28 and cross I-beams 29. The longitudinal beams have downwardly opening channels 30 in which the heads 23 are slidably disposed. The top web 31 of the beams 28 is horizontal but the channel 30 bows downwardly, being deepest at its center. A rigid thin plate 32 is mounted on top of the top frame 27. This may be a sheet of plywood, resinous plastic material or metal.

The operation of the bed spring is as follows:

The bed spring may be supported on a regular bed in place of the usual spring thereof, the mattress resting on top of the plate 32. Or the bed spring may be supported on legs to form a cot or day bed. The plate holds the mattress level against sagging without acting detrimentally to the natural softness of the mattress. When a person lies down on the mattress, his weight forces the pistons 20 down against the action of the springs 19 and the fluid beneath the pistons. The pistons 20 move downwardly reluctantly.

There is none of the fast spring action of an ordinary bed spring. This is due to the combined action of the fluid and the springs 19. The springs are willing to depress quickly, which is undesirable, but the fluid is trapped beneath the pistons except that it can escape slowly through the Venturi ports 21. Thus the pistons must move downwardly slowly and gently.

If air is beneath the pistons 20, the cylinders 18 may be open at their top but if oil is beneath the pistons, the tops of the cylinders will be closed by synthetic rubber covers 33, as shown in Fig. 3. Each cover 33 has a center port through which the piston rod 22 extends and a flange 34 which grips the top of the cylinder 18. The covers 33 do not interfere with the movement of the pistons 20.

After the pistons 20 have reached their lowermost position according to the weight of the person on the bed, they will tend to remain there, but any movement of the person will cause slight up and down movements of the pistons, which is desirable for the comfort of the person. When the person rises from the bed, the pistons 20 will be forced up by the springs 19, pulling oil or air into the cylinders through the Venturi ports 21.

It is possible to adjust the positions of the mountings 14 longitudinally of the bed by loosening the set screws 16 and 24, sliding the mountings to the desired locations, and tightening the set screws.

As the bottom webs or channels 30 of the top frame 27 are concave, that is, bow downwardly at the center of the bed spring, movement of either mounting 14 toward the center of the bed spring will be accompanied by a slight lifting of the plate 32. This will enable a person to slightly raise either end of the bed spring to a position which may suit his particular needs better. As the longitudinal beams are quite strong, the plate 32 will be well supported even though the mountings 14 are so moved.

It is to be understood that longitudinally extending I-beam 11 may also be concave if desired.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. A bed spring comprising a bottom frame having longitudinal channels, a cylinder slidably mounted in each end of each of said channels, a spring in each cylinder, a piston on each spring and vertically slidable within the respective cylinder, a top frame superimposed above said bottom frame and having downwardly opening channels in line with said bottom frame channels, piston rods slidably supported in said top frame channels and extended into said cylinders and connected to said pistons, a Venturi port in each piston, and a fluid in each cylinder adapted to pass through said port when said piston moves downward.

2. A bed spring comprising a bottom frame having longitudinal channels, a cylinder slidably mounted in each end of each of said channels, a spring in each cylinder, a piston on each spring and vertically slidable within the respective

cylinder, a top frame superimposed above said bottom frame and having downwardly opening channels in line with said bottom frame channels, piston rods slidably supported in said top frame channels and extended into said cylinders and connected to said pistons, a Venturi port in each piston, and a fluid in each cylinder adapted to pass through said port when said piston moves downward, said channels of said top frame being bowed downwardly.

3. A bed spring comprising a bottom frame having longitudinal channels, a cylinder slidably mounted in each end of each of said channels, a spring in each cylinder, a piston on each spring and vertically slidable within the respective cylinder, a top frame superimposed above said bottom frame and having downwardly opening channels in line with said bottom frame channels, piston rods slidably supported in said top frame channels and extended into said cylinders and connected to said pistons, a Venturi port in each piston, and a fluid in each cylinder adapted to pass through said port when said piston moves downward, and means for securing said cylinders at any position along said channels.

4. In a bed spring, a bottom frame having spaced longitudinally extending side beams formed with upwardly facing channels, a top frame superimposed above said bottom frame and having spaced longitudinally extending side beams formed with downwardly facing channels disposed above said upwardly facing channels, resilient mountings extended between said channels, bases mounted on the bottom of said mountings and slidable along the length of said upwardly facing channels, heads mounted on the top of said mountings and slidable along the length of said downwardly facing channels, and means for securing said bases and said heads against slidable movement in their respective channels for holding said mountings in desired adjusted positions along the length of said channels.

5. In a bed spring, a bottom frame having spaced longitudinally extending side beams formed with upwardly facing channels, a top frame superimposed above said bottom frame and having spaced longitudinally extending side beams formed with downwardly facing channels disposed above said upwardly facing channels, resilient mountings extended between said channels, bases mounted on the bottom of said mountings and slidable along the length of said upwardly facing channels, heads mounted on the top of said mountings and slidable along the length of said downwardly facing channels, and means for securing said bases and said heads against slidable movement in their respective channels for holding said mountings in desired adjusted positions along the length of said channels, and a flat plate mounted on the top of said top frame and upon which a mattress may be rested.

6. In a bed spring, a bottom frame having spaced longitudinally extending side beams formed with upwardly facing channels, a top frame superimposed above said bottom frame and having spaced longitudinally extending side beams formed with downwardly facing channels disposed above said upwardly facing channels, resilient mountings extended between said channels, bases mounted on the bottom of said mountings and slidable along the length of said upwardly facing channels, heads mounted on the top of said mountings and slidable along the

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length of said downwardly facing channels, and means for securing said bases and said heads against slidable movement in their respective channels for holding said mountings in desired adjusted positions along the length of said channels, said securing means comprising set screws threadedly engaged through said bases and said heads to be tightened against the base walls of the respective channels.

7. In a bed spring, a bottom frame having spaced longitudinally extending side beams formed with upwardly facing channels, a top frame superimposed above said bottom-frame and having spaced longitudinally extending side beams formed with downwardly facing channels disposed above said upwardly facing channels, resilient mountings extended between said channels, bases mounted on the bottom of said mountings and slidable along the length of said upwardly facing channels, heads mounted on the top of said mountings and slidable along the length of said downwardly facing channels, and means for securing said bases and said heads against slidable movement in their respective channels for holding said mountings in desired adjusted positions along the length of said chan-

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nels, each of said flexible mountings comprising a hollow cylinder mounted on the respective base, a piston depended from the respective head and vertically slidable in said cylinder, an expansion spring in said cylinder operating between said piston and the bottom wall of said cylinder urging said piston into a raised position, and a fluid in said cylinder between said piston and the bottom wall of said cylinder, said piston being formed with a Venturi port through which said fluid slowly passes to dampen vertical movements of said piston within said cylinder.

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