Dec. 7, 1943. J. MARTIN 2,335,870

COUCH BED

Filed Aug. 2, 1941 2 Sheets-Sheet 1

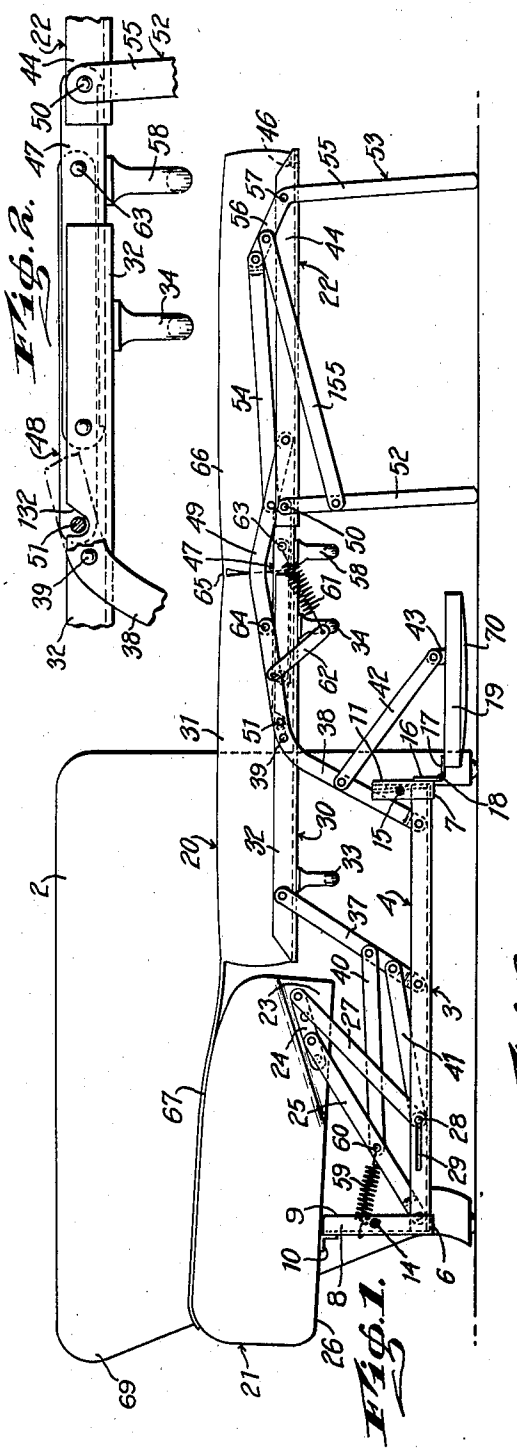


Fig. 1.

Fig. 2.

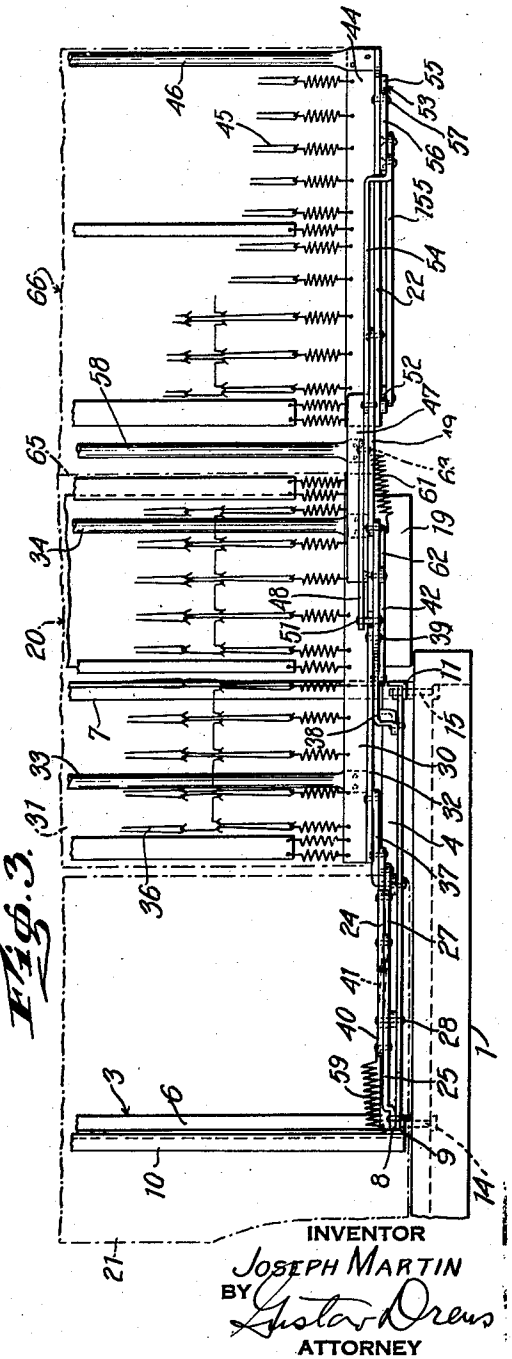


Fig. 3.

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COUCH BED

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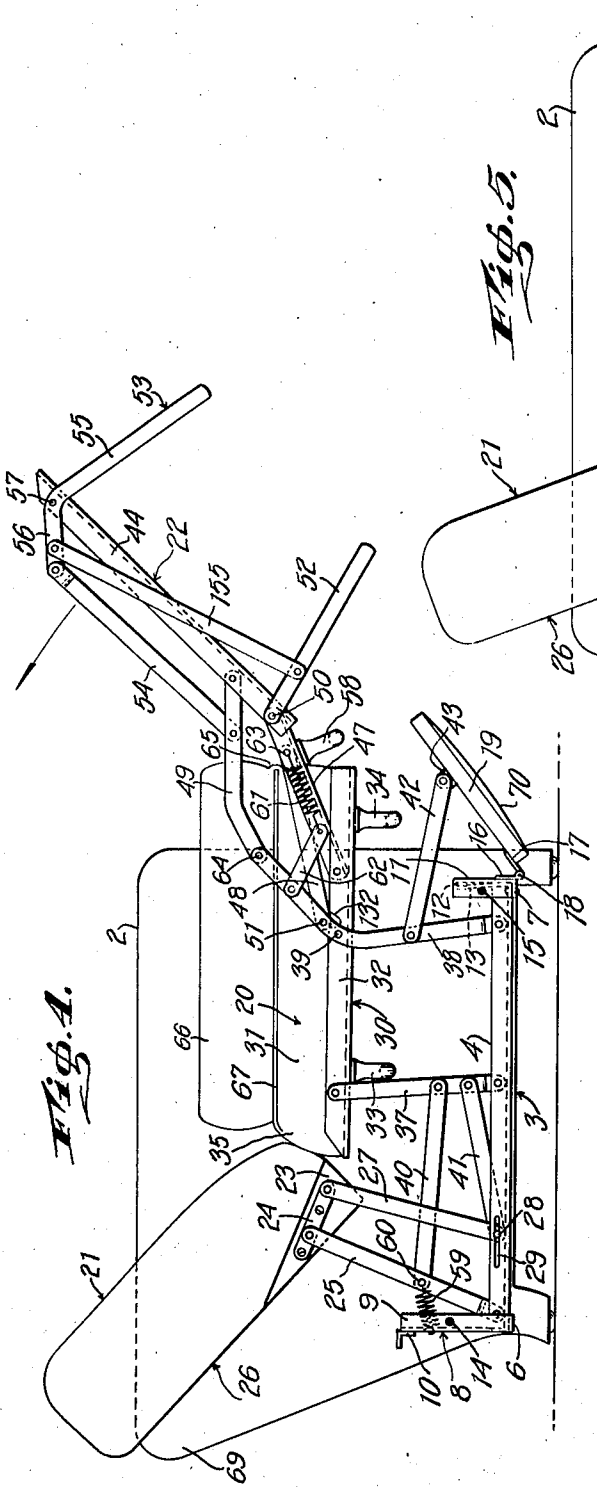


Fig. 4.

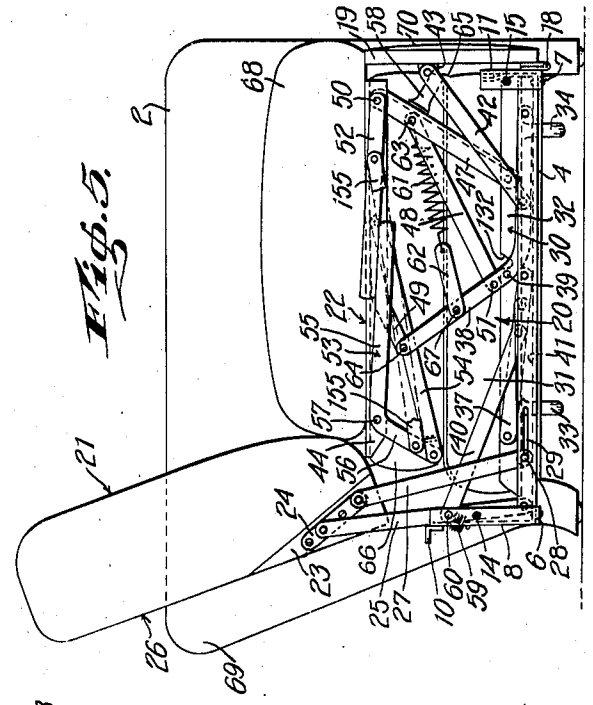


Fig. 5.

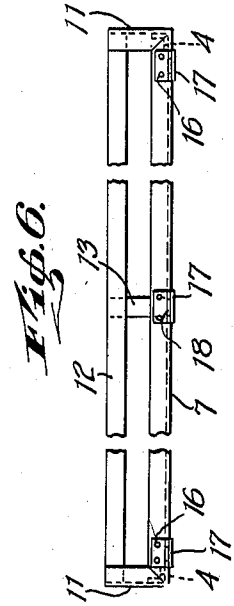


Fig. 6.

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UNITED STATES PATENT OFFICE

2,335,870

COUCH BED

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Application August 2, 1941, Serial No. 405,152

5 Claims. (Cl. 5—13)

This invention relates to couch beds in general and more especially to couch beds having three bed sections such as disclosed in my copending application for patent, Serial No. 381,265, filed March 1, 1941, which became Patent No. 2,264,090 on November 25, 1941.

Among the objects of the present invention, it is aimed to provide an improved three section bed couch requiring a minimum amount of effort to operate, which may be operated from couch formation into bed formation and back again while disposed closely adjacent to the wall against which the bed couch may be located in couch formation and the outer section of which may be supported in bed formation not only at its outer free end but also at its inner end where such other bed section is connected to an intermediate bed section.

It is also an object of the present invention to provide an improved three section bed couch having an interchangeable back and bed section which when moving from back formation into bed formation will have its rear lower edge descend without at any time projecting rearwardly of the vertical plane passing through the rearmost edge of the back section in erect position, and which, in turn, when moving from bed formation into back formation will again not protrude beyond a point lying in such vertical plane whereby the main section of a couch bed made according to the present invention may remain stationary against a wall both in couch formation as well as in bed formation and while moving the back member into and out of bed formation.

It is still another object of the present invention to provide an improved linkage for the leg members of the third or outer bed section whereby the outer end of the intermediate bed section as well as the third and outer bed section will be effectively supported in bed formation.

These and other features, capabilities and advantages of the present invention will appear from the subjoined detailed description of one specific embodiment thereof illustrated in the accompanying drawings in which

Fig. 1 is a side elevation partly in section of the couch bed in bed formation;

Fig. 2 is an enlarged fragmental detail;

Fig. 3 is a fragmental plan of the couch bed in bed formation;

Fig. 4 is a side elevation partly in section illustrating an intermediate position when moving from bed formation to couch formation;

Fig. 5 is a side elevation partly in section illustrating the couch bed in couch formation.

Fig. 6 is a fragmental detail of one of the side bars.

In the embodiment illustrated there are provided two side frames 1 and 2 to which there is secured the frame member 3 consisting essentially of a rectangular angle iron portion having two end bars 4 with the vertically extending webs extending upwardly from the outer sides thereof secured to two transversely extending side bars 6 and 7 with the vertically extending webs similarly extending upwardly from the outer sides thereof. At the corners or ends of the rear side bar 6 and extending upwardly therefrom there extend the two angle iron uprights 8 with one of their webs 9 extending forwardly along the outer faces of the end bars 4. At the upper outer ends of the uprights 8 and connecting the two there is provided the angle iron bar 10 having one of its webs extending rearwardly at the upper end of said bar 10. At the front corners of the frame member 3, that is, at the ends of the side bar 7, there extend the upright angle iron bars 11 each having one of its webs extending rearwardly along the sides of the end bars 4. To the inner faces of the upper ends of the front webs of the uprights 11 there is secured the cross bar 12 which is deflected inwardly at its intermediate portion and has secured to the outer face thereof the flat bar 13 extending down to and secured to the inner face of the upwardly extending web of the front side bar 7. The frames 1 and 2 are secured to the frame member 3 by bolts 14 extending through the uprights 8 and by the bolts 15 extending through uprights 11. To the front face of the upwardly extending web of the side bar 7 there are secured the hinge plates 16 connected to the hinge plates 17 by the pins 18 which hinge plates 17 are secured to the front footboard 19 in erect position having an upholstered outer portion 70 to serve as an outer finish for the front footboard of the couch bed in couch formation. In bed formation the footboard 19 is swung downwardly to clear the spring mattress of the intermediate or first bed section 20.

To the rear of the intermediate bed section 20 in bed formation there is provided the bed section 21 which also constitutes a back member in couch formation, serving at one time as a bed section in bed formation, shown in Fig. 1, and at another time as a back member in couch formation, the position shown in Fig. 5. To the front side of the intermediate bed section there

is provided the outer or second bed section frame 22. The interchangeable back and bed section 21 consists of an upholstered portion having recessed portions 23 at its sides to which are secured the metal bars 24. Pivotally connected to the metal bars 24 there are provided the flat links 25 extending down and pivotally connected to the inner faces of the upwardly extending webs of the end bars 4. The bars 24 in the present instance are inclined relative to the rear face 26 of the bed section 21 and at its front ends there are pivotally connected the flat links 27. The lower ends of the flat links 27 are provided with pins 28 slidably mounted in the slots 29 of the upwardly extending webs of the end bars 4. In the present instance the lower ends of the flat bars 27 extend along the inner faces of the end bars 4.

The intermediate bed section 20 includes a metal frame portion 30 and an upholstered or mattress portion 31 secured to said metal frame portion 30. The metal frame portion 30 in the present instance is provided with two end angle bars 32 connected to one another by two downwardly extending transversely extending bars 33 and 34.

The ends of the two end angle irons 32 are free, that is, are not connected to one another by side bars, so that the mattress portion 31 and its supporting flat spring 36 may freely flex downwardly throughout the entire width of the intermediate section 20.

On each side of the intermediate section 20 and pivotally connected to the outer face of one of the side bars 30, there is provided a flat bar 37 near the rear end of a side bar 30, which side bar is in turn pivotally connected at its other end to the inner face of the upwardly extending web of a side bar 4. Nearer the forward side of the intermediate bed section 20 and also at each end thereof there is pivotally connected a bent lever 38 to the outer face of a side bar 30, the pivotal connection 39 coinciding in the present instance substantially with the elbow in the bent lever 38. The lower end of such bent lever 38 is pivotally connected to the inner face of the upwardly extending web of a side bar 4 near the forward end of such side bar 4.

So that the intermediate section 20 may operate with and cooperate with the rear bed section 21, the rearmost link 25 of each set of links 25, 27 has pivotally connected to the inner face thereof, in the present instance, about one-third up from its lower end one end of the flat link 40 while the other end of such link is pivotally connected to the outer face of an adjacent link 37 also about one-third up from the lower end thereof. In addition, to the outer face of each link 37 between the link 40 and the side bar 4, there is pivotally connected one end of the link 41 while the other end of such link 41 is connected to the pin 28 on the inner face of a link 27. So that the intermediate section 20 may operate with and in turn lower the footboard 19 into the position shown in Fig. 1 in bed formation and into erect position, that shown in Fig. 5, in couch formation, each lever 38 has pivotally connected intermediate its length to the outer face thereof, one end of a link 42, while the other end of such link is pivotally connected to a bearing 43 at one end of the inner face of the footboard 19.

The outer or third section 22, as shown in Fig. 1, has not connected thereto a mattress member, but, see Fig. 3, has its end bars 44 connected to one another by the flat spring fabric 45. The outer ends of the end bars 44 of the section 22, looking at the same in bed formation, has connected thereto the side bar 46. The end bars 44 preferably as shown consist of angle irons with one of their webs extending upwardly along the outer end thereof.

So that the outer bed section 22 may operate with and cooperate with the intermediate bed section 20, there are provided three pairs of links, one pair 47 connecting the inner ends of the end bars 44 of the section 22 with the side bars 32 of the intermediate bed section 20, another pair 48 connecting the links 47 with the bent lever 38 and a third pair 49, being bent links in the present instance, connecting the side bars 44 with the upper ends of the bent levers 38. More particularly, each link 47, being angle iron, is pivotally connected to the inner end of the inner face of an upwardly extending web of an end bar 44 while the other end of such link 47 is pivotally connected to the inner face of the upwardly extending web of a side bar 32 at a point removed from the outer end of such side bar 32 and intermediate such outer end and the pivotal connection of such side bar 32 with a bent lever 38. Each link 48, of flat stock, is pivotally connected at one end, to the inner face of a link 47 removed from but near to the pivotal connection 50 of such link 47 with a side bar 44 while the other end of such link 48 is pivotally connected to the inner face of the extension of the bent lever 38 immediately above the pivotal connection 39. The pin 51 constituting the pivotal connection between such link 48 and the extension of the bent lever 38, see Fig. 3, extends across and into recess 132 in the upwardly extending web of an end bar 32 to facilitate lowering such pin 51 a predetermined distance to enable the outer bed section 22 and the bed section 20 to aline with one another in bed formation and in addition to cooperate with the links 37, 38, 25 and 27 properly to position the intermediate bed section 20 with respect to the bed section 21. Each bent link 49 has one of its ends pivotally connected to the inner face of the upwardly extending web of a side bar 44 removed from but adjacent the pivot pin 50, while the other end of such link 49 is pivotally connected to the inner face of the upper end of a bent lever 38. By means of the bent levers 49 and 38, the link 47 and the cooperation of the levers 49 and 38 with the horizontal webs of the side bars 4 and 44, respectively, forming stops in couch formation, that shown in Fig. 5, the portion of the bent levers 38 between the side bars 32 and 4 will rest on the horizontal webs of the side bars 4 as a stop, and the portions of the bent levers 49 nearest the side bars 44 will rest against the lower faces of the horizontal webs of the side bars 44, forming stops to maintain the bed sections 30 and 22 in the spaced relation shown in Fig. 5 to form a compartment for the cushions 31 and 66.

The outer bed section 22 is provided with two pairs of leg members 52 and 53 arranged to be folded up in substantial alinement with the end bars 44 of the outer bed section in couch formation, see Fig. 5, and to be extended into supporting position in bed formation, that shown in Fig. 1. So that the leg members 52 and 53 may operate with the bed sections 22, 20 and 21, when being moved into and out of bed formation, there are provided two pairs of links 54 and 155, in the present instance composed of flat stock. More particularly, each leg member 52 is sub-

stantially straight and has one of its ends pivotally connected to the pivot pin 50 and along the outer face of an upwardly extending web of an end bar 44. Each leg 53 has an elongated portion 55 and a short extension 56 slightly bent relative to the portion 55 and is pivotally connected by a pin 57 positioned at the elbow of the leg 53 with the leg 53 pivotally mounted along the outer face of the upwardly extending web of the end bar 44. As shown in Fig. 1, the portion 55 of each leg member 53 corresponds in length to a leg member 52.

The links 155 are provided to connect one leg member 52 of each pair to the short extension 56 of each leg of the other pair of leg members 53. Each link 155 has one of its ends pivotally connected to the outer face of a leg member 52 about two-thirds up from the outer free end of a leg member 52, while the other end of such link 155 is pivotally connected to the outer face of the extension 56 of a leg member 53 removed from the pivot pin 57 and adjacent to the free end of the extension 56. The links 54 are provided to connect the bent links 49 with the extensions 56. Each link 54 has one end pivotally connected to the inner face of a link 49 a short distance removed from the pivotal connection of such link 49 with an end bar 44, while the other end of such link 54 is pivotally connected to the outer face of the free end of an extension 56.

To serve as a brace for the inner ends of the end bars 44 and therefore for the inner end of the outer bed section 22, a downwardly depending cross bar 58 connects the two links 47 to one another at a position where it will clear the adjacent ends of the bed sections 20 and 22 in bed formation, see Fig. 1. To counteract the weight in the interest of operation when moving from bed formation into couch formation, and in turn to absorb the shock when moving from couch formation into bed formation, a pair of springs 59 are provided each spring in the present instance, being connected to an upright 8 at one end and to the pivot pin 60 connecting a link 40 to a link 25.

In turn, to counteract the weight in the interest of easy operation on moving from couch formation into bed formation and in turn to serve as a cushion to ease the collapsing blow when moving from bed formation into couch formation, a pair of springs 61 is provided. Each spring is connected at one end to a link 62 and at its other end to the pivot pin 63 connecting a link 48 to a link 47. Each link 62 in turn is pivotally connected at its other end to the outer face of a bent lever 38 between a pivot pin 51 and a pivot pin 64 connecting a bent lever 38 with a link 49.

The mattress member 31 of the intermediate bed section 20 is hingedly connected by a fabric hinge 65 to the mattress portion 66. The fabric hinge 65 is disposed at the outer upper side of the mattress member 31. Extending from the inner upper side of the mattress portion 31 there is provided an extended sheet of fabric 67. In bed formation, see Fig. 1, the sheet of fabric 67 preferably composed of a material such as mattress ticking, is folded over on to the decorative surface of the upholstered inner bed section 21 and the mattress portion 66 is folded over on to the spring fabric 45 and frame of the outer bed section 22. In couch formation, see Figs. 4 and 5, initially the fabric 67 is folded over on to the upper face of the mattress member 31 and then the mattress member 66 folded away from the outer bed section 22 on to the fabric 67. Thereupon, when the transformation has been completed from bed formation into couch formation, the bed section or back member 21 will be substantially erect, the intermediate bed section 20 and its mattress members 31 and 66 nested down so that the end bars 32 are disposed adjacent to the end bars 4 and the end bars 44 are disposed in substantial alinement with the then upper face of the mattress member 66, the seat cushion or cushions 68 are placed upon the spring fabric 36 of the frame 30, as shown in Fig. 5, which seat cushion or cushions 68 will extend from engagement with the lower end of the back member 21 to the upper edge of the footboard 19, the spring fabric 36 thus forming with the end board 70, a top and front wall respectively, of a compartment for the mattress members 31 and 66.

As will be clearly seen from Figs. 1, 4 and 5, during the transformation from bed formation into couch formation and in turn from couch formation into bed formation, the bed section or back member 21 will never extend beyond the rear upper extension 69 of the side frames 1 and 2. Consequently, if the couch bed is positioned against a wall with the portions 69 of the side frames 1 and 2 disposed adjacent to or engaging a wall of a room, it will be unnecessary to move this portion of the couch bed when converting the same from couch formation into bed formation and in turn from bed formation into couch formation.

It will also be seen that in couch formation the leg members 52 and 53 are neatly folded away out of view and in turn in bed formation, that shown in Fig. 1, such leg members will effectively cooperate to support not only the outer bed section 22 but also cooperate to support or aid in supporting the outer side of the intermediate bed section 22. Furthermore, the cross bar 10 will support one end of the inner bed section 21 in bed formation and aid and cooperate with the links 25 and 27 to support such bed section in prone position, shown as slightly inclined to simulate a bolster or headrest in bed formation.

In other words, one advantage of the invention results from the combination of a fixed frame 3, a first bed section 30, a second bed section 22, and two pairs of leg members 52 and 53 with a first pair of levers 38 pivotally connecting said first bed section 30 to said fixed frame 3 to control the elevation of said first bed section 30, a first pair of links 47 pivotally connecting said second bed section 22 to said first bed section 30, both pairs of said leg members 52 and 53 being pivotally connected to said second bed section 22 with one pair of said leg members 53 having bent extensions 56, a second pair of links 54 pivotally connected to said extensions 56 and also pivotally connected to the other pair of leg members 52, a second pair of levers 49 pivotally connected to said first pair of levers 38 and also pivotally connected to said second bed section 22, a third pair of links 54 pivotally connected to said extensions 56 and also pivotally connected to said second pair of levers 49, and means 37 supplementing said first pair of levers 38 to pivotally connect said fixed frame 3 with said first bed section 30, all contributing to enable said bed sections 30 and 22 at one time to be supported in alinement with one another and with the links 47, with the means 37, levers 38, and leg members 52 and 53 in upright position, see Figure 1, and at another

time, see Fig. 5, enabling the bed section 30 to be depressed relative to the fixed frame 3, with the bed section 22 spaced from the bed section 30 to form a compartment therebetween for the mattress members 20 and 66 with the links 47 now erect and the means 37, portions of the levers 38 and leg members 52 and 53 collapsed.

Another advantage of the invention results from the combination of a fixed frame 3, a first bed section 30 and an interchangeable back and bed section 26 with a pair of levers 38 pivotally connected to said first bed section 30 and to said frame 3 to control the elevation of said first bed section 30, a first pair of links 37 pivotally connected to said fixed frame 3 and to said first bed section 30, a first set of two pairs of links 35 and 27 pivotally connected to said interchangeable back and bed section 26, one pair 25 of two pairs of links also pivotally connected to said fixed frame 3 and the other pair of said two pairs of links 27 slot and pin connected to said fixed frame 3, and a second set of two pairs of links 40 and 41 pivotally connected to said first pair of links 37, one pair 40 of said second set being also pivotally connected to one pair 25 of said first set and the other pair 41 of said second set being also pivotally connected to the other pair 27 of said first set, all contributing to enable the interchangeable back and bed section 26 to aline with the first bed section 30 when said links 37 and levers 38 are erect and said links 25 and 27 are slightly inclined downwardly with the lower ends of the links 27 at the ends of the slots nearest to the links 37, see Figure 1, and see Figs. 4 and 5, to enable the back section 21 when swinging into erect position out of horizontal position not to project beyond the rear edge of the frame elements 69, and the bed section 30 in depressed position relative to the frame with the back section 21 in erect position when the links 25 and 27 are substantially erect and the links 37 and portions of the levers 38 are collapsed, see Fig. 5.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit and scope of the invention as set forth in the appended claims.

I claim:

1. The combination of a fixed frame, a first bed section, a first pair of levers pivotally connecting said first bed section to said frame to control the elevation of said first bed section, a second bed section, a first pair of links pivotally connecting said second bed section to said first bed section, two pairs of leg members pivotally connected to said second bed section, one pair of said leg members having bent extensions, a second pair of links pivotally connected to said extensions and also pivotally connected to the other pair of said pairs of leg members, said first pair of levers having offset extensions extending beyond the pivotal connections of said first pair of levers with said first bed section, a second pair of levers having offset extensions pivotally connected to the extensions of said first pair of levers and also pivotally connected to said second bed section, a third pair of links pivotally connected to said bent extensions of said one pair of leg members and also pivotally connected to said second pair of levers, means supplementing said first pair of levers to pivotally connect said fixed frame with said first bed section and stops on said bed sections for engaging said first and second pairs of levers to determine the spaced relation of said first and second bed sections in couch formation.

2. The combination of a fixed frame, a first bed section, a first pair of levers pivotally connecting said first bed section to said frame to control the elevation of said first bed section, said first pair of levers having extensions, a second bed section, a first pair of links pivotally connecting said second bed section to said first bed section, two pairs of leg members pivotally connected to said second bed section, one pair of said leg members having bent extensions, a second pair of links pivotally connected to said leg extensions and also pivotally connected to the other pair of said pairs of leg members, a second pair of levers having extensions pivotally connected to the extensions of said first pair of levers and also pivotally connected to said second bed section, one pair of the extensions of said levers being bent and of substantial length, a third pair of links pivotally connected to the extensions on one pair of said leg members and also pivotally connected to said second pair of levers, means supplementing said first pair of levers to pivotally connect said fixed frame with said first bed section and stops on said bed sections engaging said levers to determine the spaced relation of said bed sections in couch formation.

3. The combination of a fixed frame, a first bed section, a pair of levers pivotally connected to said first bed section and to said frame to control the elevation of said first bed section, a first pair of links pivotally connected to said fixed frame and to said first bed section, an interchangeable back and bed section, a first set of two pairs of links pivotally connected to said interchangeable bed section, one pair of said two pairs of links also pivotally connected to said fixed frame and the other pair of said two pairs of links slot and pin connected to said fixed frame, and a second set of two pairs of links pivotally connected to said first pair of links, one pair of said second set being also pivotally connected to one pair of said first set and the other pair of said second set being also pivotally connected to the other pair of said first set.

4. The combination of a fixed frame, a first bed section, a pair of levers pivotally connected to said first bed section and to said frame to control the elevation of said first bed section, a first pair of links pivotally connected to said fixed frame and to said first bed section, an interchangeable back and bed section, a first set of two pairs of links pivotally connected to said interchangeable bed section, one pair of said two pairs of links also pivotally connected to said fixed frame and the other pair of said two pairs of links slot and pin connected to said fixed frame, a second set of two pairs of links pivotally connected to said first pair of links, one pair of said second set being also pivotally connected to one pair of said first set and the other pair of said second set being also pivotally connected to the other pair of said first set, a second bed section, means for pivotally connecting said second bed section to said first bed section, a pair of leg members pivotally connected to said second bed section, and means for pivotally connecting said second bed section to said leg members and to said first pair of levers.

5. The combination of a fixed frame, a first bed section, a first pair of levers pivotally connecting said first bed section to said frame to control the elevation of said first bed section, a

second bed section, a first pair of links of substantial length pivotally connecting said second bed section to said first bed section, said first pair of levers having extensions extending beyond the pivotal connection of said first pair of levers with said first bed section, a second pair of levers pivotally connected to the extensions of said first pair of levers and also pivotally connected to said second bed section, a portion of substantial length of one pair of said levers being offset, means supplementing said first pair of levers to pivotally connect said fixed frame with said first bed section, stops on said bed sections engaging said first and second pairs of levers in couch formation to determine the spaced relation of said first and second bed sections in couch formation, and leg members for said second bed section for use in bed formation.

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