Dec. 9, 1969 B. E. HILL 3,482,270

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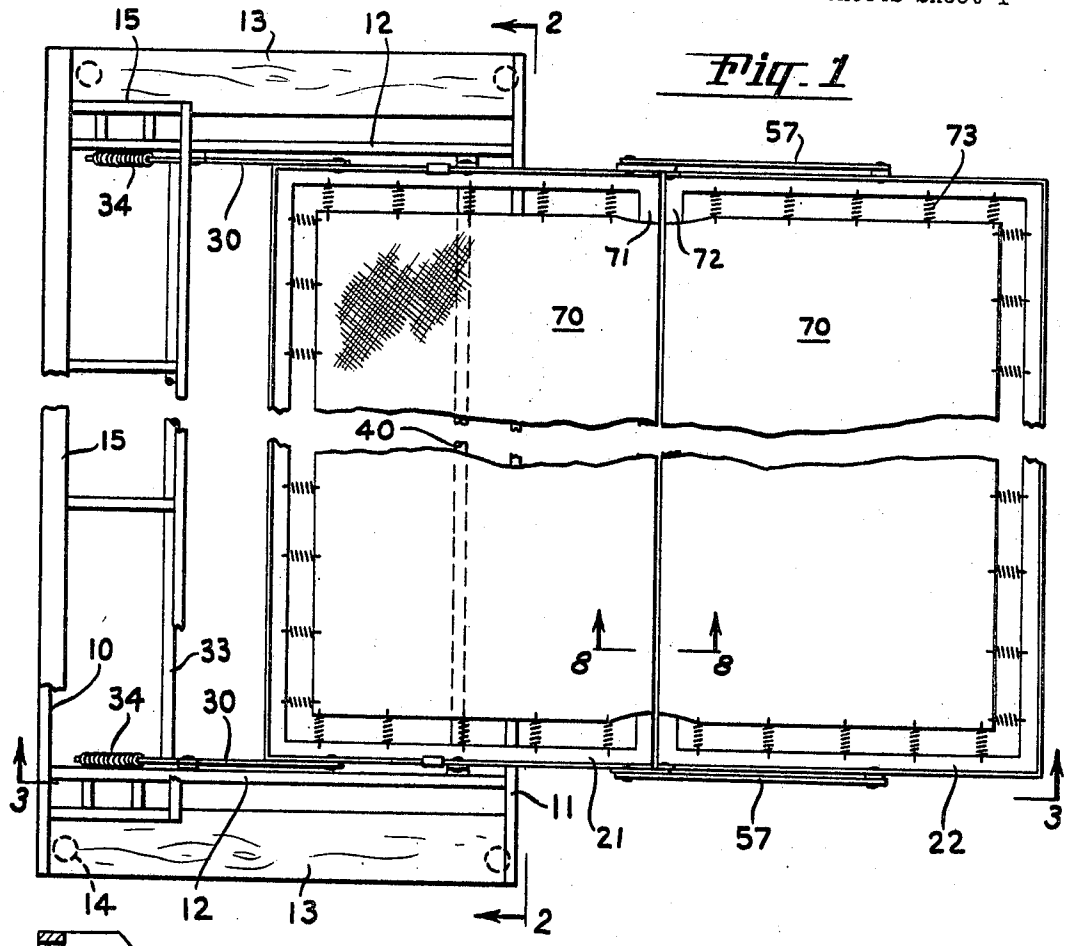


Fig. 1

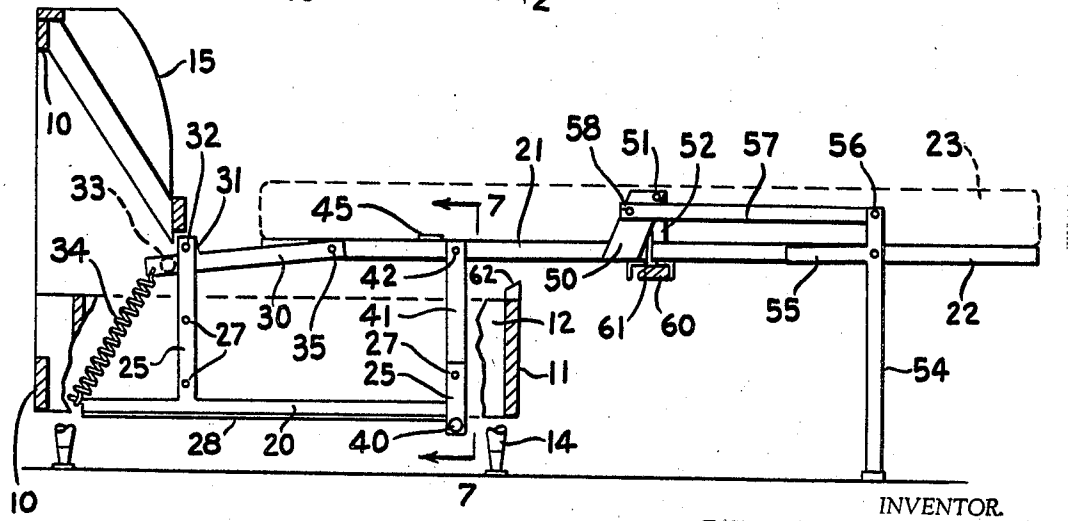


Fig. 3

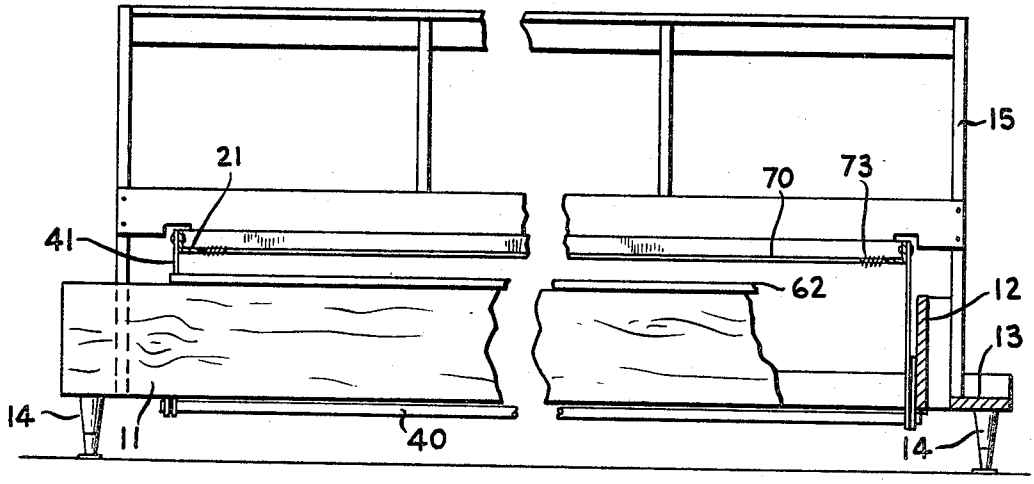
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Fig. 2



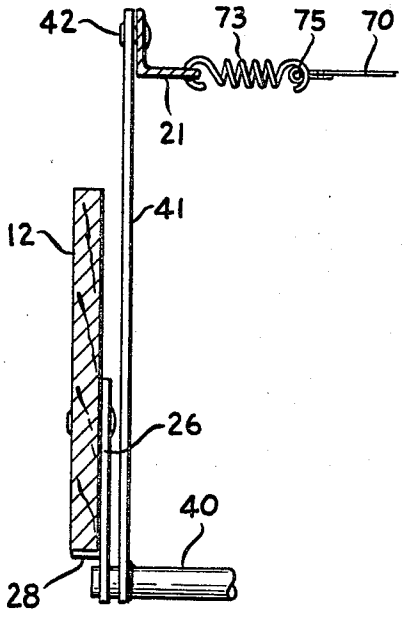


Fig. 7

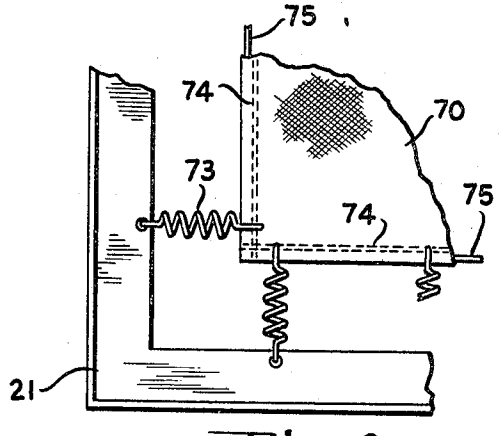


Fig. 9

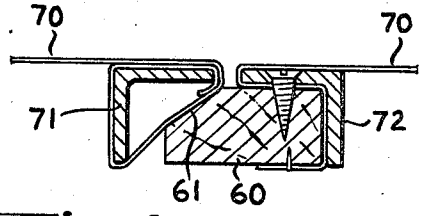


Fig. 8

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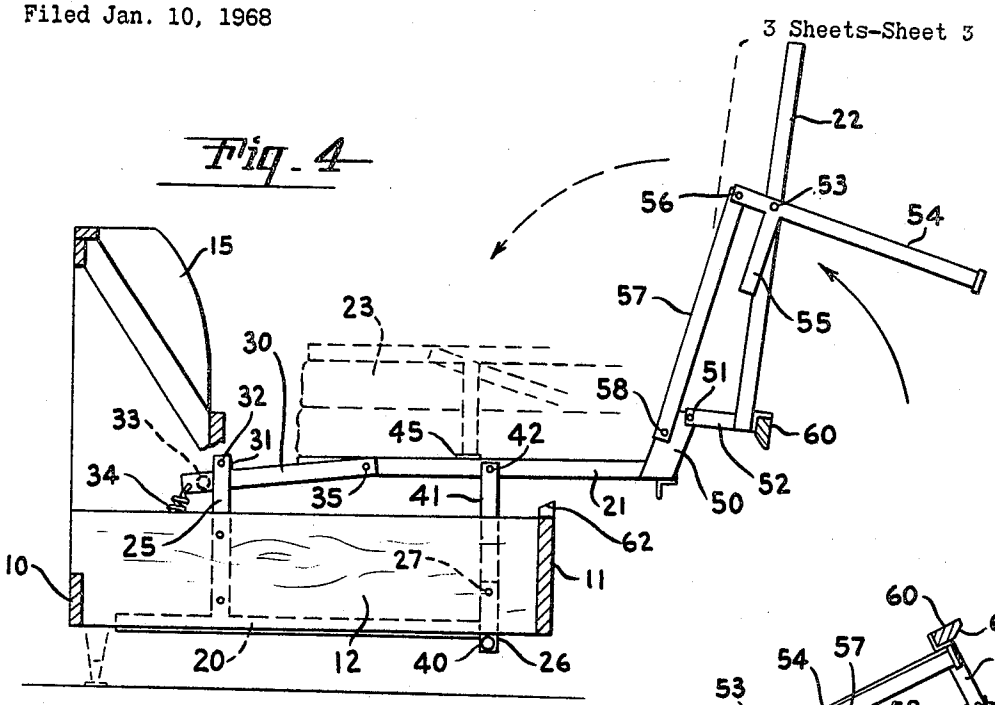
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Fig. 4



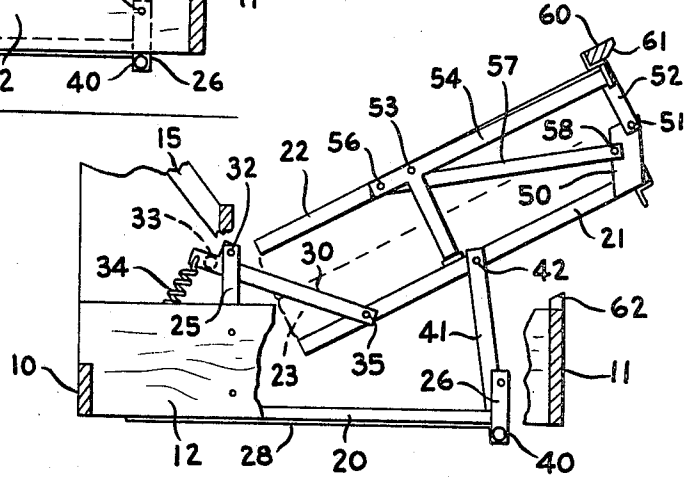


Fig. 5

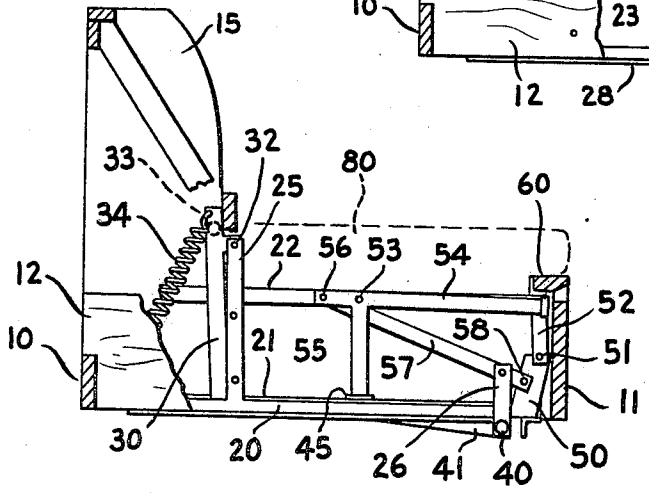


Fig. 6

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7 Claims

ABSTRACT OF THE DISCLOSURE

Head and foot bed frame sections are pivotally connected together to fold into a base structure and form a deck for a daveno seat. A simplified and improved linkage mechanism is provided for shifting the folded bed frame into and out of the base structure and for stabilizing the bed frame securely in its two positions of use.

BACKGROUND OF THE INVENTION

This invention relates to a two section daveno bed where-in the sleeping surface extends at right angles to the daveno.

Conventional daveno beds are excessively heavy. Much of the weight is the result of a cumbersome mechanism having a heavy framework, complicated linkages and heavy springs to shift the bed into and out of the daveno base structure and to fold the two bed frame sections.

Because of the types of linkages employed and the size of the bed structure, heavy steel members have been used in order to make the bed frame raise and lower uniformly on opposite sides without deflection and binding of the numerous pivotal connections. To be successful the mechanism must raise and lower smoothly and it must be spring balanced so that excessive effort is not required for manipulation.

A heavy framework is not only objectionable from a weight standpoint but this factor in conjunction with the numerous pivotal connections in the mechanism also tend to increase the cost of manufacture.

SUMMARY OF THE INVENTION

The present construction utilizes a simplified raising and lowering mechanism which employs fewer and lighter weight parts and requires lighter springs to balance the mechanism. The linkages on opposite sides of the bed frame are held in alignment in opening and closing movements by a cross shaft and tie rod which interconnects the main supporting pivotal arms. These cross members improve the rigidity to such an extent that lighter weight members may be used throughout all parts of the linkage. They also make the mechanism easier to operate.

Objects of the invention are to provide a daveno bed of reduced weight and cost, to provide an improved raising and lowering mechanism of simplified and lightweight construction, to provide a raising and lowering mechanism having a cross shaft and tie rod extending across the width of the bed frame to make the mechanism move uniformly on its opposite sides and to provide a raising and lowering mechanism which is easier to operate.

The invention will be better understood and the foregoing and additional objects and advantages will become apparent from the following description of the preferred embodiment illustrated in the accompanying drawings. Various changes may be made, however, in the details of construction and arrangement of parts and certain features may be used without others. All such modifications within the scope of the appended claims are included in the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a top plan view, with parts broken away, of a daveno bed embodying the principles of the invention, showing the bed in open position;

FIGURE 2 is a view, with parts broken away, on the line 2—2 in FIGURE 1;

FIGURE 3 is a view on the line 3—3 in FIGURE 1;

FIGURE 4 is a view similar to FIGURE 3, showing the initial folding movement of the bed;

FIGURE 5 is a view similar to FIGURE 4, showing the movement of the folded bed into the daveno base;

FIGURE 6 is a view similar to FIGURE 5, showing the folded bed contained in the daveno base to form a deck for the daveno seat;

FIGURE 7 is an enlarged fragmentary view on the line 7—7 in FIGURE 3;

FIGURE 8 is an enlarged view on the line 8—8 in FIGURE 1; and

FIGURE 9 is an enlarged fragmentary top plan view showing the spring suspension for the mattress support.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The daveno base comprises a back rail **10**, a front rail **11** and a pair of end rails **12**. Each end rail **12** is equipped with a sill plate **13** for a pair of feet **14** as shown in FIGURE 2. The base further includes a back frame **15** to support a back cushion, not shown, and may also include arms, if desired.

Mounted on the inside of each end rail **12** is a bracket **20** as shown in FIGURE 3. These brackets support a bed head section frame **21** and foldably connected therewith is a foot section frame **22**. A mattress **23** is indicated in broken lines.

Identical raising and lowering linkages are provided on opposite sides of the bed, only one of which is illustrated. Each bracket **20** has an integral upright portion **25** near its rear end and an integral upright portion **26** near its front end. These upright portions are provided with screw or bolt holes **27** for attachment to the rails **12**. The bracket **20** also has a horizontal outturned flange **28** underlying the lower edge of rail **12**.

An arm **30** has an upwardly offset portion **31** near its rear end pivotally connected at **32** with the upper end of upright **25**. Immediately behind offset **31** the arm **30** is welded to one end of a tubular tie rod **33** which is similarly welded to a corresponding arm on the opposite side of the bed frame to cause the two arms to swing in unison. The inner end of each arm **30** is pulled downward by a tension spring **34** connected to the inner end of bracket **20**. The outer end of each arm **30** is pivotally connected at **35** with a side member of bed frame **21** near its inner end. The inner ends of the various parts are defined as those ends nearest the back frame **15** while the outer ends are defined as the ends which are more remote from back frame **15**.

The lower end of each upright **26** has a circular opening immediately below flange **28** forming a bearing to rotatably receive one end of a tubular shaft **40** as best shown in FIGURE 7. Welded on each end portion of shaft **40** is an arm **41** which is pivotally connected at **42** with a mid-portion of the side member of head section frame **21**. Immediately behind pivotal connections **42**, the bed frame side members carry pads **45** for a purpose which will presently be explained.

Each side member of head section frame **21** is equipped at its outer end with an upstanding bracket **50**. This bracket is pivotally connected at **51** with an upstanding bracket **52** on the inner end of the side member of foot section frame **22** whereby the bed frame sections **21** and

22 may fold relative to each other and accommodate therebetween the double thickness of the folded mattress. A central portion of each side member of foot section frame 22 is pivotally connected at 53 with a leg 54. Leg 54 has an integral perpendicular arm 55 at its pivotal connection 53. Leg 54 extends a short distance above the bed frame and its upper end is pivotally connected at 56 with the outer end of a link 57. The inner end of link 57 is pivotally connected at 58 with the bracket 50, this pivotal connection being a distance below and behind the pivotal connection 51.

As shown in FIGURES 3 and 8, a rest rail 60 is mounted along the inner end of foot section frame 22 on its under side in a position to project a short distance beyond the end of the frame 22. This rest rail preferably has a bevelled seating surface 61 arranged to seat on the bevelled upper edge 62 of front rail 11 when the bed is folded and lowered into daveno base.

Each bed frame section 21 and 22 is equipped with a canvas support 70 for the mattress 23. Each sheet of canvas is slightly smaller than its bed frame. The outer end of the canvas for head section frame member 21 is folded around and secured to the outer cross frame member 71 and, in a similar manner, the inner end of the canvas for foot section frame 22 is folded around and secured to inner cross frame member 72 as shown in FIGURES 1 and 8. The other three sides of each canvas are connected with the sides and one end of the bed frame by tension springs 73. These three edges of the canvas are hemmed at 74 to receive stiffening rods 75 which are engaged by the spring as shown in FIGURE 9. This arrangement provides a very lightweight spring suspension for the mattress which is of minimal thickness.

In the initial closing movement, the outer end of foot section frame 22 is raised as shown in FIGURE 4, causing bracket 52 to pivot on bracket 50 and starting to fold the mattress. When foot section frame 22 is folded parallel with head section frame 21, the folded mattress is contained in the space provided by the combined height of brackets 50 and 52. During this pivotal movement link 57 swings leg 54 into the plane of frame 22, causing arm 55 to project downward and rest on pad 45 on frame 21, as shown in FIGURE 5.

After folding foot section frame 22, the outer end of frame 21 is lifted, causing its inner end to pivot downward, this pivotal motion occurring partly at the pivot points 42 and partly at the shaft 40. Then bed frames 21 and 22 are pushed inward, to the left in FIGURE 5, causing the outer end of both frames to pass over and drop behind the front rail 11. In this movement, the arms 30 and 41 again level the bed frame 21 but in a lower position with the bevelled edge 61 of rest rail 60 seating on the bevelled upper edge 62 of rail 11 as shown in FIGURE 6.

Seat cushions 80 may then be placed on the canvas 70 of bed frame 22. Bed foot section 22 provides a deck for the cushions 80, which deck is supported along its outer edge by rest rail 60 and supported at intermediate points on its daveno ends by the arms 55 resting on pads 45 on head section frame 21. Arms 30 are then in vertical position to provide stable support for the inner end of frame 21.

In opening the bed, rest rail 60 provides a convenient grasping point for raising the outer end of the two bed frames and swinging them out to FIGURE 5 position. This lifting and swinging movement is assisted by springs 34 whereby very little effort is required. In both opening and closing movements between the positions shown in FIGURES 5 and 6, shaft 40 holds the arms 41 on opposite sides of the bed parallel with each other and, in a similar manner, tie rod 33 holds the arms 30 paralel with each other whereby the arms of both pairs are constrained to swing in unison. This prevents binding of the pivotal connections, making the opening and closing movements free and easy.

When the bed is opened to its FIGURE 3 position, the arms 41 are stabilized in vertical position by arms 30 which then assume an approximately horizontal position. This prevents rotation of arms 41 about the axis of shaft 40. For this purpose the pivot points 32 are located on the same level as pivot points 42, in the FIGURE 3 position.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A daveno bed comprising a daveno base having a front rail, a folding bed frame having a head section and a foot section, a linkage supporting said head section for pivotal movement from a lower position within said base to a raised position extending across said rail, pivotal connections between the outer end of said head section and the inner end of said foot section for folding said foot section over said head section to form a daveno deck, a pair of legs pivotally mounted on opposite sides of said foot section, arms on said legs arranged to support mid-portions of said foot section on said head section when said foot section is folded over said head section, and a rest rail on said foot section arranged to seat on said front rail of said base when said folded sections are lowered into said base; said linkage comprising a pair of first arms on opposite sides of the bed frame having lower ends pivotally mounted in lower front portions of said base and upper ends pivotally connected with mid length portions of said head section, and a pair of second arms on opposite sides of the bed frame having inner ends pivotally mounted in elevated positions in rear portions of said base and outer ends pivotally connected with inner end portions of said head head section.

2. A daveno bed as defined in claim 1, including mattress supports in said head and foot sections, said mattress supports comprising a sheet of canvas in each section having one edge secured to the hinged side of the section and the other edges supported by tension springs connected to the other sides of the sections.

3. A daveno bed as defined in claim 1, said pivotal connections between said head and foot sections comprising brackets offset from the planes of said sections, and links pivotally connecting said legs with said brackets on said head section.

4. A daveno bed as defined in claim 1, said first arms being vertical and said second arms being approximately horizontal when said head section is in said raised position, and said second arms being vertical when said folded sections are in said lower position.

5. A daveno bed as defined in claim 1, said pivotal mounting for said first arms comprising a cross shaft fixedly connected with said arms.

6. A daveno bed as defined in claim 1, including a tie rod fixedly interconnecting said second arms.

7. A two section folding bed comprising a base structure adapted to contain the bed when folded, said bed having a foot section frame and a head section frame, brackets on the outer end of said head section frame and the inner end of said foot section frame, said brackets upstanding above said frames when the bed is open, the upper ends of said brackets being pivotally connected together for pivoting said frames relative to each other, legs pivotally connected with said foot section frame supporting said foot section frame when the bed is open, an arm on each leg radial to said pivotal connection of the leg, a first pair of arms supporting said head section frame above said base structure when the bed is open, said arms having upper ends pivotally connected with opposite sides of said head section frame intermediate the ends thereof and lower ends pivotally supported in said base structure, a second pair of arms arranged to stabilize said first arms in vertical position when the bed is open, said second arms having outer ends pivotally connected with opposite sides of said head section frame

adjacent the inner end thereof and inner ends pivotally supported in said base structure at the level of said head section frame so that said second arms are approximately horizontal when the bed is open; said foot section frame folding on top of said head section frame to form a daveno deck, the inner end of said head section frame being supported in lowered position within said base structure by said second arms in vertical position, the pivotally connected ends of said frames being supported by the front of said base structure to support said deck when the bed is folded, and the ends of said arms on said legs resting on said head section frame to support the rear portion of said deck, said last arms and said brackets holding said two frames in spaced relation to accommodate a folded mattress therebetween.

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