United States Patent [19]

Mizelle

[11] **3,863,280**

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[54] **SETTEE-BED WITH BACKREST CONVERTIBLE TO AN UPPER BED**

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[52] **U.S. Cl.** ..... **5/9 R**, 5/37 C

[51] **Int. Cl.** **A47c 17/40**

[58] **Field of Search** ..... 5/8, 9, 12, 37 R, 45; 297/75, 77, 84

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Attorney, Agent, or Firm—Hofgren, Wegner, Allen, Stellman & McCord

[57] **ABSTRACT**

A settee has a seat adapted to serve as a bed which is mounted between fixed structural members at the head and foot of the bed. A backrest structure is convertible to an upper bed spaced above the seat. The device is particularly useful in recreational vehicles where it may serve as the rear settee, in which case the backrest structure has a manually releasable latch for normally retaining it in settee position.

18 Claims, 7 Drawing Figures

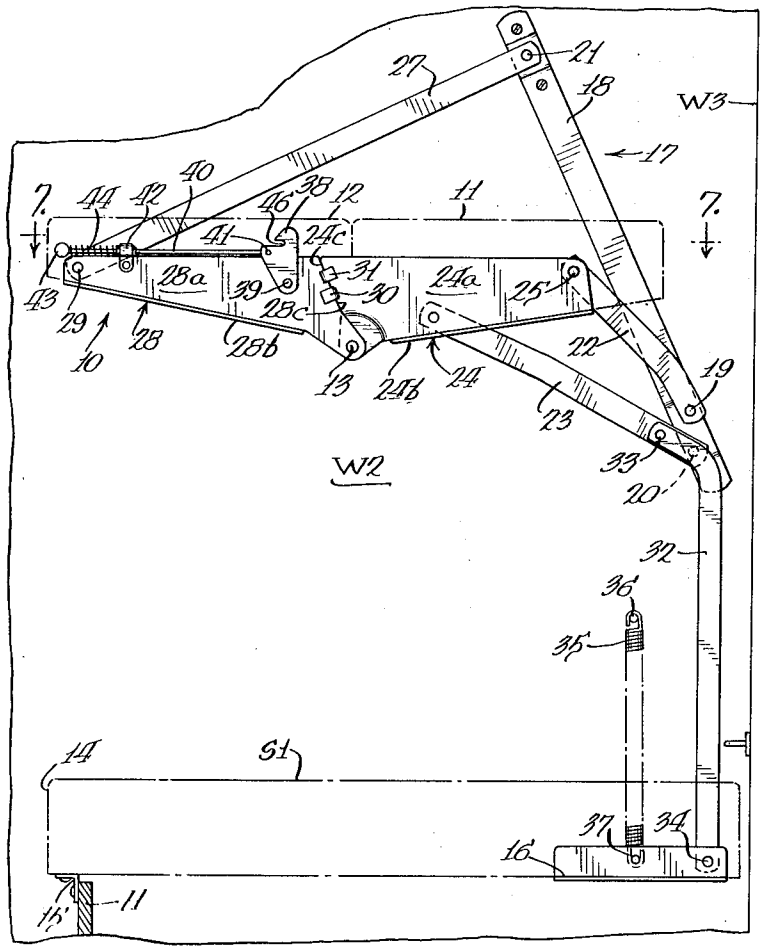


Fig. 1.

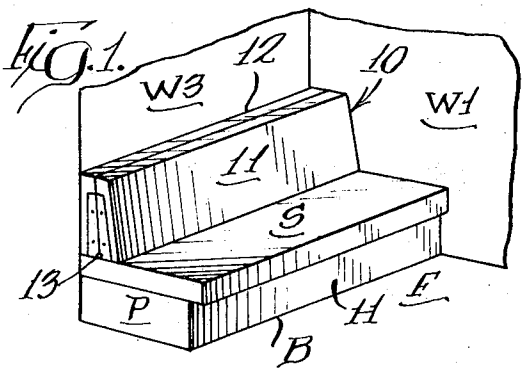


Fig. 2.

Fig. 3.

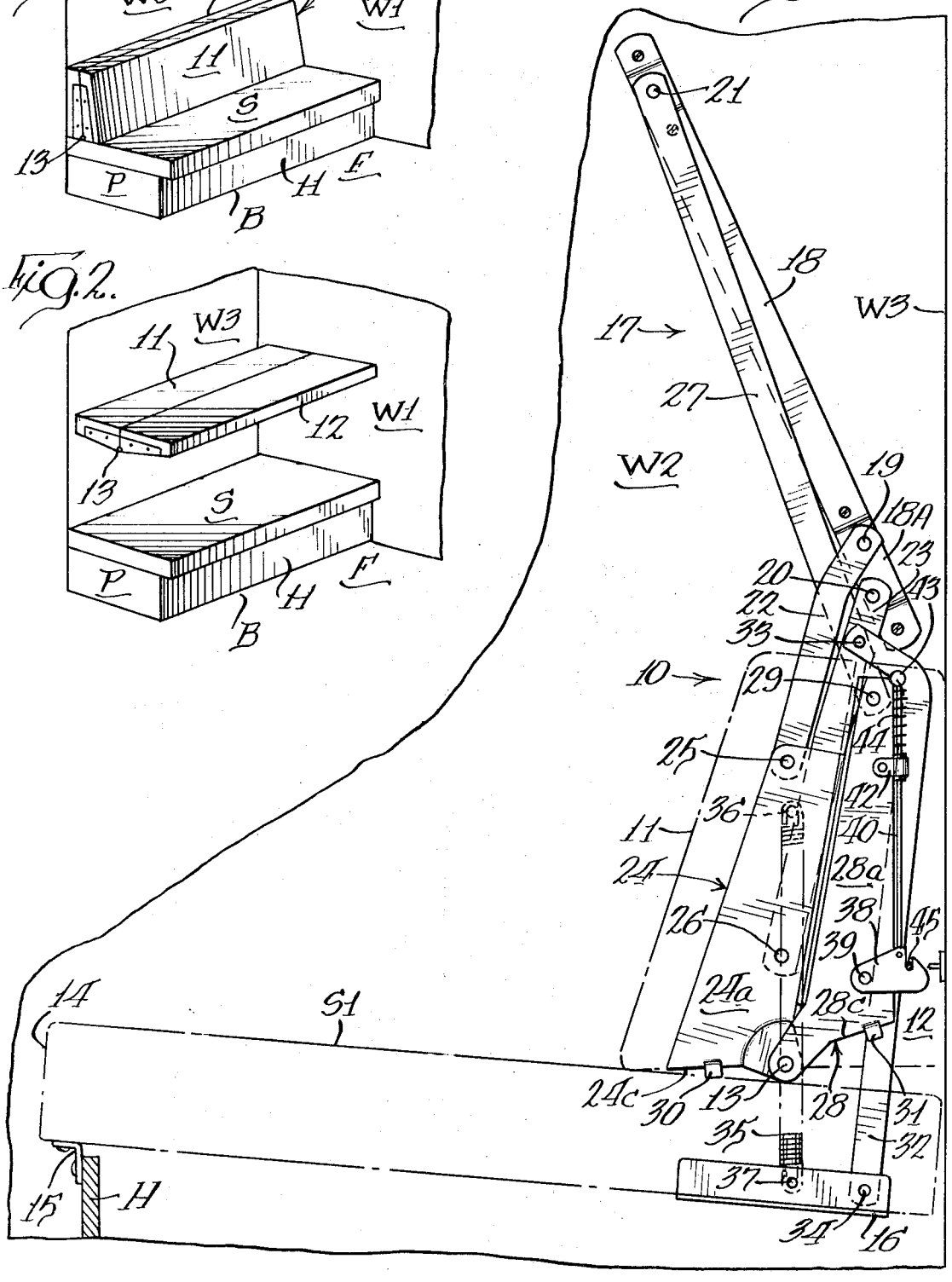
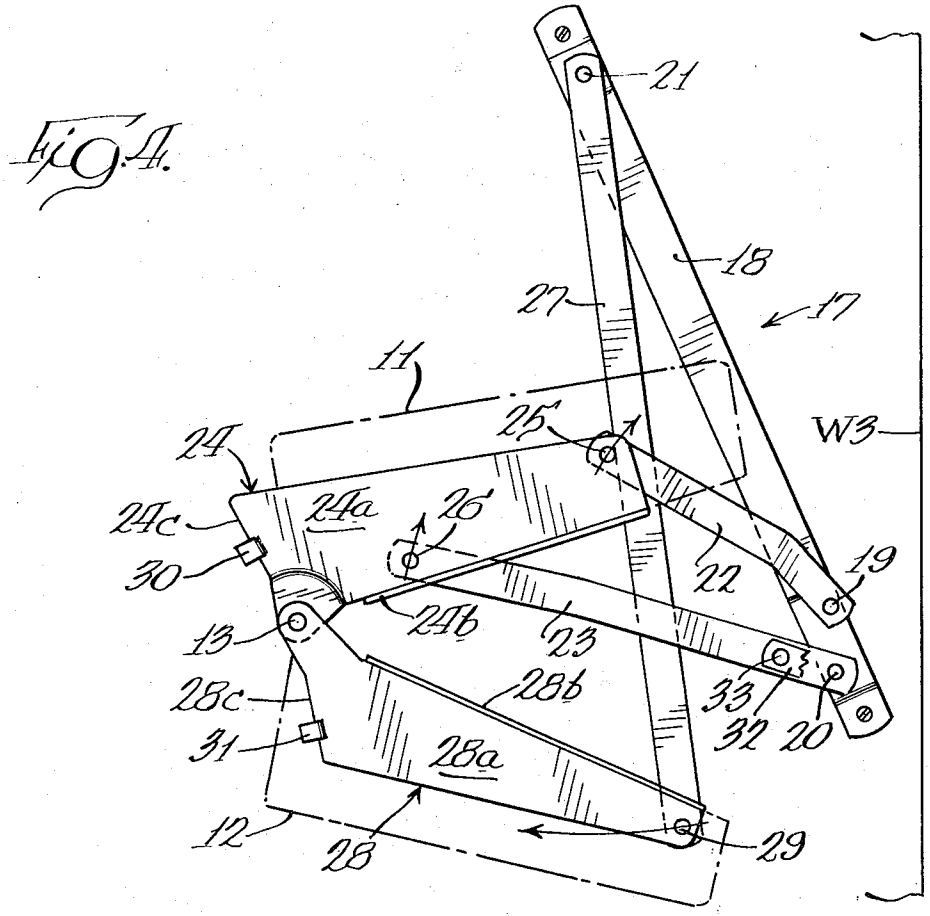


Fig. 4.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18
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W3
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24c
24a
16
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24b
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23
28c
28b
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28a
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Fig. 5.

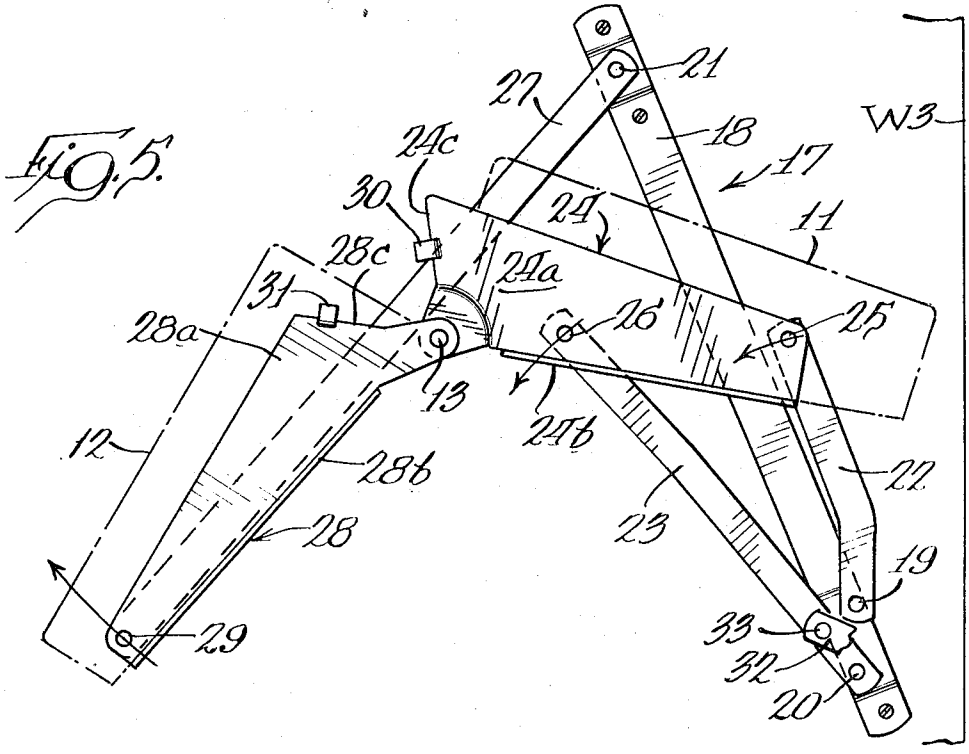
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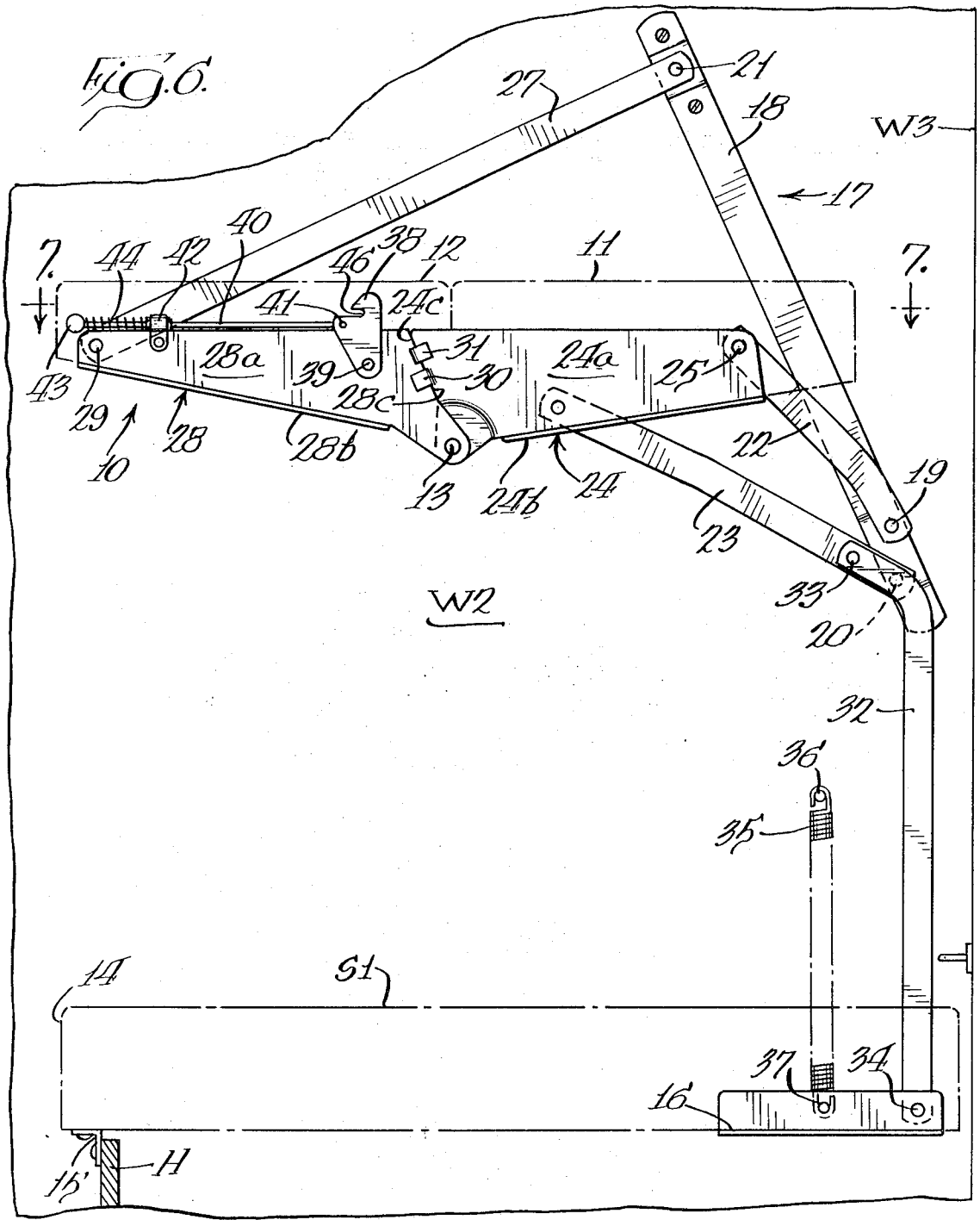
Fig. 6.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24b
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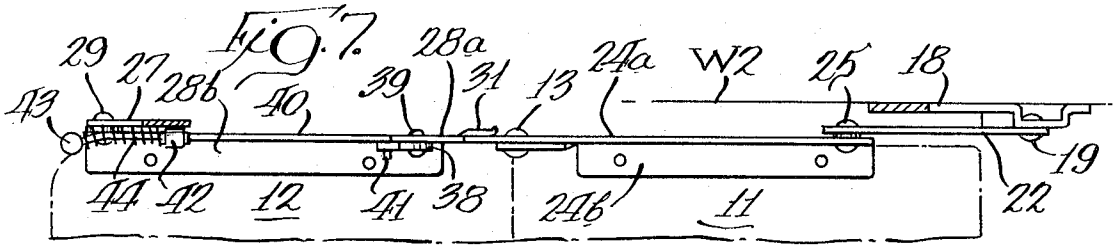
Fig. 7.


29
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SETTEE-BED WITH BACKREST CONVERTIBLE TO AN UPPER BED

BACKGROUND OF THE INVENTION

In the field of built-in furniture, and particularly settees for recreational vehicles which must also provide sleeping accommodations, there is a need for a device which may be used as a settee during the day but which converts to a double deck bed. Such a structure is particularly advantageous in relatively small recreational vehicles in which the length is inadequate to permit a rear settee to be converted into a double bed.

SUMMARY OF THE INVENTION

The present invention provides a settee in which the seat may be used as a bed, and in which the backrest may be swung up to an elevated position where it provides an upper bed.

In settee position the backrest is folded longitudinally on hinge means so that it has two parts that overlie the rear portion of the seat, one behind the other. They occupy sufficient space from front to rear that the depth of the seat is comfortable for sitting.

The settee is between two structural members which are at the head and foot when it serves as a bed, and the rear of the settee is against a wall. The backrest structure is carried on brackets which are secured to the two structural members, with the forward backrest member being a part of a four bar linkage that is pivoted to the bracket at a position which is close to the top of the backrest in settee position, so the forward backrest part swings up to a horizontal position in which it is against the wall. At the same time, the rearward backrest part, which is suspended from a pair of hanger links, swings forwardly underneath the forward backrest part and into a bed position coplanar with the first backrest part.

The backrest includes end members having end plates on which the links are pivoted and transverse webs perpendicular to the end plates. In settee position the transverse webs are in face abutting relationship at an angle to the back wall so that the forward backrest portion occupies a comfortably inclined position. In bed position the edges of the end plates are in abutment, and at each of the end plates edges is an offset finger which overlies the surface of the adjacent end plate to interlock the end plates and prevent any racking motion between them.

The settee seat may be fixed in a horizontal position, or if desired it may have its forward edge hinged and its rearward portion suspended from the backrest linkage on a pair of lifting links so that it may occupy a comfortably pitched settee position and be elevated to a horizontal position as the backrest is moved to its elevated upper bed position.

When the apparatus is installed in a recreational vehicle, it is provided with a manually operable latch which ordinarily retains the backrest in its settee position.

THE DRAWINGS

FIG. 1 is a schematic perspective view of a settee-bed in which the seat is in a permanently fixed, horizontal position and a backrest in accordance with the present invention is in settee position. The backrest operating linkage is omitted for clarity;

FIG. 2 is a view similar to FIG. 1 with the backrest in its elevated bed position;

FIG. 3 is a fore and aft sectional view on an enlarged scale illustrating the device of the present invention with the backrest structure in settee position and with a pitched settee seat, the settee cushions being illustrated in broken lines;

FIGS. 4 and 5 are views of the backrest structure of FIG. 3 at two different points during movement from the settee position of FIG. 3 to the bed position of FIG. 6;

FIG. 6 is a view like FIG. 3 illustrating the structure in bed position; and

FIG. 7 is a sectional view taken substantially as indicated along the line 7—7 of FIG. 6.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in greater detail, and referring first to FIGS. 1 and 3, a structure has a floor F, parallel side walls W1 and W2, and a rear wall W3. In FIGS. 1 and 2, of course, the wall W2 is omitted for clarity of illustration. On the floor F in the structure illustrated in FIGS. 1 and 2 is a base B which includes a front panel comprising a heel board H and either solid end panels such as the panel P, or narrow cleats secured to the walls W1 and W2 which support a horizontal, upholstered settee seat S. A backrest structure, indicated generally at 10, includes a first backrest member 11 and a second backrest member 12 which are one behind the other in settee position over the rear portion of the settee seat S and which are connected by a hinge 13 so that the backrest portions 11 and 12 may occupy the face abutting settee position of FIG. 1 or the elevated, aligned bed position of FIG. 2.

This means for mounting the back structure 10 and for moving the back members 11 and 12 between their settee position and their bed position is illustrated in FIGS. 3 and 6 in combination with an alternative seat structure S1 which has its forward end portion 14 hinged on the top edge of the heel board H at 15, and which has its rear end portion provided with brackets 16 for suspending the rear of the seat S1 from the bracket operating linkage so that the seat may occupy a comfortably pitched settee position as illustrated in FIG. 3 or a horizontal bed position as illustrated in FIG. 6.

The backrest structure 10 includes two sets, of hardware which are mirror images of one another, and which are mounted upon the structural walls W1 and W2; but only one set of such hardware, indicated generally at 17, is illustrated in the drawings. A mounting bracket 18 is secured to the wall W2 by means of screws, and has a first lower pivot 19, a second lower pivot 20, and an upper pivot 21.

A first lower link 22 is mounted on the pivot 19, and a second lower link 23 is mounted on the pivot 20; and a first backrest end member 24 has a first pivot 25 near its upper end to which the first link 22 is pivotally connected, and has a second pivot 26 near its lower end to which the second lower link 23 is pivotally connected. Thus, the first backrest end member 24, the lower links 22 and 23, and the portion 18A of the bracket 18 between the pivots 19 and 20, cooperate to form a four bar linkage.

A hanger link 27 is pivotally mounted at one end on the upper pivot 21 of the bracket 18, and a second backrest end member 28 has a pivot 29 near its upper end to which the hanger link 27 is also pivotally connected.

The backrest end members **24** and **28** each includes an end plate **24***a* and **28***a*, respectively, which have overlapping portions which are pivotally connected to form the hinge **13**, and each of the end members also includes an integral transverse web **24***b* and **28***b*, respectively, (best seen in FIGS. **4** and **5**). In the settee position of FIG. **3** the transverse webs **24***b* and **28***b* are in face abutting relationship with the upholstered surface of the first backrest member **11** facing forwardly and the upholstered surface of the second backrest member **12** facing rearwardly. The relationship of the backrest end members **24** and **28** is such that in settee position the forwardly facing upholstered surface of the first backrest member **11** occupies a comfortably inclined position for a person sitting on the settee.

As seen in FIGS. **4, 5** and **6,** as the backrest structure **10** is moved from the settee position of FIG. **3** to the bed position of FIG. **6** the four bar linkage including the first backrest end member **24** swings forwardly and upwardly so that it and its counterpart on the wall W1 swing the first backrest member **11** through the position of FIG. **4** to the position of FIG. **5** which is above the horizontal; and during this motion the hanger link **27** and its counterpart on the wall W1 swing the second backrest end members **28** and the second backrest member **12** downwardly and forwardly beneath the first backrest member **11**; and in the final motion from the position of FIG. **5** to the position of FIG. **6** the first and second lower links **22** and **23** change from a clockwise rotation to a counterclockwise rotation while the hanger links **27** continue to rotate clockwise so the backrest members **11** and **12** ultimately reach the coplanar horizontal position of FIG. **6** elevated a sufficient distance above the seat S1 to permit the latter to be used as a lower bed while the backrest members form an upper bed.

The end plates **24***a* and **28***a* have edges **24***c* and **28***c*, respectively, which are seen in FIG. **6** to be in abutment when the backrest members **11** and **12** are in bed position; and said end plates are provided with outwardly offset fingers **30** and **31**, respectively, which project beyond said edges **24***c* and **28***c* so that each of said fingers is in facing engagement with the adjacent outer surface of the other end plate when the backrest members are in bed position. This action of the fingers **30** and **31** locks the backrest end members **24** and **28,** and thus the backrest members **11** and **12,** against endwise racking movement in bed position.

The rear portion of the settee seat S1 is elevated during movement of the backrest **10** to bed position by a pair of lifting links **32** which have upper ends connected by pivots **33** to the second lower links **23,** and which have their lower ends connected by pivots **34** to the bracket **16** on the rear of the seat S1. Lifting of the rear of the seat S1 is aided by a pair of tension springs **35** which are connected at **36** to studs on the walls W1 and W2, and which are connected by pins **37** to the brackets **16.**

Referring now particularly to FIGS. **3, 6** and **7,** a latch member **38** is pivoted at **39** on the end plate **28***a* of the second backrest member **12,** and an operating rod **40** is connected at **41** to the latch member and slides in a mounting bushing **42** which is secured to the end plate **28***a*. There is an operating knob **43** on the end of the rod **40,** and a compression spring **44** surrounds the rod between the bushing **42** and the knob **43** so as to constantly urge the latch **38** upwardly as viewed in FIG. **3** and thus into engagement with a latch bar **45** which is engaged by a notch **46** which is in the edge of the latch **38** and faces upwardly in the settee position of the backrest **10.**

To move the backrest structure **10** from the settee position of FIG. **3** to the bed position of FIG. **6** the latch **38** is first disengaged from the latch bar **45** by pushing downwardly upon the knob **43,** and while the latch is held down with one hand, the lower end portion of the first backrest member **11** is grasped with the other end to start it moving upwardly and forwardly on the links **23.** At a convenient time in the movement of the backrest structure toward the position of FIG. **6,** the grip is shifted to the forward portion of the second backrest member **12** to complete the movement of the backrest members to the bed position of FIG. **6.** Return of the backrest structure to its settee position is readily accomplished by lifting upwardly on the forward portion of the first backrest end member **24** and simultaneously pushing down upon the outer portion of the second backrest member **12** to start the backrest members through the position of FIG. **5** to the position of FIG. **4** and FIG. **3.**

Comparison of FIGS. **3** to **6,** and particularly of FIGS. **4** and **5,** shows the motion of the backrest members as they travel between the settee position of FIG. **3** and the bed position of FIG. **6,** and also shows the cooperation between the four bar linkage, the second backrest member **12** and the hanger links **27** during that motion. The arrows at the pivots **25, 26** and **29** in FIGS. **4** and **5** show the direction of movement of those pivots when the components of the backrest structure are in the positions there shown.

The first backrest member **11** swings forwardly and upwardly on the links **22** and **23** while the second backrest member pivots about the hinge **13** under the control of the hanger links **27.** The upward motion of the first backrest member **11** continues until it is substantially above the horizontal bed position, as seen in FIG. **5,** with this motion terminating when the hanger links **27** cross the line of the hinge means **13.** After that the first backrest member **11** swings downwardly to the horizontal bed position while the second backrest member **12** continues to pivot about the hinge **13** until the two backrest members are in the aligned bed position of FIG. **6.**

In bed position the links **22** and **23** are in compression, while the links **27** are in tension; and the abutting hinges **24***c* and **28***c* of the backrest and plates **24** and **28** are above the hinge **13** so as to function in the manner of a rule joint. Accrodingly, the edge abutment of the backrest end plates maintains the backrest members **11** and **12** in their aligned, horizontal positions; while the links **22** and **23** and the hanger link **27** maintain the backrest members in their rigidly suspended relationship to the walls and the seat S1. FIG. **6** shows that when the backrest structure **10** is in bed position it is several inches from the rear wall W3. This permits better air circulation to occupants of both the upper and lower beds than would be the case if the upper bed were against that wall. Furthermore, the linkage system of the hardware **17** is so arranged that, as may be seen by comparing FIGS. **3** and **6,** there is a reasonable amount of space between the lower and upper beds, so the occupant of the lower bed may sit up to read in bed, and is not cramped when he is getting out of bed.

Further,as previously indicated the principal use of the device of the invention is as a rear settee in a recreational vehicle. A big percentage of such vehicles have a large back window which has its sill just above the back of a conventional built-in settee. The two part back rest **10**, the height of which is less than the distance from the front of the seat S to the front of the backrest, fits the space below such windows, while permitting the seat to be a normal distance above the floor. Finally, although the fact is not apparent from the drawings which show no back window, in many popular recreational vehicles the window has its upper end fairly close to the top of the rear wall. Where there is such a window, the back rest **10** in bed position is between the top and bottom of the window so that opening the window affords ventilation to both beds.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

I claim:

1. In a settee which is installed between a pair of fixed structural members that are at opposite ends of the settee, said settee including a seat adapted to serve as a bed, a backrest structure convertible to an upper bed spaced above the seat, said backrest structure comprising, in combination:

a first backrest member which occupies an upright settee position above the rearward portion of the seat and has an upper side and a forwardly facing cushioned surface;

a second backrest member which occupies an upright settee position behind said first backrest member and has an upper side and a rearwardly facing cushioned surface;

hinge means connecting said backrest members at their lower sides;

a pair of mounting brackets, one on each of the structural members, said mounting brackets having aligned first and second lower pivots which are adjacent the upper sides of the backrest members when said members are in their settee positions, and said mounting brackets having aligned upper pivots above the upper bed position of the backrest;

a pair of first lower link members each pivotally connected at one end to said first lower pivots and at the other end to the upper side portion of the first backrest member;

a pair of second lower link members each pivotally connected at one end to said second lower pivots and at the other end to the lower side portion of the first backrest member,

said first and second lower link members, said brackets between said first and second lower pivots, and said first backrest member forming a four bar linkage which has a swinging movement from said settee position to a position in which said second backrest member is horizontal with its cushioned surface uppermost;

and a pair of hanger links each pivotally connected at one end to an upper pivot and at the other end to the upper side portion of the first backrest member, said hanger links turning about the upper pivots during said swinging movement to guide the second backrest member to a position with its cushioned surface uppermost and coplanar with the cushioned surface of the first backrest member.

2. The backrest structure of claim **1** in which the backrest members include end plates at each end which are in the same vertical plane and which abut edgewise in bed position, each of said end plates having offset fingers at said abutting edges which slide over the adjacent end plate surfaces.

3. The backrest structure of claim **1** in which the backrest members include end members which have webs that are in face abutment in settee position, said webs being rearwardly inclined toward their upper ends in said position and the cushioned surface of the second backrest member being parallel to said webs.

4. The backrest structure of claim **3** in which the end members also have integral end plates which are at right angles to the webs and which abut edgewise in bed position.

5. The backrest structure of claim **4** in which the end plates have offset fingers at their abutting edges which slide over the adjacent end plate surfaces in bed position.

6. The backrest structure of claim **1** which is combined with a settee seat that is hingedly mounted at its forward margin and occupies a pitched seat position, said backrest structure including a pair of lifting links each of which is pivotally connected at one end to a link of one of the pairs of lower links and at the other end to the seat adjacent the rear thereof, so that during movement of the four bar linkage to bed position the rear of the seat is elevated by the lifting links to dispose the seat horizontally.

7. The backrest structure of claim **1** which includes manually releasable latch means for normally retaining the backrest in its settee position.

8. The backrest structure of claim **1** in which the hanger links, the second backrest member, and the members of the four bar linkage are so related that during movement to bed position the first backrest member swings upwardly past bed position until the hanger links pass the line of the hinge means, and thereafter swings downwardly into bed position.

9. In a settee which is installed between a pair of fixed structural members that are at opposite ends of the settee, said settee including a seat adapted to serve as a bed, hardware for mounting one end of a backrest structure which is convertible to an upper bed spaced above the seat, said hardware comprising, in combination;

a mounting bracket adapted for attachment to one of the structural members, said bracket having first and second lower pivots and an upper pivot;

a four bar linkage which includes said lower pivots and that portion of the mounting bracket which is between them, said four bar linkage also including first and second link members mounted, respectively, on said first and second pivots, and a first backrest end member pivoted on said first and second link members;

a second backrest end member;

hinge means connecting said first and second backrest end members for movement between a settee position in which said end members are side-by-side and a bed position in which said end members are aligned;

and a hanger link pivotally connected at one of its ends to said upper pivot and at the other of its ends

to the second backrest end member remote from said hinge means.

10. The hardware of claim **9** in which the first and second backrest end members each comprises a plate to which the links are pivotally connected and a web perpendicular to the plate, said webs being in facing engagement in the settee position of the end members and said plates being in edgewise abutment in the bed position of said end members.

11. The hardware of claim **10** in which the end plates have offset fingers at their abutting edges which slide over the adjacent end plate surfaces in bed position.

12. The hardware of claim **9** in which the hanger links, the second backrest end member, and the members of the four bar linkage are so related that during movement to bed position the first backrest end member swings upwardly past bed position until the hanger links pass the line of the hinge means, and thereafter swings downwardly into bed position.

13. In a settee which is installed between a pair of fixed structural members that are at opposite ends of the settee, said settee including a seat adapted to serve as a bed, hardware for mounting one end of a backrest structure which is convertible to an upper bed spaced above the seat, said hardware comprising, in combination;

a mounting bracket adapted for attachment to one of the structural members, said bracket having first and second lower pivots and an upper pivot;

a first backrest end member;

a second backrest end member;

a hinge connecting said backrest end members for relative movement between a settee position in which they are side-by-side and a bed position in which they abut end-to-end;

and link means mounting said first and second backrest end members on said mounting bracket for movement between an upright settee position substantially resting on the rear portion of the seat with the first backrest end member toward the front, and an elevated bed position,

said link means including first and second lower links connected, respectively, to the first and second lower pivots and to the first backrest end member,

and said link means also including a hanger link connected to the upper pivot and to the second backrest end member at a point remote from the hinge means,

said first backrest end member during movement to bed position swinging upwardly on the first and second links while the second backrest end member pivots about the hinge under the control of the hanger link, said forward and upward movement of the first backrest end member carrying it past bed position and terminating when the hanger link moves past the line of the hinge means, after which the first backrest end member swings downwardly into bed position while the second backrest end member pivots upwardly on the hinge into bed position.

14. The hardware of claim **13** in which the first and second links are in compression in bed position and the hanger link is in tension in said position, and the ends of the backrest end members abut above the line of the hinge means in the fashion of a rule joint.

15. In a settee which is installed between a pair of fixed structural members that are at opposite ends of the settee, said settee including a seat adapted to serve as a bed, a backrest structure convertible to an upper bed spaced above the seat, said backrest structure comprising, in combination:

a first backrest member which occupies an upright settee position above the rearward portion of the seat and has an upper side and a forwardly facing cushioned surface;

a second backrest member which occupies an upright settee position behind said first backrest member and has an upper side and a rearwardly facing cushioned surface;

hinge means connecting said backrest members for movement between said settee positions and a bed position in which their cushioned surfaces are uppermost and coplanar;

a pair of mounting brackets, one on each of the structural members, above the upper sides of the backrest members;

and linkage means pivotally connected to said brackets, said linkage means including first links pivotally connected to the first backrest member which swing it from settee position to a horizontal bed position in vertically spaced relationship to the rear portion of the seat, and second links pivotally connected to the second backrest member which swing it from settee position to a horizontal bed position in vertically spaced relationship to the front portion of the seat, said first links being below the first backrest member in bed position and said second links being above the second backrest member in bed position.

16. The backrest structure of claim **15** in which the upper side of the first backrest member is to the rear in bed position and is forward of a vertical plane projected from the rear of the seat.

17. The backrest structure of claim **16** in which the height of the backrest structure in settee position is substantially less than the distance from the front of the seat to the front of the backrest structure.

18. The backrest structure of claim **15** in which the backrest members in bed position are substantially above the horizontal plane which is occupied by the upper sides of the backrest members in settee position.

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