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Quakenbush

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[54] **CONVERTIBLE SEAT-BED**

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[52] **U.S. Cl.** ..... **5/17,** 5/51 J

[51] **Int. Cl.** **A47c 19/00,** A47c 13/00

[58] **Field of Search** .....5/13, 17, 18, 21, 51 J, 51 K; 297/337

[56] **References Cited**

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Attorney, Agent, or Firm—Alberts, Brezina & Lund

[57] **ABSTRACT**

Convertible seat-bed wherein a movable seat-carrying frame is connected by links to a main frame for movement between rearward inclined seating position in which the rear portion of the seat is below a backrest and a forward sleeping position in which the seat is horizontal, the links being moved over-center between the two positions.

5 Claims, 3 Drawing Figures

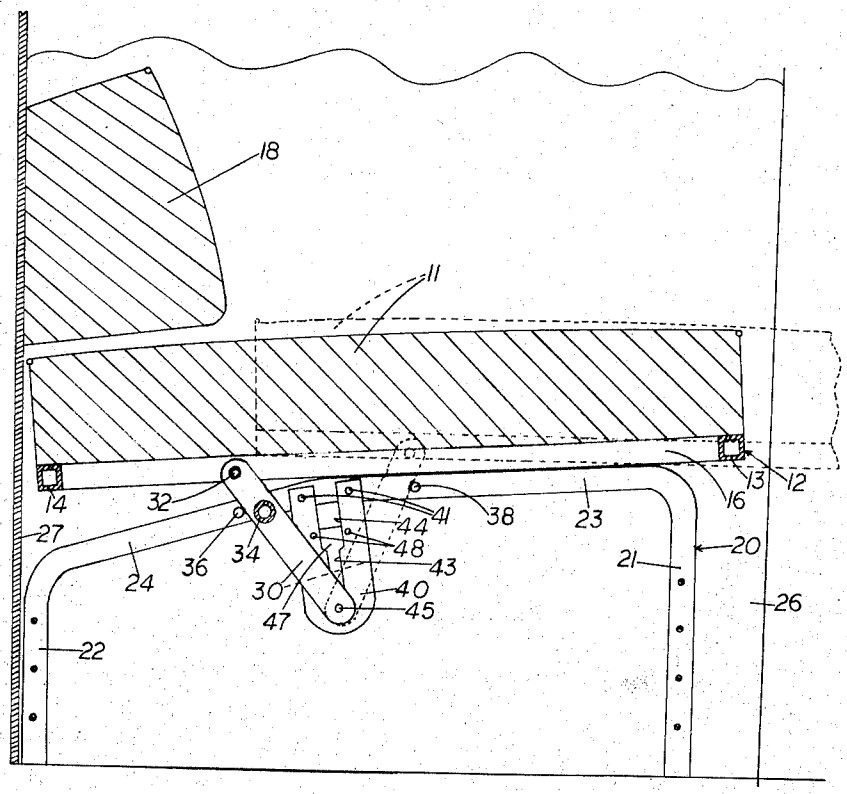


FIG 3

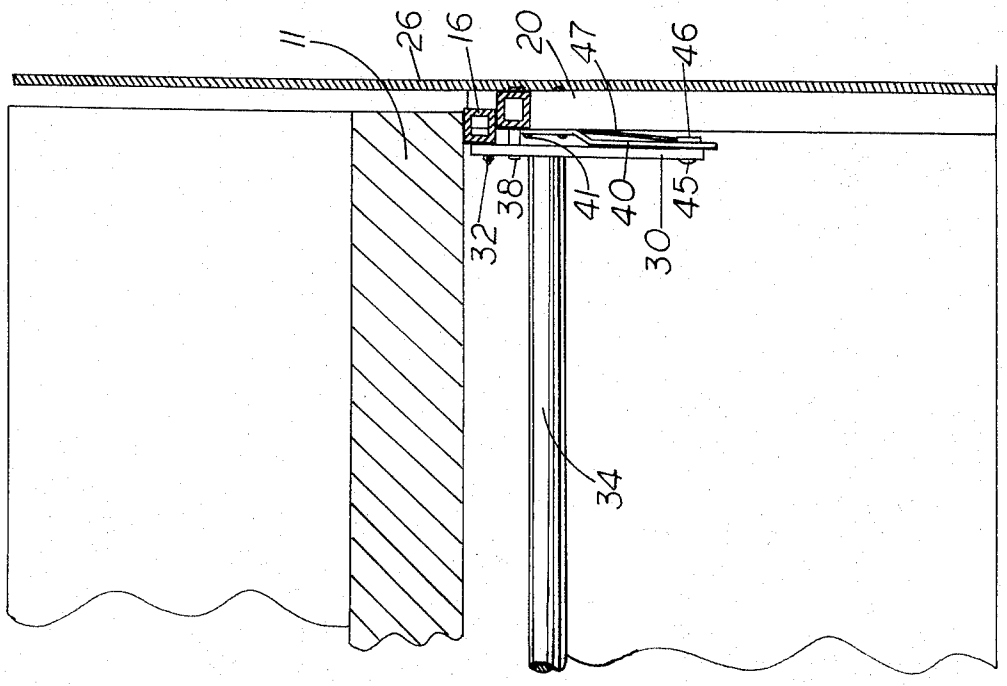
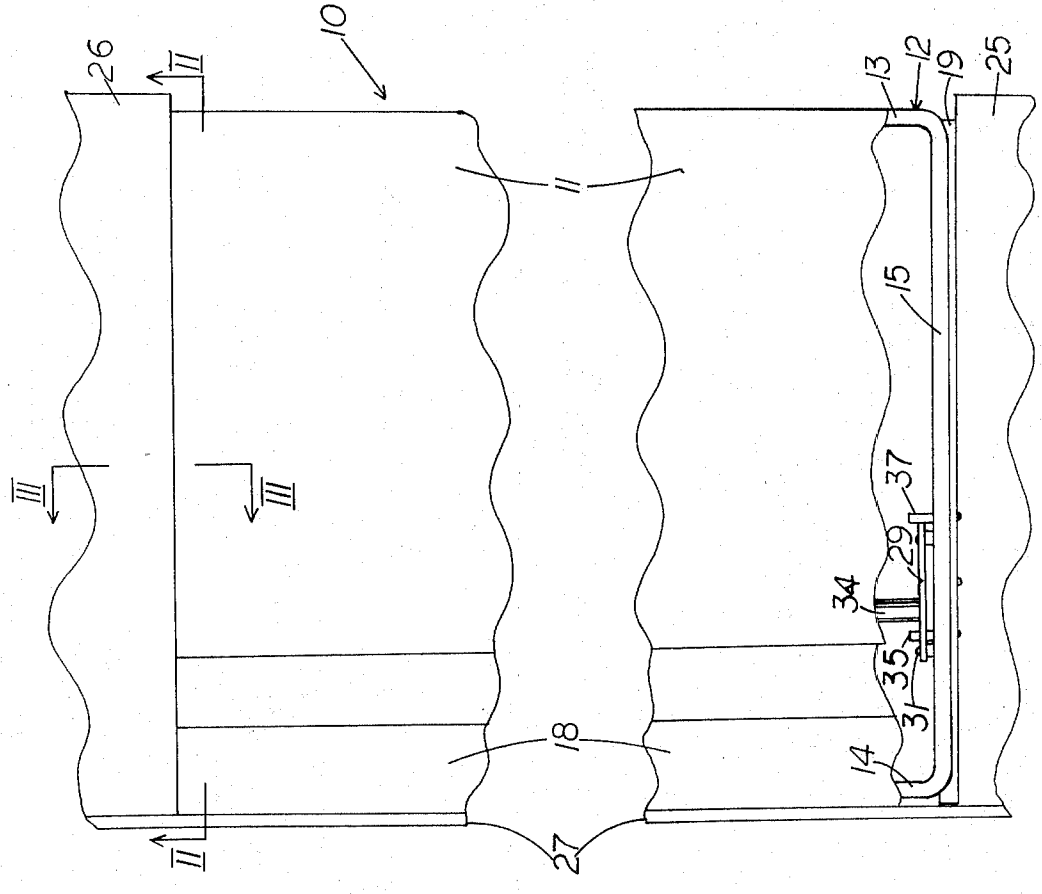

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FIG 1


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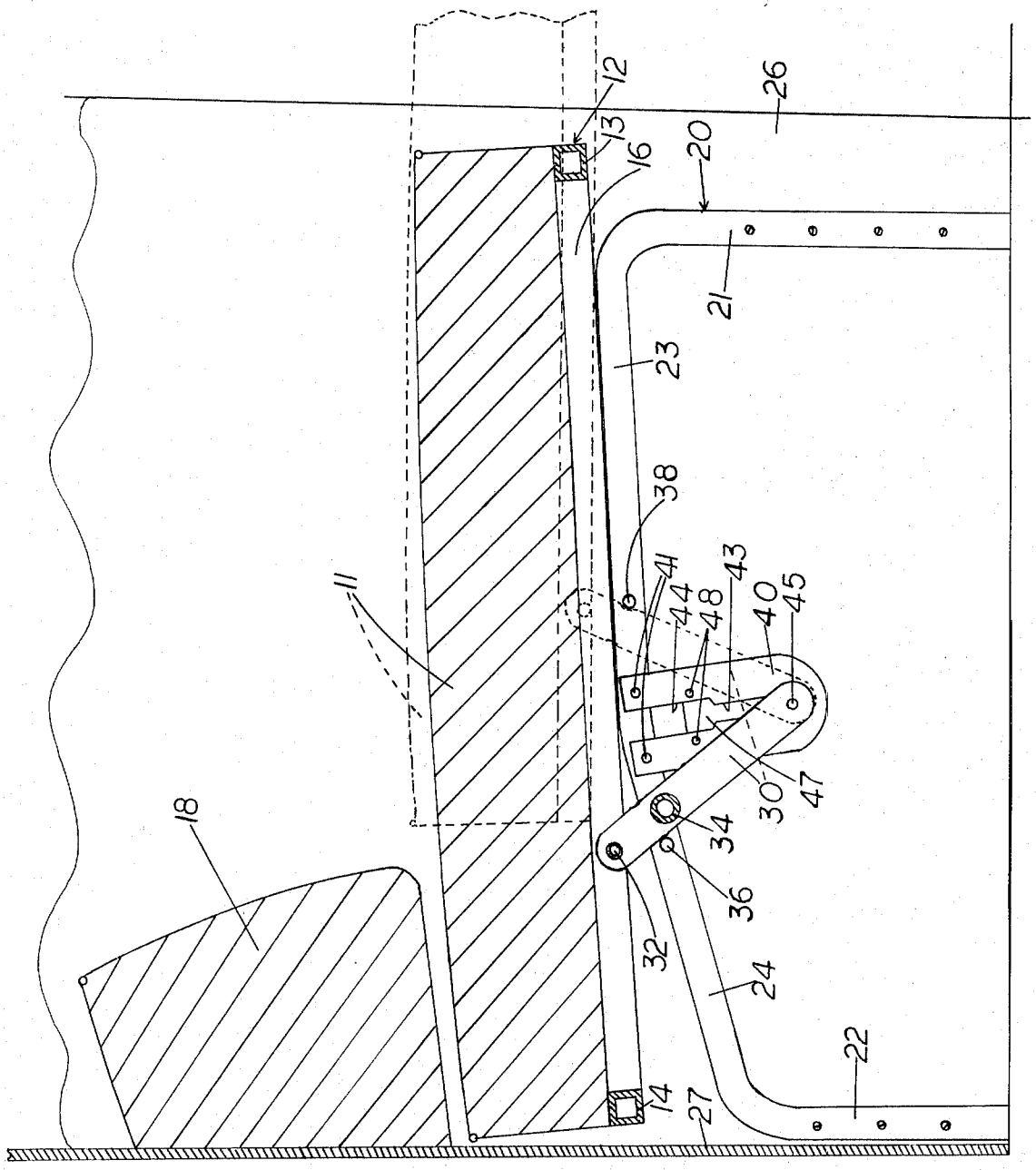

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FIG 2

CONVERTIBLE SEAT-BED

This invention relates to a convertible seat-bed and more particularly to a unit which is readily converted for use either as a seat or as a bed while being comfortably usable in either condition and which is simple and inexpensive in construction while being rugged and durable.

Convertible units usable both for seating and sleeping have been provided in the prior art but have been generally been complex and expensive in construction and/or have not permitted comfortable use either as a seat or as a bed.

This invention was evolved with the object of overcoming the disadvantages of prior constructions and of providing a unit which is comfortably usable either as a seat or as a bed and which is readily converted from one use to another while being readily and economically manufacturable, rugged and durable.

According to this invention, a convertible seat-bed is provided including a seat-support frame supported from a main frame for movement of the seat between a rearward seating position in which a rear portion of the seat is under a backrest and a forward sleeping position. According to an important feature, the upper surface of the seat is inclined rearwardly in the rearward seating position while the upper surface of the seat is substantially horizontal in the forward sleeping position, thus permitting comfortable use in both positions.

According to another specific feature, the support means comprises link means, and lower and upper pivot means connecting the link means to the main frame and to the fixed frame. Preferably, the link means pivots over-center between the two positions, the upper pivot means being behind a vertical plane through the pivot axis in the seating position and being in front of the vertical plane in the sleeping position.

Another specific feature is in the provision of a longitudinally extending rigid bar interconnecting a pair of links at opposite ends of the movable frame, for conjoint movement thereof.

Other important features relate to a construction which simplifies and makes more economical the manufacture of the unit and the assembly thereof.

This invention contemplates other objects, features and advantages which will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate a preferred embodiment and in which:

FIG. 1 is a top plan view of a convertible seat-bed constructed in accordance with the principles of the invention;

FIG. 2 is a sectional view taken substantially along line II—II of FIG. 1; and

FIG. 3 is a sectional view taken substantially along line III—III of FIG. 1.

Reference numeral 10 generally designates a convertible seat-bed unit constructed in accordance with the principles of the invention. The unit 10 is designed for use in a camper type vehicle but it will be understood that the invention is not limited thereto.

The unit 10 comprises a seat 11 supported by a generally rectangular frame 12 including front and rear portions 13 and 14 in opposite end portions 15 and 16. Frame 12 may also include additional portions, not shown, extending between the front and rear portions 13 and 14 at intermediate positions for additional support of the seat unit 11. The seat-support frame 12 is supported from main frame means for movement of the seat 11 between a rearward seating position, shown in full lines in the drawings, in which the rear portion of the seat is positioned under a stationary backrest 18 and a forward seating position indicated in dotted lines in the cross-sectional view of FIG. 2. In accordance with the invention, the upper surface of the seat 11 is generally horizontal in the forward sleeping position but may be rearwardly inclined in the rearward seating position, as illustrated, so as to be usable in both positions with maximum comfort.

The main frame means include a pair of members 19 and 20 and as shown in FIG. 2, the member 20 comprises a front leg portion 21, a rear leg portion 22, a portion 23 extending rearwardly from the upper end of the front leg portion 21 to an intermediate point and a portion 24 extending rearwardly from the rear end of the portion 23 to the upper end of the rear leg portion 22. In the rearward seating position, the end portion 16 of the seat support frame 12 is in flush engagement with the portion 23, which is inclined rearwardly and downwardly at the proper angle for defining the seating position seat 11. Portion 24 is inclined rearwardly and downwardly in a greater angle for a purpose which will be clarified hereinafter. The configuration of the member 19 is like that of the member 20.

The unit 10 as illustrated may be installed in a camper type vehicle in which the members 19 and 20 are secured by screws or the like against facing surfaces of spaced vertical walls 25 and 26 while the backrest 18 is suitably secured to another vertical wall 27 in a plane at right angles to the planes of the walls 25 and 26. It will be understood, however, that the members 19 and 20 may be part of a self-supporting framework adapted to rest on the floor and on which the backrest 18 is supported.

In the seating position of the seat 11, illustrated in full lines in FIG. 2, the seat-support frame 12 is supported in part by the engagement between portions 15 and 16 of the frame 12 and the members 19 and 20, portion 16 being in flush engagement with portion 23 of member 20 and portion 15 being in flush engagement with the corresponding portion member 19. The supporting means for the frame 12 further includes link means in the form of a pair of links 29 and 30 having upper ends pivotally secured to the portions 15 and 16 of the seat-support frame 12 by means of pins 31 and 32. The lower ends of links 29 and 30 are pivotally connected to the members 19 and 20 as hereinafter described. Links 29 and 30 are rigidly connected together by a longitudinally extending bar 34 having opposite ends welded or otherwise secured to intermediate portions of the links 29 and 30.

Rearward movement of the links 29 and 30 is limited by engagement with a pair of rear stop pins 35 and 36 secured to the members 19 and 20, thus defining the seating position. To move to the forward sleeping position, the forward side of the seat-support frame 12 is lifted and pulled forwardly until the seat 11 clears the backrest 18 at which time the links 29 and 30 engage forward stop pins 37 and 38 on the frame members 19 and 20 and the frame 12 is then lowered to rest the portions 15 and 16 thereof on the members 19 and 20. It is noted that because of the downward inclination of the portion 24 of member 20 (and that of the corresponding portion of member 19), the upward lifting

motion of the frame **12** about the pins **31** and **32** is accomplished without interference. Of course, the backrest **18** may be positioned high enough to avoid the possibility of interference, but normally, it is desirable to have little or no spacing between the lower surface of the backrest and the upper surface of the seat in the seating position.

It is also here noted that because of the provision of the rigid connecting bar **34,** both ends of the frame **12** are moved together and the possibility of an objectionable canting action is obviated.

For pivotally supporting the lower end of the link **30** from the frame member **20,** a plate **40** is provided the upper end of which is secured by rivets **41** to the frame member **20,** at the junction between the portions **23** and **24** thereof. Plate **40** has a central slot extending from the upper end thereof to a point close to the lower end thereof, so as to present a generally U-shaped configuration, as viewed in FIG. **2.** The slot has a wider upper portion **43** and a narrower lower portion **44.** The link **30** has a pin **45** rigidly secured thereto and having an enlarged head portion **46** spaced from the facing surface of the link **30** by a distance at least equal to and preferably slightly greater than the thickness of the plate **40.** In assembly, the pin **45** is positioned with the head portion thereof in the wider portion **44** of the slot and is then moved downwardly to move the shank of the pin into the narrower portion of the slot and to position the plate **40** between the head portion **46** of the pin and the adjacent surface of the link. When the pin **45** is moved to the lower end of the narrow portion **43** of the slot, a leaf retainer spring **47** moves against the surface of the plate **40** to engage the upper surface of the head portion **46** of the pin and to prevent upward movement thereof. Spring **47** is secured at its upper end to the plate **40** by rivets **48.** Preferably, the plate **40** may have an offset as illustrated, the lower portion being offset inwardly from the upper portion, for clearance purposes. If it should be desired to disassemble the unit, the spring **47** may be manually retracted. It will be understood that a similar assembly is provided for connecting the lower end of the link **29** to the frame member **19,** at the opposite end of the unit.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of this invention.

I claim as my invention:

1. In a convertible seat-bed, main frame means arranged for support of a backrest in fixed relation thereto, a movable frame for supporting a seat, support means supporting said movable frame from said main frame means for movement of the seat between a rearward seating position and a forward sleeping position, the upper surface of the seat being inclined rearwardly in said rearward seating position with the rear portion of the seat being under the backrest, and the upper surface of the seat being substantially horizontal in said forward sleeping position, said support means being comprised of link means, lower pivot means connecting a lower end portion of said link means to said main frame means for movement about a first horizontal axis, and upper pivot means connecting said movable frame and an upper end portion of said link means for movement about a second horizontal axis, said link means comprising a pair of links at opposite ends of said movable frame, said upper pivot means comprising a pair of pivot pins, and a longitudinally extending rigid bar interconnecting said links for conjoint pivotal movement thereof about said first horizontal axis.

2. In a convertible seat-bed, main frame means arranged for support of a backrest in fixed relation thereto, a movable frame for supporting a seat, support means supporting said movable frame from said main frame means for movement of the seat between a rearward seating position and a forward sleeping position, said movable frame comprising forward and rearward longitudinally extending portions and a pair of end portions, and said main frame means comprising a pair of portions for underlying and supporting said end portions of said movable frame, said link means comprising a pair of links at opposite ends of said movable frame, a pair of pins carried by lower ends of said links and having enlarged head portions in spaced relation to adjacent surfaces of said links, and a pair of plates having upper slot portions wide enough to receive said heads and lower narrower slot portions for receiving shank portions of said pins.

3. In a convertible seat-bed as defined in claim **2,** retainer spring means for retaining said pins in the lower ends of said slots.

4. In a convertible seat-bed as defined in claim **1,** the rearward end portion of said movable frame being disposed over said first horizontal axis in said forward sleeping position of said seat with said link means being operative to support said rearward end portion of said seat, said support means further including means on said main frame spaced forwardly a substantial distance from said first horizontal axis and arranged for underlying said movable frame for support of the forward end of said seat in said forward sleeping position thereof.

5. In a convertible seat-bed as defined in claim **4,** said movable frame comprising forward and rearward longitudinally extending portions and a pair of end portions, said main frame means comprising a pair of portions for underlying and supporting said end portions of said movable frame, the upper surfaces of said pair of portions of said main frame means being inclined rearwardly for flush engagement with said end portions of said movable frame in said rearward seating position of the seat, forward ends of said rearwardly inclined upper surfaces being operative to support said movable frame in said forward sleeping position of the seat.

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