

[54] **CONVERTIBLE BERTH**

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

[58] Field of Search ..... 5/8, 9, 10, 118, 309

[56] **References Cited**

**UNITED STATES PATENTS**

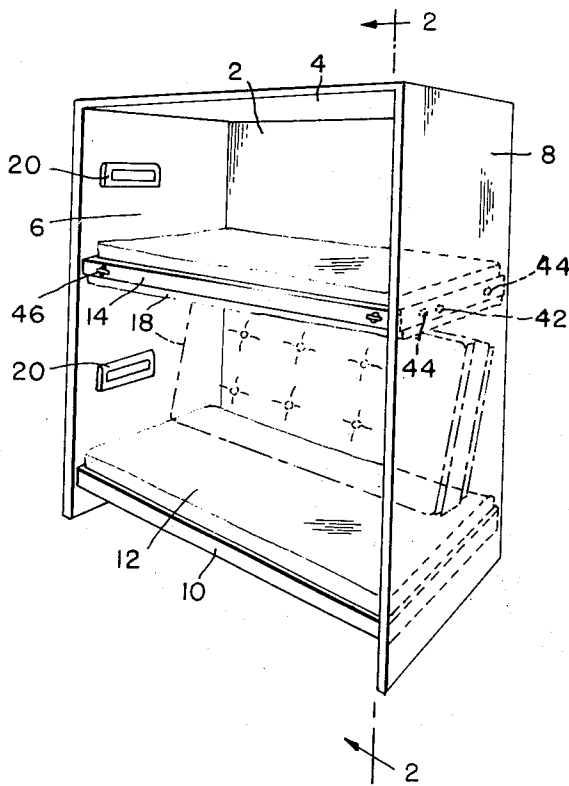
3,311,932	4/1967	Ahola.....	5/9 R
3,522,615	8/1970	Tudisco.....	5/10 R
3,641,599	2/1972	Addante .....	5/309

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[57] **ABSTRACT**

A two level berth structure for use on ships, in railroad cars or the like wherein space is at a premium including a counter balanced upper bunk mounted upon track means at opposite ends whereby the berth may be easily moved from a relatively horizontal position whereat it is locked for sleeping to an inclined position having one side adjacent the top of the lower bunk at a location comfortable for sitting upon the lower bunk and resting your back against the upper bunk. The structure includes the end walls for both the upper and lower bunk and has within the end walls weights to counterbalance the weight of the upper bunk during movement from one location to another.

**3 Claims, 6 Drawing Figures**



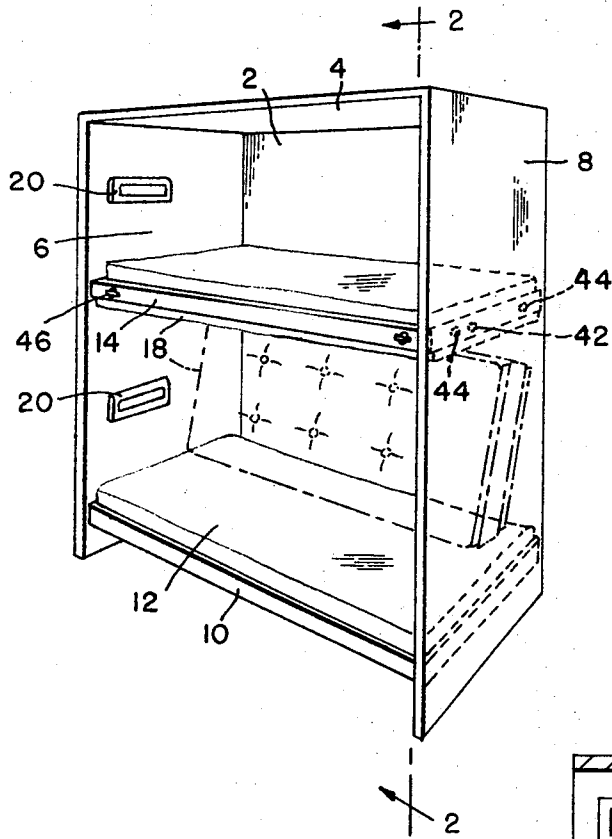


FIG. 1

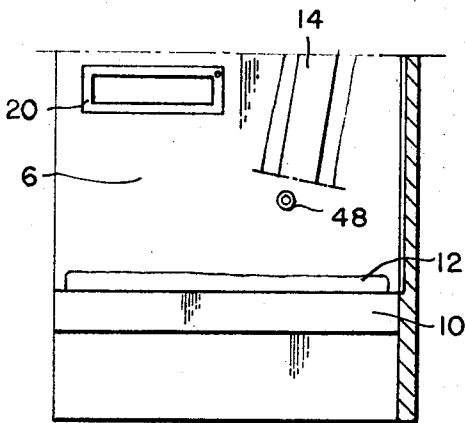


FIG. 3

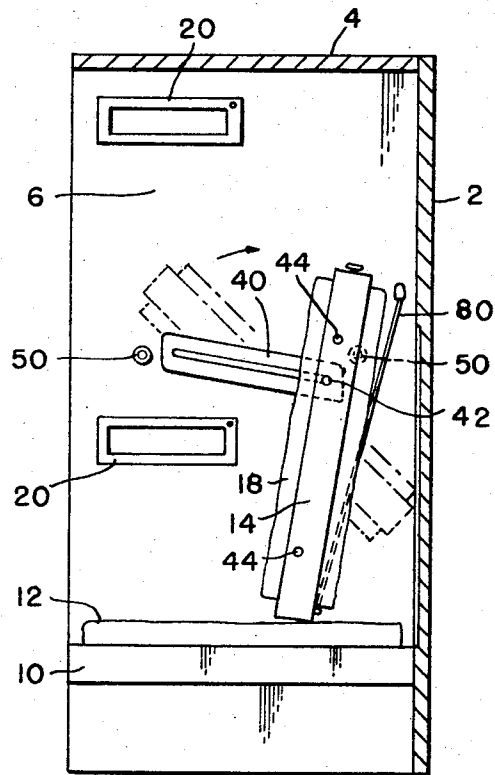


FIG. 2

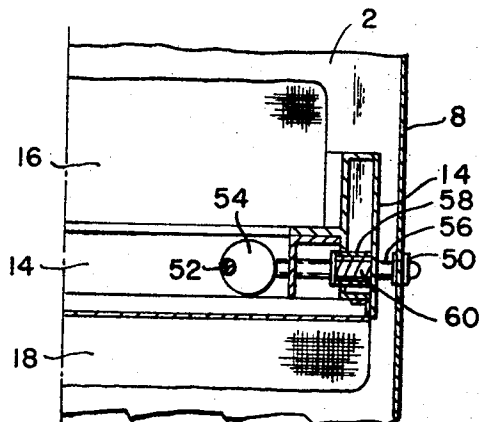


FIG. 4

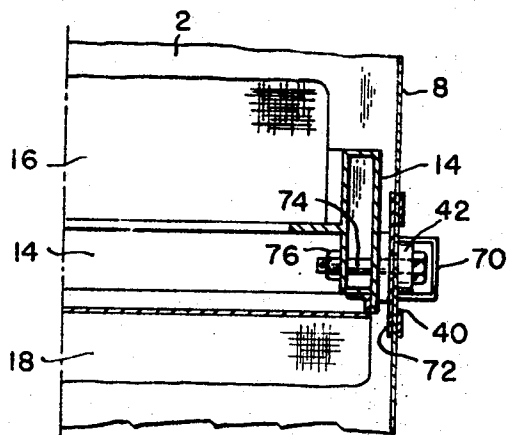


FIG. 5

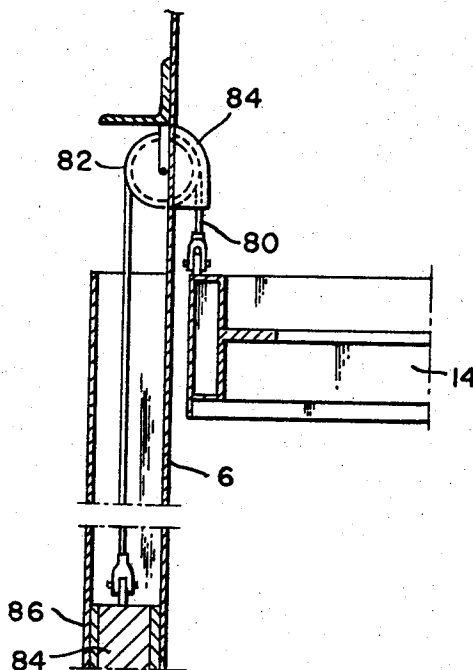


FIG. 6

## CONVERTIBLE BERTH

### BACKGROUND OF THE INVENTION

The cabins on ships as well as many other locations, primarily connected with travel, are of necessity quite small. The small size is to capitalize on space but it is also necessary to provide comfortable accommodations. To accomplish the desired results it is desirable to have a berth structure which is usable not only as a sleeping facility but also convertible to a place to sit or lounge. The convertible unit must be comfortable as well as being simple to convert.

In the past there have been many attempts to take a two-deck berth and convert it into a davenport or the like by pivoting the upper berth about its central portion or some other fashion such that it will form a back rest for the lower bunk. However, the prior constructions have suffered from the fact that either the back support is approximately vertical, very uncomfortable, or is in a position abutting the back wall. Since the berth is normally wider than the average length of a human upper leg the support at the back of the berth makes it uncomfortable to sit for any length of time on the berth. Another problem which has been apparent in prior art convertible berth structures is the weight involved in the upper berth is such that it becomes an extremely strenuous job to move the berth from its sleeping position to its back support position or vice versa.

Further, as is the case in any structure which is convertible, there is the lack of secure fastening such that the berth may not be completely stable in either its sleeping or its back supporting positions, thereby rendering the structure somewhat dangerous.

With the above noted facts in mind, it is an object of the present invention to provide a berth structure wherein the upper berth is readily movable from a horizontal position to a vertically inclined position.

Another object of the present invention is to provide a convertible berth structure wherein the upper berth is guided by tracks at either end in its movement from a horizontal to a relatively vertical position.

Still another object of the present invention is to provide a secure latching system for a convertible berth which is operable from the front of the berth and secures the bunk at a plurality of points resulting in a rigid structure.

A further object of the present invention is to provide a convertible berth which is counterbalanced such that the movement from the sleeping position to the back supporting position is done with great ease.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric environmental view showing the upper berth shown in solid in its sleeping position and in phantom in its back support position.

FIG. 2 is an end view taken along line 2—2 of FIG. 1 with the upper berth in its back support position.

FIG. 3 is a partial end view showing the means for locking the upper berth in the back supporting position.

FIG. 4 is a detailed showing of the berth locking mechanism.

FIG. 5 is a detailed showing of the track and roller mechanism.

FIG. 6 is a detailed view of the counterbalancing weight system.

### DETAILED DESCRIPTION OF THE DRAWINGS

As seen in FIG. 1 the berth structure in accordance with the present invention is preferably a package item or structural unit which includes the end walls, back wall, and top wall as well as an upper and lower berth. However, it could easily be provided with either completely built-in features or partially built in with appropriate accommodations as desired such as the mountings placed in existing wall structures. As shown in the figures, the preferred embodiment is the complete structure which includes back wall 2, a top wall 4, and end walls 6 and 8. The structure includes a lower berth having a frame member 10 which is fixedly secured to the end walls 6 and 8 as well as back wall 2 and supports a mattress 12. The upper berth includes a frame 14, a mattress 16, and padding 18 upon its lower portion. As shown in phantom in this figure, the upper berth is in its lower, back supporting position wherein the padding 18 is exposed and positioned to support a person sitting on the lower berth. The berth structure further includes light fixtures 20 and could well include drawers or other storage means beneath the lower berth.

The upper berth is readily and easily movable from the horizontal position shown in solid in FIG. 1 to the back supporting position shown in phantom in FIG. 1 and shown in solid in FIG. 2.

A means by which the upper berth may be moved from its horizontal or sleeping position to its relatively vertical or back supporting position can be seen partially in FIG. 2 and comprises a track 40. An identical track unit will be mounted upon each end 6 and 8 of the berth structure and adapted to cooperate with rollers 42 (see FIGS. 1, 2 and 5) which are locked into the track means as will be described in greater detail with particular reference to FIG. 5. The upper berth is further locked in either of its positions, i.e., horizontal sleeping position or relatively vertical back supporting position, by locking means 44 operable from the front of the berth by means of handles 46. The particular locking mechanism will be described in greater detail hereinafter.

As seen in FIG. 3 there is a grommet 48 slightly above the lower berth which is adapted to cooperate with locking means 44 to lock the bunk in position as shown in FIG. 2. Further to be seen in FIG. 2 are a pair of grommets 50 which serve to lock the berth in the horizontal sleeping position. The pair of grommets 50, one pair will be installed at each end of the berth, securely lock the structure in its horizontal position and as will be described later, the lock is positive assuring safety of the user. Only one lock need be used in the relatively vertical position since, as noted below, the roller is captured in the track and further is at the end of the track when the berth is in this position.

Referring now in particular to FIG. 4, the locking mechanism may be seen in greater detail. As can be seen, the mattress 16 is supported on its edges by a portion of the frame 14 and the padding 18 is secured to the bottom of frame 14 spacedly located with regard to the mattress 16. Passing between the mattress 16 and the padding 18 in a direction generally parallel to and adjacent the ends of the bunk is a rod 52 secured to handles 46, as seen in FIG. 1, having a pair of cams 54

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rigidly mounted thereon. Mounted so that it may protrude beyond the side or the end of the frame 14 is a locking rod 56 mounted for axial movement within a sleeve 58 and continuously urged inwardly by spring 60. In order to lock the rod 56 into the grommet 50 or 48 the handle 46 must be turned causing the cam 54 to push the rod 56 outwardly thereby intermeshing with the grommet 50 thereby serving as a positive action lock.

Referring now to FIG. 5 the frame, mattress and padding can again be seen but further it can be seen that the track 40 is actually recessed in the end wall 8 having a rectangular enclosing cover 70 and an outwardly facing plate 72 such that the roller itself 42 is captured within the track. The roller 42 is mounted upon an axle 74 which extends through the end of the frame and is secured in position by means of a nut 76. It is to be understood that the track at the other end of the berth will be identical and therefore is not described in detail.

The weight of the bunk during movement from the horizontal to vertical position is partially carried by means of a counterbalancing system comprising a pair of cables, one at each end of the berth, mounted to the rearward portion of the upper berth and extending through the end wall passing over a sheath 82 which is covered by shield 84. The cable 80 then extends downwardly through the interior of the hollow end wall 6 or 8, 6 being shown, to terminate in a weight 84 having insulated padding 86 thereon to prevent damage to the end walls and further to make the movement of the weight within the walls relatively quiet.

Thus, it can be seen that the upper berth structure is quickly and easily movable from a horizontal sleeping position to a relatively vertical back supporting position. The movement of the upper berth from one position to the other is assisted by means of a counterbalancing weight within the hollow wall thereby greatly economizing upon the space necessary and making the movement quite easy. For safety reasons the bunk is se-

curely locked in both positions and the movement from the horizontal position to the vertical position is guided by means of a track wherein the roller is captured.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A convertible berth structure for use on ships and the like comprising:

an enclosing structure having a pair of end walls, a lower berth fixedly secured to the lower section of the enclosing structure,

a single straight track section secured to each end wall a sufficient distance above the lower berth to allow a person to sleep between a horizontal plane passing through the lowermost portion of the track sections and the lower berth,

an upper berth mounted between the track sections along a longitudinal axis extending the length of the berth and adapted to move in a direction transverse to the length of said section simultaneously with pivotal movement about the axis converting from a horizontal berth position to an angular position adjacent the lower bunk and serving as a settee back, and

counterweight means captured within the enclosing structure to lessen the force necessary to move the berth from one position to another.

2. A berth structure as in claim 1 and including a locking means comprising a rod adjacent and parallel to the end of the berth having at least one camming surface intermediate the ends of the rod to contact and extend a bolt into a bore in the end wall to effect the locking.

3. A berth structure as in claim 1 wherein the counterweight means comprises a cable secured to the back end of the upper berth, said cable interacting with a pulley mounted to the end wall and extending downwardly within the wall to terminate in a weight means.

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