

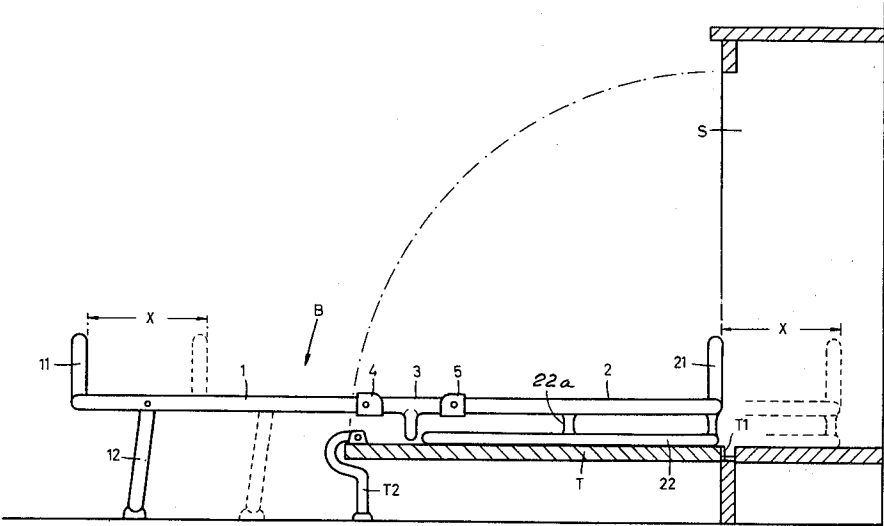
[54] **FOLDING BED**
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Attorney, Agent, or Firm—Murray Schaffer

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5/146, 147, 149, 150, 171, 173, 170; 297/14
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[57] **ABSTRACT**
A folding bed adapted to be stored in a wall opening or the like. A door is mounted or a door panel hinged about a horizontal axis, at the wall opening. The bed comprises a frame having a plurality of sections articulately linked to fold together transversely of its longitudinal axis. One of the sections is mounted to the inner face of the door panel so as to swivel about an axis which permits the bed to be arranged perpendicularly or parallel to the axis of the horizontal hinge.
9 Claims, 8 Drawing Figures



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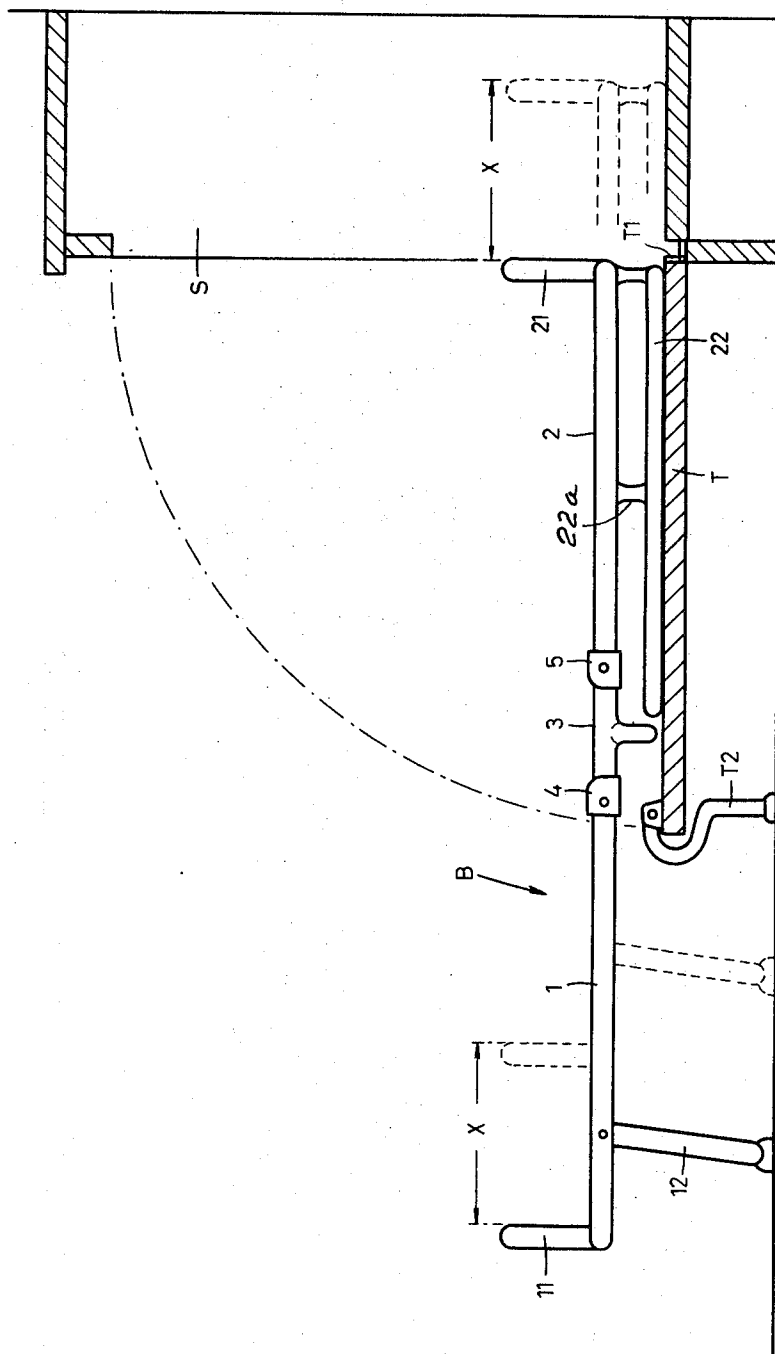


Fig.1

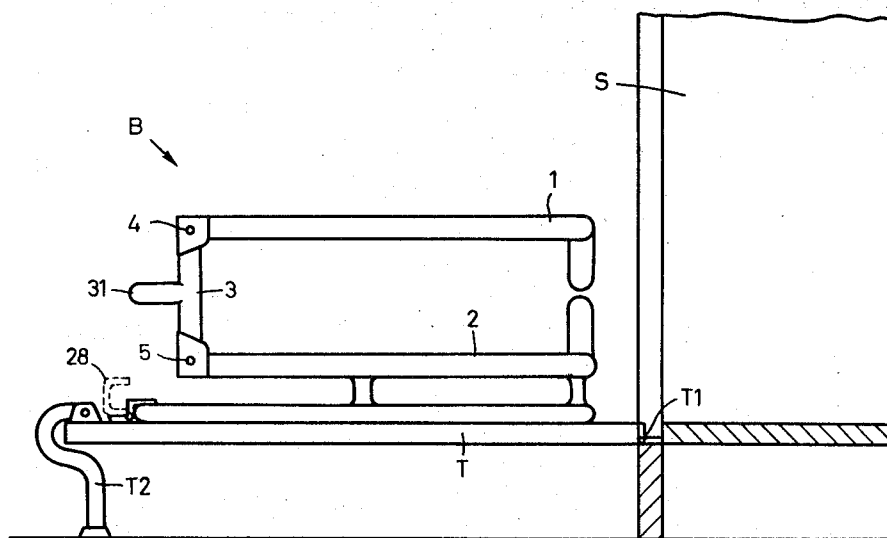


Fig. 2

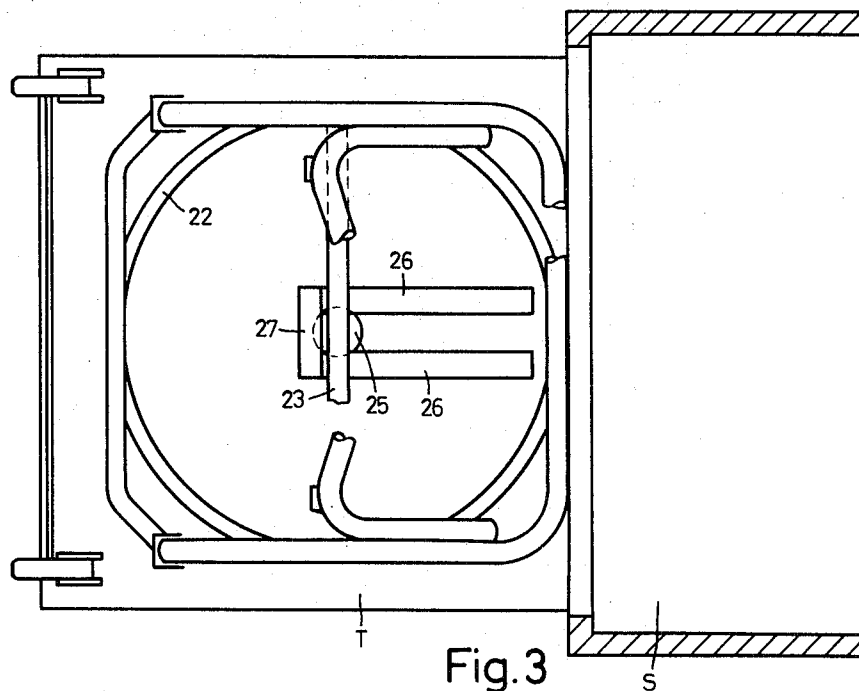


Fig. 3

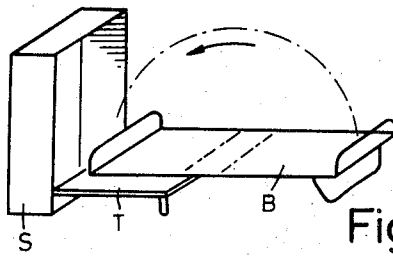


Fig. 5a

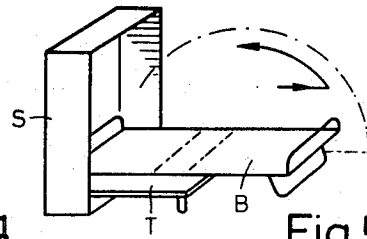


Fig. 5b

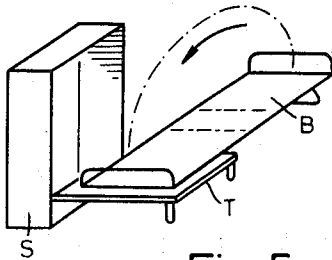


Fig. 5c

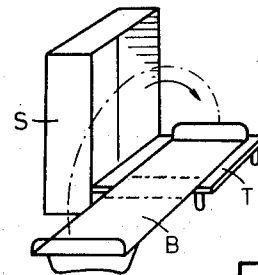


Fig. 5d

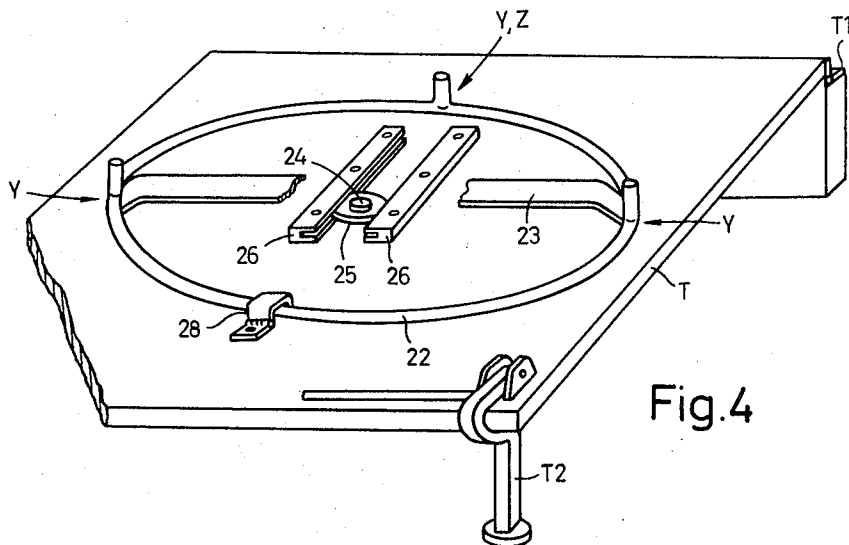


Fig. 4

FOLDING BED

BACKGROUND OF THE INVENTION

The present invention relates to a folding bed, particularly to the type of folding bed which can be collapsed and stored in a closet or wall opening.

Folding beds are known having a singular frame mounted on the door of a closet or wall opening which door pivots about a horizontal axis. Such beds are generally arranged so that the frame is fixedly secured along its entire length and swung upwardly together with the door. It is also known to provide a bed having a frame which is itself foldable or articulated so that when stored it takes up less room. In general the latter beds have the disadvantage that they have complex frame structures, are difficult to unfold and still take up a great deal of room.

It is the object of the present invention to provide a new and improved folding bed.

It is another of the present invention to provide a folding bed which when folded together is small and compact and which takes up very little storage room.

It is a further object to provide an articulated folding bed which can be moved axially relative to the door so as to be movable into the closet in open condition and pivotable with respect to the door so that it can be placed angular to or parallel to the wall or closet.

These objects, other objects as well as numerous advantages will be seen from the following disclosure of the present invention.

SUMMARY OF THE INVENTION

According to the present invention a folding bed is provided which is adapted to be stored in a wall opening or the like. A door is mounted on a door panel hinged about a horizontal axis, at the wall opening. The bed comprises a frame having a plurality of sections articulately linked to fold together transversely of its longitudinal axis. One of the sections is mounted to the inner face of the door panel so as to swivel about an axis which permits the bed to be arranged perpendicularly or parallel to the axis of the horizontal hinge, that is the plane of the wall. Thus the bed may be arranged at selected positions in the room.

Further, in accordance with the present invention, the frame sections are dimensioned and articulated so that when the frame assembly is folded, it assumes a size wherein the width and length are substantially the same. This provides the smallest configuration possible and thus allows the closet to be made as small as possible.

Preferably, the frame is mounted to the door panel on a swivel device which also allows the frame to be moved axially backwards and forwards with respect to the hinge axis. Thus the bed, when opened, may be shoved into the closet or wall opening further saving space.

A further feature of the present invention is the provision of means to resiliently hold the bed frame to the door, so that the frame will be lifted conjointly with the door and allow the door to be securely and properly closed.

Full details of the present invention are set forth in the following disclosure, and are shown in the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

In the drawing:

FIG. 1 is a side view of the folding bed of the present invention, in unfolded position perpendicular to the wall;

FIG. 2 is an enlarged view of the head or wall end of the bed of FIG. 1 in folded position;

FIG. 3 is a plan view of the bed shown in FIG. 2;

FIG. 4 is a perspective view of the door panel showing the mounting mechanism for the frame in enlarged detail; and

FIGS. 5a through 5d are perspective views showing several arrangements for opening and utilizing the bed of the present invention.

DESCRIPTION OF INVENTION

As seen in the Figures, the folding bed assembly comprises a frame generally depicted by the letter B which is secured to the door panel T, of a closet S. The door panel T is secured by horizontally directed hinge means T1 extending along the lower edge of the closet spaced from the floor. The hinge T1 may be a single piano hinge or multiple hinge members. To more clearly show the present invention, the drawings omit the coverings for the bed frame such as the springs. Also the mattress and other appurtenances for the bed are omitted from the drawings. The frame B is, however, so formed that it may be provided with a complete assembly of mattress, etc. when it is folded and stored in the closet, as is customary with such devices. Naturally, the mattress, must be correspondingly flexible and foldable. The closet may be in a wall, or free standing and the door may be the primary or secondary door of the wall or closet opening.

The frame B of the bed assembly comprises three sections 1, 2, and 3 which are linked together by hinge joints 4 and 5 or other suitable means, to pivotally articulate with respect to each other so as to be foldable in a direction transverse to its longitudinal axis. The hinges 4 and 5 are so arranged that the sections 1, 2 and 3 have dimensions which when the bed is folded, the folded assembly has a width substantially equal to that of its length, and a depth as small as possible. This square, box-like arrangement thus formed is seen clearly in FIG. 3.

The forward frame section 1 is provided with an upwardly directed end rail 11 which may serve as a foot board and with a downwardly directed leg iron 12 serving to support the end of the bed in horizontal position on the floor. The leg iron 12 may be U-shaped, and is pivotally secured to the frame section 1 so that it may be folded against the frame section when the bed is itself folded. The frame section 2 is also provided with an upwardly directed end rail 21 (similar to that of rail 11) which may serve as the head board. The head frame section 2 is also supported in a parallel plane to the door T by an annular supporting member 22 which lies flat against the face of the door. Extending connecting members 22a fixedly hold the frame section 2 spaced from the ring support 22. The center section 3 is provided with a fixed support 31.

As seen in FIG. 4 a cross-tie 23 is secured diametrically across the supporting ring 22. The ring 22 and cross tie 23 may be welded or otherwise securely fastened together. At the approximate center of the ring 22, the cross-tie is secured by means of a spacer washer

disk 24 with a circular swivel plate 25. The circular plate 25 is held in the bights of a pair of U-shaped parallel spaced rails 26 which are fixed to the inner surface of the door by suitable screws or bolts. In this manner the swivel plate is held movably spaced from the surface of the door and is reciprocable axial along the length of the rails 26 and is rotatable about its central axis. At the end of the rails 26, furthest from the hinge T1, there is provided a closing piece 27, having the same profile as the rails 26. The closing piece prevents the circular swivel plate 25 from being pulled out from between the rails. The closing piece may if desired be latched to the rails or door rather than being permanently fastened as rails 26, so that if desired the plate 25 may be selectively removed. An elongated U-shaped latch 28 fitting loosely over the ring 22 is pivotally secured to the door T at a point furthest from the hinge T1. The ring 22 is thus loosely held so it may be easily rotated. Lifting of the latch 28 permits the frame to be axially shifted.

The door panel T has at its upper end pivotal foot supports T2 which are dimensioned so that when the bed assembly is opened it maintains the door T in a substantially horizontal plane. When the bed is to be used, and frame B opened as seen in FIG. 1 a portion of its weight is supported by the front leg iron 12 while the remainder of the weight is absorbed by the door T through the ring support 22 which is pressed onto the inner surface of the door. The door T is itself supported at its rear end by the hinges T1 and at its forward end by the feet T2, thus giving the open frame great stability.

As noted earlier, the U-shaped rails 26 carrying the swivel plate 25 allows the bed frame to be moved in a direction axial to the rails while simultaneously being rotatable about the center of the plate. Thus the bed frame even in open position has a degree of adjustability. For example, in the arrangement where the bed frame is longitudinally extended perpendicular to the axis of the hinge T, the bed can be moved a distance "X" into the closet S as seen in dotted lines in FIG. 1.

FIGS. 5a to 5d show various dispositions possible with the folding bed of the present invention. In FIG. 5a the bed is shown with its longitudinal axis perpendicular to the hinge axis as in FIG. 1. The bed is collapsible and folded by lifting the foot end in the direction of the arrow. In FIG. 5b the bed is shown shoved into the closed S while in extended position, as was shown in the dotted lines of FIG. 1. In order to close the bed, the bed must first be pulled forward out of the closet as indicated by the arrows. In FIGS. 5c and 5d the beds are arranged with its longitudinal axis parallel to the hinge axis. This is particularly advantageous in small rooms or where space is a problem. The bed may be folded in this parallel position and stored in the closet since the folded dimension of the bed is square in any arrangement. The swivel plate 25 permits the bed to be swung either in closed or open condition.

The shifting of the swivel plate 25 between the rails 26 arises only when the bed is to be employed as seen in FIGS. 5a and 5b. The shiftability is a small problem when the door is swung upwardly to close the closet. The position of the bed has in this position the tendency to shift and fall into the closet before the door is completely closed. The pivotal latch 28, shown in FIGS. 2 and 4 prevents this from happening. Preferably the latch 28 is only opened when the bed is placed in

the position of FIG. 5b and remains engaged over the ring 22 at other times.

In order to securely locate the folded bed frame in its predetermined and correct position before the door is closed, suitable cooperating catches and detents may be provided. For example, a spring-ball catches or the like may be arranged in the surface of the door panel which would cooperate with recesses formed in the swivel plate 25 and in the supporting ring 22, and fix the bed frame assembly in its folded position properly so that the door can be easily and perfectly closed. The recesses may be located on the under side of the ring 22 and the swivel plate 25 and are therefore not visible in the drawings. However, in FIG. 4 the positions of the recesses in the ring 22 are shown by the arrows Y. The arrow Z points to one spring-ball catch located on the door and covered by the ring 22. In the same angular position recesses are formed in the swivel plate 25 and ball-catches secured on the surface of the door.

The legs T2 supporting the door T, may also be made to swivel so that they may be swung into a recess shown in FIG. 4 on closing of the door, leaving the facing surface of the door free. The bed frame may be easily folded as seen in FIGS. 2 and 3. The foot and head board rails 11 and 21 form an opposing wall to the frame section 3 when the frame is folded over so that a box-like form is provided which holds the mattress. The leg rail 12 folds downwardly into the frame as seen in FIG. 3.

It will be seen from the foregoing that the present invention allows a folding bed to be made which when folded can have for example a size of about 1 meter to 1.20 meter in width and length and between 40 - 50 centimeters in depth. Thus the storage closet can be made correspondingly small, resulting in considerable saving of space as well as costs in home building. Further, it will be obvious that considerable advantages accrue even when the bed is opened. The combined swivel and axially reciprocable mounting allows the bed to be shoved partially into the closet, utilizing what would otherwise be waste space, or allows the bed to be turned into a parallel position with the wall, an arrangement not possible with earlier known structures.

Various changes, modifications and embodiments have been suggested in the foregoing description, others will be obvious to those skilled in the art. It is intended therefore that the present disclosure be taken as illustrative only and not as limiting of the present invention.

What is claimed:

1. A folding bed adapted to be stored in a wall opening, comprising a bed frame having a plurality of sections, link means pivotally joining said sections together to be folded transversely to its longitudinal axis into a compact assembly having a width equal to its length, a panel hinged along a horizontal axis at said wall opening, and means for rotatably mounting one section of said frame to said panel to permit said frame to be swivelled about an axis perpendicular with respect to said panel allowing said bed to be opened with its longitudinal axis selectively perpendicular to and parallel to the horizontal hinge axis.

2. The bed according to claim 1 wherein the means for mounting said bed comprises a pair of parallel spaced U-shaped rails secured to the inner surface of said door panel, and a circular plate secured to said one section of said frame, said plate being arranged withint

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the bight of said rails whereby said plate is rotatable and axially movable with respect to the rails.

3. The bed according to claim 2 wherein said rails are arranged perpendicular to the hinge axis of said door.

4. The bed according to claim 2 wherein at least said one section of said frame is provided with supporting means adapted to engage the inner surface of said door panel when open.

5. The bed according to claim 4 wherein said supporting means comprises an annular member concentrically secured to said circular plate and secured along its circumference to said one frame section.

6. The bed according to claim 2 including arresting means for securing said plate against movement relative to said door.

7. The bed according to claim 5 including a movable latch secured to the inner surface of said door panel, said latch being engageable with said annular member to selectively secure said annular member against movement.

8. The bed according to claim 7 wherein said annular member is a ring and said latch a hook positionable over the ring.

9. The bed according to claim 1 wherein said door panel and said means for mounting said frame are provided with cooperating resilient catch and detent means for locating said frame in a predefined position on said door panel.

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