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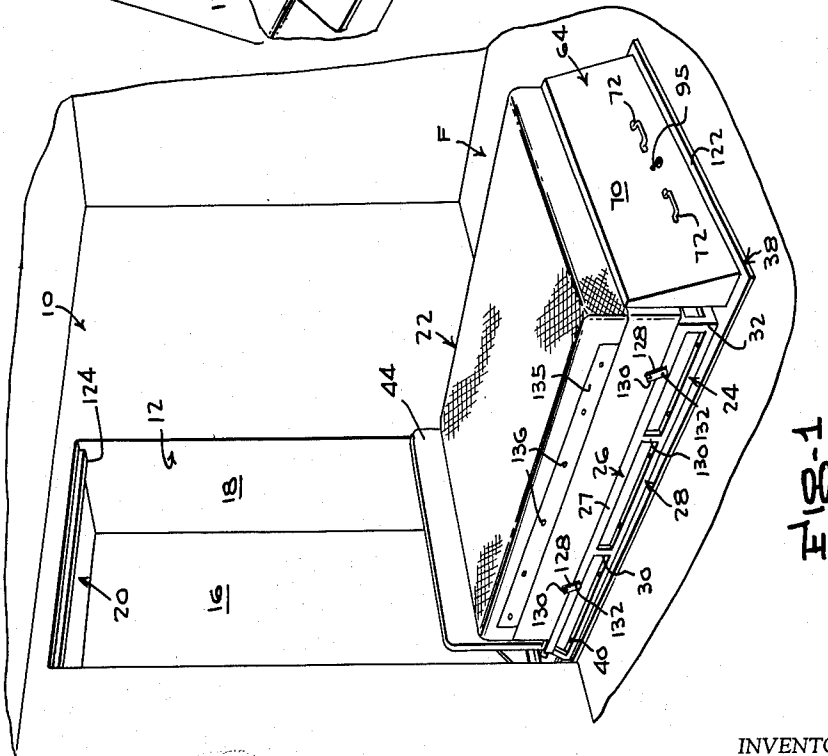
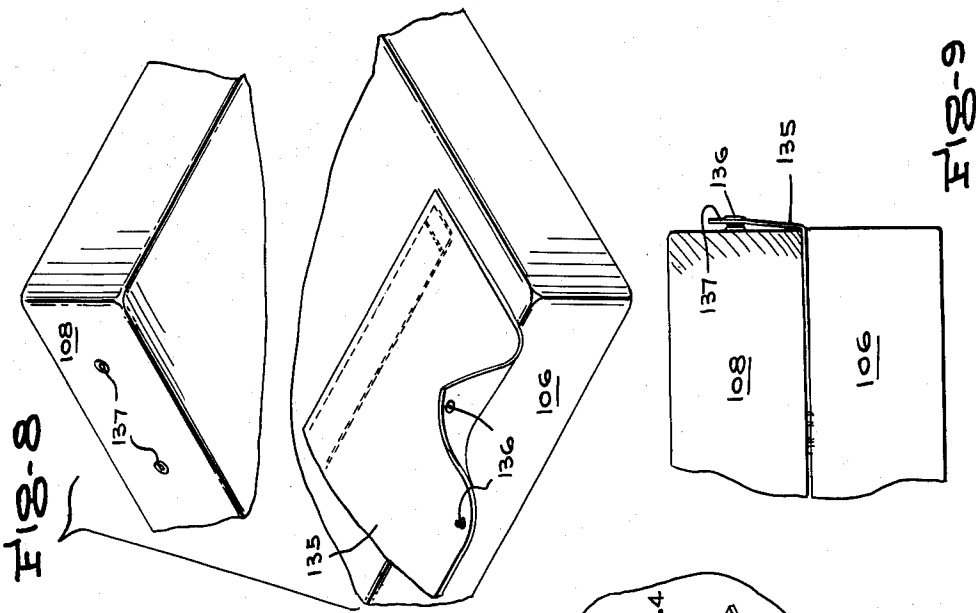
H. D. BENNETT ETAL

3,116,494

WALL BED STRUCTURE

Filed Jan. 26, 1962

3 Sheets-Sheet 1



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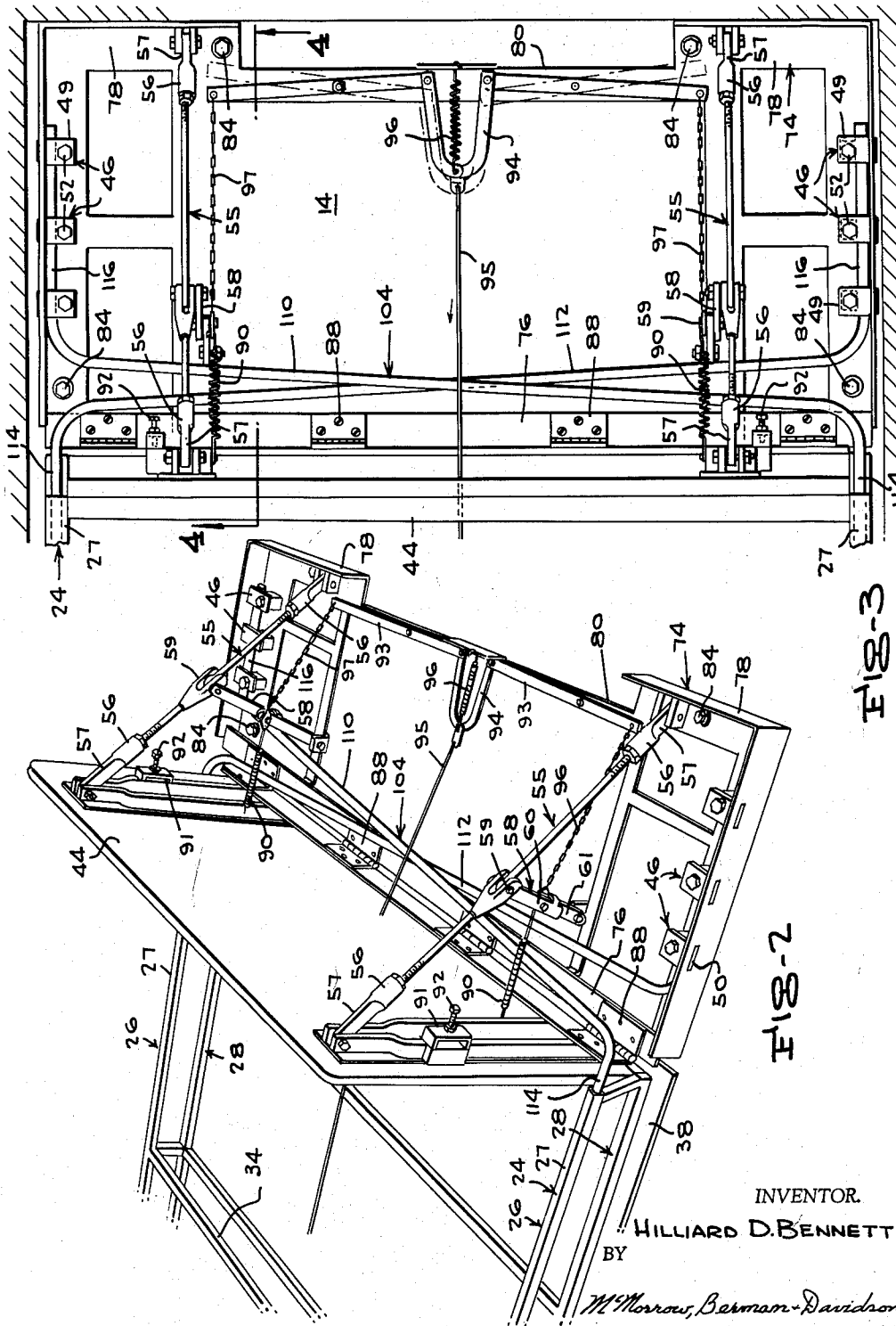
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3 Sheets-Sheet 2



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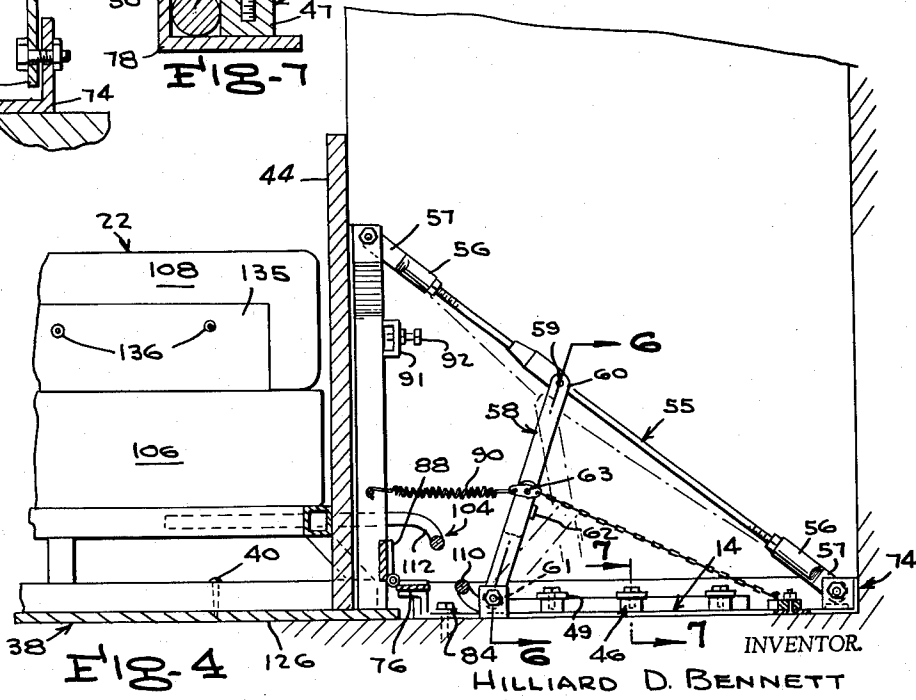
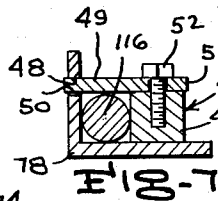
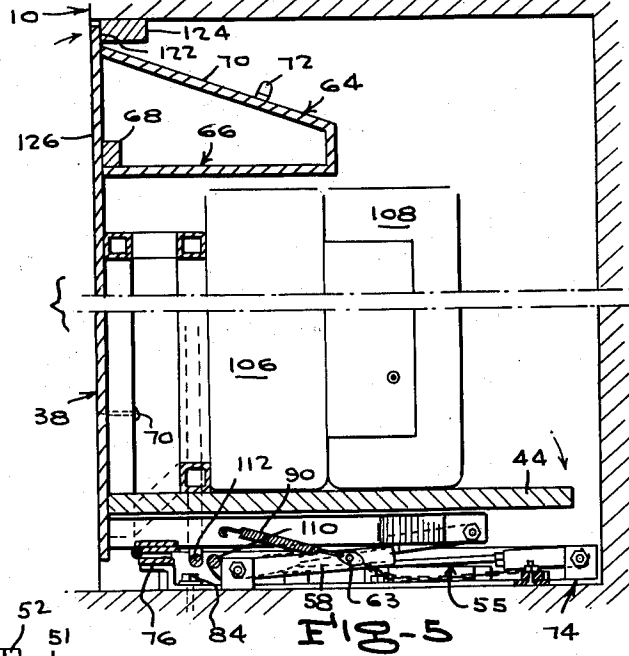
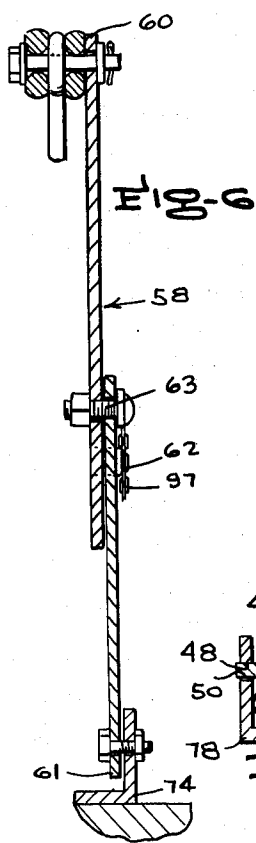
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WALL BED STRUCTURE

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3 Sheets-Sheet 3



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3,116,494

**WALL BED STRUCTURE**

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2 Claims. (Cl. 5—136)

This application is a continuation-in-part of application Serial No. 103,776, filed April 18, 1961, now abandoned, and relates to a wall bed structure.

The primary object of the invention is the provision of a generally improved wall bed structure which utilizes a regular box spring and mattress, and which is supported on a wall panel, which, when the bed is pivoted into the wall recess, matches and is flush with the rest of the wall, so that the presence of the bed structure is concealed, the bed structure being thereby suitable for installation in living areas wherein space is at a minimum, and/or wherein extra sleeping accommodations for occasional or regular use are required, which do not interfere with or detract from the decorative schemes of the areas, as in family dens or living rooms, hotel and motel rooms, dormitories, and trailers.

Another object of the invention is the provision of a wall bed structure wherein a torsion bar assembly is provided which enables the bed to be easily operated between storage and use positions, and wherein the bed, once started out of its wall recess, subsides gradually to its use position on the floor, whereby no substantial strength or skill is required, and exertions such as might be injurious to elderly or ill persons are eliminated.

A further object of the invention is the provision of a wall bed structure wherein a locking means is provided which is actuable upon execution of the movement of the bed to the use position to releasably hold the bed in fixed position upon the adjacent portion of the floor surface.

A still further object of the invention is the provision of a wall bed structure wherein a releasing means is operatively connected to the locking means for retaining the locking means in the position releasably holding the bed in the fixed position upon the adjacent portion of the floor surface and which releasing means is releasable at the will of the user of the bed.

A still further object of the invention is to provide a wall bed structure which utilizes a bed assembly including a box spring and a mattress superimposed upon and fixed to a bed frame, the mattress and box spring being detachably secured together by cooperating releasable attaching means on the spring and mattress and of a construction such as to permit the tucking of a sheet between the complementary side edges of the spring and mattress when said cooperating means are in attaching relation and the bed assembly is in use position, and permit re-positioning or replacement of the mattress when said cooperating means are in detached relation and the bed assembly is in use position.

A still further object of the invention is the provision of a bed structure of the character indicated above which is simple in construction and is composed of a small number of simple and easily assembled parts, and which is devised to be manufactured in rugged, serviceable, and well-finished forms at substantially lower cost than present wall beds.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a perspective view of a room showing the wall bed structure of the present invention installed

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for movement into a wall recess, the bed assembly being shown in the position of use;

FIGURE 2 is an enlarged fragmentary perspective view of the head portion of the bed assembly of FIGURE 1, with the box spring and mattress removed and illustrating the bed frame in use position and the association therewith of the torsion bar assembly, the locking means, and the releasing means;

FIGURE 3 is an enlarged plan view of the structure of FIGURE 2;

FIGURE 4 is a sectional view taken along the line 4—4 of FIGURE 3;

FIGURE 5 is a view of the structure of FIGURE 4, with parts broken away, but showing the bed assembly moved to the storage position;

FIGURE 6 is a sectional view taken along the line 6—6 of FIGURE 4;

FIGURE 7 is a sectional view taken along the line 7—7 of FIGURE 4;

FIGURE 8 is a partial exploded view of the box spring and mattress and illustrating the cooperating releasable attaching means on the spring and mattress; and

FIGURE 9 is a fragmentary view of the mattress and box spring illustrating the attachment of the mattress to the box spring.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated bed structure comprises a wall 10 of a living area, the wall being formed with a vertically-elongated rectangular recess 12, which includes a portion 14 of the room floor F as a bottom wall, has a perpendicular back wall 16, parallel perpendicular side walls 18, and a horizontal top wall 20. As shown in FIGURE 1, the recess 12 extends from the floor F to a point spaced above the floor F and is of an area to receive a bed assembly when in an upstanding position. Arranged in a position of use is a non-folding bed assembly designated by the numeral 22, the assembly being disposed, FIGURE 1, so as to extend along the floor F with the head 44 contiguous to and in alignment with the recess 12 and the foot 64 spaced longitudinally outwardly of and in alignment with the recess 12.

The bed assembly 22 comprises a bed frame 24, which is composed of upper and lower frame members 26 and 28, respectively, which are preferably made of square tubing, and are spaced and connected together by means of longitudinally-spaced intermediate vertical elements 30 and outer vertical corner elements 32. In any construction of the frame 24, the same is to be strong enough and rigid enough to resist all stresses and strains, including twisting, to be expected in its use and operation. A crossbar 34 extends between and is fixed to the side members 27 of the upper frame member 26, midway between its ends.

The lower frame member 28 reaches longitudinally inwardly beyond the upper frame member 26, as shown in FIGURES 4 and 5, and a wall panel 38 which reaches outwardly beyond the outer end of the frame 24, underlies and is fixed to the underside of the lower frame member 28, as by means of screws 40.

The head 44 in the form of a headboard is fixed to the inner end of the bed frame 24.

At a location longitudinally outwardly of the outer end of the bed frame 24, the foot or footboard 64 is fixed upon the wall panel 38. The footboard 64 preferably comprises a perpendicular wall 66 which is fixed to and rises from the upper surface of the wall panel, to a level above the frame 24. The well 66 is preferably corner-blocked relative to the wall panel, as indicated at 68, and an outwardly-declining finish panel 70 is secured to and extends downwardly from the upper end of the wall

66 and is suitably secured, at its lower end to the wall panel 38. Transversely-spaced operating handles 72 are suitably fixed to the outer surface of the finish panel 70.

The bed frame 24 is transversely pivoted, at its inner end, to the outer end of an anchor frame 74, located on the floor portion 14 within the wall recess 12, and constituting the means connecting the head 44 of the bed assembly 22 to the anchor frame 74 for movement of the assembly between the use position and an upstanding position of storage within the recess, as shown in FIGURE 5. The anchor frame 74, as shown in FIGURE 2, includes an elongated side member 76 which extends along the inner end of the bed frame 24, a tray-like end member 78 projecting transversely from each end of the side member 76, and a connecting member 80 extending between and having its ends secured to the end members 78. To the side member 76 of the anchor frame 74 is pivoted, as by hinges 88, the inner end of the bed frame 24. The anchor frame 74 is fixed to the floor portion 14 by means of screws 84 extending through the end members 78 and threaded into the floor portion 14.

A torsion bar assembly, generally designated 104, is provided for controlling and assisting in the movement of the bed assembly 22 between the use position and the upstanding position of storage within the recess 12, the torsion bar assembly being so constructed as to be under maximum load condition when the bed assembly is in the use position, and under minimum load condition when the bed assembly 22 is in the storage position. The torsion bar assembly 104 comprises a pair of straight bars 110 and 112 arranged so as to extend in criss-cross relation with the adjacent ends secured to the complementary ends of the anchor frame 74 and the bed frame head 44.

As shown in FIGURE 3, the torsion bar 110 terminates, at its ends, in oppositely-directed arms 114 and 116, which are initially disposed at right angles thereto. The arm 114 is stressed and is extended into the related side member 27 of the upper bed frame member 26, and the arm 116 is stressed and extends along the adjacent end member 78 and is suitably fixed upon the end member 78 of the anchor frame 74 by means of a plurality of spaced clamp means 46. Each clamp means 46 comprises, FIGURE 7, a fixed block 47 rising from the adjacent end member 78, and overlying and abutting against the arm 116 is a bar 49 which has one end 48 supported in a slot 50 provided in the end member 78 and has the other end portion 51 bearing upon and secured to the block 47 by means of a bolt 52.

The torsion bar 112 underlies the torsion bar 110, and has its arm 114 extended into the related side member 27 of the upper bed frame member 26. The arm 116 of the torsion bar 112 extends along the adjacent end member 78 and is fixed upon the end member 78 of the anchor frame 74. As shown in FIGURES 4 and 5, in the use position of the bed 22, the arms of the torsion bars 110 and 112 are in spaced parallel horizontal positions and the torsion bars are under maximum torsional stress; and in the storage position of the bed, the arms of the two torsion bars are at right angles to each other and the torsion bars are under minimum torsion stress. Since the intersection of the torsion bars is located inwardly of the axes of the hinges 88, the stressed condition of the torsion bars, in the storage position of the bed 22, serves to hold or counterbalance the bed 22, including the box spring 106 and the mattress 108, in erect position within the recess 12 and to overbalance the same slightly in an inward direction, so that the outer end 122 of the panel 38 is forcibly engaged with a transverse stop bar 124, which is suitably fixed to the underside of the top wall 20 of the recess 12, inwardly of the wall 10, so that the wall panel 38, secured to the underside of the bed frame 24, is disposed with its then outer surface 126 flush with the outer surface of the wall, as shown in FIGURE 5, and closes the opening of the recess, in a manner to

constitute a practically indistinguishable part of the wall 10.

Locking means is provided which is operatively connected to the anchor frame 74 and the head 44 of the bed assembly 22 and which is actuatable upon execution of the movement of the bed assembly to the use position, said locking means serving to releasably hold the bed assembly 22 in fixed position upon the adjacent portion of the floor surface F. Specifically, this locking means comprises a pair of articulated rod members 55 which have their ends pivotally connected to the head 44 of the bed frame 24 and the anchor frame 74. Each of the ends of each rod member 55 is provided with a sleeve 56 adjustably connected to the adjacent end of the rod member with the free end of the sleeve 56 provided with a flattened stem 57 which permits pivotal connection to the adjacent head 44 or anchor frame 74. An articulated arm 58 has one end pivotally connected to the joint 59 of each of the rod members 55 and has the other end pivotally connected to the anchor frame 74. It is to be noted that the part of the arm 58 having the end 60 is longer than the part of the arm 58 having the end 61, and disposed transversely of the first-named part and fixedly secured in a block 62 serving as a stop, the block being located adjacent to and below the joint 63 of the arm 58. This stop or block serves to retain the arm 58 in the extended position, but permits the two parts of the arm 58 to pivot about the joint 63 in a direction away from the head 44. Spring means in the form of a coil spring 90 is operatively connected to each of the arms 58 and the head 44 of the bed frame 24 for retaining the arm 58 in its extended position.

The head or headboard 44 is provided with floor-levelling means for adjusting the bed when in the storage position to the level of the floor portion 14 of the floor to thereby permit the panel 38 to snugly fit the recess 12. This means comprises a U-shaped member 91 located on the under face of the head 44 inwardly of and adjacent each end and having the legs fixedly secured to the head with the bight parallel to the head, and a floor-engaging element 92 threadably supported in the bight.

The bed assembly 22 is also provided with a releasing means which is operatively connected to the anchor frame and the locking means and which is operable at the will of the user of the bed assembly to shift the locking means out of the position releasably holding the bed assembly in the fixed position upon the floor F. Such means comprises a pair of bars 93 arranged in confronting end-to-end spaced relation, and a connecting member 94 interposed between and pivotally connected to the confronting end of the bars 93, the connecting member 94 being connected to a cable 95, whose free end extends through the footboard 64 and may be grasped by the user of the bed assembly to actuate the releasing means. Spring means in the form of a coil spring 96 is operatively connected to the connecting member 94 and the anchor frame 74, the spring 96 serving to urge the connecting member 94 away from the head 44. A flexible member or chain 97 connects the non-confronting end of each bar 93 to the joint 63 of the adjacent articulated arm 58.

The box spring 106 and mattress 108 are provided with cooperating releasable attaching means which extend along each of the complementary sides of the spring and mattress and which is of a construction such as to permit tucking of a sheet between the complementary side edges of the box spring and mattress when the cooperating means are in attaching relation and the bed assembly is in use position. This cooperating means comprises a flexible tab 135 which extends along and inwardly of and spaced from each of the sides of the box spring and which has one side edge secured to the top of the box spring and which has a plurality of male fasteners 136 extending in spaced relation along the opposite side edges of the tab 135. Extending in spaced relation along each of the sides of the mattress are a plurality of female fasteners

137. The thus described cooperating attaching means permits re-positioning or replacement of the mattress when the cooperating means are in detached relation and the bed assembly is in use position.

In operation, the bed 22 being in storage position in the recess 12, the bed is manually started out of the recess, a ratch (not shown) or other suitable finger-hold means being provided for the purpose on an edge of the panel, until the weight of the bed 22 overcomes the stress of the torsion bar assembly 104, whereat the weight of the bed takes over and lets the bed 22 swing slowly and gently down to a use position upon the room floor F. This action can be restrained or accelerated by grasping the footboard handle 72. As soon as the bed 22 has executed its movement to the use position the locking means acts to releasably hold the bed in fixed position upon the adjacent portion of the floor F, and to retain it in such position until the user is desirous of restoring it to the storage position.

For moving the bed 22 from use position to storage position in the recess 12, the free end of the cable 95 is grasped and pulled outwardly, resulting in the shifting of the locking means out of the position releasably holding the bed in fixed position. The handles 72 are then grasped and the bed started upwardly by a gentle upward pull thereon, to a point whereat the panel 38 can be pushed toward the recess 12 until the counter-balance assembly 104 and the weight of the bed take over and close the panel into place in the recess, the action being such that risk of slamming the panel into place is minimal.

The bed spring 106 is preferably lightly secured to the bed frame 24, as by means of straps 128 secured, as indicated at 130 and 132, to the outer sides of the bed spring 106 and side members of the upper bed frame member 26.

What is claimed is:

1. In combination, a floor, a wall rising from said floor, there being a recess formed in said wall and extending from the floor to a point spaced above said floor, said recess being of an area to receive a bed assembly when in upstanding position, a bed assembly arranged in a position of use disposed so as to extend along the floor with the head contiguous to and in alignment with the recess and the foot spaced longitudinally outwardly of and in alignment with the recess, an anchor frame lying upon and fixed to the portion of the floor within the recess, said bed assembly including a bed frame, and a wall panel underlying and fixedly carried by said bed frame and conformably shaped and constructed to concealingly close the recess when the bed assembly is in storage position within the recess, a torsion bar assembly connected to the head of said bed frame and to the anchor frame controlling and assisting the movement of said bed assembly between the use position and the upstanding position of storage within the recess, said torsion bar assembly comprising a pair of straight bars, each bar having arms at its ends extending at right angles thereto and in opposite directions, said bars being disposed so as to extend in criss-cross relation and having the adjacent arms secured to the complementary ends of said anchor frame and said bed frame head, and a locking means operatively connected to said anchor frame and the head of said bed assembly and actuable upon execution of the movement of said bed assembly to the use position to releasably hold said bed assembly in fixed position upon the adjacent portion of the floor, said locking means comprising a pair of articulated rod members having the ends pivotally connected to the head of the bed frame and anchor frame respectively, an articulated arm having one end pivotally connected to the joint of each of said rod members and having the other end pivotally connected to said anchor frame, and spring means operatively connected to each of said arms and the head of said bed frame for retaining the arms in their extended positions, a releasing means operatively connected to said anchor frame and to said locking means for shifting the locking means out of the position releasably holding the bed assembly in the fixed position, and hand-actuable means operatively connected to said locking means for releasing said locking means, said releasing means comprising a pair of bars arranged in confronting end-to-end relation, a connecting member interposed between and pivotally connected to the confronting ends of said bars, a flexible cable connecting the non-confronting end of each bar to the joint of the adjacent articulated arm, and hand-actuable means embodying a cable operatively connected to said connecting member.

2. In combination, a floor, a wall rising from said floor, there being a recess formed in said wall and extending from the floor to a point spaced above said floor, said recess being of an area to receive a bed assembly when in upstanding position, a bed assembly arranged in a position of use disposed so as to extend along the floor with the head contiguous to and in alignment with the recess and the foot spaced longitudinally outwardly of and in alignment with the recess, an anchor frame lying upon and fixed to the portion of the floor within the recess, said bed assembly including a bed frame and a wall panel underlying and fixedly carried by said bed frame and conformably shaped and constructed to concealingly close the recess when the bed assembly is in storage position within the recess, a torsion bar assembly connected to the head of said bed frame and to the anchor frame controlling and assisting the movement of said bed assembly between the use position and the upstanding position of storage within the recess, said torsion bar assembly comprising a pair of straight bars, each bar having arms at its ends extending at right angles thereto and in opposite directions, said bars being disposed so as to extend in criss-cross relation and having the adjacent arms secured to the complementary ends of said anchor frame and said bed frame head, a locking means operatively connected to said anchor frame and the head of said bed assembly and actuable upon execution of the movement of said bed assembly to the use position to releasably hold said bed assembly in fixed position upon the adjacent portion of the floor, said locking means comprising a pair of articulated rod members having the ends pivotally connected to the head of the bed frame and anchor frame respectively, an articulated arm having one end pivotally connected to the joint of each of said rod members and having the other end pivotally connected to said anchor frame, and spring means operatively connected to each of said arms and the head of said bed frame for retaining the arms in their extended positions, a releasing means operatively connected to said anchor frame and to said locking means for shifting the locking means out of the position releasably holding the bed assembly in the fixed position, and hand-actuable means operatively connected to said locking means for releasing said locking means, said releasing means comprising a pair of bars arranged in confronting end-to-end relation, a connecting member interposed between and pivotally connected to the confronting ends of said bars, a flexible cable connecting the non-confronting end of each bar to the joint of the adjacent articulated arm, and hand-actuable means embodying a cable operatively connected to said connecting member.

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