April 19, 1938. M. THUM 2,114,581

WALL BED

Filed Dec. 10, 1935 3 Sheets-Sheet 1

Fig. 1.

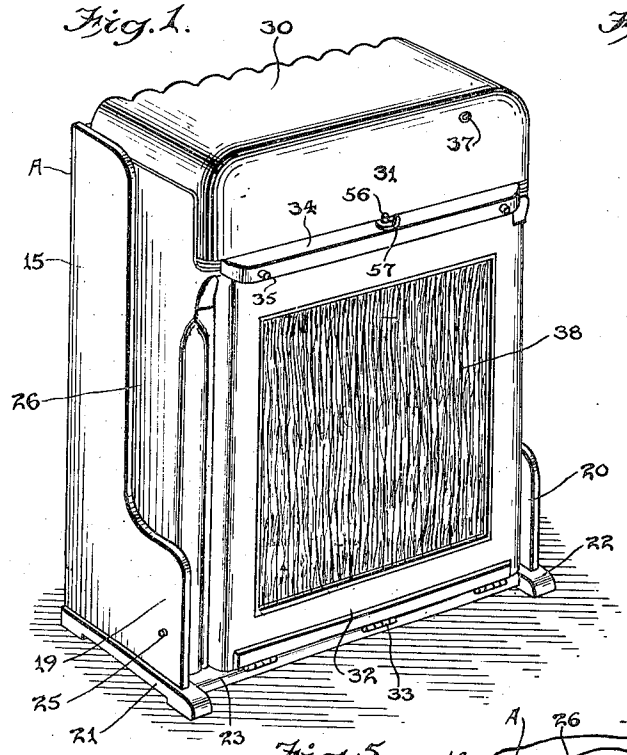


Fig. 2.

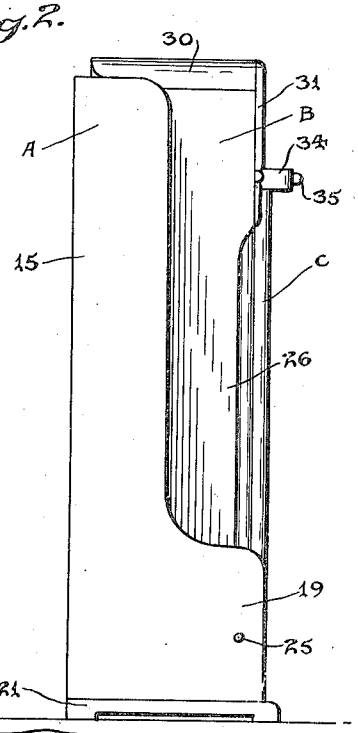


Fig. 5.

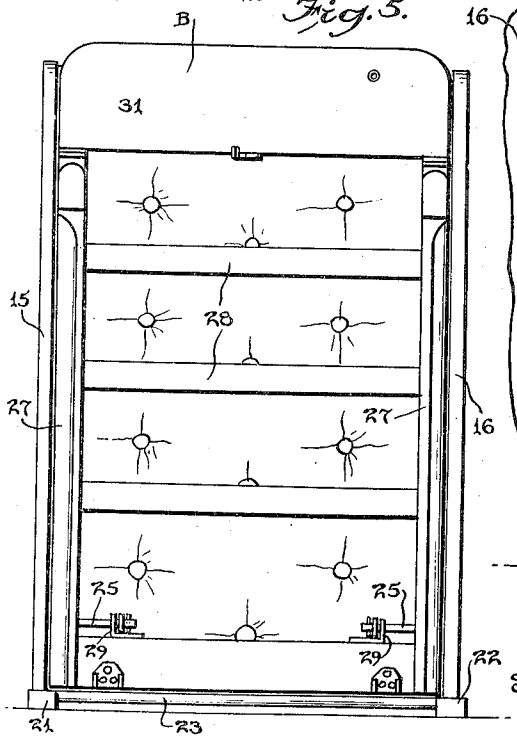
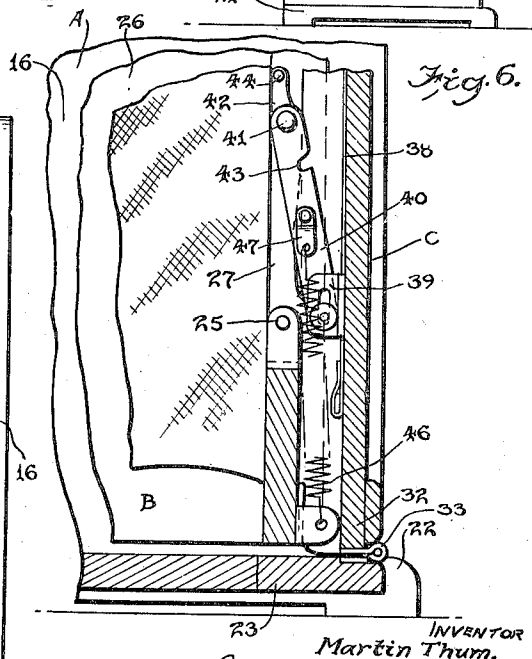


Fig. 6.



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April 19, 1938. M. THUM 2,114,581

WALL BED

Filed Dec. 10, 1935 3 Sheets-Sheet 2

Fig. 3.

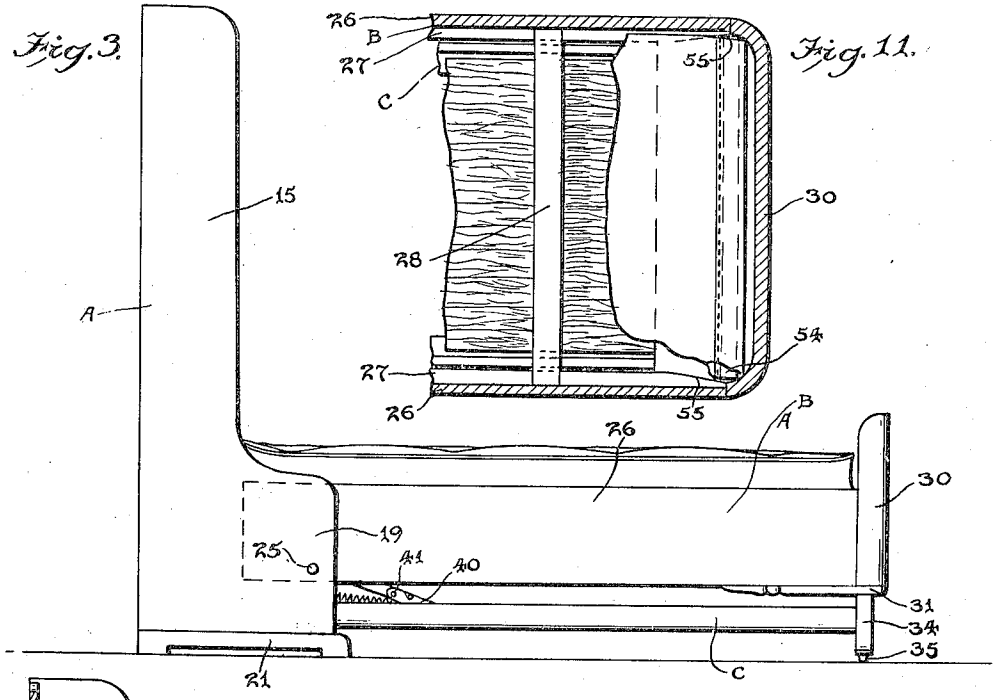


Fig. 11.

Fig. 4.

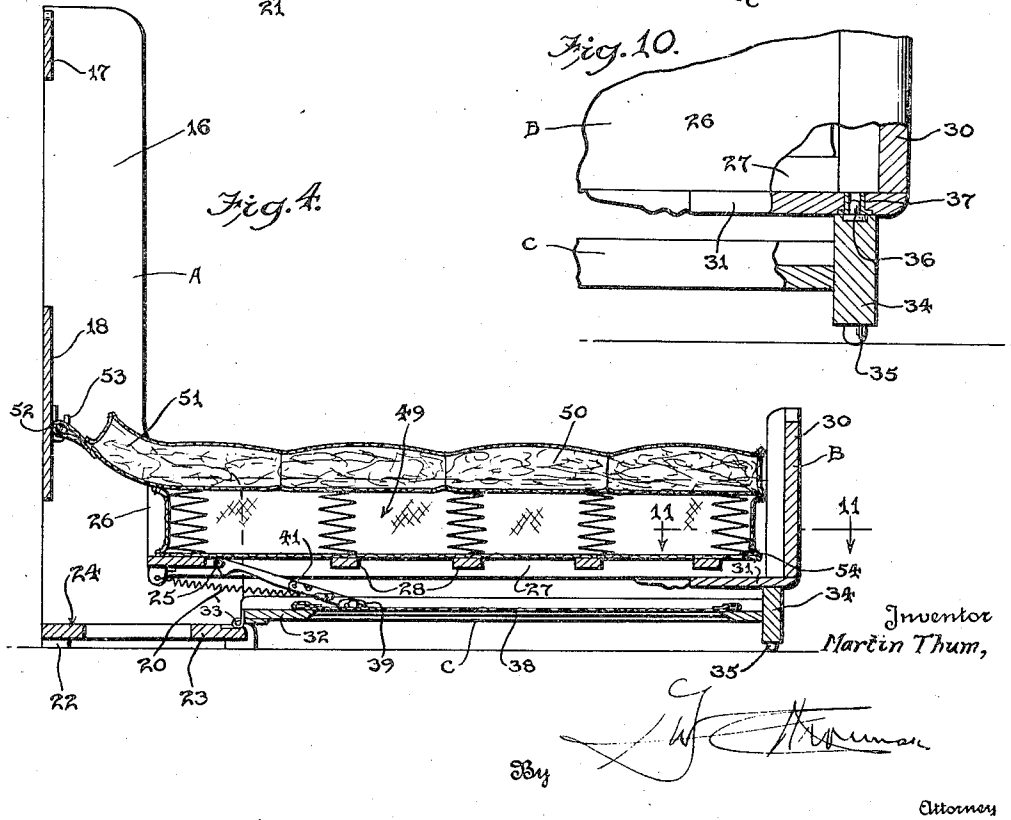


Fig. 10.

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WALL BED

Filed Dec. 10, 1935 3 Sheets-Sheet 3

Fig. 7.

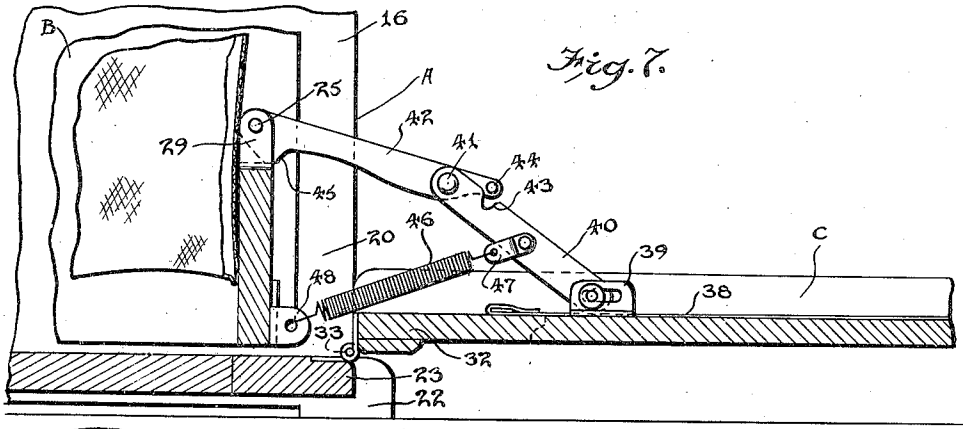


Fig. 8.

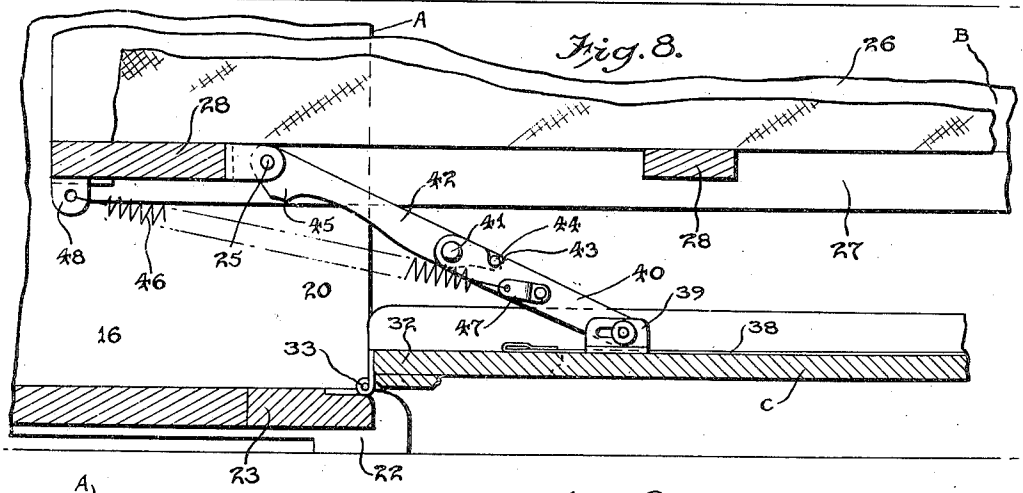
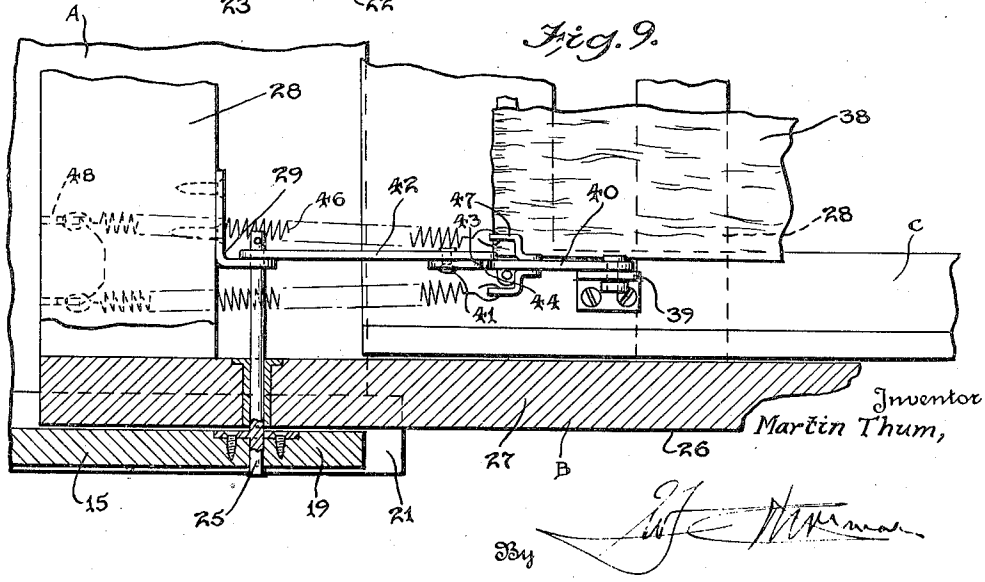


Fig. 9.



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UNITED STATES PATENT OFFICE

2,114,581

WALL BED

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Application December 10, 1935, Serial No. 53,819

15 Claims. (Cl. 5—136)

The present invention relates to what is commonly known as wall beds, being that type of bed structure in which the bed frame, between periods of use, is swung upwardly to vertical position within a standard or supporting frame, the latter standing in an upright position at all times.

It is a well known disadvantage in the above type of beds that they are commonly so weighty as to defeat ready transfer from place to place in a house or apartment and so heavy with counterweights and other features as to make transportation a difficult and costly matter.

The present invention has for its primary purpose the provision of a bed structure of the above general type which eliminates the use of counterweights and in fact all weighty connections and in which the parts mutually contribute to their necessary bracing and interconnection so that the structure as a whole may be transported without excessive cost, may be moved with considerable ease and freedom from place to place in a room, and may be so moved without strain upon the connected parts in either the open or closed positions.

These and other objects of the present invention will be better understood and more thoroughly appreciated from the following description in detail of the best mode so far devised for carrying the invention into practical effect, reference being made to the accompanying drawings, which form a part of this specification, and wherein,

Figure 1 is a perspective view of the complete bed, the parts being in closed position.

Figure 2 is a side elevation thereof.

Figure 3 is a side elevation with the parts in open position.

Figure 4 is a central vertical longitudinal sectional view of the parts in the open position.

Figure 5 is a front elevation of the bed with the base frame removed.

Figure 6 is an enlarged fragmentary vertical section through the parts in closed position, adjacent to one of the link braces.

Figure 7 is a similar view, the base frame being lowered to open position.

Figure 8 is another similar view with the bed bottom or mattress frame lowered to open position.

Figure 9 is an enlarged fragmentary horizontal section showing, in plan, the parts of Figures 6 to 8 inclusive.

Figure 10 is a fragmentary side view of portions of the bed bottom and base frame in the open positions, certain parts being broken away and in section, and

Figure 11 is a detail horizontal section through the forward portion of the bed frame on line 11—11 of Figure 4.

Referring now to these figures, and as particularly seen by a comparison of Figures 1 and 3, my improved wall bed consists essentially of a bed standard or supporting back frame A, a bed bottom or mattress frame B and a base or cover frame C of which, in the use of the apparatus, it is necessary to first lower the base or cover frame, since in the upright closed position of the parts, it is this latter frame which prevents lowering of the bed bottom or mattress frame. Hence, as long as the base or cover frame is latched in the upright or closed position, the wall bed as a whole may be readily moved from place to place in a room or wherever it is in use.

Furthermore, when, after lowering of the base or cover frame, lowering of the bed bottom or mattress frame is initiated, means are provided by which a rigid brace is formed between the then horizontal cover frame C and the upright supporting frame A which thereafter, and until the bed bottom B is again raised to vertical position, acts as an effective brace to prevent any forwardly tilting tendency of the supporting frame, especially during the further downward swinging movement of the bed bottom. With such bracing means, it is preferable to utilize counterbalancing springs in order to make for easy raising and lowering of the bed bottom. Moreover, when the bed bottom is completely lowered to horizontal position, means are provided which act to relatively engage as between the bed bottom and the cover frame, upon which in this position the bed bottom rests so that these parts will be relatively immovable in a horizontal direction and, considering that the cover frame is, in this position, rigidly braced to the supporting frame, it is obvious the entire structure may be shifted in this, the open position of the parts without any danger of displacement angularly relative to one another and without strain upon any of the parts.

In furtherance of the foregoing, it will be seen by reference to Figures 1 to 4, inclusive, that the supporting frame or bed standard A has upright side members 15 and 16 whose upper portions are rigidly spaced and connected by upper and intermediate cross rails 17 and 18 extending horizontally between the rear edges of the sides 15 and 16. The lower portions of the sides 15 and 16 are enlarged by forwardly extending portions 19 and 20, respectively, and the lower edges of these enlarged portions are securely fastened in con-

nection with the side rails 21 and 22 of a lower platform or base which also includes front and rear cross rails 23 and 24 extending horizontally between and rigidly connecting the side rails 21 and 22, as best seen in Figure 4.

Through the forwardly extended lower portions 19 and 20 of the sides of the supporting frame A are mounted the outer ends of a pair of axially aligned pivot bars 25, which pass inwardly of the supporting frame for the purpose of hinging the vertically swinging bed frame B.

The bed frame B has upright sides 26, and these sides are provided with thickened portions 27 along the lower edges thereof to form inner longitudinal shoulders which, with the cross slats 28 set at their ends into portions 27, form the supporting surface for the spring mattress to be hereinafter described. It is through these portions 27 adjacent to the rear ends of the frame sides that the pivot or hinge bars 25 extend as will be seen in Figure 9 wherein it will be noted the inner ends of the bars further project through the outstanding portions of angular brackets 29 secured to the inner forward edge of the rearmost cross slat 28.

At the forward end of the sides 26, the bed frame has an end board 30 and, adjoining this end board, has a bottom board 31 covering the bottom of the frame and forming, with the sides 25 and 26 and the end board 30, a box at the outer end of the frame and around that portion of the bottom of the frame which is exposed to view when the parts are in the closed position of Figure 1.

Referring now to Figures 4 and 7 to 9, inclusive, it will be seen that the base or cover frame C is of rectangular shape and is hinged at its inner cross member 32 by hinges 33 to the forward cross rail 23 of the standard base so that in the upright closed position of the parts, this frame stands upright between the lower edges of the bed frame sides 25 and 26, with its outer cross member 34 fitting under the inner edge of the bottom board 31 of the bed frame. Thus, since the hinges 33 of this base frame are substantially below the pivot bars 25, any lowering movement of the bed frame B on the pivot bars 25 will be prevented until the base frame C has been lowered on its hinges 33.

The outer cross member of base frame C carries a foot rail 34 having depending feet 35 to rest upon the floor and having upstanding studs 36 which, when the bed frame B is lowered, extend into sockets 37 in the forward portion of the bottom board 31 and thus securely hold the bed frame and base frame against relative horizontal movements in the open position as seen in Figures 4 and 10.

It will also be observed from Figures 7 to 9, inclusive, that adjacent to its opposite sides and near its inner hinged end, the base frame C, which may be covered by any suitable flexible or ornamental panel 38 to in turn cover the slatted portion of the bottom of the bed frame B in the closed position (Figure 1), has slotted brackets 39 in the slots of which the outer ends of a pair of links 40 are movable. Each of these links is pivotally connected at its opposite end at 41 to a link 42 and provided adjacent to its pivot with an upwardly opening recess 43. The pivot 41 is between the ends of link 42, and this link has at its forward end an angular extension 44 which enters the recess 43 when the links 40 and 42 are in line forming a rigid brace between the base frame C in its lowered position and the standard or supporting frame A to the pivot bars 25 of which the opposite end of link 42 is swingingly connected. Adjacent to its latter end, each link 42 has an enlarged portion 45 which, when the bed frame B is raised to vertical position, is engaged by the forward edge of the bracket 29 to thus elevate link 42 sufficiently to move extension 44 upwardly out of recess 43, breaking the alignment of the links from the braced position shown in Figure 8 to the position shown in Figure 7 whereupon the base or cover frame C may be raised to closed position as shown in Figure 6, the links 40 and 42 folding upon one another between the two frames.

To the links 40 of the base frame, the forward ends of springs 46 are anchored by shackles 47, the rear ends of these springs being connected to brackets 48 secured to the rear edge of the rearmost bed bottom slat 28 so that the springs act to counterbalance the weight of the bed frame in raising and lowering the latter. It is also obvious that when the base or cover frame C has been lowered to open position, initial movement of the bed frame in its downward swinging movement acts, through the springs 46, to pull the links 40 and 42 into effective alignment as will be seen by a comparison of Figures 7 and 8 so that thereafter, and until the bed frame is again raised to the vertical position, the links form effective bracers between the supporting frame A and the base or cover frame C.

Since in the open position the bed frame B cannot by reason of connections 36, 37 shift with respect to the base frame C and in this position the links 40 and 42 form a rigid brace, the wall bed as a whole may be shifted along the floor or other support without strain, and since the rigid brace between the standard A and the lowered base frame C through the said links is completed as soon as downward movement of the bed frame B is started, it is obvious that in the further downward movement of the bed frame onto the lowered cover frame C, the standard or supporting frame A will be rigidly braced against any tendency to fall or overturn forwardly with the weight of the bed frame. This permits of dispensing with heavy unwieldy counterweights ordinarily employed for this purpose.

The mattress within the bed frame B, according to the invention, as plainly seen in Figure 4, preferably comprises a lower covered spring section 49 of a length to extend only the length of the bed frame, and an upper relatively thin padded section 50 extended at its rear end 51 substantially beyond the rear end of the spring section to extend across the space between the rear end of the bed frame in lowered position and the intermediate cross rail or back board 18 of the supporting frame A. The extension 51 carries a terminal cross bar 52 which seats in spring hooks 53 attached to the forward or inner face of the back board 18 to thus support the mattress extension 51 in such manner that the mattress may be removed when desirable, and so the extension 51 may fold with respect to the rear end of the mattress when the bed frame is shifted to vertical position.

To prevent the mattress from slipping rearwardly and downwardly as the bed frame is raised, the forward lower edge of the spring section 49 carries a cross rail 54 which seats at its ends against the cut away forward ends 55 of the lower portions 27 of the sides of the bed frame to thus hold the mattress and at the same time permit of its bodily removal when desired.

Thus in the manner fully outlined, the invention provides an arrangement well adapted to the carrying out of the objects first above stated, as well as a wall bed which may be easily manipulated between opened and closed positions, which will present a sightly appearance in either position, which promotes comfort and convenience, and which avoids all weighty controls and accessories commonly necessary with beds of this character.

It is furthermore plain that when the two movable sections B and C are raised into the standard or supporting frame A, virtually a complete cabinet is formed and all bedding is completely covered and hidden from view.

The end rail **34** of the base or cover frame preferably has an outstanding pin **56** which projects upwardly in the closed position for engagement by a swinging latch **57** carried by the inner edge of the bottom board **31** of the bed frame to thus lock the base frame against accidental lowering movement.

It is to be observed that the bracing means, including the links or arms **40**, **42**, are pivotally connected at one end upon the aligned pivot bars **25** which form the hinge between the bed frame and the supporting frame and thus the slots of brackets **39** give the brace links **40**, **42** at opposite sides of the apparatus some measure of independent play and permit some measure of independent adjustability of the base frame relative to the supporting frame, so as to accommodate the same very readily to any slight inequalities in a supporting surface upon which the apparatus stands. For instance, one side of the apparatus may rest on the floor and the other side on a rug or floor mat and, since such instances cannot well be avoided in practical use, it is important that they be provided for.

What is claimed is:

1. In a wall bed, an upright supporting frame, an upwardly folding bed frame hingedly connected to the supporting frame to swing upwardly into the same, a base frame also hingedly connected to the supporting frame to swing upwardly and in vertical position covering a major portion of the bottom of the bed frame, and means controlled by the bed frame rigidly bracing the base frame and supporting frame in rightangular relationship when the former is in horizontal position, said means being in effective position during the major portion of the raising and lowering movements of the bed frame to and from the supporting frame.

2. In a wall bed, an upright supporting frame, an upwardly folding bed frame hingedly connected to the supporting frame to swing upwardly into the same, a base frame also hingedly connected to the supporting frame to swing upwardly and in vertical position covering a major portion of the bottom of the bed frame, means rigidly bracing the base frame and supporting frame in rightangular relationship when the former is in horizontal position, and during the major portions of the raising and lowering movements of the bed frame to and from the supporting frame, cooperating means carried by the bed frame and bracing means for shifting the latter to inactive position when the bed frame is in upright position within the supporting frame, and springs extending between said bracing means and portions of the bed frame for shifting said bracing means into active position upon initial downward swinging movement of the bed frame and for counterbalancing the bed frame in its upwardly and downwardly swinging movements.

3. In a wall bed, an upright supporting frame having a rear cross member, a bed frame hinged at one end in connection with the supporting frame and foldable vertically into the said frame, a mattress disposed within the bed frame and having a foldable extension projecting beyond the hinged end of said frame and normally in detachable engagement with the rear cross member of the supporting frame, supporting rails for said mattress carried within the bed frame and cut away at their ends adjacent the outer end of the bed frame to form between said cutaway ends and the outer end of the bed frame side pockets, and a cross bar carried by the outer end of the mattress, the ends of which are free to drop into the said pockets to hold the mattress against sliding movement when the bed frame is shifted into the supporting frame.

4. In a wall bed, the combination of an upright supporting frame, a bed frame hinged to the supporting frame to fold upwardly therein, a base frame also hinged to the supporting frame to fold upwardly against the folded bed frame and forming a support for the bed frame when the latter is in lowered position, and means forming a rigid brace between the supporting frame and the base frame in the lowered position of the latter, said means being movable into and out of effective position by movements of the bed frame to and from vertical position in the supporting frame.

5. In a wall bed, the combination of an upright supporting frame, a bed frame hinged thereto to fold upwardly therein, a base frame also hinged to the supporting frame, means forming a rigid brace between the supporting frame and the base frame in the lowered position of the latter, including pivoted links shiftable into and out of effective position by movements of the bed frame to and from vertical folded position, and counterbalancing springs attached to the bed frame and anchored in connection with said brace links.

6. In a wall bed, the combination of an upright supporting frame, a bed frame hinged to fold upwardly therein, and a base frame hinged to the supporting frame to fold upwardly along the bed frame and forming in its upright folded position a cover for the major portion of the bottom of the bed frame, said base frame serving in its lowered position as a support for the bed frame when the latter is lowered and means automatically actuated and controlled by the bed frame for locking the base frame in lowered position to the supporting frame, said means being effective when the bed frame is in lowered position and also during the major portions of the raising and lowering movements of the bed frame.

7. In a wall bed, the combination of a supporting upright, a bed frame hinged to the upright to swing between vertical and horizontal positions, and a base frame hinged to the upright to swing between vertical and horizontal positions, folding braces connecting the base frame and the upright to hold the base frame in lowered horizontal position and means in connection with the bed frame to shift said braces into and out of effective position respectively during downward and upward swinging movements of the bed frame.

8. In a wall bed, the combination of a supporting upright, a bed frame hinged to the upright to swing between vertical and horizontal

positions, a base frame hinged to the upright to swing between vertical and horizontal positions, and folding braces between the base frame and the upright to rigidly connect these parts when in bracing position with the base frame in lowered position, means carried by the bed frame to throw said braces into effective position upon initial downward movement of the bed frame, and to throw the braces into inactive position during the last part of the upward closing movement of the bed frame, said base frame having means engaging the bed frame in the vertical folded position of the parts to prevent accidental lowering movement of the latter.

9. In a wall bed, the combination of a supporting upright, a bed frame hingedly connected to the upright to swing between vertical and horizontal positions, and a base frame hinged to the supporting upright to swing between vertical and horizontal positions and in its vertical position serving as a cover for the bed frame in the vertical position of the latter, means foldable between the base frame and supporting frame and operable when in active position in the horizontal position of the base frame to effectively brace and prevent tilting movements of the supporting frame during swinging of the bed frame, and means in connection with the bed frame to automatically control said bracing means including spring means to counterbalance swinging movements of the bed frame.

10. In a wall bed, a rigid upright section, a vertically swinging section in connection with said rigid section and forming a mattress holding bed frame, and a second vertically swinging section in connection with said upright section, having means effective in its vertical position to cover and control movement of the bed frame and other means effective in its horizontal position and automatically controlled by movements of the bed frame to and from vertical position to brace and prevent tilting movement of the upright section.

11. In combination, a bed standard, a bed frame pivoted to said standard to swing between vertical and horizontal positions, a base frame pivoted to said standard to swing between horizontal and vertical positions independent of the bed frame and arranged when in the vertical position to hold the bed frame against swinging movement and when in horizontal position to serve as a support for the bed frame, and pivoted brace links connecting the base frame with the standard and when aligned serving to lock the base frame and standard in substantially rightangular relationship whereby the former acts as a rigid brace for the latter, said bed frame having means to shift said brace links into and out of effective aligned positions respectively at the start of its downward swinging movement and the finish of its upward swinging movement.

12. In combination, a bed standard, a bed frame pivoted to said standard to swing between vertical and horizontal positions, a base frame pivoted to said standard to swing between horizontal and vertical positions independent of the bed frame and arranged when in the vertical position to hold the bed frame against swinging movement and when in horizontal position to serve as a support for the bed frame, and pivoted brace links connecting the base frame with the standard and when aligned serving to lock the base frame and standard in substantially rightangular relationship whereby the former acts as a rigid brace for the latter, said bed frame having means effective as the bed frame swings to vertical position to engage and disalign the brace links, and counterbalancing springs for the bed frame, said springs being connected to said brace links to shift the latter into aligned position at the start of downward swinging movement of the bed frame.

13. In a wall bed, the combination of a supporting upright frame, a base frame hinged thereto for movement between horizontal and vertical positions, a bed frame between the supporting and base frames, means forming pivots with the supporting frame upon which the bed frame swings between horizontal and vertical positions, and folding braces between the supporting frame and the base frame controlled as to their movement into and out of effective position by movement of the bed frame, the base frame having slotted brackets in which the respective ends of the braces have limited movement whereby to adjust themselves to any unevenness of the base frame.

14. In a wall bed, the combination of a supporting upright frame, a base frame hinged thereto for movement between horizontal and vertical positions, a bed frame between the supporting and base frames, means forming pivots with the supporting frame upon which the bed frame swings between horizontal and vertical positions, folding braces between the supporting frame and the base frame controlled as to their movement into and out of effective position by movement of the bed frame, said braces being movably connected at one end to the pivot forming members of the supporting frame, and slotted brackets carried by the base frame and in which the other ends of the braces have limited movement.

15. In a wall bed structure of the character set forth, an upright supporting frame, a base frame hingedly connected to the supporting frame to swing downwardly to a lower horizontal position and be supported on the floor at the outer end, a bed frame pivotally connected adjacent its lower end within the lower portion of the supporting frame to swing downwardly upon the base frame when the latter is in a horizontal position, and spring control means for the bed frame including a folding brace pivotally connected to the supporting frame and to the base frame and foldable when the base frame is swung upwardly and arranged to form a rigid straight brace when the base frame is in a horizontal position, and a spring connected at one end with the folding brace and at the other end to the bed frame and arranged to exert a downward pull on said brace when the spring is placed under tension by the downward swinging of the bed frame whereby downward pressure is exerted on both the base frame and the supporting frame thereby bringing the base frame and the supporting frame into rigid relation to each other in the operation of the control means, the entire weight of the bed frame resting upon its axis during downward movement thereof and the upright supporting frame being prevented from tipping forwardly.

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