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A. COHN

1,965,370

FOLDING BED

Filed June 12, 1931

FIG. 1.

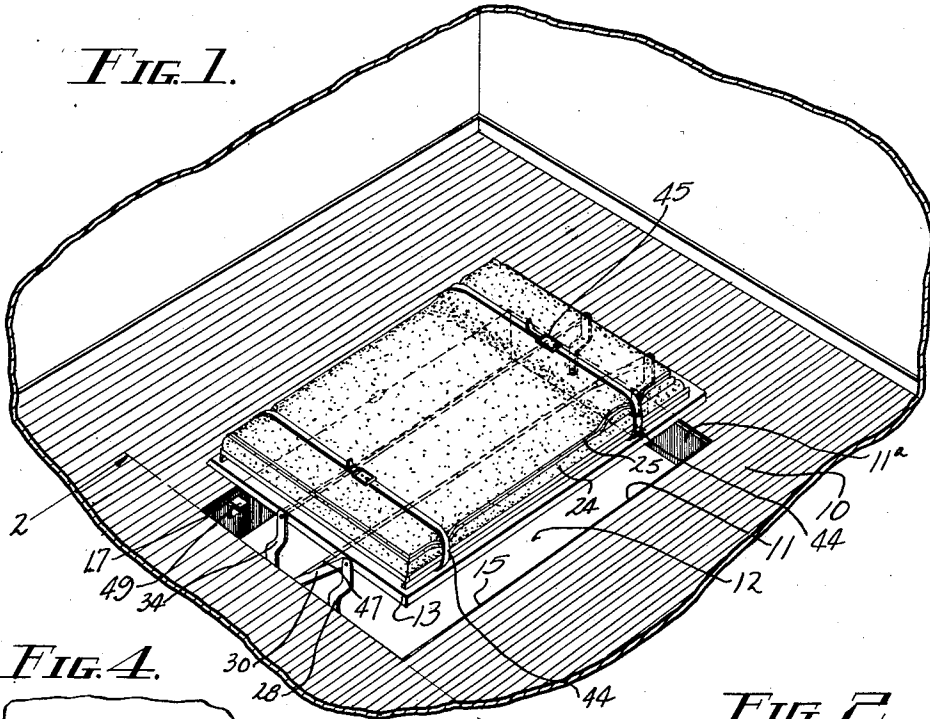


FIG. 4.

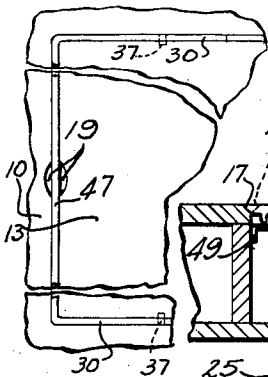


FIG. 2.

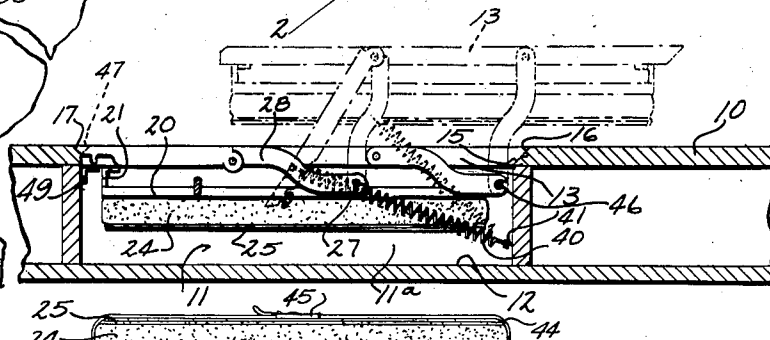
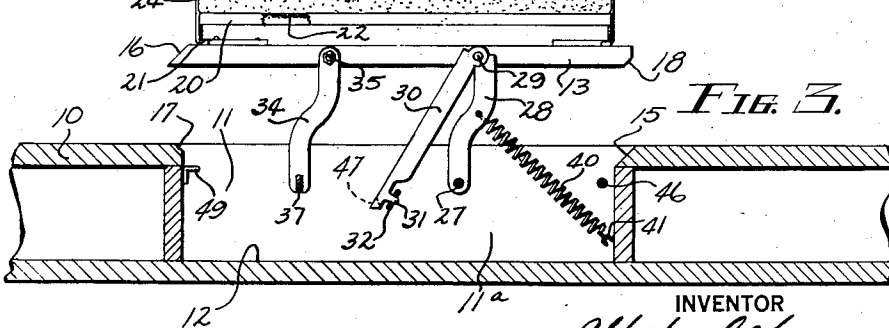


FIG. 3.



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FOLDING BED

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12 Claims. (Cl. 5—10)

My invention relates to improvements in folding beds.

The primary object of my invention is to provide improved means whereby a bed, when not in use, may be concealed within a recess formed in the floor of a room or apartment, and whereby such a bed may be removed and exposed above the recess in a position for use.

Further objects of my invention are to provide means whereby a section of a floor may also serve, in an inverted position, as a bed bottom; to provide means to facilitate lifting, inverting, and supporting such a bed bottom above the floor level and directly over a recess in the floor which normally receives the bed; to provide means for securely locking the bed supporting mechanism with the bed in a raised position for occupancy; and to provide means to facilitate manipulation of the bed to either the exposed or the concealed position.

In the drawing:

Figure 1 is an isometric view of a folding bed embodying my invention as it appears when in position for occupancy, a portion of the room being also illustrated.

Figure 2 is a sectional view drawn to line 2—2 of Figure 1, showing the bed in its folded position, with dotted lines indicating its initial raised position preparatory to inversion.

Figure 3 is a sectional view drawn to the same plane, showing the bed in inverted position and ready for occupancy.

Figure 4 is a fragmentary plan view of the braces 30 and associated portions of the floor, when the braces are in their folded position.

Like parts are identified by the same reference characters throughout the several views.

The floor 10 of the room is provided with a rectangular box-like recess 11, the bottom 12 of which may constitute the ceiling of a room underneath that in which the bed is to be used. A section 13 of the floor is made removable, and this portion of the floor normally constitutes a top or cover for the recess 11. Along one side margin of the fixed floor portion 10 is beveled, as indicated at 15, and the abutting portion of the removable section 13 is similarly beveled, as indicated at 16. The margins of the portions 10 and 13 of the floor at the opposite side of the recess may be slightly beveled, as indicated respectively at 17 and 18, but substantially at the center of this side of the recess 11 the floor 10 is cut away to provide a hand receiving notch 19 to facilitate initially lifting the bed from the recess 11.

The bed frame 20 is secured to the floor sec-

tion 13 by suitable brackets 21. Frame 20 will preferably be provided with a woven wire spring 22, and the spring 22 will support the mattress 24, which, with the covers or blankets 25, will normally be held in place as hereinafter described. The end walls 11a of the recess are permanently connected by pivot pins or bolts 27 with links 28, the upper ends of which are pivotally connected with the movable floor section 13 by pivot pins 29. These pivot pins 29 may also serve as hinge pins for braces 30, the lower ends of which are each provided with a hook arm 31 to engage a staple-shaped catch or bracket 32 on each end wall 11a of the recess. At each end of the movable floor member 13 a link 34 is pivoted thereto at 35, and has its opposite end forked to engage a flat sided stud 37 projecting inwardly from the associated wall 11a of the recess, these links 34 being removable from the studs 37 preparatory to folding the bed into the recess 11.

When the bed is in the raised position in which it is shown in Figures 1 and 3, it is held in that position by the brace 30 and is prevented from vibrating upon its supporting links 28 and 34 (then serving as legs) by tension springs 40 connecting the intermediate portions of the links 28 with suitable hooks 41 on the side wall of the recess near its bottom.

When the bed is to be folded, the mattress 24 and covers 25 are secured in position by straps 44, these straps each having one end connected with the frame and their meeting ends will be connected by buckles 45 across the bed covers preparatory with the folding operation. Thereupon by lifting the beveled margin 16, the bed may be swung to an inverted position upon the pivot pins 29, the links 34 lifting from the studs 37. In the inverted position these links 34 may have their forked ends engaged with studs 46 on the end walls 11a, at the opposite sides of the studs 27 from those occupied by the studs 37. Thereupon the braces 30 may be disengaged from the brackets 32 and the bed drawn from the dotted line position in which it is shown in Figure 2, to its position as shown in full lines in said figure, in which a V-shaped cross bar 47 connecting the braces 30 will be received in the V-shaped recess formed by the beveled margins 17 and 18 of the floor members 10 and 13, as clearly shown in Figures 2 and 4. The links 28 will then have folded downwardly until their upper ends are in alignment with the braces 30 and in horizontal position, the lower ends being downwardly offset to their permanent connections 27 with the walls 11a of the recess. The links 34 will be similarly

folded, and at each end of the bed the links 34, 28 and braces 30 will occupy a common vertical plane between the associated end of the movable floor portion 13 and the end wall 11a of the recess, leaving only two narrow slot-like openings above the downwardly offset portions of the links to interrupt the continuity of the floor. These openings are so narrow that when the bed is in its folded position and the floor portion 13 covered by a rug, the bed will not only be wholly concealed but there will be no variation in level to indicate its presence to any person walking over the floor.

The purpose of the offsets in the links 28 and 34 is to allow these links to be connected with studs at a distance below the floor level and at a sufficient distance below the top of the end walls 11a of the recess to avoid any tendency to split or break out portions of the upper margins of these walls under the strains to which the studs will be subjected. Also, in cases where the size of the bed makes it desirable to have the upper ends of the links 34 overlap the lower ends of the links 28 when in the folded position, this will be possible. It will, of course, be understood that the springs 40 will have sufficient tension to materially assist in raising the bed from the recess, although the initial pull of these springs upon the links 28 may be downwardly exerted by reason of their connection with the link at points above the pivot studs 27 so located with reference to the hooks 41 that the springs will swing across the axial line of the pivot studs 27 during the final bed folding movement and will again be swung across the line during the initial lifting or infolding movement. The precise effect of the springs when the bed is completely folded is, of course, determined by the relative location of the respective ends of the springs with reference to the pivot studs 27, and the arrangement should be such that there will be no accidental lifting of the floor section 13 when the latter has been adjusted to the level of the adjacent floor. The V-shaped cross arm 47 connecting the otherwise free ends of the braces 30, serves as a handle for lifting the bed and associated floor section from the recess, its cross bar being easily grasped by inserting the fingers in the hand opening 19.

When the bed is folded into the recess, the floor member is supported at one side by the beveled shoulder 15 and at the other side by brackets 49, thereby relieving the linkage from strain.

I claim:

1. The combination with a floor having a box-like recess, of a bed having a bottom member adapted, when the bed is inverted, to serve as a section of the floor substantially closing the recess, and linkage connecting said bottom member with the walls of the recess and adapted to permit said member to be lifted and swung to an inverted position to serve as a bed bottom, said linkage being adapted to serve as legs to support the bed at a substantial distance above the top of the recess when the bed is in position for use.

2. The combination with a floor provided with a bed receiving recess, of a removable floor section normally covering said recess and having a bed secured to its under surface, linkage connecting said floor section with the walls of the recess and adapted to allow the floor section to be swung to an inverted position to be supported above the floor level by such linkage, said linkage including links detachable from the walls of the recess to permit folding and unfolding op-

erations, and bracing links having lower ends also detachable from the recess walls to permit such operations.

3. The combination with a floor provided with a bed receiving recess, of a removable floor section normally covering said recess and having a bed secured to its under surface, linkage connecting said floor section with the walls of the recess and adapted to allow the floor section to be swung to an inverted position to be supported above the floor level by such linkage, said linkage including link members adapted to serve as supporting legs for the raised bed, some of said legs being detachably engaged with the walls of the recess to permit folding and unfolding operations and bracing members engageable with the walls of the recess to support the inverted and raised bed in a position directly above the recess.

4. The combination with a floor provided with a bed receiving recess, of a removable floor member normally covering said recess and having a bed secured to its under surface, a pair of links permanently connecting the ends of said floor member with the end walls of the recess and adapted to serve as legs to support the removable floor member in a raised position, cooperating links pivotally connected with the ends of said floor member at the opposite side of its longitudinal center from that occupied by the first mentioned links, said cooperating links being detachably engageable with the end walls of the recess and also adapted to serve as legs to support said floor member in a raised position, with either its floor surface or its bed carrying surface uppermost.

5. The combination with a floor provided with a bed receiving recess, of a removable floor member normally covering said recess and having its ends linked to the walls thereof and pivotally connected with the linkage for inversion about the pivotal axis, said floor member having a floor surface on one side and a bed attached to the other side thereof, and means cooperating with said linkage for supporting said member in a raised position above the level of the fixed portion of the floor and with the bed in a horizontal position, said cooperating means being detachably engageable with the walls of the recess and being foldable with the linkage and bed into the recess when the floor member is inverted to bring its floor surface uppermost.

6. In a folding bed mechanism for floor recesses, the combination with a movable floor member having a bed attached to one side thereof, of a set of links having their ends pivoted to the floor member and the respective side walls of the recess, folding braces hinged thereto and adapted to be detachably connected with said recess side walls at a distance from the link connections, and a cooperating set of links pivoted to the floor member and detachably connectible with suitable supports at their other ends, whereby they may be swung to supporting positions at either side of the first mentioned links for cooperation in supporting the floor member with either side uppermost.

7. In a folding bed mechanism for floor recesses, the combination with a movable floor member having a bed attached to one side thereof, of a set of links adapted to connect the movable frame member with the side walls of the recess and having folding braces hinged thereto and also adapted to be connected with the recess side walls, and a cooperating set of links pivoted to the floor member and detachably connectible

with suitable supports at their other ends, whereby they may be swung to supporting positions at either side of the first mentioned links for cooperation in supporting the floor member with either side uppermost, said links being offset intermediate of their ends to facilitate folding them along the end margins of the floor member.

8. In a folding bed mechanism for floor recesses, the combination with a movable floor member having a bed attached to one side thereof, of a set of links adapted to swing to supporting positions with reference to the floor member when inverted, said links being adapted to be pivoted to suitable supports within the floor recess and having folding braces hinged thereto and at the points of connection between the links and the movable floor member, and a cooperating set of links pivoted to the floor member and detachably connectible with suitable supports at their other ends, whereby they may be swung to supporting positions at either side of the first mentioned links for cooperation in supporting the floor member with either side uppermost, and resilient connections tending to hold the links in an upright position while permitting them to be folded to horizontal position.

9. The combination with a floor provided with a bed receiving recess, of a floor member adapted to close said recess and having legs pivotally connecting the ends of the floor member with end walls of the recess, tension springs connecting said legs with the side walls of the recess, hinged braces connecting said links with the end walls of the recess and cooperating with the springs to hold the legs in an upright position, and auxiliary legs pivoted to the floor member and detachably engageable with the end walls of the recess on either side of the braced links, said floor member having a floor surface upon one side and a bed attached to the other side thereof and being invertible when the braces are disconnected with the recess walls, said legs and braces being adapted to fold into the recess between its end walls and the ends of the floor member when the floor member has been swung to a position with its floor surface uppermost.

10. The combination with a floor provided with a bed receiving recess, of a floor member adapted to close said recess and having legs pivotally connecting the ends of the floor member with end walls of the recess, tension springs connecting said legs with the side walls of the recess, hinged braces connecting said links with the end

walls of the recess and cooperating with the springs to hold the legs in an upright position, and auxiliary legs pivoted to the floor member and detachably engageable with the end walls of the recess on either side of the braced links, said floor member having a floor surface upon one side and a bed attached to the other side thereof and being invertible when the braces are disconnected with the recess walls, said legs and braces being adapted to fold into the recess between its end walls and the ends of the floor member when the floor member has been swung to a position with its floor surface uppermost, said braces having their swinging ends connected by a cross bar receivable between the movable floor member and other portions of the floor along one side when the braces and legs are in their folded position.

11. The combination with a floor provided with a bed receiving recess, of a movable floor member normally covering said recess, and having a bed attached to the under side thereof, said movable floor member having opposite margins permanently connected to the associated wall of the recess by links, each located at one side of the center of the margin to which it is connected, said floor member margins each having a link pivoted thereto at the other side of its center and adapted to be detachably engaged with the associated recess wall in supporting relation to the floor member when the latter is in its raised and inverted position, all of said links being adapted to fold with the bed into the recess when the floor member is being adjusted to normal position as a part of the floor.

12. The combination with a floor provided with a bed receiving recess having bed supporting walls and a floor member adapted to close the recess, said floor member having a bed mounted on one side thereof, of means associated with the walls for supporting the floor member therefrom in raised position and in covering relation thereto, said means including linkage permanently pivoted to said walls and floor member and cooperative linkage detachably engageable and adapted to connect the floor member with the recess walls at opposite sides of the permanently pivoted linkage in the folded and unfolded positions respectively, whereby to allow the floor member and bed to be inverted and folded with the linkage into the recess.

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