March 8, 1932. J. MARTIN 1,849,023

COMBINATION COUCH AND BED

Filed Jan. 7, 1930 2 Sheets-Sheet 1

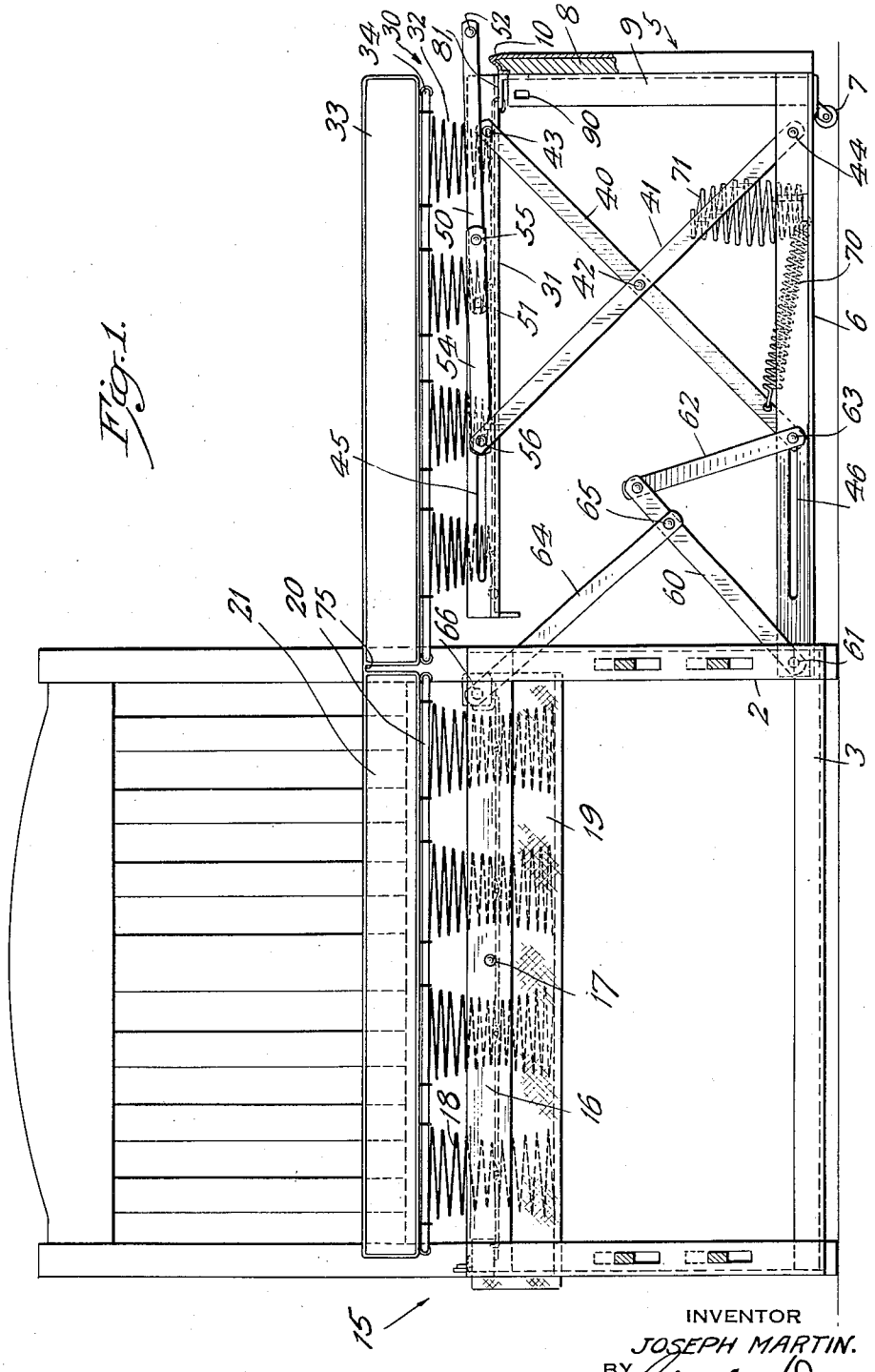


Fig. 1.

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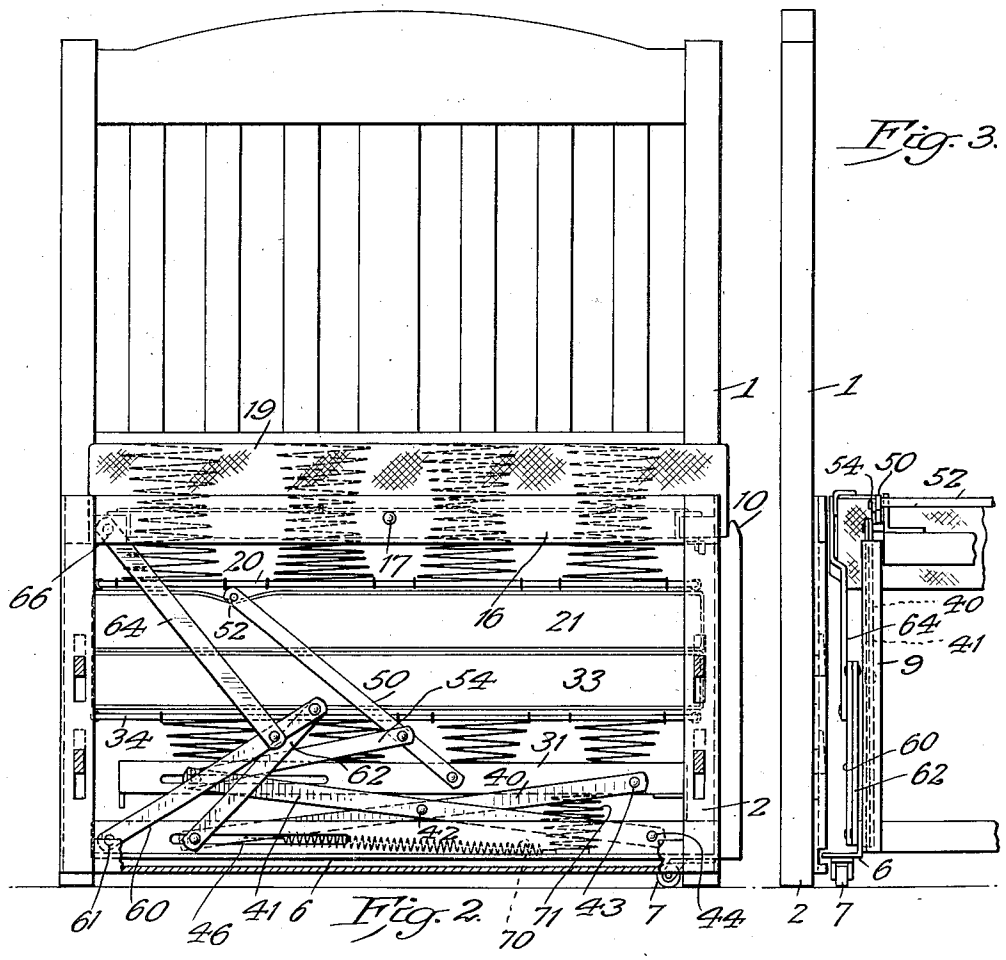


Fig. 3.

Fig. 2.

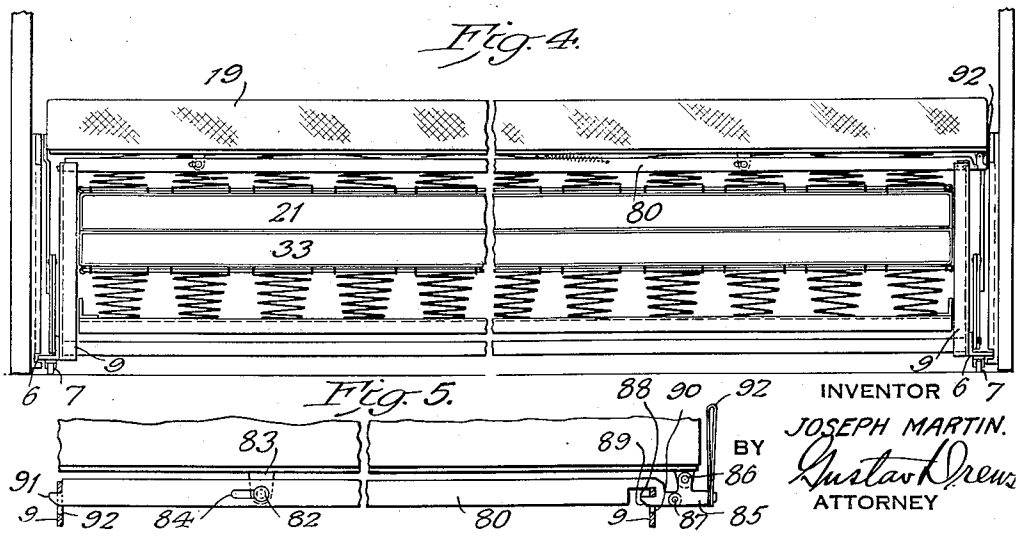


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE

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COMBINATION COUCH AND BED

Application filed January 7, 1930. Serial No. 419,012.

My invention relates to combination bed and couch structures, that is, to beds having an extensible section foldable under the main section to thus provide a couch or bed of a single or double width.

The present structure is generally similar to that disclosed in my prior application, Ser. No. 391,587, filed September 10, 1929, which matured into Patent No. 1,811,057 on June 23, 1931; that is, as shown in said application, the present bed structure includes a main bed frame and bed bottom revolubly mounted therein, an anxiliary or extension bed frame with an extension bed bottom thereon, and means for moving the extension bed bottom down into its frame as the latter is moved or telescoped into the main frame, with concurrent rotation of the main bed bottom, which finally lies in inverted position over the axiliary or extension bed bottom, with substantially reverse movements in opening the structure to double width.

The present invention consists principally in improvements in the supporting and operating means for the extension or auxiliary frame and bed bottom, and especially to improvements in the operating linkage connecting the auxiliary and main bed bottoms, so designed as to prevent inadvertent collapse of the structure when in extended or double width position; an improved operating element of bail formation, or including a long hand piece extending alongside the auxiliary bed bottom when extended, which may be conveniently grasped and moved up over the auxiliary bottom in the collapsing or folding action, and when in final position overlies the mattresses enclosed between the main and auxiliary bed bottoms and assists materially in retaining bedclothes between the mattresses during the collapsing or folding action and until the auxiliary bed bottom is again extended and positioned for use; and also an improved, positive and conveniently operated lock for maintaining the outer portion of the extensible bed bottom in locked position, against inadvertent collapsing or folding movement.

These and other features, capabilities and advantages of the invention will appear from the subjoined detail description of one embodiment thereof, illustrated in the accompanying drawings, in which

Fig. 1 is a vertical, transverse section of a foldable structure embodying the invention in one form, the section plane being just inside one of the main frame end uprights (head or foot board) and looking toward the other end of the bed.

Fig. 2 is a similar view showing the structure folded or collapsed to single width.

Fig. 3 is an elevation from the side, of one end of the structure in open or extended position.

Fig. 4 is a side elevation of the structure, folded.

Fig. 5 is a detail in side elevation, of the locking device.

The main frame includes end uprights (head or foot boards) 1, which have legs 2 connected by cross rails 3 and also by longitudinal frame structures, substantially as in the above identified application. An auxiliary or extension frame 5 is arranged to slide in and out from the main frame. This auxiliary frame includes bottom end members 6 to slide on the main frame cross rails 3 and provided with casters 7, and has at its outward side a front board 8 secured to the end uprights 9 and forming the front of the couch when the structure is closed. The upper edge 10 of the front board is designed to fit against a side edge of the main bed bottom as later referred to.

The main frame supports a bed bottom structure 15 including a frame having end members 16 mounted in the main frame on trunnions 17 so that the entire main bed bottom structure may rotate on the trunnions as an axis. The frame has springs 18 properly arranged to carry the seat or cushion 19 which serves as the seat or mattress of the bed or couch when in folded or single width position, as in Fig. 2, being then uppermost, and also has to carry the mattress supporting frame 20 to support mattress 21 when the structure is in open or double width position, Fig. 1. In the extension frame structure 5 is the auxiliary or extension bed bottom structure 30, including a frame having transverse

end rails 31, and this frame supports springs 32 which in turn support the extension or auxiliary mattress 33, or a frame 34 on which such mattress rests.

Desirably the mattresses 21 and 33 or at least the first named, may be unconnected to their supporting frames such as 20, 34, so that in folding action the main mattress 21 may first be folded over upon the other one. They are desirably connected at adjacent edges by a fabric hinge 75, thus providing for their more convenient manipulation, and retention of the bed covers between the mattresses.

The auxiliary bed bottom is supported and operated by crossed bars 40, 41, at each end of its frame structure, these bars being fulcrumed or pivotally connected together at their mid-length at 42. The upper ends of bars 40 are pivotally connected at fixed points 43 to end rails 31, and the lower ends of bars 41 are similarly connected at 44 to the lower end frame members 6. The upper ends of bars 41 are slidably mounted in slots 45 in the end rails 31, and the lower ends of bars 40 are similarly mounted in slots in the lower frame members 6.

To operate the stated cross bar mechanism, which as so far described is substantially similar to that disclosed in the above mentioned application, I provide improved means including what is conveniently called a bail handle in an upward location where it is readily accessible and also cooperates in retaining the mattresses and the bedclothes in proper position during folding actions. This mechanism includes at each end of the auxiliary frame structure an arm or lever 50 pivotally connected at a fixed point 51 on the corresponding end rail 31. The outward ends of these two arms or levers are connected by a hand bar or bail 52 which extends along the entire length of the auxiliary frame structure at the outer side thereof, in a position where it may easily be grasped and manipulated as clearly shown in Fig. 1. The arms or levers 50 are connected to the upper ends of bars 41 of the cross bar mechanism by links 54, these links being pivotally connected to the levers at 55, and at the other ends being pivotally connected to the upper ends of bars 41 at 56, that is to say, at the points where the ends of these bars slide in slots 45, suitable slide and pivot structures being provided, the details of which may vary and are not a part of the invention in a specific sense.

For the concurrent operation of the main bed bottom structure, the following connections or linkage is provided:—

At each end of the bed structure a lever 60 is fulcrumed on a fixed pivot point 61 at the inward end of one of the corresponding bottom end members 6 of the auxiliary frame. The upper or outward end of each of these levers is pivotally connected to the upper end of a link 62, the lower end of which is pivotally connected to the lower end of bar 40 of the crossed bar mechanism at a point 63, which is the point at which the bar is slidably mounted in the lower guide slot 46. Another link 64 is pivotally connected at 65 to the corresponding lever 60 at a point relatively near its pivotal connection to the link 62. The upper or inward end of each of the links 64 is pivotally connected at 66 to a bracket fixed on the frame of the main bed bottom.

Springs 70 tensioned between bars 40 near their lower ends, and the lower frame member 6, are stretched when the structure is folded, and as it is unfolded assist in the unfolding action, reducing the manual effort required by tending to move the cross bar structures 40, 41 to the position of Fig. 1. Shock absorbing springs 71 are also desirably mounted in the auxiliary frame structure to cushion the descending movement of the auxiliary or extension bed bottom, these spring arrangements being substantially as in the above mentioned application.

As an important feature of the invention I provide an improved lock to positively retain the structure in extended position, and prevent inadvertent collapse by upward pulling on the hand rail 52 or otherwise. This lock mechanism comprises a longitudinal bar 80, located below the longitudinal outer side rail 81 of the auxiliary bed bottom frame, and slidably supported at one point by a stud 82 on a bracket 83 depending from said frame member and engaging in slot 84 of the locking bar 80. At one end the bar is supported by a bell crank lever 85 fulcrumed at 86 on another bracket and pivotally connected at 87 to the locking bar. Near one end the bar is slotted to accommodate the upper end portion of the adjacent frame end upright 9, and is there provided with a locking dog 88 having a lower beveled face 89 and engaging in a slot 90 in the frame upright 9, Figs. 1 and 5. At its other end the locking bar has a similar dog 91 engaging in a slot 92 at the upper end of the other extension frame upright 9. The outer end of bell crank 85 has connected to it a suitable handle, such as a strap 92 extending upward at one end of the auxiliary bed bottom, in a position (Figs. 4 and 5) to be readily grasped and pulled up to release the locking bar from engagement with the uprights 9, and thereupon the auxiliary or extension structure may be moved back to folded or collapsed position by manipulation of the bail or hand rail 52.

While the parts are in extended position, Fig. 1, collapse of the structure by weight applied near the center of the combined bed bottoms is prevented by the position of the supporting and operating linkage of the revoluble main bed bottom structure, including lever 60, and links 62 and 64. Evidently any weight so applied tends to move the support-

ing links 64 downward in the direction of their length. This force is resisted by levers 60, which are connected at the fixed pivot points 61 to the lower end frame members 6, and also have their upper ends supported by the links 62, the levers 60 and links 62 in this position thus forming in effect, in conjunction with the lower frame members 6, rigid tripods preventing any downward movement of links 64 and positively supporting the respective bed bottoms.

To fold the structure, after the locking bar has been released as above explained, hand rail 52 is grasped and swung upward, the arms or levers turning on their fulcrums 51. Links 54 thereupon act on the upper ends of bars 41 causing them to slide in slots 45, and simultaneously the lower ends of bars 40 are caused to slide in slots 46, as the crossed bar structures are folded to approximately parallel position as shown in Fig. 2. Simultaneously the movement of links 62 and levers 60 acting through links 64 cause rotation of the bed bottom frame structure, and finally all the links and levers are in the position of Fig. 4 and the main bed bottom is inverted, bringing its cushion 19 upward, while the auxiliary bed bottom is in lower position in the extension frame and the latter has been moved or telescoped into the main frame. To open or extend the structure, substantially reverse operations are performed, the user first starting the rotation of the upper or main bed bottom and then as handle 52 becomes accessible that may be moved to complete the extension operation.

Preferably in folding the structure the mattress 21 is first folded over on the outer mattress 33, and the bedclothes may be folded and retained between the mattresses. Thereupon in the folding action as above described the handle or bail 52 moves up over the two mattresses and finally rests upon mattress 21, as shown in Fig. 2, thus retaining the mattresses and the enclosed bedclothes in proper position.

It is obvious that various changes and modifications may be made in the details of construction without departing from the general spirit of the invention set forth in the appended claims.

I claim:

1. A foldable bed or couch structure comprising a main frame, a main bed bottom structure revolubly mounted therein, an auxiliary frame slidable into and from the main frame, an auxiliary bed bottom structure therein, means supporting the auxiliary bed bottom for vertical movement in its frame, said supporting means including crossed bars pivotally and slidably connected to the auxiliary frame and auxiliary bed bottom structures, levers pivotally connected to ends of the auxiliary bed bottom, a longitudinal bail handle connecting the levers, and links connecting the levers to certain of the crossed bars.

2. A foldable bed or couch structure comprising a main frame, a main bed bottom structure revolubly mounted therein, an auxiliary frame slidable into and from the main frame, an auxiliary bed bottom structure therein, means supporting the auxiliary bed bottom for vertical movement in its frame, said supporting means including crossed bars pivotally and slidably connected to the auxiliary frame and auxiliary bed bottom structures, and a linkage connecting lower end portions of certain of the crossed bars to the main bed bottom structure, said linkage comprising levers fulcrumed at fixed points on the auxiliary frames, links connecting upper ends of the levers to lower ends of two of said crossed bars, and other links connecting the levers to the main bed bottom structure.

3. A foldable bed or couch structure comprising a main frame, a main bed bottom structure revolubly mounted therein, an auxiliary frame slidable into and from the main frame, an auxiliary bed bottom structure therein, means supporting the auxiliary bed bottom for vertical movement in its frame, said supporting means including crossed bars pivotally and slidably connected to the auxiliary frame and auxiliary bed bottom structures, and a linkage connecting lower end portions of certain of the crossed bars to the main bed bottom structure, said linkage comprising levers fulcrumed at fixed points on the auxiliary frames, links connecting upper ends of the levers to lower ends of two of said crossed bars, and other links connecting the levers to the main bed bottom structure, said levers and links last named being so positioned in the extended position of the structure as to positively support the central portions of the main and auxiliary bed bottom structures.

4. A foldable bed or couch structure comprising a main frame, a main bed bottom structure revolubly mounted therein, an auxiliary frame slidable into and from the main frame, an auxiliary bed bottom structure therein, means supporting the auxiliary bed bottom for vertical movement in its frame, said supporting means including crossed bars pivotally and slidably connected to the auxiliary frame and auxiliary bed bottom structures, levers pivotally connected to ends of the auxiliary bed bottom, a longitudinal bail handle connecting the levers, and links connecting the levers to certain of the crossed bars, said bail handle in the folding movement passing above and finally lying upon superposed mattresses located on the auxiliary bed bottom structure.

5. A foldable bed or couch structure comprising a main frame, a main bed bottom structure revolubly mounted therein, an

auxiliary frame slidable into and from the main frame, an auxiliary bed bottom structure therein, means supporting the auxiliary bed bottom for vertical movement in its frame, a linkage connecting said means to the main bed bottom structure and to the auxiliary frame and constructed and arranged to operate it and also when the structure is in extended position to support adjacent portions of the main and auxiliary bed bottoms and prevent downward displacement by weight thereto applied, and locking means acting between the auxiliary bed bottom structure and its frame and retaining the structure in extended position, said locking means including a longitudinal bar reciprocably mounted in relation to the auxiliary bed bottom, means for operating it including a handle accessible at one end of said structure, and dogs on the bar adapted to engage in sockets on end portions of the auxiliary or extensible frame.

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