

Jan. 7, 1958

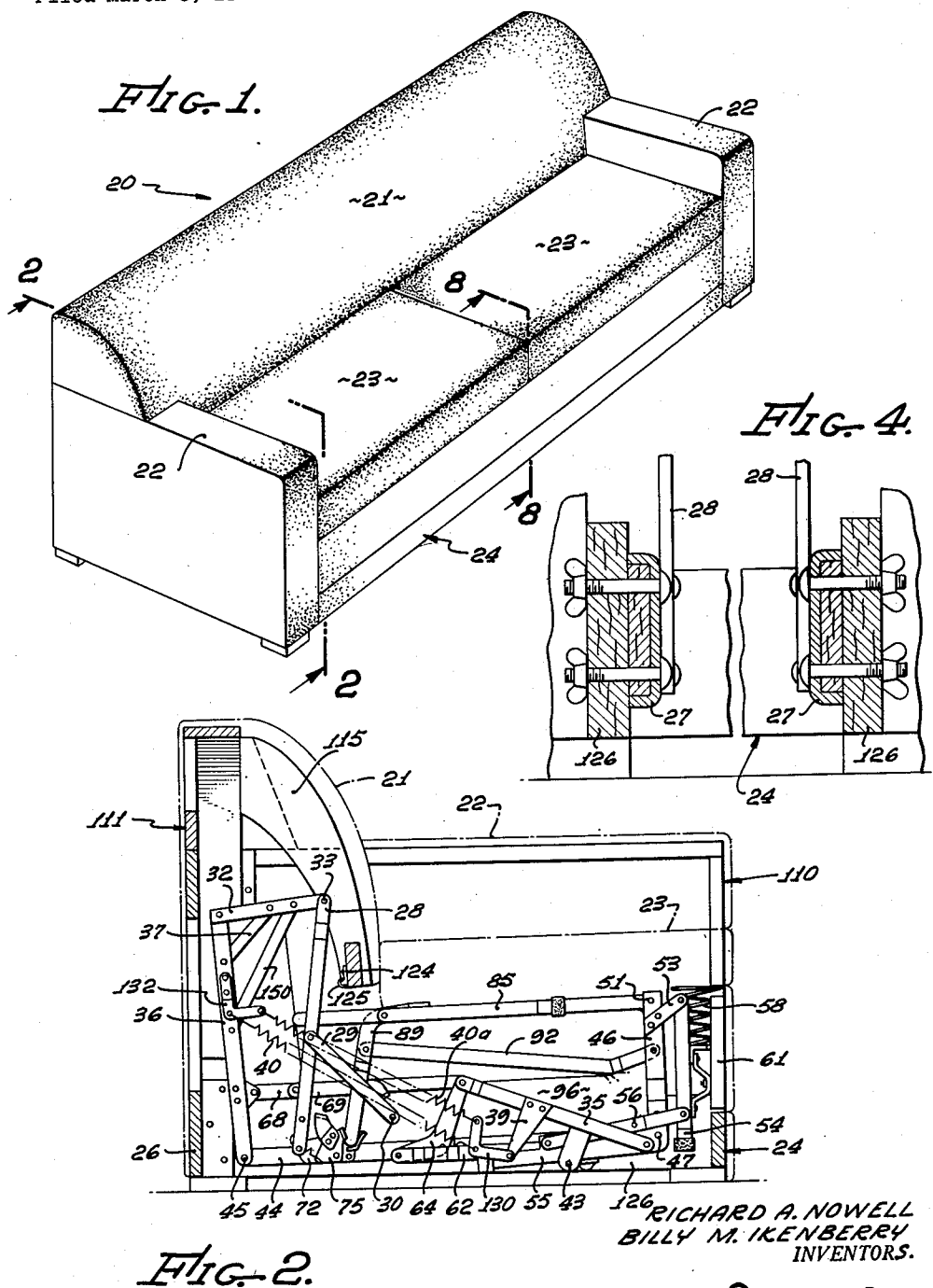
R. A. NOWELL ET AL

2,818,583

SOFA BED

Filed March 3, 1955

4 Sheets-Sheet 1



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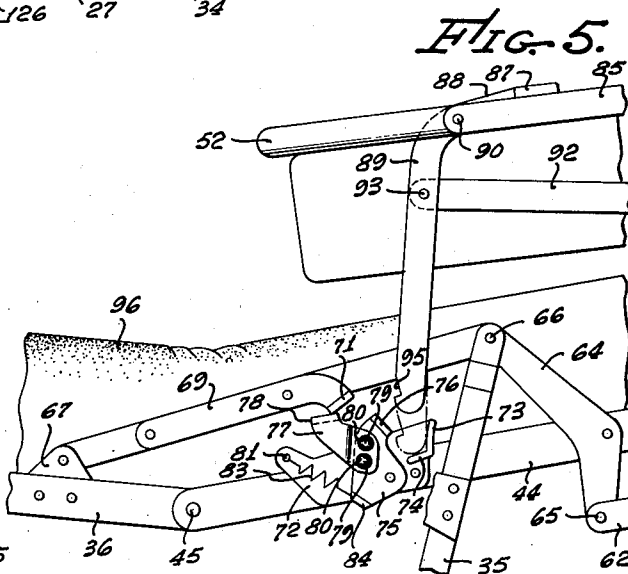
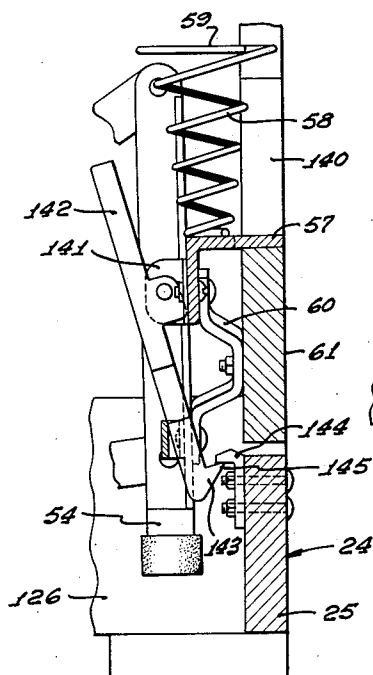
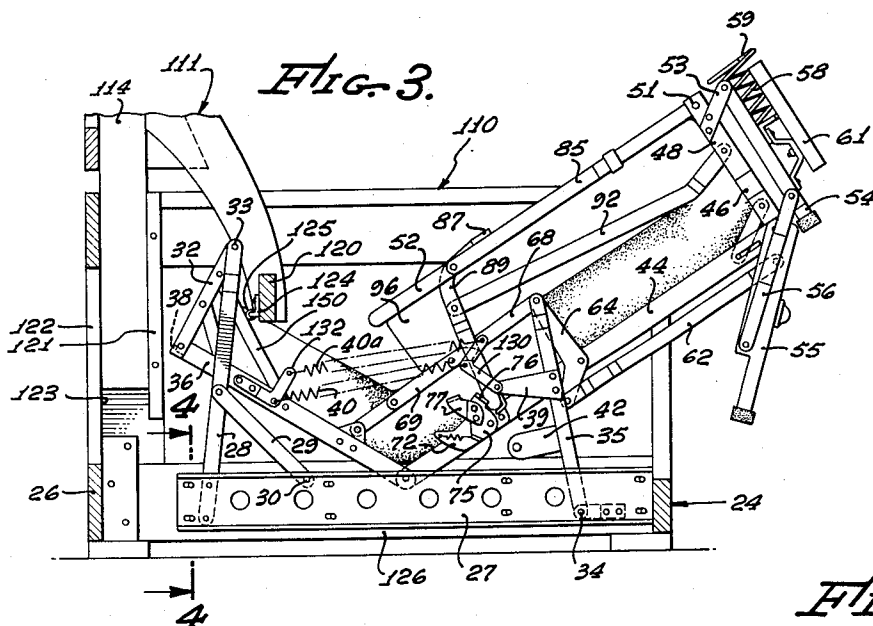
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4 Sheets-Sheet 2



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FIG. 6.

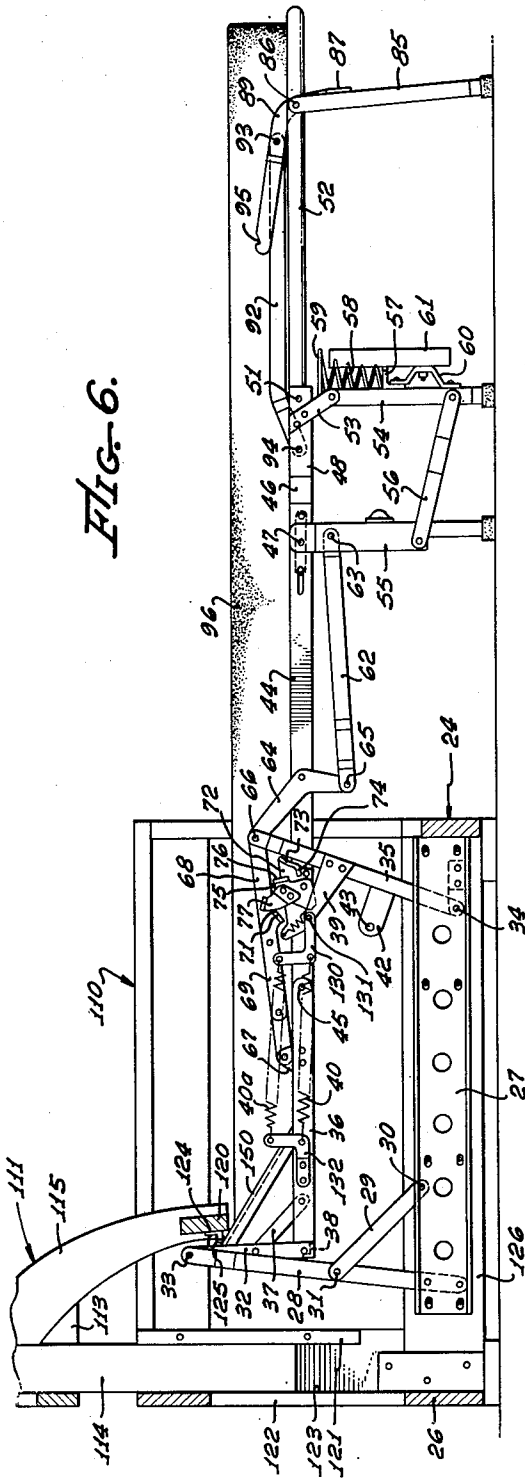
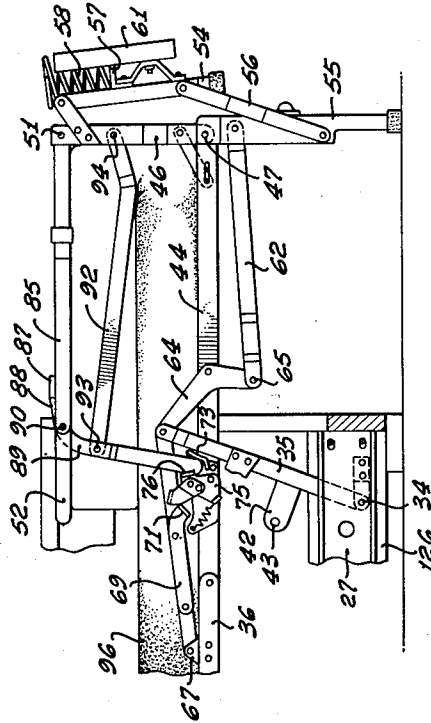


FIG. 7.



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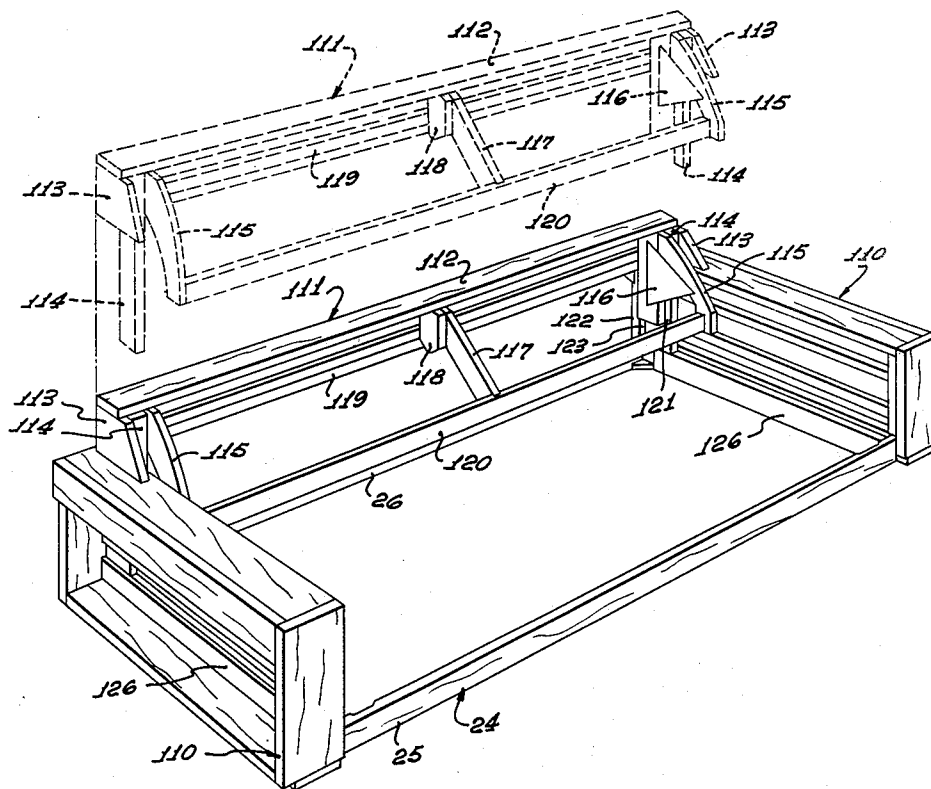


FIG. 9.

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SOFA BED

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Application March 3, 1955; Serial No. 491,828

5 Claims. (Cl. 5—13)

This invention relates to a sofa bed and more particularly to an improvement on the sofa bed which forms the subject matter of copending application Serial No. 396,184 filed December 4, 1953 by Ole J. Hesselberg and Richard A. Nowell.

It has been found in practice that some people, particularly small women, experience some difficulty in unfolding the sofa bed described in said copending application as the initial step of unfolding requires a raising of the folded end sections which requires considerable strength.

It is accordingly one object of this invention to overcome this defect in the sofa bed.

It is a feature of this invention that springs are provided to assist the initial opening step and as a result thereof it is a further feature of this invention that a releasable latch mechanism is provided to hold the bed in its completely folded condition.

Another defect in the above mentioned soft bed is the fact that the backrest portion of the sofa is stationary so that when a person sits upon the sofa and depresses the springs a gap may possibly appear between the bottom of the backrest and the seat cushions.

It is a further object of this invention to overcome this defect, and it is a feature of this invention that the backrest portion is movable from an upper position in which the portion of the mattress which is stored behind the backrest when the sofa bed is folded in sofa condition has ample room to clear the backrest on unfolding to a lower position which places the lower edge of the backrest in a position normally below the top of the seat cushions thus assuring that no such gap will be made despite depressing of the cushion by the weight of the sitter.

These and other objects, features and advantages of the present invention will be apparent from the annexed specification in which:

Figure 1 is a perspective elevation of a sofa bed embodying the present invention.

Figure 2 is a section taken along the line 2—2 of Figure 1.

Figure 3 is a section similar to Figure 2 showing one stage of unfolding of the bed.

Figure 4 is a fragmentary section taken along the line 4—4 of Figure 3.

Figure 5 is an enlarged fragmentary side view of a portion of the linkage illustrating the unlatching of the two outer sections.

Figure 6 is a view similar to Figures 2 and 3 showing the bed completely unfolded.

Figure 7 is an enlarged fragmentary view of a portion of the linkage showing the two outer sections folded and latched.

Figure 8 is a fragmentary section taken along the line 8—8 of Figure 1.

Figure 9 is a perspective elevation of a wooden frame suitable for receiving the hardware illustrated.

Referring now more particularly to the drawings, there is shown in Figure 1 a sofa bed indicated generally by the

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numeral 20 including a backrest 21, side arms 22, cushions 23 and a frame 24. As shown in Figure 1, the frame 24 is upholstered. In Figure 9, there is illustrated the frame 24 prior to the upholstering thereof and prior to the insertion of the hardware hereinafter described. The frame 24 includes a longitudinal front board 25, a longitudinal rear board 26, box like arm frames 110 and a backrest frame 111. The backrest frame includes a top board 112, side pieces 113 affixed thereto, a pair of slides 114 affixed to the side pieces and top piece as shown, forwardly and downwardly extending members 115 at each end of the backrest frame, reinforced by gusset plates 116 and a central brace 117 connected by a block 118 to the back board 119 and the front board 120 of the backrest frame as shown. The arm frames 110 each carries at its rear inward edges a pair of spaced rails 121 and 122 forming a guide 123 for the slides 114. The members 115 are provided with brackets 124 mounting rollers 125. The box like arm frames 110 are each provided with anchor plate mounting boards 126 to which are bolted metallic side members 27 having a U-shaped cross section. Each side of the metallic hardware is identical, and only one side thereof will be described, it being appreciated of course that the mechanism described is duplicated in connection with the other side of the sofa bed. Each metallic side member 27 has riveted thereto an upstanding arm 28 reinforced by a brace 29 riveted to the side member as at 30 and to the arm 28 as at 31. The upper end of the arm 28 is pivotally attached to a link 32 as at 33. The side member 27 has pivotally attached thereto as at 34 a link 35. The links 35 and arms 28 with reinforcing braces constitute the sole means of attachment of the remaining hardware to the side members 27. The link 32 has riveted thereto an arm 36, and a brace 37 is provided between the link 32 and the arm 36 as shown. Between one of the links 32 on one side of the hardware and the other of the links 32 on the other side of the hardware there extends a longitudinally extending L-shaped member 38. A plate 39 is riveted to the link 35, and an L-shaped arm 130 is pivoted thereto as at 131. An L-shaped bracket 132 is riveted to the arm 36, and a pair of strong coil springs 40 and 40a extend from the bracket 132 to the L-shaped arm 130 as shown. A second plate 42 is attached to each of the links 35, and a rod 43 extends longitudinally between each of the plates 42. A link 44 is pivoted to the free end of the arm 36 as at 45.

A further link 46 is pivoted to the link 44 as at 47. The link 46 has an offset portion 48. An arm 53 is pivoted to the link 46, and a leg 54 is pivoted to the arm 53. A leg 55 is pivotally mounted on the link 44, and a link 56 extends from the leg 54 to the leg 55. An angle 57 extends between the two legs 54, and a plurality of coil springs 58, having their upper loops fastened to a rectangular open metallic frame 59, are affixed to the horizontal flange of the angle 57. A bracket 60 extends from each leg 54 and engages the horizontal flange of the angle 57 and provides a seat for the front upholstery board 61. A link 62 is pivoted to the leg 55 as at 63 and to a bell crank 64 as at 65. The other end of the bell crank 64 is pivoted to the upper end of the link 35 as at 66. A plate 67 is riveted to the arm 36 and an arm 68 is pivoted to the plate 67 and to the upper end of the link 35. A member 69 is riveted to the arm 68 and is provided with a detent 71. Riveted to the link 44 is a member 72 having an upwardly extending portion 73 and a horizontally extending portion 74 forming a seat. Pivoted to the member 72 is a latch bar 75, which latch bar is provided with an outwardly extending dogging mechanism 76. The latch bar 75 has mounted thereon a plate 77 having an inwardly turned generally horizontally spaced end 78, and the plate 77 is fastened to the latch bar 75 by a pair of enlarged

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headed rivets 79 with coil springs 80 mounted on the shank of the pins between the plate 77 and the head thereof to thus mount the plate 77 for limited lateral movement. A coil spring 83 is connected to an outwardly bent portion 84 of the bar 75 and a tip 81 of the member 72 thus constantly biasing the latch bar 75 to urge the dogging mechanism 76 towards the seat 74. A tubular member 52 is pivoted to the link 46 as at 51. The tubular member 52 is U-shaped, and one arm thereof is associated with each link 46 with the web extending longitudinally and forming the outer edge of the frame of the sofa bed.

A leg 85 is pivoted to the tube 52 as at 86, and a plate 87 is welded to the leg 85 and to one end 88 of a bell crank 89 pivoted as at 90 to the other side of the tube 52. The crank 89 and leg 85 are thus joined for conjoint pivotal movement about the same axis. A link 92 is pivoted to the crank 89 as at 93 and to the member 46 as at 94. The free end of the crank 89 is notched as at 95. A mattress 96 is provided lying freely on the spring network (not shown) which extends from the angle 38, side channels 36, 44 and 46 and U-shaped tube 52.

Adjacent the front center of the sofa bed, when in the position shown in Figure 1, there is a further latching mechanism best illustrated in Figure 8. A front upholstery board 61 is cut away as at 140. A bracket 141 is mounted upon the vertical flange of the angle 57 and pivotally mounts a latch lever 142, which latch lever is provided with a detent 143 for dogging connection with the member 144 mounted on the inner side of the front frame member 24. Spring means (not shown) is mounted between the base of the bracket 141 and the upper arm of the latch member 142 and serves to constantly bias the latch bar 142 towards dogging connection with the member 144. The lower end of the member 143 is bevelled as at 145 to permit the same to slip over the member 144 to engage therewith.

The operation of the above described device is as follows: Assuming the sofa bed to be in the condition shown in Figure 1, the cushions 23 are removed therefrom and the bed unfolded. The first step in unfolding is to engage the latch bar 142 by the fingers of the operator and release the detent 143 from the member 144. Thereafter under the force of the springs 40 and 40a, the device will automatically move into the position shown in Figure 3. The rollers 125, being in engagement with a bar 150 riveted to the arm 36 and the link 32 as shown, ride upwardly with the movement of the bar 150 thus causing the backrest to move vertically, the slides 114 riding upwardly in the guides 123. It will be noted that in Figure 3 the notch 35 of the crank 89 is engaged under the dogging mechanism 76 and locked upon the seat 74. Thus the outer sections of the mechanism are locked together to pivot as a unit about the pivots 66 which swing outwardly as the links 35 swing about the pivots 34.

Further swinging of the assembled unit counterclockwise about the pivot 66 causes the detent 71 to engage the inwardly extending member 78 causing the latch bar 75 to rock laterally to permit the notch 95 of the crank 89 to be disengaged from the dogging mechanism. Such disengagement is illustrated in phantom in Figure 5. Further swinging of the unit about pivots 66 causes legs 55 to engage the floor, and thereafter the remaining unit is pivoted about pivots 47 until legs 54 engage the floor, after which the remaining mechanism pivots about pivots 51 until legs 85 engage the floor. This further unfolding of the unit raises the backrest to the extreme position shown in Figure 6 thus clearing the lower end of the backrest and permitting the inner end of the mattress 96 to be moved from behind the backrest without jamming.

To fold up the sofa bed, the outer section is first pivoted counterclockwise about pivots 51 until the notches

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95 are engaged under dogging mechanism 76 of latch 75. This locks the outer sections together, securely holding the folded mattress 96 therein. Further counterclockwise rotation of the unit about pivots 66 returns the mechanism to the position shown in Figure 2, and as the unit approaches its fully folded position the bevelled edge 145 of detent 143 passes over member 144 and latches the unit in its sofa position. Concurrently with this movement, bar 150 is swung to the position shown in Figure 2 completely disengaging the rollers 125 and allowing the backrest to drop to its lowermost position as shown in Figure 2.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be appreciated by those skilled in the art that various changes and modifications can be made therein without departing from the essence of the invention and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

We claim:

1. A combined bed and sofa forming structure comprising: a sofa frame including arm portions and a back rest; guide means and a slide mounted therein mounted between said back rest and arm portions to mount said back rest for vertical movement; a bed frame including a plurality of articulated sections foldable to form a sofa and unfoldable to form a bed; one of said sections being disposed behind said back rest when folded; and means carried by said one section to engage said back rest and raise the same upon unfolding of said one section.

2. A combined bed and sofa forming structure comprising: a sofa frame including arm portions and a back rest; guide means and a slide mounted therein mounted between said back rest and arm portions to mount said back rest for vertical movement; a bed frame including a plurality of articulated sections foldable to form a sofa and unfoldable to form a bed; one of said sections being disposed behind said back rest when folded; means carried by said one section to engage said back rest and raise the same upon unfolding of said one section; and spring means biasing said sections towards partially unfolded position.

3. A combined bed and sofa forming structure comprising: a sofa frame including arm portions and a back rest; guide means and a slide mounted therein mounted between said back rest and arm portions to mount said back rest for vertical movement; a bed frame including a plurality of articulated sections foldable to form a sofa and unfoldable to form a bed; one of said sections being disposed behind said back rest when folded; means carried by said one section to engage said back rest and raise the same upon unfolding of said one section; spring means biasing said sections towards partially unfolded position; and latch means disposed between said bed frame and said sofa frame for releasably locking said sections in folded position.

4. A combined bed and sofa forming structure comprising: a sofa frame including arm portions and a back rest; guide means and a slide mounted therein mounted between said back rest and arm portions to mount said back rest for vertical movement; a bed frame including a plurality of articulated sections foldable to form a sofa and unfoldable to form a bed; one of said sections being disposed behind said back rest when folded; means carried by said one section to engage said back rest and raise the same upon unfolding of said one section and disengaging said back rest upon folding of said section to permit said back rest to drop to its lowermost position; and spring means biasing said sections towards partially unfolded position.

5. A combined bed and sofa forming structure comprising: a sofa frame including arm portions and a back rest; guide means and a slide mounted therein mounted

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between said back rest and arm portions to mount said back rest for vertical movement; a bed frame including a plurality of articulated sections foldable to form a sofa and unfoldable to form a bed; one of said sections being disposed behind said back rest when folded; means carried by said one section to engage said back rest and raise the same upon unfolding of said one section and disengaging said back rest upon folding of said section to permit said back rest to drop to its lowermost position; spring means biasing said sections towards partially unfolded position; and latch means disposed between said bed frame and said sofa frame for releasably locking said sections in folded position.

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