March 19, 1946. A. KRAKAUER 2,397,017

FOLDING BED COUCH

Filed Aug. 28, 1941 2 Sheets-Sheet 1

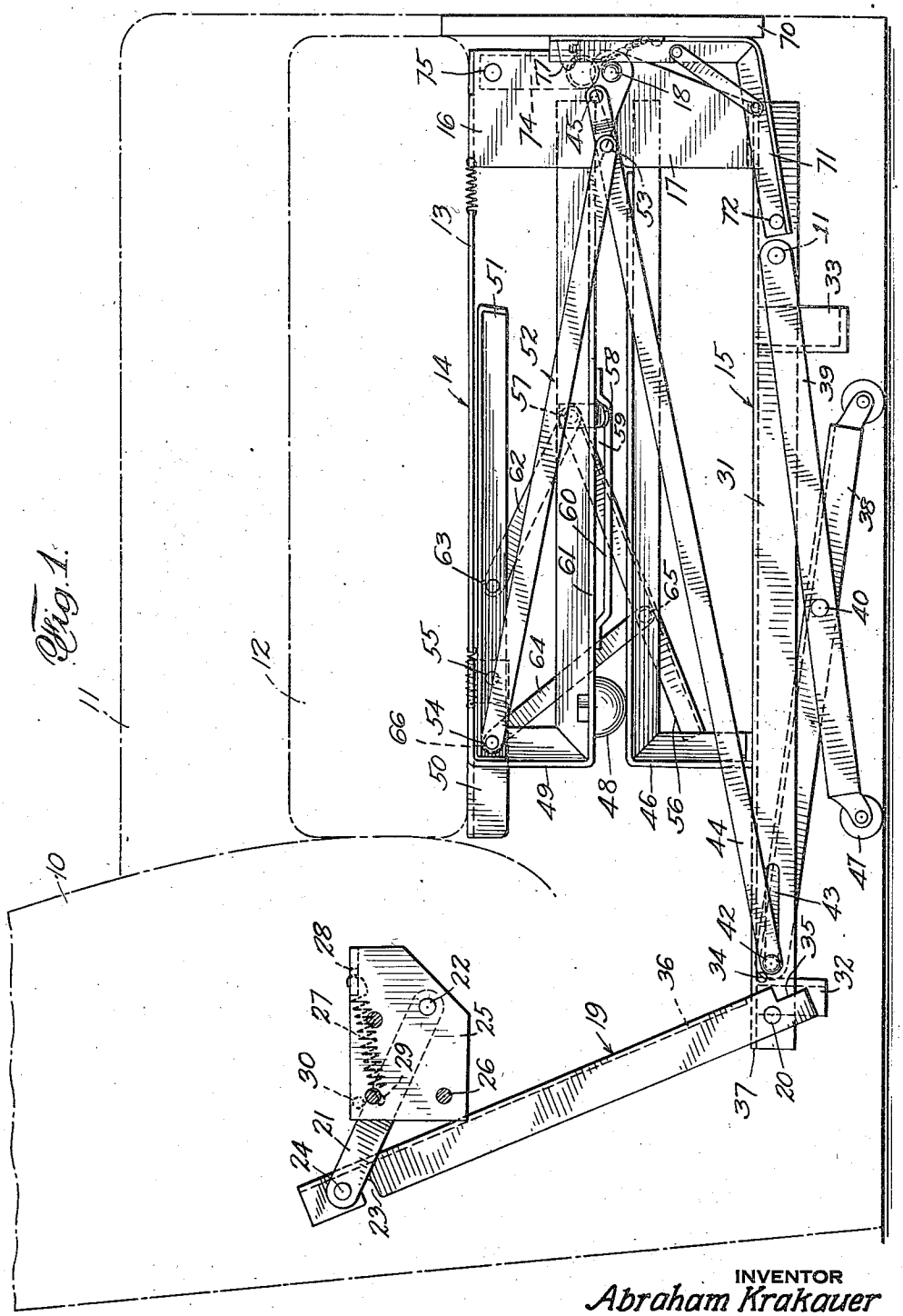


Fig. 1.

INVENTOR
Abraham Krakauer
BY Harry Jacobson
ATTORNEY

March 19, 1946. A. KRAKAUER 2,397,017

FOLDING BED COUCH

Filed Aug. 28, 1941 2 Sheets-Sheet 2

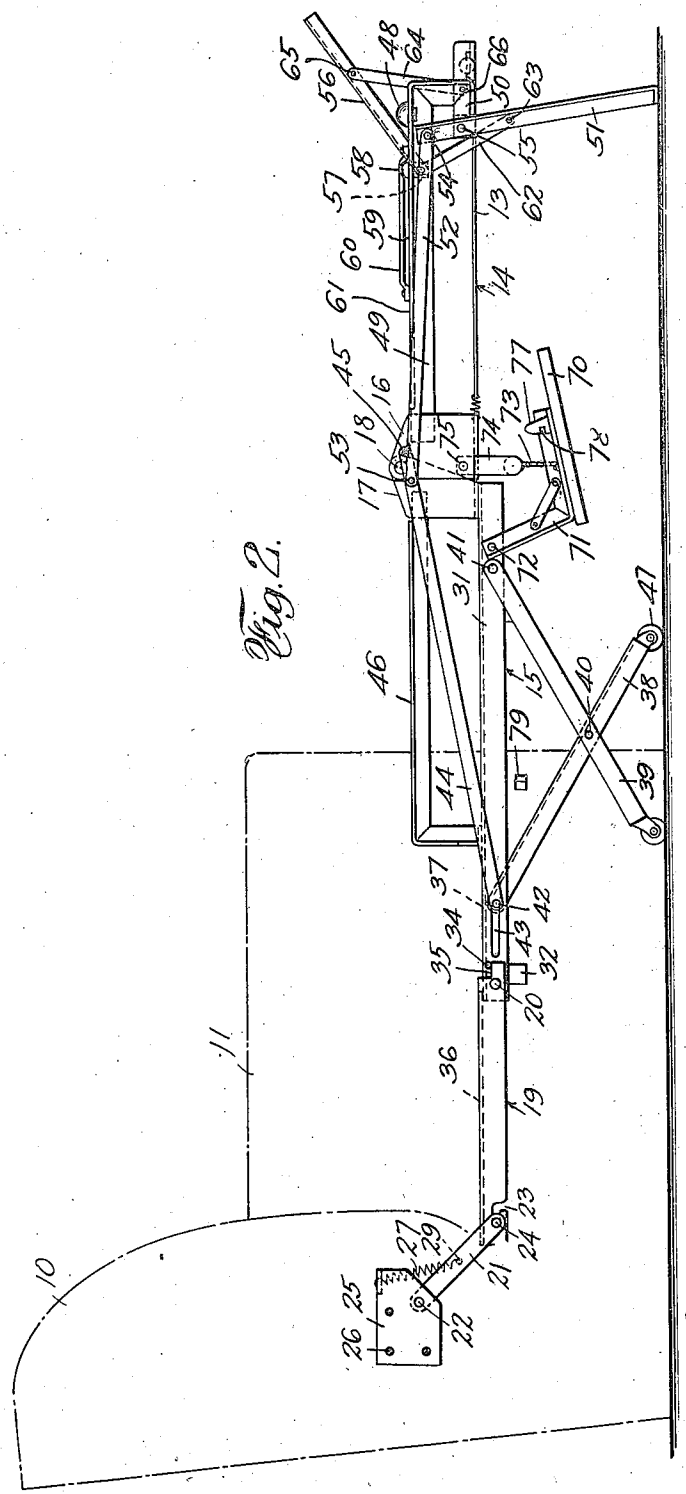


Fig. 2.

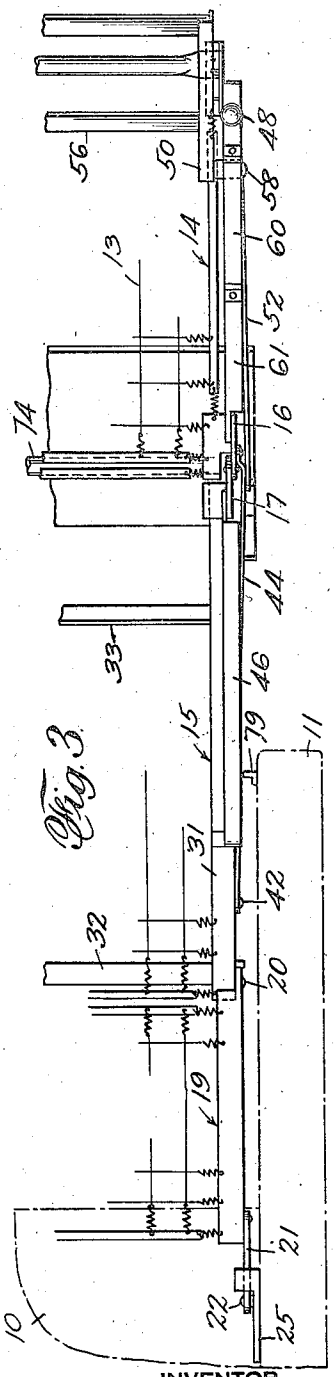


Fig. 3.

INVENTOR
Abraham Krakauer
BY Harry Jacobson
ATTORNEY

Patented Mar. 19, 1946

2,397,017

UNITED STATES PATENT OFFICE

2,397,017

FOLDING BED COUCH

Abraham Krakauer, Brooklyn, N. Y., assignor to Kay Manufacturing Corporation, Brooklyn, N. Y., a corporation of New York

Application August 28, 1941, Serial No. 408,595

14 Claims. (Cl. 5—31)

This invention relates to folding articles of furniture of the type designed to be used as a couch when collapsed and as a bed when unfolded.

The invention contemplates the provision of three interconnected foldable sections, two of which, when collapsed, serve as the couch seat, the third or rearmost section being foldable out of the way into a substantially upright position within the fixed back of the couch without interfering with the operation of the other two sections as a seat.

The invention further contemplates the provision of a three-section foldable unit which may be readily detached from the remainder of the couch when desired for purposes of cleaning or repair or movement from place to place.

The invention further contemplates the provision of means for automatically effecting the movement of certain parts such as a front panel cover member, a head-rest and supporting legs when the sections are unfolded into their bed-forming positions.

The invention further contemplates the provision of a resilient mattress-supporting structure in each of the sections, free of cross bars or braces in such positions as might cause discomfort to the user or which might interfere with the yielding of the mattress-supporting parts.

The various objects of the invention will be clear from the description which follows and from the drawings, in which,

Fig. 1 is an enlarged vertical section of my improved folding bed couch showing the parts in their folded or collapsed positions and showing the upholstered back, seat and arms of the couch in dash-dot lines.

Fig. 2 is a similar view of the same showing the parts in their extended or bed-forming positions.

Fig. 3 is a fragmentary top plan view of one side of the same.

In the practical embodiment of the invention shown by way of example, the back 10, side arms 11 and removable cushions 12 may be upholstered in the usual manner with or without inner spring units, said cushions resting on the resilient mattress-supporting part 13 of the front section 14 when the parts are collapsed and the article is used as a couch. The front section 14 is hinged at its rear part to the front part of the preferably longer intermediate or central section 15 by means of the hinge members 16, 17 pivoted together as by means of the hinge pivot 18. The rear section 19 is swingably suspended between the crank bars 21 and the rear part of the section 15, being pivoted at its front end as at 20 to the section 15 and at its rear end being pivotally and detachably supported by the crank bar 21 for movement about the pivot 22 which fixes one end of the crank bar to the plate 25. The section 19 is thereby so mounted that it moves forwardly into the horizontal position thereof shown in Fig. 2 and coplanar with the sections 14 and 15 when the latter sections are extended and drawn forwardly.

It is to be noted that when the three sections are unfolded, a bed of full length and full double width may be obtained, adequately provided with mattress-supporting parts, a head-rest and supporting legs. The crank bar 21 is duplicated at each end of the section 19 and serves the double purpose of normally maintaining the various sections folded in their seat-forming positions, and of controlling the movement of the sections into and out of the bed-forming positions thereof. To connect the bar 21 to the end rail of the section 19, an L-shaped slot as 23 is made in said rail in which slot operates the pin 24 of the bar 21. When said pin is in the rear part of the slot, it serves as a pivot and constrains the corresponding end of the section 19 to swing about the fixed pivot 22 which joins the bar 21 to the fixed plate 25, secured to the frame of the couch adjacent the arms 11 thereof by suitable means such as the screws or bolts 26. The spring 27, secured at one end to the plate 25 by the passage of said spring through the opening 28 in a flange thereof, and secured at its other end to a suitable pin 29 on the bar 21, serves to maintain the bar in the position thereof shown in Fig. 1 against the fixed stop 30 on the plate 25. The section 19 is thereby maintained in the substantially vertical, but somewhat rearwardly inclined position shown in Fig. 1, the spring also tending to draw the sections 14 and 15 rearwardly into and maintain them in their seat-forming positions.

When desired, however, the pin 24 may easily be removed from its slot 23 to detach the sections completely from the bars 21 so that the sections may be moved as a unit to any part of a room if desired, for cleaning, repairing, painting, or the like without the necessity for the handling and manipulation of the entire article of furniture, or for reaching thereinto.

The section 19 comprises a pair of angle iron members forming the end rails in said section and a suitable resilient mattress-supporting part not necessary to be shown in detail nor described and consisting for example of any well-known

combination of springs, straps, and wire fabric and on which part of the mattress rests and is resiliently supported.

Then central section 15, like the rear section 19, comprises a pair of end rails as 31 each formed of angle iron, and of a resilient mattress-supporting part stretched between said rails. To brace the section, a transverse bracing member as 32 may have its end parts bent into vertical position and secured to the respective vertical flanges of the rails 31, the intermediate part of the member 32 being below the lowermost part of said rails to avoid interference with the resilient mattress-supporting structure suspended between the horizontal flanges of the rails 31. Similarly, a bracing angle member 33 may be arranged in spaced relation to the member 32 and similarly secured to the rails 31 at its ends in a position such that it does not interfere with the mattress-supporting structure.

To limit the movement of the rear section 19 relatively to the central section 15 when the parts are unfolded or extended, a fixed pin as 34 projects outwardly from the rail 31 adjacent the pivot 20, said pin being arranged to engage the edge 35 of a corner cut-out portion in the side rail of the section 19 to limit the upward or counterclockwise movement of said end portion, as viewed in Fig. 1, and thereby to substantially align the mattress-supporting surfaces of the sections 19 and 15 in the unfolded positions thereof. The horizontal flange 36 of the end rail of the section 19 is adapted to rest on the horizontal flange 37 of the rail 31 when the parts are in their extended positions (see Figs. 2 and 3).

Secured to the rails 31 of the central section 15 are the crossed legs 38 and 39 pivoted together as at 40 and provided with suitable casters as 41 adapted to roll on the floor. The upper end of the leg 39 is pivoted to the rail 31 as at 41, while the upper end of the leg 38 is provided with a pin 42 passing through the slot 43 of said rail 31 and also passing through the lower end of the link 44. The pin 42 may therefore slide in the slot 43 to the limiting position shown in Fig. 2 when the parts are moved into their bed-forming positions and the legs 39 and 38 are extended.

The link 44 at its upper end is pivoted to the hinge member 16 by means of the pivot 45. Consequently, when the hinge member 16 is rotated about the hinge pin 18 in a clockwise direction, the pin 45 is swung about said hinge pin also in a clockwise direction to raise the link bar 44 and the pin 42 connected therewith and thereby to raise the section 15 bodily, the pin 42 at this time sliding in the slot 43. To transmit the weight of the section 14, as well as that of the cushion 12 and the weight of the person sitting upon said cushions to the legs 38, 39 and thence to the floor and also for bracing purposes, an L-shaped angle member 46 is secured at the lower end of its vertical leg, as viewed in Fig. 1, to the rail 31 and at the right end of its horizontal leg to the hinge member 17. Said member 46 serves as a support for the fixed caster 48 secured to the L-shaped end bracing member 49 for the section 14, said member 49 being secured to the comparatively short angle member 50 at the front part (when extended) of the section 14. At the right end of said section, as viewed in Fig. 1, the hinge member 16 is provided with a horizontal flange to which the resilient mattress-supporting structure 13 is secured, said structure connecting and being stretched between the hinge member 16 and the angle member 50. The right end of the bracing member 49 is also secured to the hinge member 16 so that the weight put upon the seat is transmitted from the section 14 to the member 49 and therefrom through the caster 48 to the member 46 of the section 15 and thence to the rails 31 and the legs 38 and 39 to the floor. In the collapsed position of Fig. 1, the sections 14 and 15 form the seat of the couch, the cushions 12 resting removably on the upper face of the resilient structure 13, and the mattress being folded between said structure and the corresponding structure of the section 15.

It will be understood that when the section 14 is swung in a clockwise direction, as viewed in Fig. 1, toward its bed-forming position, the foldable leg 51 carried by said section is automatically extended into the substantially upright position thereof shown in Fig. 2. This is accomplished by the link bar 52 pivoted at one end to the bar 44 as at 53, and at its other end pivoted to the end of the leg 51 as at 54. Said leg is in turn pivoted to the member 50 as at 55. When the section 14 is extended, the pivot 53 moves with the hinge member 16 in a clockwise direction about the hinge pivot 18, causing the bar 52 to move toward the right, as viewed in Figs. 1 and 2, and causing the pivot 54 to move in a counterclockwise direction to swing the leg 51 about its pivot 55 into its extended or operative position.

Means are also provided to extend the head-rest 56 automatically on the extending movement of the section 14 above described. Said head-rest is pivoted at one end as 57 to the slide 58 operating in the groove 59 between the guide member 60 and the horizontal portion 61 of the member 49. The link 62, connected at one end by the pivot 57 to said slide and pivoted at its other end 63 to the leg 51 on the opposite side of the pivot 55 to that on which the pivot 54 is arranged, transmits the movement of said leg to the slide 58, whereby the slide is moved toward the right, as viewed in Fig. 2, when the section 14 is extended. The link 64, pivoted at its end 65 to the head-rest and at its other end pivoted to the angle member 50 as at 66, controls the movement of the head-rest and causes it to move toward a vertical position as the slide 58 moves in its groove. Said link 64 also serves as a brace to maintain the head-rest in its extended or raised position.

Means are also provided to move the front-concealing panel 70 out of the way when the section 14 is extended. Said front panel is pivotally supported by the angle bracket 71 pivoted as at 72 to the rail 31 of the section 15. A chain or other flexible member as 73 connects the panel to the U-shaped bracing bar 74, which is secured at the top portion of its upright legs as at 75 loosely to the hinge member 16. The bracing bar 74 consequently hangs by gravity in a vertical plane from its pivot 75 regardless of the positions assumed by the various sections. In the folded or collapsed positions of the section shown in Fig. 1, the pivot 75 is in its uppermost position and consequently the bar 74 is also in its uppermost position, thereby tensioning the chain 73 and raising the panel 70 about its pivot 72 into its operative vertical position. When the section 14 is extended, however, and the hinge member 16 is swung in a clockwise direction about its pivot, the bar 74 is lowered, thereby lowering the chain 73 and permitting the panel 70 to drop by gravity out of the way of the sections into the position shown in Fig. 2 as far as is permitted by the bar 74 and chain 73.

To maintain the panel 70 in its operative posi-

tion, a grooved latch 77 is secured thereto and is provided with a groove 78 adapted removably to receive therein the edge of the fixed member 79 on the couch arm 11 after the panel has been raised at the end of the collapsing movement of the various sections. The panel cannot swing open until the section is first raised enough to remove the latch from its cooperating locking member 79 on the extending movement of the parts.

A suitable cross bar in the form of a pipe may be secured between the end angles 50 for use as a handle to manipulate the section 14, said bar serving also as a brace for the section, being arranged beneath the head-rest so that it does not interfere with the mattress or with the mattress-supporting structure.

In the normal collapsed or seat-forming positions of the parts, the crossed legs 38, 39 are collapsed, the pin 42 being at the extreme left end of the slot 43 (Fig. 1) and the weight of the section 15 and of the parts resting thereon being transmitted to the floor on which the couch rests through the casters 47. Said section 15 besides being lowered has also been moved as far as it will go toward the rear, thereby swinging the rear section 19 about the fixed pivot 22 under the control of the crank bar 21 assisted by the spring 27. Said section 19 is therefore arranged well within the fixed back of the couch bed in a nearly vertical position and out of the way of the remaining seat-forming sections 14 and 15. The space between the mattress-supporting parts of the sections 14 and 15 is occupied by part of the folded mattress intended to lie on said supporting parts when the sections are extended, the remaining rear part of the mattress resting in an inclined position against the upper surface of the section 19 in a manner which will be clear and hence need not be illustrated, nor further described. The engagement of the caster 48 of the end bracing member 49 with the end bracing member 46 maintains said sections 14 and 15 in their proper spaced relation and said members serving to transfer the weight put upon the seat cushions 12 to the section 15 and therethrough to the floor. The panel 70 is in its section-concealing position, being locked therein by the engagement of the latch 77 thereof with the fixed locking member 79.

To remove all of the sections for cleaning or other purposes, the pin 24 need merely be removed from the slot 23, thereby freeing the section 19 and permitting all of the sections together with the panel 70 and the connecting parts and mattress to be removed from the frame bodily. The parts can be rolled back into place and the pin 24 reinserted into the slot 23 after the sections have been cleaned, repaired or inspected.

To convert or extend the sections into a bed, the cushions 12 are first removed, whereafter the pipe handle at the front end of the section 14 is grasped and carried upwardly and forwardly to rotate the section 14 about its hinge pin 18, whereby the leg 51 and the head-rest 56 are automatically extended in the manner hereinbefore described and the panel 70 simultaneously released to drop by gravity about its pivot. During the rotation of the section 14, it is also pulled forwardly, thereby not only to raise the section 15 and to extend the leg and head-rest, but also to swing the rear end of the section 19 downwardly and forwardly and to swing its front end upwardly and forwardly to carry the mattress-supporting surfaces of all the sections into coplanar positions. It will be understood that since each of the sections is of substantially the same length as that of the frame, and since the combined width of said sections is substantially equal to the length of a bed, a bed of full length and full double width may readily be obtained with a suitable head-rest so that the head of the user is free of the fixed side arms and back usually found on a couch and the user consequently can get the benefit of fresh circulating air.

To collapse the couch from the position of Fig. 2 to that of Fig. 1, the pipe handle at the front end of the section 14 is grasped and raised while said section is rotated about the hinge pivot 18, and at the same time pushed rearwardly. The leg 51 and head-rest are thereby automatically collapsed and the section 14 folded in to the position shown in Fig. 1 resting on the section 15, the spring 27 aiding in the rearward movement of the parts in the collapsed positions thereof.

It will be seen that I have provided a comparatively simple couch bed capable of being easily extended into an adequate full size bed with proper supports and head-rest without necessitating the removal of the mattress therefrom, but capable of being disconnected from the frame as a unit and moved from place to place when desired, and that I have provided a couch bed well designed to meet the requirements of practical use.

While I have shown and described a specific embodiment of my invention, I do not wish to be understood as limiting myself thereto, but intend to claim my invention as broadly as may be permitted by the state of the prior art and the scope of the appended claims.

I claim:

1. In a folding bed couch, a plurality of sections each comprising a pair of parallel spaced end rails, and a resilient mattress-supporting structure suspended between the rails, the intermediate one of said sections being bodily movable, means pivotally connecting the front and rear of said sections to the intermediate section, collapsible means for supporting the intermediate section, a foldable leg and a foldable head-rest on the front section, means operatively connecting the leg and head-rest to said collapsible means to extend and collapse the leg and head-rest automatically on the extension and collapse of said collapsible means, said connecting means including a slide at one end of and having an operative connection to the head-rest, a guide for the slide, and a link between the slide and the leg, and pivoted means for suspending the rear end of the rear section for movement of said rear section toward and from a vertical position at the back of the bed couch.

2. In a folding bed couch having a fixed frame comprising a back and sides, a central section, means for supporting said section for bodily movement parallel to itself, a front section hinged to the front part of the central section and foldable thereupon to form a seat therewith, a rear section hinged to the rear part of the central section and swingable into the back into substantially vertical position, a crank bar fixed at one end to the frame and having a pin at the other end thereof entering an L-shaped slot in the rear section and thereby permitting detachment and removal of the sections as a unit from the frame, a plate fixed to a side of the frame and provided with a flange having a perforation therein, and a spring having one end thereof passing through the perforation and having the other end thereof fixed to a part of the crank in-

termediate the ends of the crank, said spring maintaining the pin in the slot and urging the rear section upwardly in all positions of said rear section, said crank bar and the hinged connection of the rear section to the central section constituting the means controlling the movement of the rear section into and out of the back.

3. In a folding bed couch, a central section, a front section hinged to the front part of the central section, a rear section hinged to the rear part of the central section, and adapted to be swung into and out of coplanar relation to the central section, a fixed plate in the back part of the bed couch, a swingable bar pivoted to the plate at one end and having a pin and slot connection at its other end to the rear section, whereby the rear section moves from a horizontal toward a vertical position on the downward and rearward movement of the central section, a spring fixed at one end to the plate and fixed at the other end to the bar at a point intermediate the ends of the bar and urging the rear section upwardly in all positions of said rear section, and means for supporting the central section to move bodily parallel to itself from its folded position in the couch to an unfolded position out of the couch and from its unfolded to its folded position.

4. In a folding bed couch, a first seat-forming swingable section having substantially parallel spaced end members, a resilient mattress-supporting structure suspended between said members, and a U-shaped bracing member having end parts loosely pivoted to the end members, a second seat-forming section, a hinge joining said sections whereby the first section is swingable through approximately 180° on to the second section to form a seat support therewith, a front cover-panel loosely pivoted to the second section and a chain connection between the bracing member and the panel to maintain said panel in a section covering position when the front section is in its seat-forming position, and to permit said panel to drop when the first section is moved toward its bed-forming position.

5. In a folding bed couch, a pair of mattress-supporting sections each having an end spacing member, a hinge joining adjacent parts of the sections to permit the sections to be folded one on the other in a seat-supporting position with the spacing member of the upper section transmitting the weight on the seat to the lower section, a cover-panel loosely pivoted to the lower section and concealing the front parts of the sections in the seat-forming position of the sections, a bracing bar pivoted loosely to the upper section and a flexible connection between and operatively connecting the bar and the panel.

6. In a folding bed couch, a frame, a pair of mattress-supporting sections each having an end spacing member, a hinge joining adjacent parts of the sections to permit the sections to be folded one on the other in a seat-supporting position with the spacing member of the upper section transmitting the weight on the seat to the lower section, a cover-panel loosely pivoted to the lower section and concealing the front parts of the sections in the seat-forming position of the sections, a bracing bar pivoted loosely to the upper section and a flexible connection between and operatively connecting the bar and the panel, a latch member on the panel and a cooperating fixed latch member on the frame normally and removably to maintain the panel in its section-concealing position.

7. In a folding bed couch having a front section and having a central section joined to the front section by a hinge, an end spacing member on the front section, a guide on the member having a part thereof spaced from the member to provide a guide slot, a slide movable in the slot and adapted for connection to one point of a head-rest, a first link pivoted at one end to the front section and at the other end adapted to be pivoted to a second point of the head-rest to control the movement of the head-rest, a folding leg pivoted to the section, a second link pivoted at one end to the slide and at its other end to the leg on one side of the pivot for the leg, a third link pivoted at one end to the leg on the other side of said pivot, a pair of crossed legs pivoted together and pivoted to the central section, and a fourth link connected to one of the legs and adapted to be connected to the hinge, the other end of the third link being pivoted to the fourth link adjacent the hinge, whereby swinging movement of the front section out of its seat-forming position operates the fourth link and therethrough operates the third link and thereby extends said crossed legs, said head-rest and the folding leg simultaneously.

8. In a folding bed couch, a front section swingable into a bed-forming position, a slide on said section, guide means for the slide, a head-rest carrying the slide, a foldable leg pivoted to the section adjacent the head-rest, means for operating the slide to extend the head-rest and the leg on the swinging of said section into bed-forming position including a link pivoted to the leg, means for moving the link on the extension of said section and a second link connected to the leg and to the slide, and a third link pivoted to the head-rest and to the section and controlling the movement of the head-rest on the movement of the slide.

9. In a folding bed couch, a pair of hinged sections swingable into vertical spaced relation constituting a seat-forming position thereof, means for transmitting the weight on the upper section to the lower section and to a floor comprising a bracing member extending downwardly from the upper section, a caster extending downwardly from the member, a bracing member extending upwardly from the lower section and contacting said caster, and pivoted legs on each of said sections, the legs on the lower section being crossed and pivoted to each other, a third section pivoted at its front part to the rear one of said hinged sections, and a spring-pulled swingable arm removably pivoted to the rear part of the third section and to a fixed part of the couch, said arm maintaining said third section substantially upright in the collapsed positions of said sections and suspending the rear part of the section in the extended positions thereof, said legs and spring urging the sections to complete the folding and unfolding movements thereof respectively after such movement has been initiated and only partly carried through, said legs, spring and bracing members absorbing a substantial part of the shock resulting from uncontrolled movement of the sections when control of such movement is lost by the user after only part of the folding and unfolding movement is carried through.

10. In a folding bed couch, a frame, a foldable combined bed and seat part comprising a central section, a front section hinged to the central section and constituting a seat support therewith when folded on to and resting on the central section, bracing members on said sections extending

toward each other when said sections are folded, a spacer member extending from one of the bracing members and arranged to rest on the other bracing member when said sections are folded thereby to transmit the weight of the front section to the central section, collapsible legs on said sections extensible to support the sections when the sections are extended into the bed-forming positions thereof, the legs of the central section supporting both of said sections when the sections are folded, a legless rear section hinged at its front end to the rear part of the central section, and a crank bar fixed at one end to the frame and at its other end removably connected to the rear part of the rear section by a pin operating in an open slot in the rear section and suspending said rear part in the bed-forming position of the rear section, whereby all of said sections are adapted for removal from the frame as a unit on the disconnection of the crank bar from the rear section.

11. In a folding bed couch having a frame including a fixed back, a central section, means for supporting said section for bodily movement parallel to itself, a front section foldable upon the central section to form a seat therewith, a hinge connecting adjacent parts of said sections, said hinge comprising a pair of plates pivoted together at a point in upward spaced relation to the central section, a link pivoted at one end to one of the plates in spaced relation to the pivot of the hinge, said link being pivoted at its other end to the supporting means for said central section, a rear section hinged to the rear part of the central section and swingable into the back into substantially vertical position, and means for yieldingly supporting the rear end of the rear section comprising a crank bar fixed at one end to the frame and having a pin at the other end thereof entering an L-shaped slot in the rear section and thereby permitting detachment and removal of the sections as a unit from the frame and a spring fixed at one end to the frame and at the other end fixed to a point of the crank bar intermediate the ends of the bar, said spring maintaining the pin in the slot.

12. In a folding bed couch, a frame, a foldable combined bed and seat part comprising a rear section, a central section, a front section hinged to the central section and constituting a seat support therewith when folded on to the central section, collapsible legs on said central and front sections adapted to rest on a floor and extensible to support the central and front sections when the sections are extended into the bed-forming positions thereof, a crank bar fixed at one end to the frame and at its other end removably connected to the rear part of the rear section and suspending said rear part in the bed-forming position of the rear section, whereby all of said sections are adapted for removal from the frame as a unit on the disconnection of the crank bar from the rear section, and a spring fixed at one end to the frame at a point above the fixed end of the crank bar and at the other end fixed to a point of the crank bar intermediate the ends of said crank bar, said legs and spring absorbing part of the shock resulting when the sections are partly collapsed and then control thereof by the user is lost, and also tending automatically to complete the folding and unfolding of the sections when manual folding and unfolding thereof has been initiated and partly carried out.

13. In a folding bed couch, a front section, a central section hinged to the front section, a first link pivoted at one end to the front section and pivoted at its other end to a head rest, a folding leg pivoted to the section, a second link pivoted at one end to the head rest and at its other end to the leg on one side of the pivot for the leg, a third link pivoted at one end to the leg on the other side of said pivot, a pair of legs pivoted together and pivoted to the central section, and a fourth link between the legs and the front section, the other end of the third link being pivoted to the fourth link, whereby swinging movement of the front section out of its seat-forming position operates the fourth link and the third link and thereby extends the legs, the head rest and the folding leg simultaneously.

14. In a folding bed couch provided with a swingable head rest, a frame, a central section, means for supporting said section for movement in and out of the frame in a direction parallel to itself, said means being pivoted to the central section, a front section hinged to the front end of the central section, a rear section hinged to the rear end of the central section, a folding leg on the front section, and linkage connecting the sections to the supporting means, the leg and the head rest to extend the same and to collapse the same on swinging movement of the front section comprising a first link pivoted to the front section and to the head rest, a second link pivoted to the folding leg and to the head rest, a third link pivoted to the leg, and a fourth link pivoted to said supporting means and to the front section and to the third link.

ABRAHAM KRAKAUER.