

S. KARPEN.
SOFA BED.

APPLICATION FILED MAY 7, 1910

Patented Dec. 12, 1911

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1,011,441.

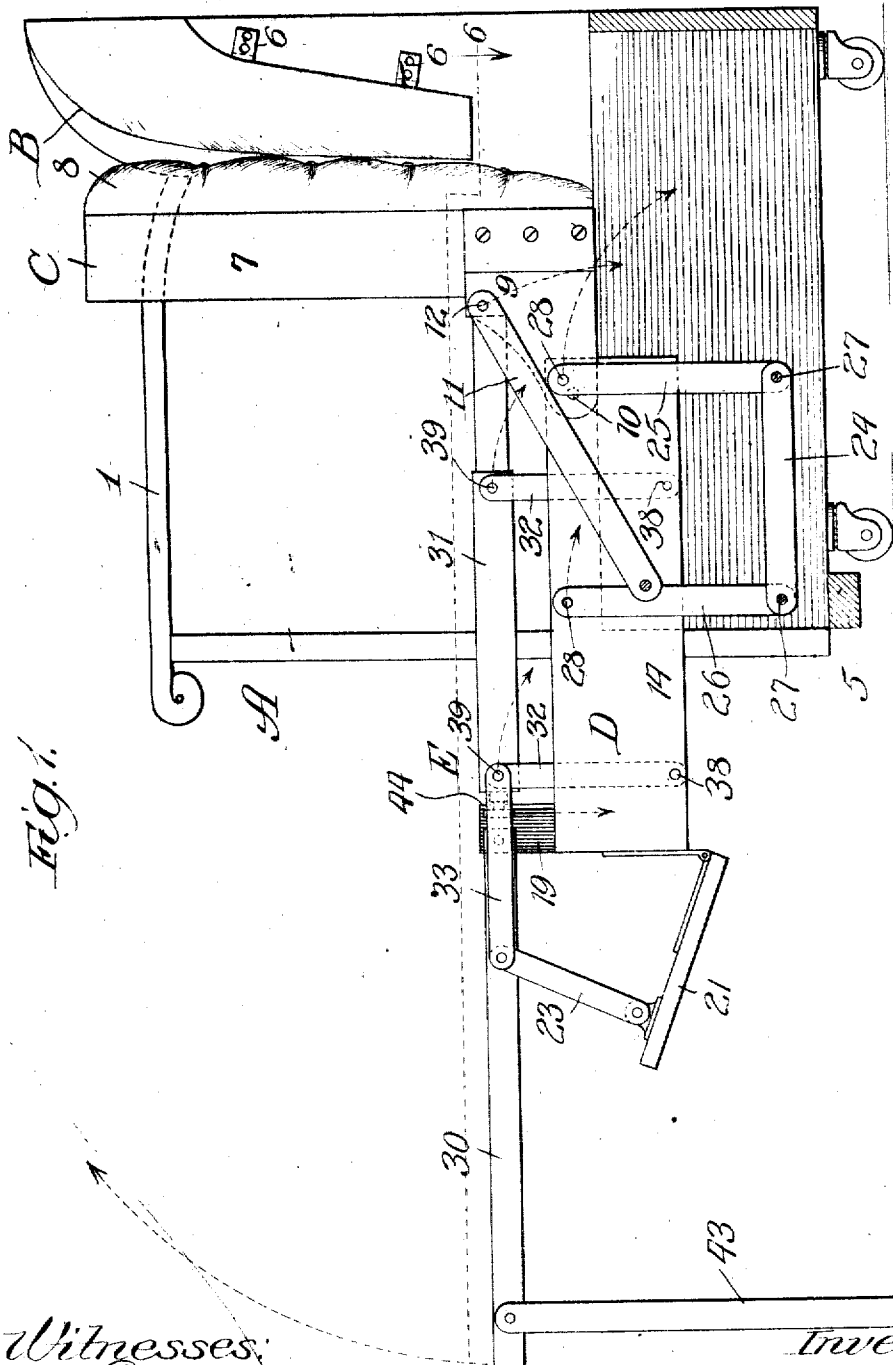


Fig. 1.

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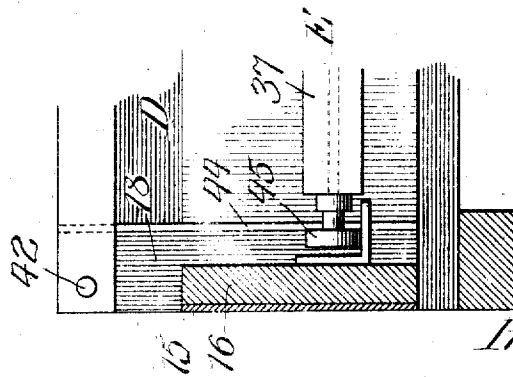
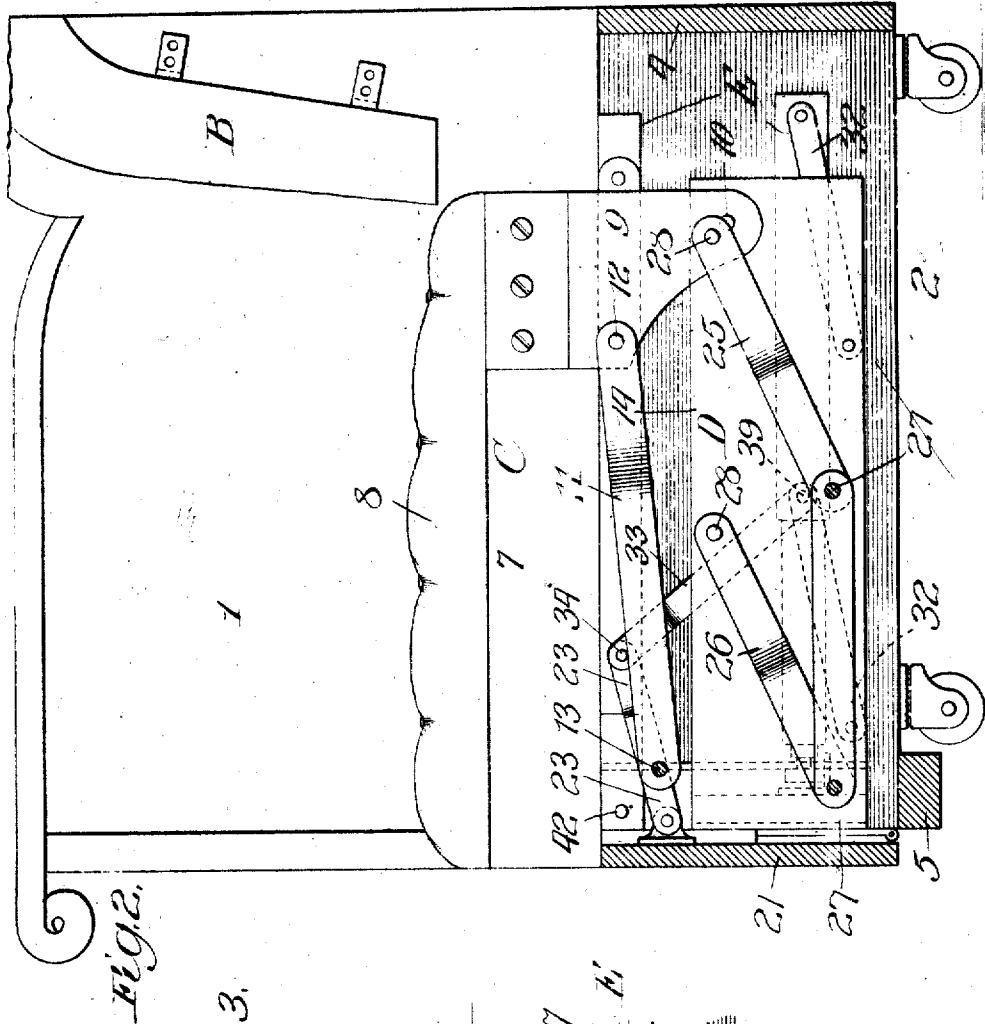
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4 SHEETS-SHEET 3.

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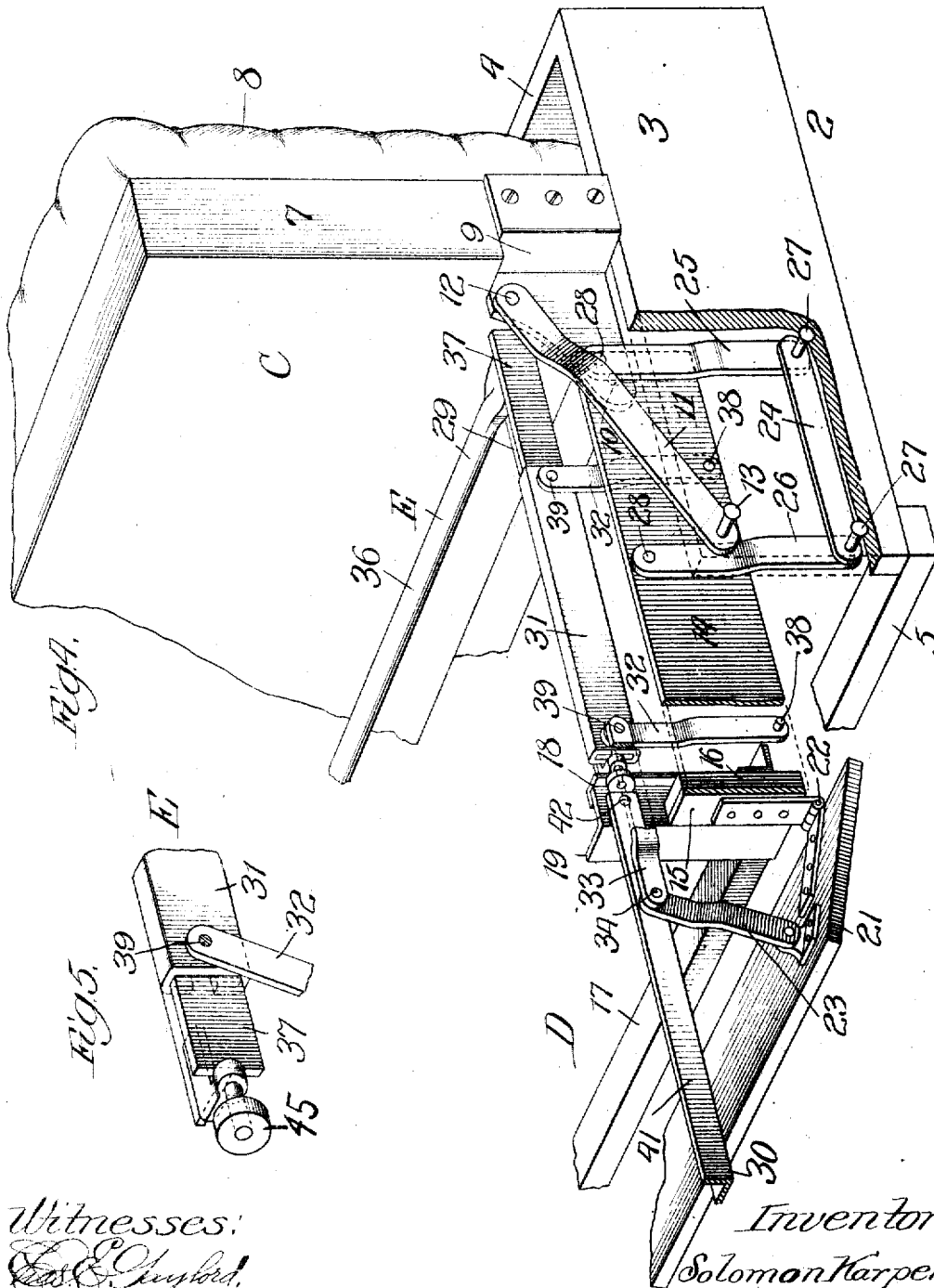
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4 SHEETS-SHEET 3

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4 SHEETS-SHEET 4

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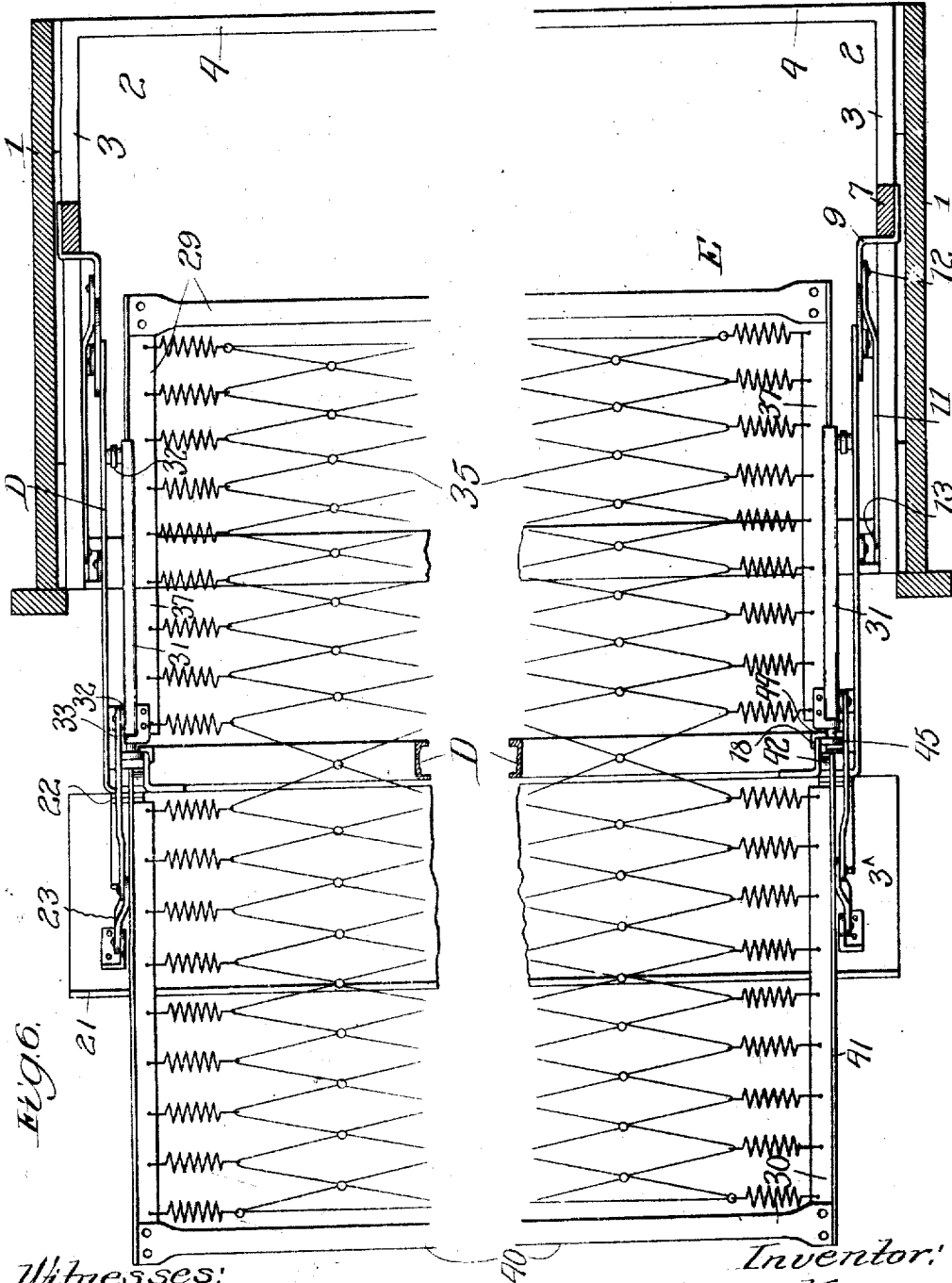


Fig. 6.

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UNITED STATES PATENT OFFICE.

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SOFA-BED.

1,011,441.

Specification of Letters Patent.

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Application filed May 7, 1910. Serial No. 559,937.

To all whom it may concern:

Be it known that I, SOLOMON KARPEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Sofa-Beds, of which the following is a specification.

My invention relates particularly to combination sofas and beds, or combination couches and beds, in which a foldable mattress frame, or foldable bed frame, is normally housed within the main frame beneath the seat of the sofa and equipped with a foldable wire mattress or spring bed-bottom, the parts being so related as to afford room between the sections of the folded bed-frame and bed-bottom for the bedding, *i. e.*, the mattress-pad, bed-linen and covers.

The present invention constitutes an improvement upon the construction set forth in my Letters Patent No. 949,374, granted February 15, 1910; and my primary object is to provide a structure of improved construction and operation whereby the forward shifting of the folded bed which occurs in this type of structure may be accomplished in an improved manner, which is such that when the bed is unfolded it will occupy a position approximating in height the height of an ordinary bed of the standard or non-folding type.

It may be preliminarily stated that in the preferred construction, which is illustrated in the accompanying drawings, there are employed a main frame; a stationary back carried thereby; a seat mounted between the end-standards of the main frame and adapted to swing rearwardly and upwardly and assume a standing position adjacent the sofa-back; a foldable mattress-frame normally housed within the main frame beneath the seat; a cradle, or carrier, mounted on links carried by the main frame; and links mounted on said carrier and upon which the foldable bed is mounted. The arrangement is preferably such that the carrier upon which the folded bed is mounted will be automatically shifted forwardly and elevated in the operation of swinging the seat from the horizontal to the standing position, after which the folded bed mounted on the carrier may be unfolded, in which operation the bed will be elevated with relation to the carrier; and further, that after

the bed has been folded upon the carrier the carrier will be automatically retracted and lowered, thereby carrying the bed to the housed position in the operation of lowering the seat from the standing position. As has been indicated, the mattress-frame is preferably equipped with a flexible mattress, or bed-bottom, which is unfolded or spread in the operative position in the operation of unfolding the bed-frame; and the mattress-pad, or mattress proper, and other bedding, including the bed-linen and covers, are secured in position and folded between the sections of the foldable mattress-frame, so that the bedding will be spread out with the mattress or flexible bed-bottom when the device is converted into bed form.

In the accompanying drawings, which show my sofa-bed in its preferred form—Figure 1 is a sectional view of my improved combined sofa and bed, illustrating the device in bed form; Fig. 2, a similar section showing the bed housed in the main frame beneath the sofa-seat; Fig. 3, a detailed sectional view taken as indicated at line 3 of Fig. 6, and showing one of the guides employed at the front corners of the link-supported carrier employed, with which guides the rear bed-section is raisably connected; Fig. 4, a broken perspective view showing the main frame with the ornamental end-standard removed, and the seat and bed mounted on said frame; Fig. 5, a broken perspective view showing the manner in which the rear bed-section is mounted on link-supported slides carried by said carrier, or cradle; and Fig. 6, a broken plan sectional view taken approximately as indicated at line 6 of Fig. 1.

In the preferred construction, A represents the main frame; B, a sofa-back fixedly secured between the end-standards thereof; C, a swinging sofa-seat adapted to swing rearwardly and upwardly from its horizontal position and assume a standing position adjacent said back; D, a cradle, or carrier, mounted on links carried by the main frame and connected with the seat, so that the carrier will be automatically shifted forwardly and raised in the operation of swinging the seat to the standing position and will be automatically retracted and lowered in the operation of lowering the seat; and E, a foldable bed-frame or mattress-frame mount-

ed on links carried by said carrier, so that the bed, when in folded condition, will be shifted with said carrier in the operations of raising and lowering the seat.

5 The frame A may be of any suitable construction. In the construction illustrated, the frame comprises end-standards 1, which constitute the arms of the sofa; and a box or frame 2 interposed between said end-standards and firmly secured thereto. The box or frame 2 comprises end members 3, a rear connecting member 4, and a front connecting member 5, said rear connecting member being preferably of the same height as the end-members 3, and said front connection member being so disposed as to leave the front of the open box frame 2 practically open or unobstructed.

The back B may be of any suitable construction, and is securely joined to the rear upper portions of the ornamental end-standards 1 of the main frame in any preferred manner. As shown, the back is secured to said end-standards by clips 6.

25 The seat C may be of any suitable construction. As shown, it comprises a frame 7 upon which is mounted a cushion 8. The frame 7 usually supports upholsterers' springs (not shown) over which the cushion 8 is disposed. The end members of the seat-frame 7 are equipped at their rear portions with fixedly secured hinge-plates, or pivot-members 9, which normally depend, when the seat is in the horizontal position, into the rear portion of the frame 2 and are joined by pivots 10 to the rear portion of the carrier D. Links 11 are connected at their rear ends, by pivots 12, to the plates 9, and are connected at their front ends, by pivots 13, to the front portions of the end members 3 of the frame 2.

In the form shown, the carrier D comprises a frame composed of end members 14 having inturned front ends 15; corner uprights 16 secured to said inturned ends; a front connecting member 17; angle-bars 18 secured to the rear surfaces of the members 16 and projecting above the same and affording guides for the rear bed-frame section; upright angle-bars 19 having rearwardly turned flanges secured to the forwardly turned flanges of the members 18; and a front piece 21 connected at its lower edge by hinges or pivots 22 to the front portion of the carrier frame, said front piece 21 having connected with its upper corners links 23 adapted to swing the front piece on its hinges when the bed is unfolded, after the carrier D has been shifted forwardly and raised to its elevated position during such movement. The seat C normally rests on the frame 2 when the structure is in sofa form, and the front piece 21 of the carrier D, at such time, serves as a front piece for the sofa bed disposed beneath the front portion of the seat, thus

hiding the interior mechanism from view. The frame 2 has applied to the front lower portions of the inner surfaces of the end members 3 thereof bars or clips 24 pivotally connected with links 25 and 26 which serve as mountings for the carrier D. The links 25 are connected at their lower ends by pivots 27 to said bars 24, and are connected at their upper ends, by pivots 28, to the upper rear portions of the outer surfaces of the end members 14 of the carrier D. When the structure is in sofa form, the links 25 and 26 incline rearwardly and upwardly, and when the seat C is swung to the standing position, the links 25 and 26 swing by a parallel movement to the standing position. In the illustration given, the rear links 25 are not connected directly to the end pieces 14 of the carrier D, but are connected to the hinge-plates 9 near the pivots 10.

The bed E, in the form illustrated, comprises a rear bed-frame section 29 raisably connected with the carrier D; a front bed-frame section 30 pivotally connected with the upright members 19 of the carrier D; slides 31 connected with the arms or end members of the rear frame section 29; links 32 pivotally joined to the slides 31 at their upper or rear ends and pivotally joined at their lower ends to the end members of the carrier D; links 33 connected at their rear ends with the slides 31 and having their front ends connected with pivots 34 which connect the upper or rear ends of the links 23 to the end members or arms of the front bed-section 30; and a foldable wire fabric or bed-bottom 35 connected with the folding bed-frame. The rear bed-frame section 29 is of U-form, comprising a longitudinal rear member 36 and forwardly extending arms 37 which preferably are of T-form in cross-section and have the slides 31 mounted thereon. The lower ends of the links 32 are joined by pivots 38 to the lower portions of the end members of the carrier frame D and the upper ends of said links are joined by pivots 39 to the slides 31. The front pivots 39 also serve as pivots for the rear ends of the links 33. The front or upper bed-frame section 30 comprises a longitudinal member 40 and rearwardly extending arms or end members 41 whose extremities are joined by pivots 42 to the rearwardly turned flanges of the upright members 19 of the frame D. Pivotally connected with the free or swinging edge-portion of the front bed-section 30 are legs 43 adapted to support the front portion of the front bed-section in the elevated position shown in Fig. 1.

As shown in Figs. 3 and 6, the upright angle-bars 18 have out-turned flanges 44 adapted to be engaged by flanged rollers or guide-studs 45 which project forwardly from the front ends of the arms 37 of the

rear bed-section. Thus the rear bed-section is positively guided in its raising and lowering movements while the links 32 are swinging on their pivots 38 and the slides 31 are moving on the end members 37 of the rear bed-section. Also, the angle-bars 18 being disposed at the inner sides of the rollers 45, *i. e.*, between the arms 37 of the rear bed-section, serve to hold said arms against springing together when the bed is occupied. The arms of the front bed-section are similarly held separated by the upright members 19 at the outer sides of which said arms are pivoted.

The operation will be readily understood from the foregoing detailed description. Preparatory to converting the structure from bed form to sofa form, the bed is properly made up and the bedding secured to the folding bed frame, so that when the bed-frame is folded upon the carrier, by swinging the front bed-section 30 rearwardly and upwardly from the position shown in Fig. 1, the bedding will be folded at the same time. After such folding operation, the seat may be lowered, thereby, through the medium of the pivotal connections between the lower portion of the seat and the carrier D, causing said carrier to be automatically shifted rearwardly and depressed, the links 25 and 26 swinging rearwardly about the pivots 27 in such movement. During this portion of the operation, the thrust is transmitted from the seat through the links 11 to the main frame. In the operation of folding the bed on its carrier, previous to the operation of lowering the seat, the links 33 connected with the front bed-section serve to shift the slides 31 rearwardly, thereby turning the links 32 on their pivots 38, so that the rear bed-section will be lowered with relation to the carrier, the rollers 45, during this movement, traveling along the guide-flanges 44 of the uprights 18. During this operation, the links 23 automatically fold the front-piece 21 with relation to the carrier. When the carrier is automatically retracted, thus carrying the bed to the housed position, during the operation of lowering the seat, the front piece 21 of the carrier is carried to the position shown in Fig. 2, where it serves as a front piece for the sofa bed, closing the space beneath the front portion of the seat and extending from one end-standard 1 of the main frame to the other end-standard. In converting from sofa form to bed form, the seat is swung to the standing position, in which operation the carrier D is automatically shifted forward and elevated, after which the operator unfolds the bed, in which operation the front bed-section 30 is swung forwardly, thereby drawing the slides 31 forwardly and elevating the rear bed-section, owing to the swinging of the links 32 to the standing position.

During this operation, the front piece 21 is automatically lowered by the links 23, so as to be out of the way of the bed.

The construction described is simple, durable and may be manufactured at moderate cost, all of the parts being of such form and construction as to enable them to be readily applied in a furniture factory. When the structure is in bed form, the bed is supported at a convenient height for use, and the disposition of the parts is such that no obstruction is presented beneath the flexible bed-bottom to interfere with its comfortable use.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation is to be understood therefrom, but the appended claims are to be construed as broadly as permissible in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is—

1. In means of the character set forth, the combination of a main frame, a back rigidly mounted thereon, a rearwardly swinging seat adapted to assume a standing position adjacent said back, a carrier frame normally housed beneath said seat, mechanism connected with said seat, carrier frame and main frame serving automatically to advance and elevate the carrier frame in the operation of swinging the seat to the standing position, and a folded bed mounted on said carrier frame and normally housed therewith beneath said seat when the structure is in sofa form.

2. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat mounted thereon, a carrier frame normally housed beneath said seat, links pivotally connected with said carrier frame and main frame and adapted to carry forwardly and elevate said carrier frame, means connected with said seat for automatically shifting said carrier frame, a folded bed mounted on said carrier frame and comprising a plurality of foldably related sections, and links foldably connected with said carrier frame and upon which one of said sections is raisably mounted.

3. In a sofa bed, the combination of a main frame, a rearwardly swinging seat, links connecting said seat to said main frame, a carrier pivotally connected with the rear portion of said seat, means serving to elevate and carry forward said carrier when the seat is swung to the standing position, and a folded bed mounted on said carrier frame and comprising a plurality of foldably related sections.

4. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, links connecting said seat to said main frame, a carrier frame normally housed beneath said seat and connected with

the rear portion of said seat, links pivotally connected with said carrier frame and with the main frame, and a folded bed mounted on said carrier frame and comprising a plurality of foldably related sections.

5. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, a carrier frame normally housed beneath said seat, mechanism connected with said seat, main frame and carrier frame serving to carry forward and elevate said carrier frame when the seat is swung to the standing position, and a folded bed mounted on said carrier frame comprising a plurality of foldably related sections, slides connected with the rear one of said sections, and links connecting said slides with said carrier frame.

6. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, a carrier frame normally housed beneath said seat, mechanism for carrying forward and elevating said carrier frame, a front piece movably connected with said carrier frame and adapted to serve as a front piece for the sofa when the structure is in sofa form, and a folded bed mounted on said carrier frame and comprising a plurality of foldably related sections, said front piece being movable with relation to the carrier frame to accommodate the bed when in extended position.

7. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, a carrier frame normally housed beneath said seat, mechanism adapted to carry forward and elevate said carrier frame, slides linked to the carrier frame, a rear bed-section connected with said slides, and a front bed-section pivotally connected with said carrier frame and linked to said slides.

8. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, a carrier frame mounted to move forwardly and upwardly with relation to the main frame, a front piece pivotally connected with said carrier

frame, and a folded bed mounted on said carrier frame and comprising a plurality of foldably related sections, one of said sections linked to said front piece.

9. In means of the character set forth, the combination of a main frame, a rigidly mounted back, a rearwardly swinging seat adapted to assume a standing position adjacent said back, a carrier frame linked to said main frame and connected with said seat whereby the carrier frame will be automatically shifted in the operation of raising and lowering the seat, and a folded bed comprising a plurality of foldably related sections, one of said sections linked to said carrier frame.

10. In means of the character set forth, the combination of a main frame having a rigidly mounted back, a rearwardly swinging seat adapted to assume a standing position adjacent said back, a carrier frame, mechanism connected with said main frame, seat and carrier frame and serving to elevate and carry forward said carrier frame when the seat is swung to the standing position, guides mounted on the front portion of said carrier frame, a rear bed-section having arms whose extremities are slidably connected with said guides, and a front bed-section pivotally connected with said carrier frame and having links connected therewith adapted to elevate the rear bed-section with relation to the carrier frame when the front bed-section is unfolded.

11. In means of the character set forth, the combination of a main frame, a rearwardly swinging seat, a carrier frame normally housed beneath said seat, links connecting the rear portion of the carrier frame with the front lower portion of the main frame, a folded bed comprising a plurality of sections, and links pivoted on said carrier frame and connected with one section of said bed.

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In presence of—

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