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4 SHEETS—SHEET 1.

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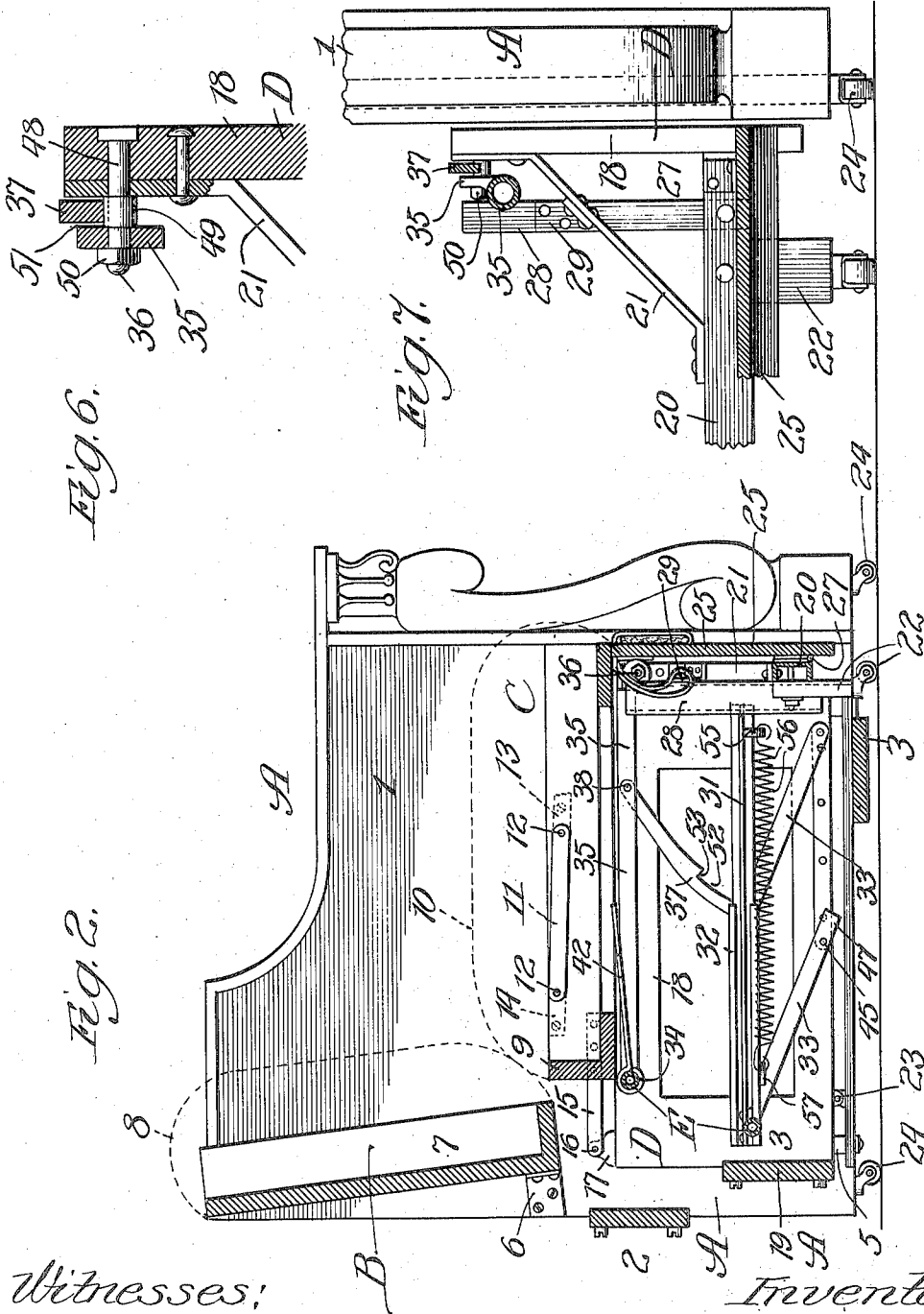
SOFA BED.

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Patented Mar. 1, 1910.

4 SHEETS—SHEET 2.

950,925.



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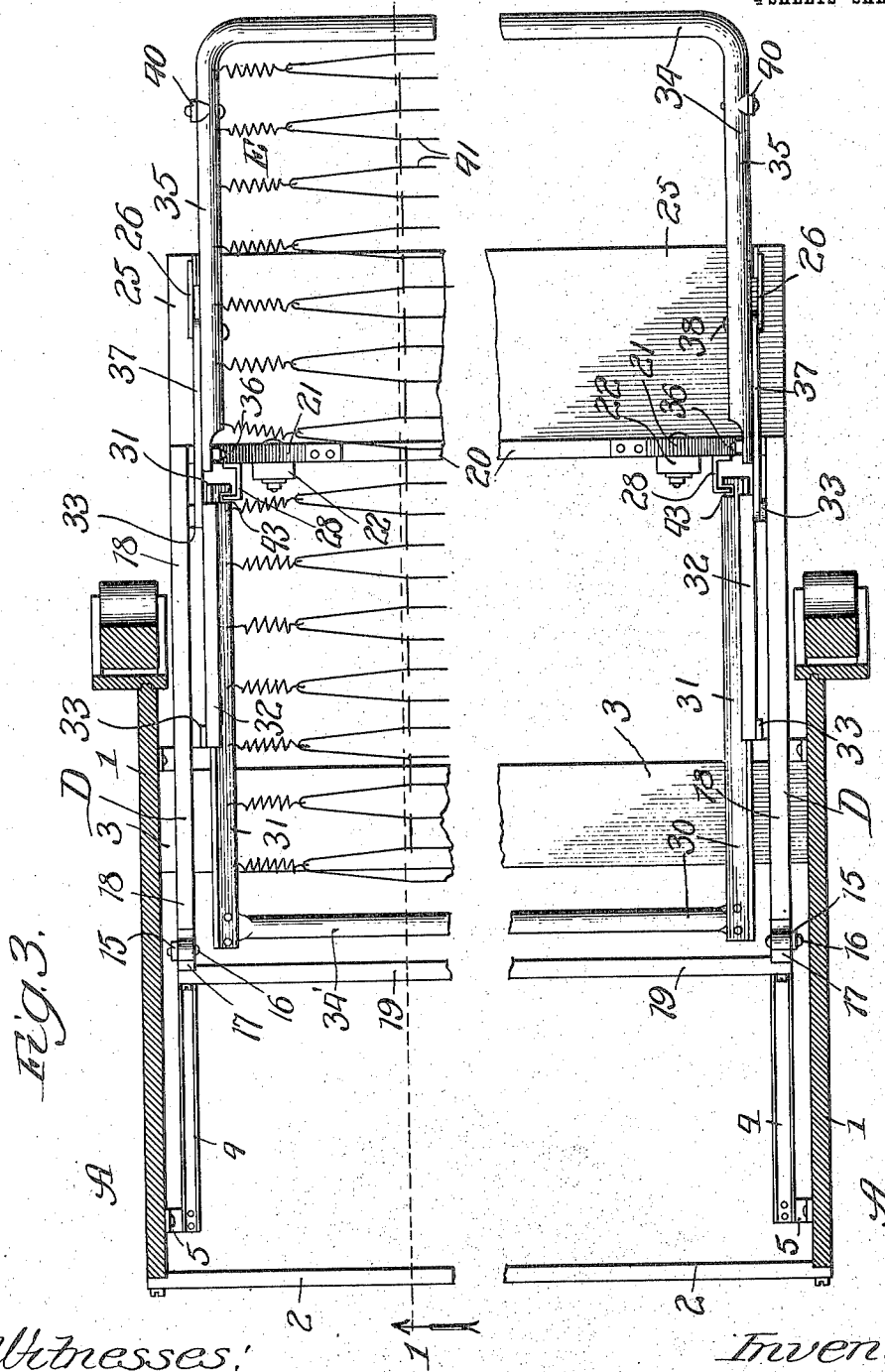
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4 SHEETS—SHEET 4.

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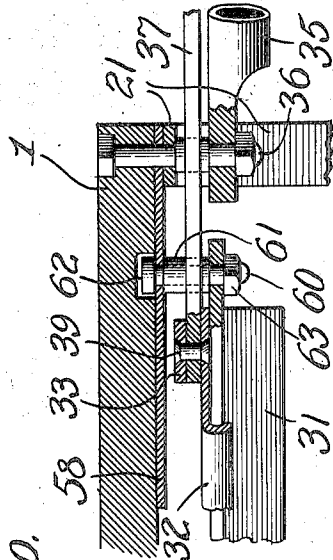


Fig. 10.

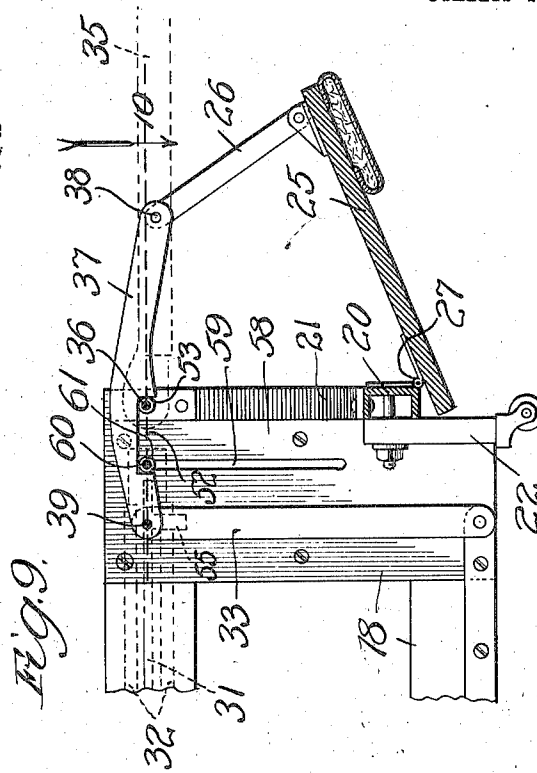


Fig. 9.

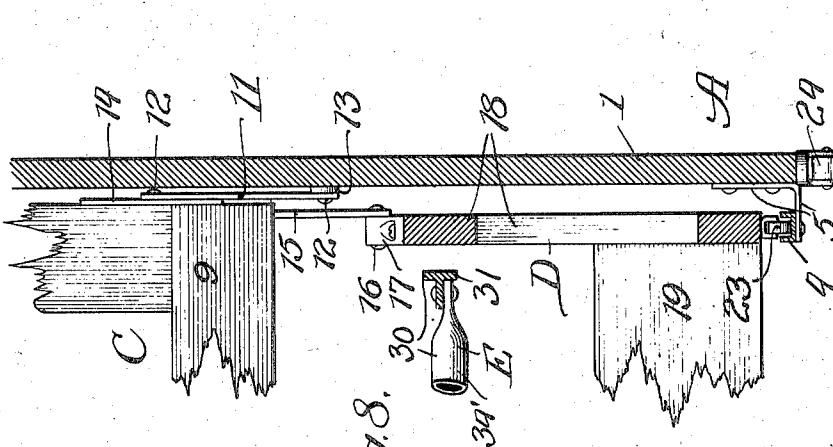


Fig. 8.

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UNITED STATES PATENT OFFICE.

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SOFA-BED.

950,925.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed June 1, 1909. Serial No. 489,572.

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 flexible bed-bottom, the parts being so related as to afford room between the sections of the folded bed-frame and bottom for the bedding, *i. e.*, the mattress pad, bed linen and covers.

My primary object is to provide an improved construction of the character indicated possessing the qualities of simplicity, durability and handiness of operation, while affording a comfortable sofa of pleasing appearance when in the sofa form and a thoroughly comfortable bed when in the bed form.

The present invention constitutes a modification of an improvement on the invention disclosed and broadly claimed in my application No. 485,973, filed March 26, 1909.

It may be preliminarily stated that in the preferred construction of the invention which is illustrated in the accompanying drawings there are employed a main frame; a stationary back carried thereby; a seat mounted to swing rearwardly and assume a standing position adjacent to the back; a forwardly shiftable carriage normally housed in the main frame when the structure is in sofa form; and a folding bed mounted on said carriage and shiftable forwardly therewith with relation to the main frame, said folded bed comprising a front bed-section pivotally joined to the front upper portion of said carriage, a normally depressed rear bed-section having its end members forming guides, or equipped with guides, and slides connected with said guides and carried by links mounted on said carriage, said slides and links connected with the front bed-section, whereby, when the front bed-section is swung forwardly to the open position said links will be swung and thereby elevate said slides, the slides at the same time moving on the guides of the rear

bed-section and serving to elevate the same to the level of the front bed-section. As has been indicated, the mattress-frame, or folding bed, is preferably equipped with a flexible mattress, or bed-bottom, which is unfolded; or spread in the operative position when the device is converted to bed form; 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 to bed form.

In the drawings—Figure 1 represents a sectional view of my improved combined sofa and bed, taken as indicated at line 1 of Fig. 3, and illustrating the device in unfolded condition, that is in bed form, the flexible bed-bottom and bedding not being shown in this view, however; Fig. 2, a similar section showing the device in sofa form; Fig. 3, a horizontal section taken as indicated at line 3 of Fig. 1; Fig. 4, a broken plan view showing the connections between the front and rear bed-sections and one of the front corners of the carriage; Fig. 5, a broken vertical section taken as indicated at line 5 of Fig. 4, and showing a connection between one of the slides which carries the rear bed-section and one of the links supporting said slide; Fig. 6, a broken vertical sectional view taken as indicated at line 6 of Fig. 1 and showing a connection between the front bed-section and the carriage; Fig. 7, a broken vertical sectional view taken as indicated at line 7 of Fig. 1; Fig. 8, a broken vertical section taken as indicated at line 8 of Fig. 1; Fig. 9, a broken vertical sectional view illustrating the front portion of the carriage and showing a modified form of connection between the front extremities of the end members of the rear bed-section and the front portion of the carriage; and Fig. 10, a broken horizontal sectional view taken as indicated at line 10 of Fig. 9.

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 assume a standing position adjacent the back; D, a forwardly and rearwardly movable carriage mounted on the main frame; and E, a folding bed mounted on the carriage D.

The frame A may be of any suitable con-

struction. In the construction illustrated, the frame comprises wooden end-standards 1 which constitute the arms of the sofa and which may be made as ornamental as desired; a rear connecting member 2; and a bottom connecting member 3 which joins the end-standards near their front portions. As shown, the end-standards 1 are equipped on their inner surfaces at their lower portions with channel-bar tracks 4, which are carried by brackets 5 at their ends.

The back B may be attached in any preferred manner. As shown, it fits between the end-standards 1 and is rigidly connected therewith by angle-bars 6. The back preferably inclines rearwardly slightly, as shown. Ordinarily, the back comprises a frame 7 equipped with an upholstered pad 8, which is shown by dotted lines.

The seat C may be of any preferred construction. As shown, it comprises a spring-supporting frame 9 which usually is equipped with an upholstered pad 10, shown by dotted lines. The rear portion of the seat is linked to the main frame, the connection being made by means of links 11 whose ends are joined, by pivots 12, to clips 13 and 14, carried, respectively, by the end-standards 1 of the main frame and the end pieces of the seat-frame 9. The rear, or inner edge portion, of the seat is preferably pivotally joined to the rear portion of the carriage D. As shown, the connection is made by means of arms 15 which are rigidly attached to the end members of the seat frame 9 and have their extremities joined, by pivots 16, to the clips or brackets 17 with which the end members of the carriage D are equipped at their rear upper corners. The pivotal, or hinged, connections may be of any desired form.

The carriage D, in the form illustrated, comprises a pair of rectangular frames, or slides, 18 mounted on the tracks, or runways, 4; a rear connecting member 19 joining the rear lower corners of the slidable frames 18; and a front truss member 20 which connects the front lower corners of the slidable frames 18, the end portions of the member 20 being joined, by braces 21, to the upper front corner portions of the members 18. Casters 22 support the front portion of the carriage through the medium of the truss member 20; and casters, or rollers, 23 support the rear portion of the carriage on the tracks of runways 4. The main frame is also preferably provided with casters 24, for convenience in moving the article of furniture, as a whole, about the room. The carriage D carries a movable front piece 25 which serves as a front piece for the sofa beneath the seat C when the structure is in sofa form, and which moves forward with the carriage when the seat is raised to the standing position and is automatically swung downwardly out of the

way of the bed when the bed is unfolded, the operation of swinging said front piece downwardly being performed by links 26 which are pivotally connected with said front piece and with the front section of the bed. The lower portion of the front piece 25 is preferably connected with the cross member 20 of the carriage by means of hinges 27. The carriage is equipped at its front corners with uprights, or standards, 28, 28 which form guides for the front extremities of the end members of the rear bed section. The members 28 are preferably in the form of channel-bars with their flanges turned toward the end-standards 1 of the main frame. Said members 28 have their lower ends connected with the end portions of the member 20 and have their upper portions connected, by brackets 29, with the braces 21.

The folding bed E preferably comprises a U-formed rear bed-section, or mattress-frame section, 30 whose end members 31 are carried by slides 32 mounted on parallel links 33 carried by the end frames 18 of the carriage D; a U-shaped front bed-section, or mattress-frame section, 34 whose end members 35 are connected, by pivots 36, with the end frames 18 of the carriage; links 37 having their front ends connected, by pivots 38, with the end members 35 of the front mattress-frame section, and having their rear ends connected, by pivots 39 (see Figs. 4 and 5), with the upper ends of the front links 33 and the front ends of the slides 32; legs 40 pivotally connected with the end members 35 of the front bed-section and adapted to fold alongside said end members when the bed is folded; and a wire fabric, or flexible bed-bottom, 41 connected with the front and rear mattress-frame section and adapted to fold therewith. A loop, or handle-device, 42 embraces the section 34 and is provided for the purpose of affording convenient means for swinging the front bed-section forwardly about the pivots 36 from the folded position.

According to the preferred construction, the end members 31 of the rear mattress-frame section are of T-shaped cross-section, upon the vertical flanges of which the slides 32 are folded and to the horizontal flanges of which the bottom fabric 41 is attached. This will be readily understood by reference to Figs. 4 and 5. The front extremities of the horizontal flanges of the end members 31 are provided with notches, or guide-grooves, 43, which, as shown in Fig. 4, engage the rearmost upturned flanges of the standards, or guide-members, 28 located near the front corners of the carriage. The extremities of the members 31 lie outside the standards, or guides, 28, so that the standards 28 serve effectually to prevent the extremities of the rear mattress-frame section from being

drawn toward each other when the bed is occupied and the actual bed-bottom under tension. The upper ends of the rear links 33 are joined by pivots 44 (shown in dotted lines in Fig. 1), to the rear ends of the slides 32. The lower ends of both pairs of links 33 are joined to the bottom portions of the end-frame 18 of the carriage by pivots 45, the connections being made through the medium of bars 46 applied to the lower portions of said end-frames, as shown in Fig. 1. The lower ends of the rear pair of links 33 have extensions 47 which project beneath the pivots 45 and engage the front ends of the tracks 4 when the bed is in the open condition shown in Fig. 1, thereby locking the carriage against rearward movement with relation to the main frame, so that it will be impossible to lower the seat C when the bed is in the open condition.

The form of the pivots 36 is best shown in Fig. 6, from which it will be understood that each pivot comprises a bolt having a shank 48 extending through the end-frame 18 and the vertical portion of the brace 21, a spacing collar 49 adapted to space the extremities of the end member 35 of the front mattress-frame section with relation to the end frame 18, and a nut 50 applied to the bolt, the extremity of the end member 35 being confined between said nut and collar. As thus described, there is afforded a space 51 adapted to accommodate the link 37. The link 37 is provided at its lower edge with a notch or recess 52, affording a shoulder 53 adapted to engage the pivot-bolt 36 (or its collar 49) and lock the bed in its unfolded position. This feature is not an essential, inasmuch as the links 37 occupy a substantially horizontal position when the bed is unfolded and the pivots 36 are preferably somewhat above the horizontal plane in which the pivots 38, 38, which connect the front ends of the links 37 with the end members 35 of the front mattress-frame section, lie. The pivots 38 also serve, as before stated, to connect the adjacent extremities of the links 26 to the front mattress-frame section.

I have shown the front extremities of the end members 31 of the rear mattress-frame section equipped with lugs 55 to which are attached springs 56 whose rear ends are connected by lugs 57 carried by the slides 32. These springs aid in drawing the slides 32 forwardly in the operation of unfolding the bed, and hence aid in swinging the links 33 upwardly and elevating the slides 32 upon which the rear mattress-frame section is mounted.

The operation will be readily understood from the foregoing description. Assuming the structure to be in the sofa form, as illustrated in Fig. 2, the seat may be swung to a standing position, in which operation, by

reason of the relation of the links 11 and hinges 15, the carriage D will be moved forwardly with relation to the main frame. In this operation, the front piece 25 of the sofa moves forward with the carriage. The operator may then swing the front bed-section forwardly about the pivots 36, in which operation the links 37 will draw the slides 32 forwardly and turn the links 33 to a standing position, so that the slides will be elevated and through the medium thereof the rear bed-section will be raised to the level of the front bed-section. When the bed is in the unfolded condition, the extensions 47 at the lower ends of the rear links 33 engage the adjacent ends of the track 4, thereby locking the carriage against retraction and thus locking the seat in the standing position. As has been indicated, the springs 56 aid in the operation of unfolding the bed. Assuming the bed to have been properly made up before the structure was folded into sofa form, the bedding will be spread out when the bed is unfolded in the manner just described. Prior to the operation of converting to sofa form, the bed is made up and the bedding secured to the mattress-frame. The bed is then folded, the rear section at the same time dropping so as to lie a sufficient distance below the superposed front section to afford ample space for the bedding in the folded condition thereof. After the bed has been folded, the seat C, which becomes released when the bed is folded, may be swung to the horizontal position, in which operation the carriage will be automatically retracted. In the operation of folding the bed, prior to the retraction of the carriage, the front piece 25 is automatically swung to the vertical position, so that when the carriage is retracted the front piece serves as a front piece for the sofa and to hide the bed which is normally housed beneath the sofa seat.

While it is preferred to employ the links 11 to automatically shift the bed, as a whole, when the seat is swung to the standing position, it is to be observed that the invention is not limited to the employment of this expedient. If desired, the links 11 may be omitted, and the final shifting of the carriage may be effected by hand, after which the seat may be swung to the standing position, and the bed may then be unfolded as above described.

In the modification shown in Figs. 9 and 10, the construction is similar to the construction already described, except for slight changes; and the corresponding parts are similarly identified by numerals, and the changes will now be described. Instead of employing the channel-form vertical guide member 28 and notching the front extremity of the end member 31 to the rear mattress-frame section to engage therewith, I

employ, in the modification, a guide-plate 58 which is secured to the front portion of the end frame 18 and equipped with a vertical guide-slot 59 in which slides a bolt 60 carried by the extremity of the end member 31 of the rear mattress-frame section. The extremity of the member 31, as shown in Fig. 10, is spaced with relation to the guide-plate 58 by a sleeve 61 located between the end member 31 and said guide-plate. The front upright of the end frame 18 is provided with a slot 62 which accommodates the head of the bolt 60 in its vertical movement. It will be noted that the bolt 60 is equipped with a nut 63, and thus the front extremities of the end members 31 of the rear mattress-frame section are prevented from springing toward each other when the bed is occupied. While the modified form of guide-sections between the front extremities of the end members of the rear mattress-frame section and the front portions of the end frames of the carriage is a desirable form, the form previously explained is preferred, because it can be more cheaply constructed and will nevertheless prove entirely satisfactory in 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 frame, a movable seat mounted thereon and adapted to be swung out of the way, a forwardly movable carriage, and a folded bed mounted on said carriage and normally housed beneath said seat when the structure is in sofa form, said bed comprising a vertically movable bed-section, slides supporting said section, and means for elevating said slides with relation to the carriage and shifting the same with relation to said section.

2. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, and a folded bed mounted on said carriage, comprising a front bed-section mounted to swing with relation to said carriage, a rear bed-section adapted to be raised and lowered with relation to said carriage, slides connected with the end members of the rear bed-section, connections joined to said front bed-section and adapted to actuate said slides, and means mounted on said carriage serving to elevate said slides when the slides are moved forwardly in the operation of unfolding the front bed-section.

3. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage contained therein, slide-

elevating links mounted on said carriage, slides mounted on said links, a rear bed-section mounted on said slides, a front bed-section mounted to swing with relation to said carriage, and means connected with said front bed-section serving to turn said links and elevate and shift said slides with relation to said carriage.

4. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage therein, slide-elevating links mounted on said carriage, slides mounted on said links, a rear bed-section mounted on said slides, a front bed-section mounted to swing with relation to said carriage, and links connecting said front bed-section with said slides and said first-named links.

5. In a structure of the character set forth, the combination with a frame, of a forwardly movable carriage therein, slide-carrying links mounted on said carriage, slides mounted on said links, a rear bed-section mounted on said slides, vertical guide-sections between the front portions of said rear bed-section and said carriage, a front bed-section mounted to swing with relation to said carriage, and means connected with said front bed-section serving to actuate said slides and said first-named links when the front bed-section is swung to the unfolded position.

6. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a U-shaped rear mattress-frame section, vertical guide-connections between the front extremities of the end members of said mattress-frame section and the front of said carriage constructed and arranged to prevent said end members of said mattress-frame section from being drawn toward each other when the bed is occupied, a front mattress-frame section adapted to swing with relation to the carriage, and means serving to elevate said rear mattress-frame section in the operation of unfolding the bed.

7. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage equipped with vertical guide-members, a U-shaped rear mattress-frame section having the extremities of its arms slidably engaging said guide-members on non-adjacent sides thereof, whereby said arms are prevented from springing toward each other when the bed is occupied, a front mattress-frame section mounted to swing with relation to said carriage, and elevating mechanism for the rear bed-section connected with and actuated by the front mattress-frame section.

8. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a U-shaped front mattress-frame section pivotally mounted on the front upper corners of said carriage, vertical

guide-members carried by said carriage and located near the front corners thereof, a vertically movable U-shaped rear mattress-frame section having the extremities of its arms slidably connected with said guide-members, slides connected with the arms of said rear mattress-frame section, slide-elevating means mounted on said carriage, and connections between the front mattress-frame section and said slides and slide-elevating means.

9. In a structure of the character set forth, the combination of a carriage comprising end frames and a front truss member, a rearwardly swinging seat, a front piece mounted on said carriage and adapted to swing downwardly, and a folded bed mounted on said carriage and normally housed beneath said seat in the rear of said front piece.

10. In a structure of the character set forth, the combination of a frame, a movable seat, a forwardly movable carriage comprising end frames and a front truss member connecting said end frames, a front piece pivotally connected with the lower front portion of said carriage, a folding bed normally housed beneath said seat in the rear of said front piece, and connections between said folding bed and said front piece, whereby the front piece will be automatically swung downwardly in the operation of unfolding the bed upon its carriage.

11. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a swinging front piece mounted on the carriage, a folding bed mounted on the carriage and having a section mounted to swing with relation to the carriage, and links connecting said section with said front piece.

12. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, links mounted on said carriage, slides mounted on said links, a U-shaped rear mattress-frame section having arms with which said slides are connected, springs connected with said arms and tending to move said slides forwardly, a front mattress-frame section mounted to swing with relation to said carriage, and links actuated by said mattress-frame section and serving to actuate said slides and said first-named links.

13. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a vertically movable rear mattress-frame section, links mounted on said carriage, slides mounted on said links and serving to elevate said mattress-frame section, a front mattress-frame section mounted to swing with relation to said carriage, means connected with said front mattress-frame section and serving to actuate said slides and said first-named links, a rearwardly swinging seat,

and connections between said seat, carriage and frame, whereby said carriage will be shifted forwardly when the seat is swung rearwardly.

14. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a seat pivotally mounted on the rear portion of said carriage, links connecting said seat and frame, whereby the carriage will be moved forwardly when the seat is swung rearwardly, links mounted on said carriage, slides mounted on said links, a rear mattress-frame section mounted on said slides, a front mattress-frame section mounted to swing with relation to said carriage, and means actuated by said front mattress-frame section in the operation of swinging the same, serving to actuate said slides and said first-named links.

15. In a structure of the character set forth, the combination of a main frame, a forwardly shiftable carriage, a rearwardly swinging seat, connections between said seat, frame and carriage, whereby the carriage will be automatically moved forwardly when the seat is swung rearwardly, slides and elevating means therefor mounted on said carriage, a rear mattress-frame section mounted on said slides, means for locking the carriage against retraction when the bed is in extended position, a front mattress-frame section, and slide-actuating means actuated by said front mattress-frame section.

16. In a structure of the character set forth, the combination of a main frame, a forwardly movable carriage, a rearwardly swinging seat, connections between said seat, frame and carriage, whereby the carriage will be automatically advanced when the seat is swung rearwardly, links mounted on said carriage, slides mounted on said links, an extension carried by one of said links and adapted to lockingly engage a portion of the main frame to prevent accidental lowering of the seat when the bed is extended, a rear bed-section mounted on said slides, a front bed-section mounted to swing with relation to said carriage, and actuating means for said links and slides connected with and actuated by the front bed-section.

17. In a structure of the character set forth, the combination of a frame, a forwardly movable carriage, a rear mattress-frame section having end members of T-shape cross-section, slides engaging the vertical flanges of said frame members, links mounted on said carriage and carrying said slides, a front mattress-frame section mounted to swing with relation to said carriage, and actuating means for said slides and links connected with and actuated by said front mattress-frame section.

18. In a structure of the character set forth, the combination of a frame, a for-

wardly movable carriage equipped near the front corners thereof with guide-members having flanges turned from each other, a rear mattress-frame section having end members provided with notches engaging said flanges, slides connected with said end members, slide-elevating means mounted on said carriage, a front mattress-frame section mounted to swing with relation to said carriage, and slide-actuating means actuated through the medium of said mattress-frame section.

SOLOMON KARPEN.

In presence of—

CHAS. E. GAYLORD,
F. L. BROWNE.