

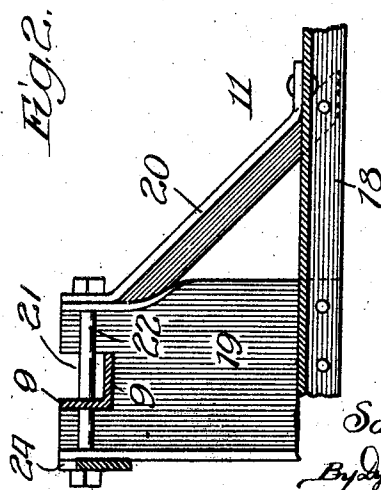
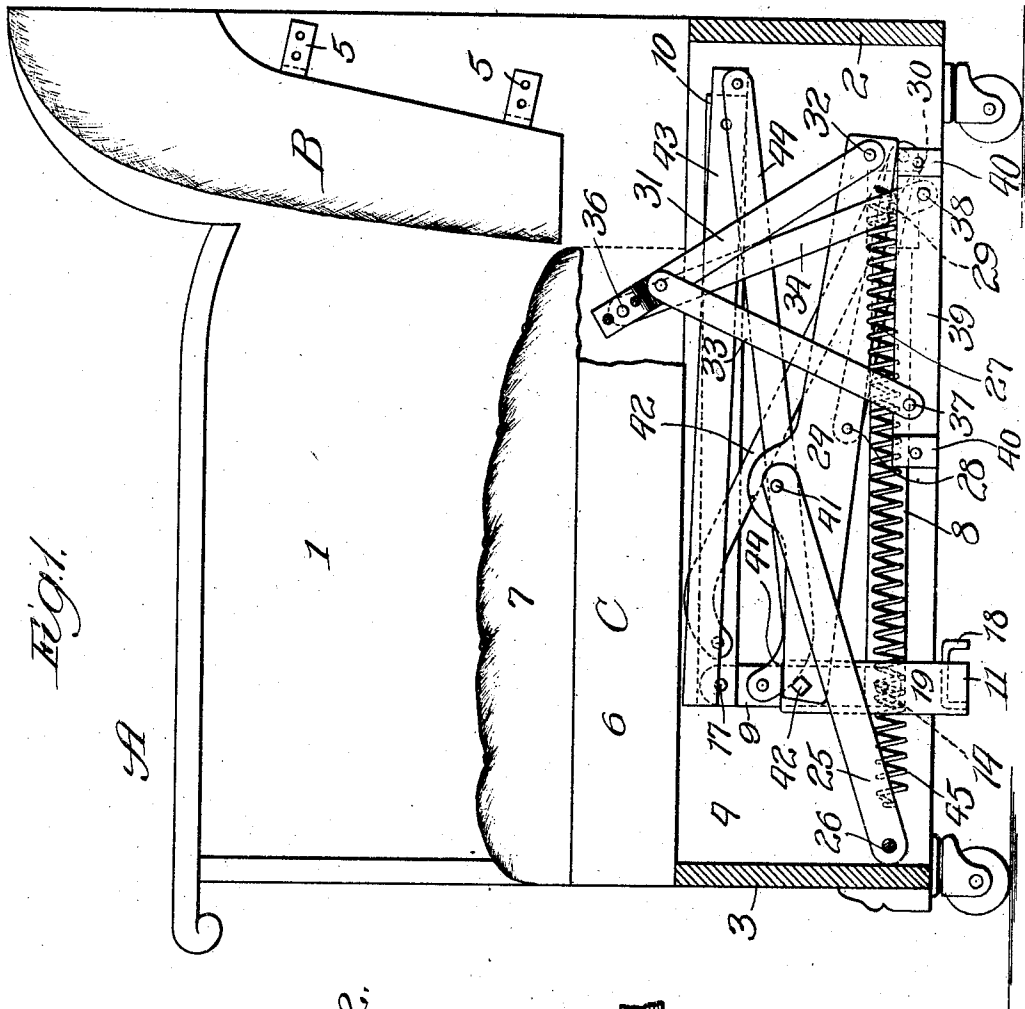
S. KARPEN.
SOFA BED.

APPLICATION FILED MAY 7, 1910.

1,011,440.

Patented Dec. 12, 1911.

3 SHEETS-SHEET 1.



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3 SHEETS—SHEET 2.

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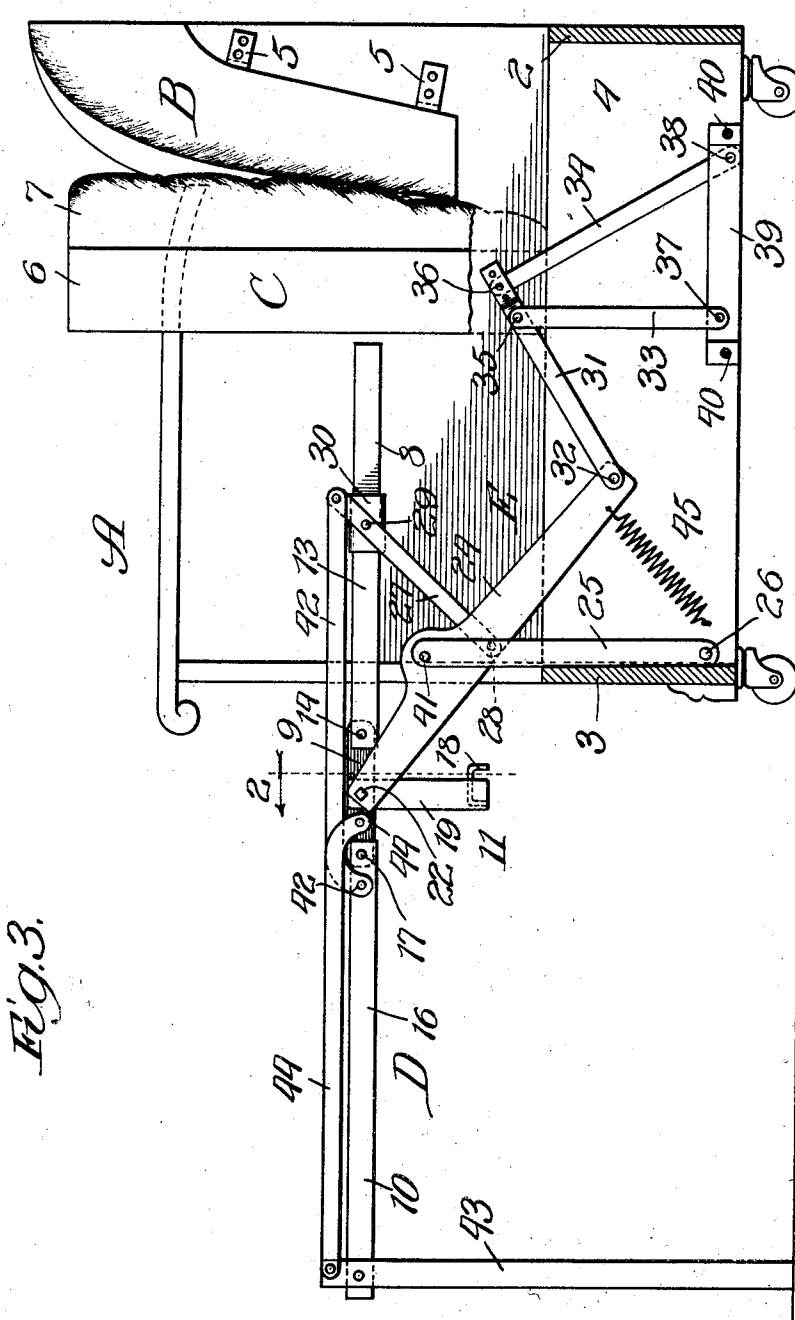


Fig. 3.

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3 SHEETS-SHEET 3.

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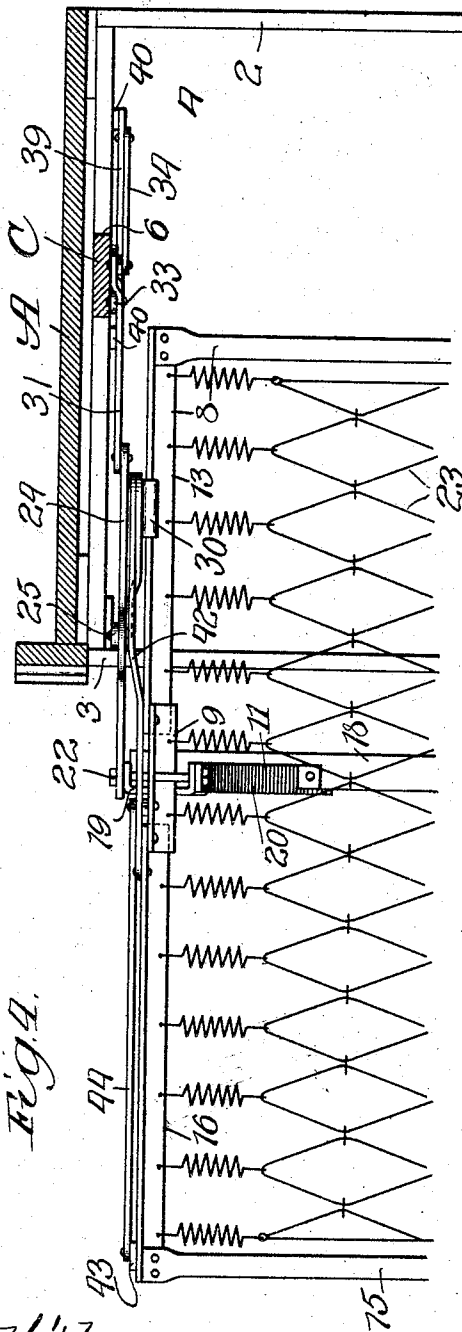
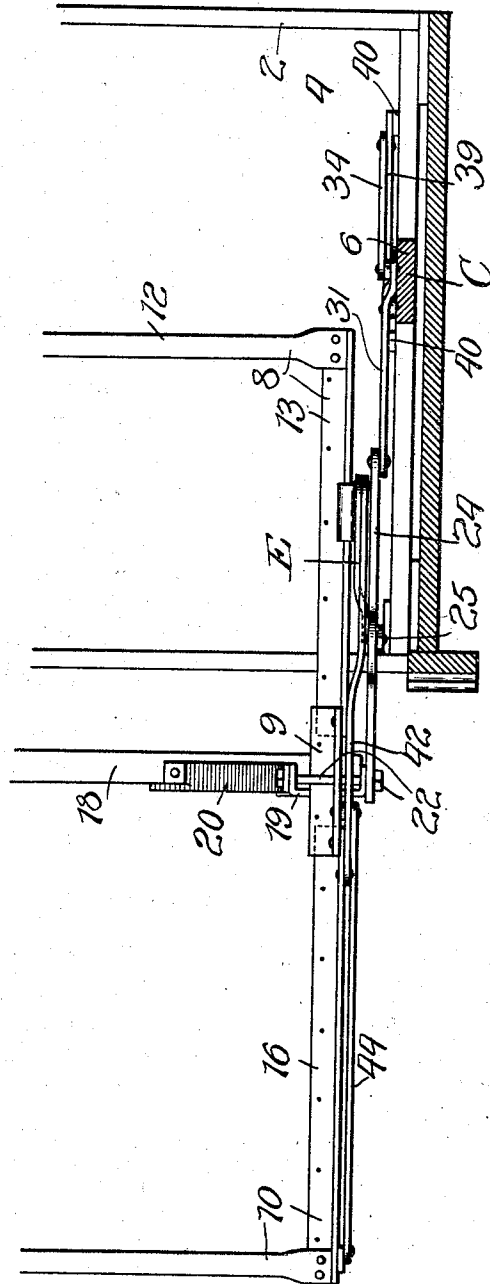


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SOFA-BED.

1,011,440.

Specification of Letters Patent.

Patented Dec. 12, 1911.

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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 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 through the medium of links and levers and whereby the bed will at the same time be elevated so that when 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 of the invention 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; and link and lever devices adapted to carry the folded bed from its housed position to the position for unfolding, and vice versa. The construction is preferably such that the folded bed will be automatically shifted forwardly and elevated in the operation of swinging the seat from the horizontal to the standing position, and will be automatically returned to the housed position in the operation of lowering the seat from the standing position to the horizontal 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 to bed-form.

In the accompanying drawings, which show my improved sofa-bed in its preferred form—Figure 1 represents a sectional view of my improved combined sofa and bed, illustrating the device in sofa-form, with the folded bed housed in the main frame beneath the sofa-seat; Fig. 2, a broken sectional view taken, as indicated, at line 2 of Fig. 3, and showing a truss employed in connection with the intermediate bed-section; Fig. 3, a section similar to Fig. 1 but showing the device after conversion to bed-form; and Fig. 4, a broken plan sectional view showing the structure in the bed-forming position.

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 foldable bed-frame or mattress-frame normally housed in folded condition within the main frame beneath the sofa-seat; and E link and lever mechanism adapted to carry the bed from the housed position to the position for unfolding, and vice versa.

The frame A may be of any suitable construction. In the construction illustrated, the frame comprises wooden end-standards 1 which constitute the arms of the sofa; a rear connecting bar 2 joining the rear lower portions of said end-standards; a front connecting member 3 joining the lower front portions of said end-standards and constituting a front piece for the main frame; and end-pieces 4 connecting the end-ports of the members 2 and 3 and forming therewith a box, said members 4 lying adjacent the inner surfaces of the lower portions of said end-standards. As will be understood, the end-standards may be made as plain or as ornamental as desired.

The back B may be attached in any preferred manner. As shown, it fits between

the upper rear portions of the end-standards 1 and is rigidly connected therewith by angle-form clips. The back is usually suitably upholstered.

5 The seat C may be of any preferred construction. As shown, it comprises a spring-supporting frame 6 which usually is equipped with an upholstered pad 7. When the seat occupies the horizontal position, it is supported on the frame comprising the front member 3 and the end-members 4.

The foldable bed-frame, or mattress-frame, D preferably comprises a rear frame-section 8 of U-form; an intermediate frame-section 9 having the rear ends of its members pivotally connected with the front ends of the arms of the section 8; a front frame-section 10 of U-form and having the extremities of its arms pivotally connected with the front ends of the end-members of the frame-section 9; and a truss 11 having its upturned arms pivotally connected with the intermediate portions of the end-members of the section 9. The frame-section 8 comprises a rear longitudinal member 12 and end-members 13 which constitute the forwardly-turned arms of the U-shaped members. The section 9 is composed of bars whose rear ends are connected by pivots 14 with the front ends of the arms 13 of the rear section 8. The front-frame section 10 comprises a longitudinal member 15 and end-members 16 constituting the rearwardly-turned arms of the U-shaped frame-section. The extremities of the arms 16 are joined by pivots 17 to the front ends of the bars composing the section 9. The arms 13 and 16 and the bars composing the section 9 are of angle-form and the bars of the section 9 are adapted to overlap with the end-ports of the arms 13 and 16, so that while the bed-sections may be unfolded so as to lie in the same plane, the joints are such as to prevent the sections from turning too far, or, in other words, beyond the plane which the sections normally occupy in the extended position. The truss 11, in the form shown, comprises (Fig. 2) a longitudinal channel-bar 18 equipped at its extremities with upturned arms 19 and braces 20 for said arms. The upper ends of the arms 19 are notched, as indicated at 21, to accommodate the bars composing the intermediate bed-section 9, and said bars are connected with said arms 19 by pivot-bolts 22. A foldable wire-mattress, or spring bed-bottom, 23 is stretched between the foldably-connected end-members of the bed-frame, as indicated in Fig. 4.

The link and lever mechanism E, in the form illustrated, comprises a pair of levers 24 (one at each end of the sofa-bed), mounted on links 25 which are connected by pivots 26 with the members 4 of the main frame, the front ends of said levers 24 carrying the pivots 22 which support the intermediate

bed-section 9; a pair of links 27, connected at one end by pivots 28 with the levers 24 and near the other end by pivots 29, with slides 30 mounted on the arms 13 of the rear bed-section; a pair of arms 31 rigidly secured at their upper ends to the rear portions of the end-members of the seat-frame 6 and connected by pivots 32 with the rear ends of the levers 24; and links 33 and 34, whose upper ends are connected, respectively, by pivots 35 and 36 with the attaching or base portions of the arms 31, and whose lower ends are connected, respectively, by pivots 37 and 38 with bars or members 39, which are rigidly secured to the frame-members 4, being separated from said frame-members by spacing-blocks 40. The upper ends of the links 25 are joined with the intermediate portions of the levers 24 by pivots 41. The links 27 have extensions above the pivots 29 which are joined by links 42 to the end-members 16 of the front bed-section 10 near the pivotal connections 17. The bed-section 10 has connected therewith, near the free or swinging edge thereof, legs 43 which are joined by links 44 to the bars constituting the intermediate bed-section 9. The truss 19 depends from the intermediate bed-section, and the longitudinal member 18 of said truss is disposed at a suitable distance beneath the spring bed-bottom.

The rear portions of the levers 24 have connected therewith coil-springs 45 whose front ends are connected with the front-100 portions of the frame-members 4. After the bed is folded on its link and lever supporting mechanism, and while the seat is being swung from the standing to the horizontal position and the bed is therefore being carried to the housed position, the springs 45 are placed under tension, so that they will assist in shifting the bed forwardly and upwardly when the seat is swung from the horizontal position to the standing position. 110

Assuming the bed to have been properly made up, that is, the bedding to have been properly spread and secured to the foldable bed-frame, before the conversion of the structure to sofa-form, the structure may be converted to bed-form by raising the seat C to the standing position and then unfolding the bed. In the operation of raising the seat to the standing position, the arms 31 attached to the base-portion of the seat are turned forwardly from the position shown in Fig. 1 to the position shown in Fig. 3, in which operation the folded bed, mounted on the levers 24, is bodily shifted forwardly and elevated. The springs 45 assist in this operation, and the links 33 and 34 swing forwardly somewhat from the position shown in Fig. 1 until they assume the position shown in Fig. 3. After the folded bed has been bodily shifted automatically in the op- 130

eration of raising the seat, the bed may be unfolded by the operator grasping the rear or free edge of the front or superposed section and swinging the same forwardly, in which operation the intermediate bed-section will turn on the pivots 22 carried by the supporting levers 24, and the links 42 will operate to draw the slides 30 forwardly, thereby swinging the rear end of the lowermost or rear bed-section upwardly. During the operation the legs 43 will be extended through the medium of the links 44, and at the end of the operation the bed will be unfolded and occupy the position shown in Fig. 3. In the reverse operation the bedding is first properly spread and secured to the mattress-frame in the usual manner, after which the front bed-section 10 is swung upwardly and rearwardly, which results in turning the intermediate section on the pivots 22, and at the same time the slides 30 are moved rearwardly, thereby swinging the rear end of the rear bed-section 8 downwardly. The folded bed is then automatically retracted and lowered in the operation of swinging the seat downwardly from the standing position. In this operation, the weight of the parts assists in applying tension to the springs 45, thereby storing power to aid in the operation of shifting the bed forwardly and elevating it, when it is again desired to convert the structure to bed-form.

The structure described is of such character as to dispose the bed, when the structure is converted to bed-form, at a convenient height, corresponding with the height of the standard bed of the non-folding type.

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 rearwardly swinging seat mounted thereon, a folded bed normally housed beneath said seat and comprising a plurality of foldably-related sections, and link and lever mechanism serving to carry forward and elevate said bed as a whole and including a pair of links foldably mounted on said frame, and connections between said links, bed and seat whereby the bed will be automatically shifted in the operation of raising and lowering the seat.

2. In means of the character set forth, the combination of a frame, a rearwardly swinging seat mounted thereon, a folded bed normally housed in said frame beneath said seat and comprising a plurality of foldably-related sections, a pair of levers linked to said frame and pivotally connected with one

section of said bed, means for maintaining said bed in extended position on said levers and connections between said levers and said seat, whereby the bed will be automatically shifted in the operations of raising and lowering the seat.

3. In means of the character set forth, the combination of a frame, a movably-mounted seat, a folded bed normally housed in said frame beneath said seat and comprising a plurality of foldably-related sections, a pair of levers pivotally connected with one section of said bed, slides connected with another section of said bed and linked to said levers, supporting means for said levers foldably connected with said frame, and means for sustaining the levers in the extended position.

4. In means of the character set forth, the combination of a frame, a movably-mounted seat, a folded bed normally housed in said frame beneath said seat and comprising a plurality of foldably-related sections, a pair of levers pivotally connected with one section of said bed, slides connected with another section of said bed and linked to said levers, supporting means for said levers foldably connected with said frame, means for sustaining the levers in the extended position, and connections between said levers and said seat, whereby said bed will be automatically shifted in the operations of raising and lowering the seat.

5. In means of the character set forth, the combination of a frame, a movably-mounted seat, a folded bed normally housed in said frame beneath said seat and comprising foldably-related front, intermediate and rear sections, a pair of levers linked to said frame and pivotally connected to said intermediate bed-section, slides connected with the rear bed-section and linked to one of the other bed-sections, links connecting said slides and levers, legs adapted to support the front bed-section, and supporting means for said levers adapted to carry said levers from the extended to the folded position.

6. In means of the character set forth, the combination of a frame, a rearwardly-swinging seat mounted thereon, arms secured to the rear portion of said seat, levers connected with said arms and linked to the front portion of the frame, and a folded bed comprising a plurality of sections, one of said sections pivotally connected with said levers.

7. In means of the character set forth, the combination of a frame, a rearwardly-swinging seat mounted thereon, arms secured to the rear portion of said seat, levers connected with said arms and linked to the front portion of the frame, and a folded bed comprising front, intermediate and rear sections, said intermediate section pivotally mounted on said levers, slides connected

with the rear section and linked to said levers and linked also to the said front section, and legs pivotally connected with said front section and linked to said intermediate
5 section.

8. In means of the character set forth, the combination of a frame, a rearwardly-swinging seat mounted thereon, links pivotally connected with the front portion of
10 said frame, a bed comprising a plurality of foldably-related sections, link and lever mechanism mounted on said first-named links and serving to support said bed, connections between said link and lever mechanism and said seat, and a spring adapted to
15 assist in shifting the bed-structure during the operation of raising the seat.

9. In means of the character set forth, the combination of a frame, a seat mounted
20 thereon and adapted to swing rearwardly, a pair of links connecting each end of said seat with said frame, arms rigid with said seat, a bed comprising a plurality of foldably-related sections, and link and lever

mechanism connected with said arms and
frame and adapted to carry the bed-structure from the housed position to the extended position, and vice versa. 25

10. In means of the character set forth, the combination of a frame, comprising end-standards and a front piece connecting the
30 lower portions of said end-standards, a seat mounted on said frame and adapted to swing rearwardly, a bed comprising a plurality of foldably-related sections adapted
35 to be housed beneath said seat in the rear of said front piece, a pair of levers projecting over said front piece in the extended position of the structure and upon which
40 said bed is mounted, links connected with the front portion of the said frame and with the intermediate portions of said levers, and connections between the rear ends of said levers and said seat.

SOLOMON KARPEN.

In presence of—

A. U. THORIEN,

R. A. RAYMOND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."