S. KARPEN.

SOFA BED.

APPLICATION FILED JULY 20, 1912.

1,200,950.

Patented Oct. 10, 1916.

3 SHEETS—SHEET 1.

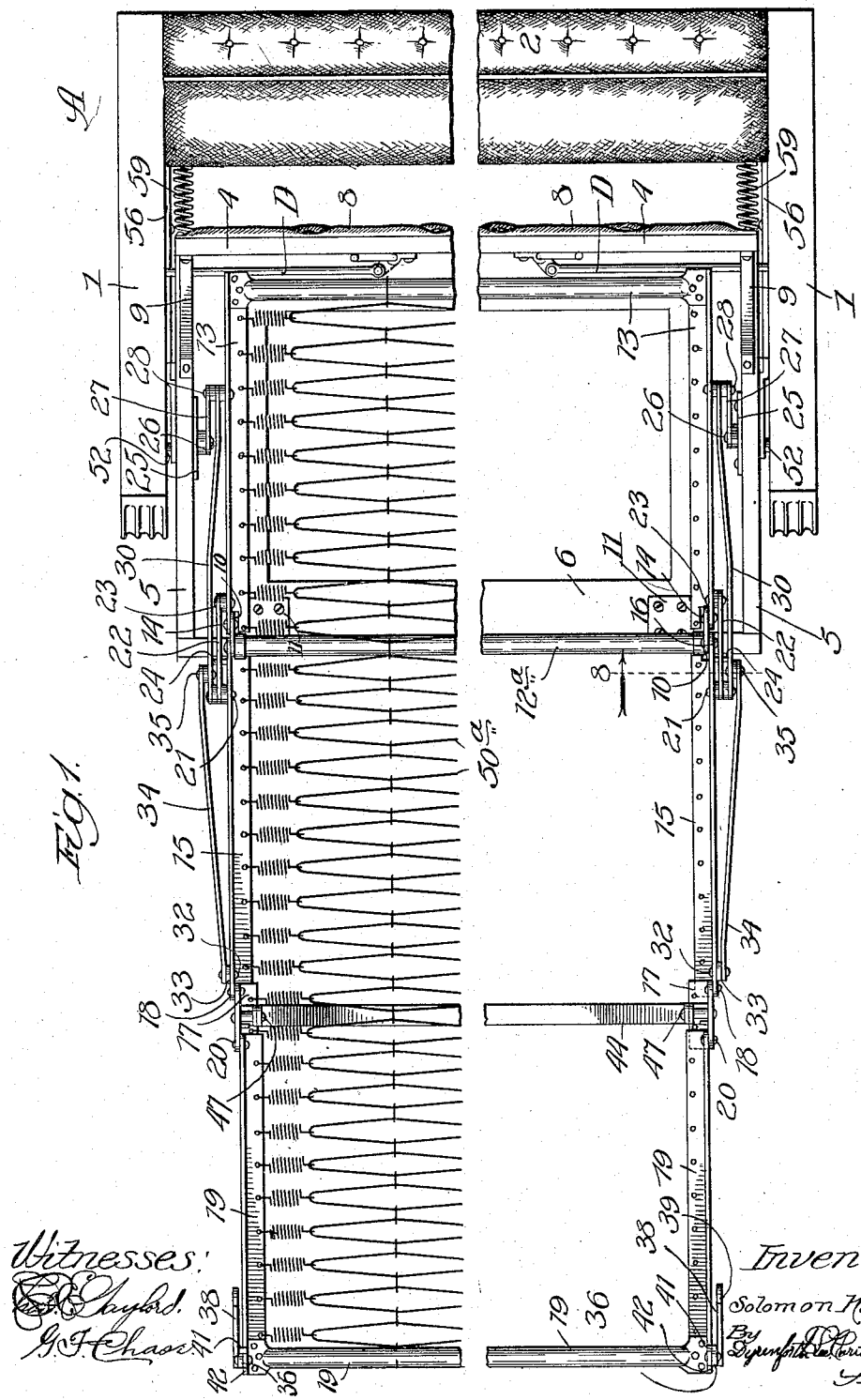


FIG. 1.

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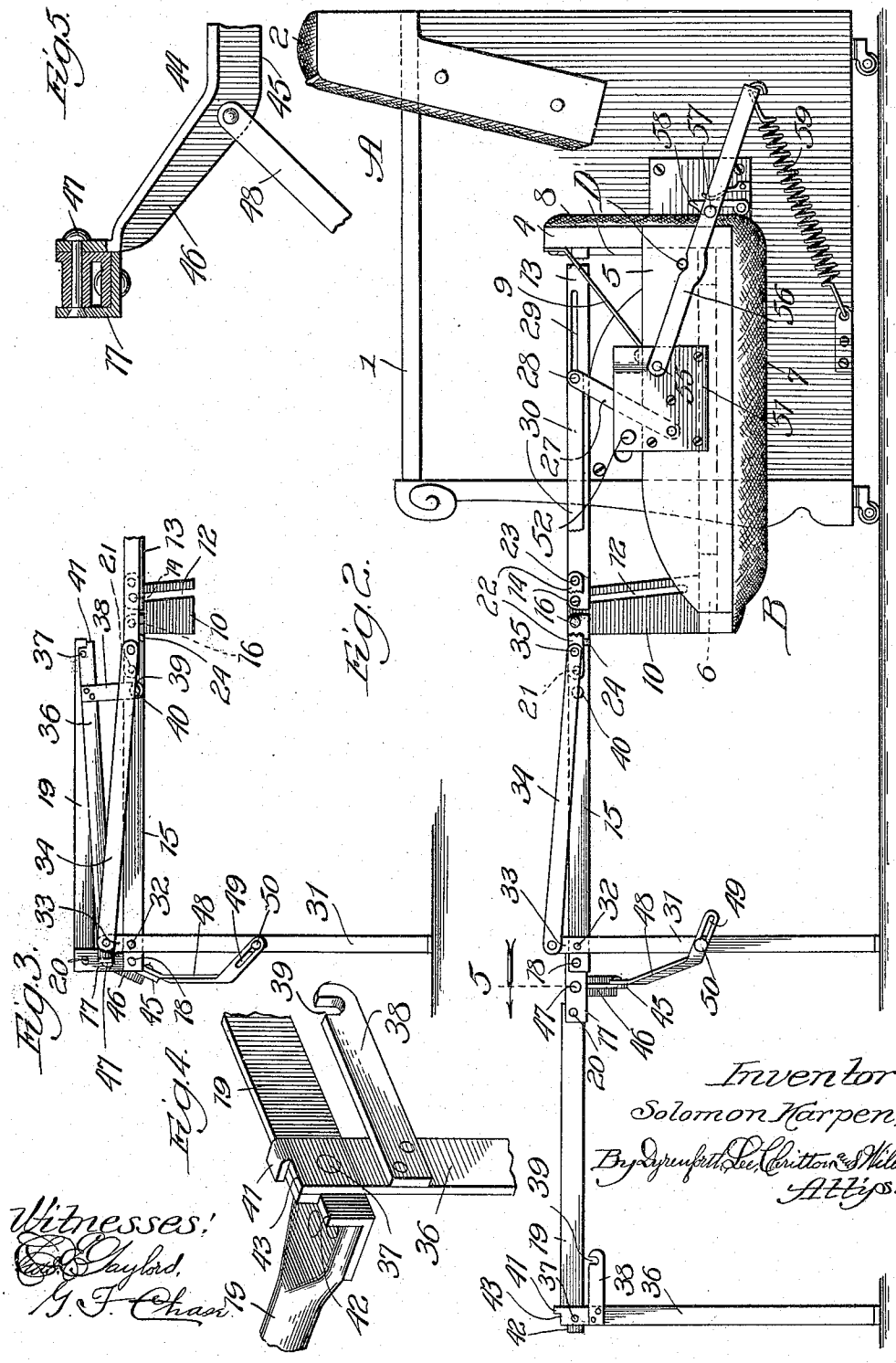
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3 SHEETS—SHEET 2.



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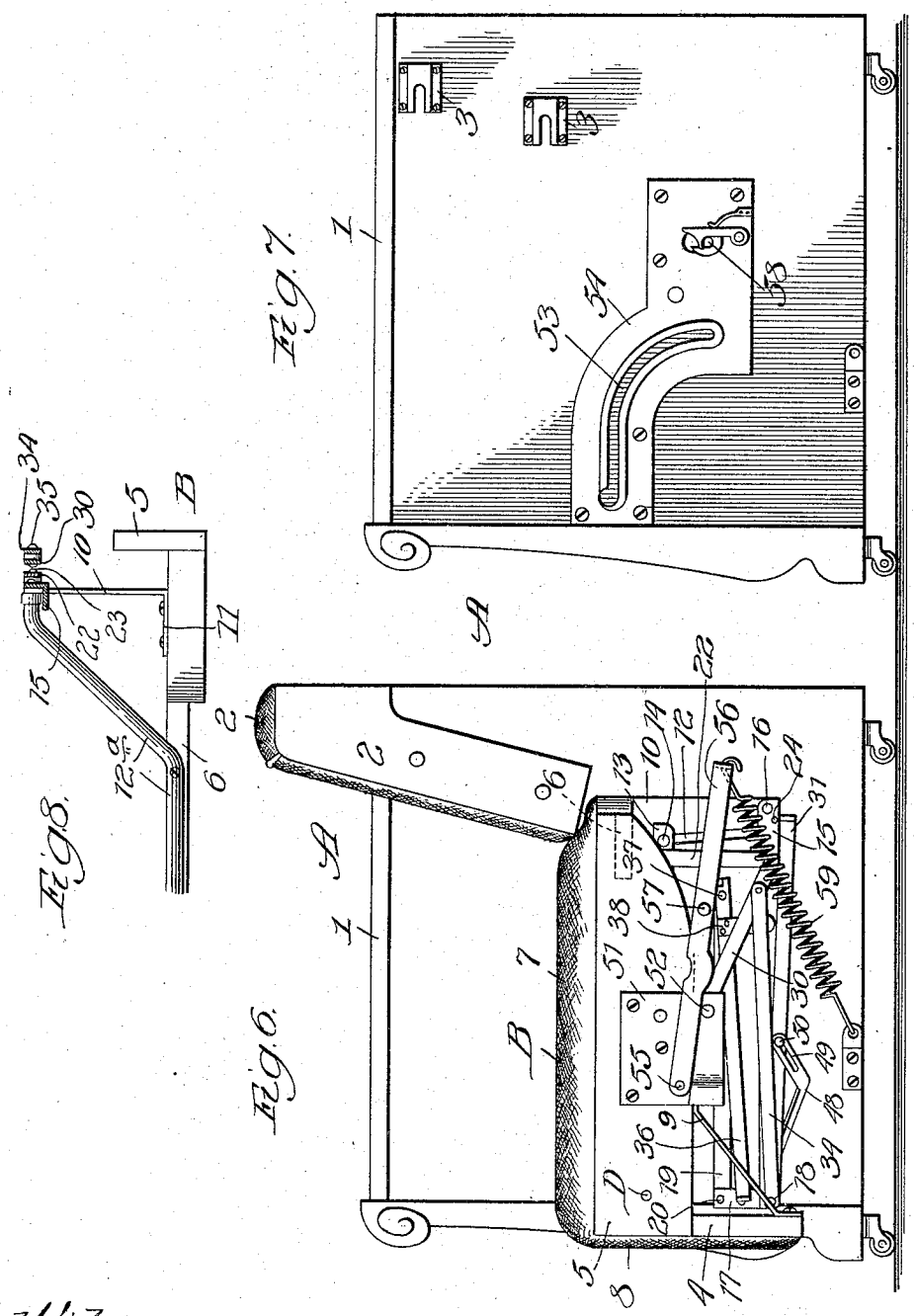
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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SOFA-BED.

1,200,950. Specification of Letters Patent. Patented Oct. 10, 1916.

Application filed July 20, 1912. Serial No. 710,600.

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 bed-frame is mounted in an overturnable, or reversible, sofa-seat, and equipped with a foldable wire mattress or spring bed-bottom, having the parts so related as to afford room between the sections of the folded bed-frame and bottom for the bedding, *i. e.*, mattress-pad, bed-linen and covers.

My primary object is to provide an improved construction of the character indicated, in which provision is made whereby the length of the bed shall extend parallel with the arms or end-standards of the sofa, thus reducing the length of the structure when used as a sofa, and to accomplish this purpose without undue complication of the mechanism in a structure which shall be capable of being readily converted from one form to another, durable, and capable of being produced at a moderate cost.

The invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 represents a broken plan view of my improved combined sofa and bed, illustrating the structure in unfolded condition; Fig. 2, an elevational view with one end of the main frame removed, certain of the parts being shown broken; Fig. 3, a broken elevational view, showing the main outer bed-section folded with relation to the main intermediate bed-section and the spacing bed-section which connects the first-named two sections; Fig. 4, a broken perspective view, showing the construction at one of the corners of the outer bed-section; Fig. 5, a broken sectional view taken as indicated at line 5 of Fig. 2, and showing the pivoted truss of the spacing bed-section; Fig. 6, a view similar to Fig. 2 but showing the structure in sofa form; Fig. 7, an inner view of one of the end-standards or arms of the sofa; and Fig. 8, a broken sectional view taken as indicated at line 8 of Fig. 1 and showing a fixedly-secured truss which connects the hangers or standards carried by the rear portion of the seat, with which hangers the extremities of the arms of the rear bed-section are raisably connected.

The invention comprises, in the embodiment shown, a main frame A; a seat B reversibly mounted on the main frame; and a folding bed C mounted in the sofa-seat and capable of being extended in bed form after the seat has been reversed with relation to the main frame.

The frame A may be of any suitable construction. As shown, it comprises ornamental end-standards 1 which constitute the arms of the sofa; and a back 2 fixedly secured between said end-standards, by means of connections 3, and serving to connect the end-standards rigidly together.

The seat B may be of any suitable construction. Described in its normal position (sofa form), it comprises a rectangular frame having a front-piece 4; end-members 5; a rear member 6; a suitably upholstered seat or cushion 7 mounted on the frame, the upholstering being continued over the outer surface of the front-piece 4, if desired, as indicated at 8; braces 9 connecting the lower edges of the end-boards 5 with the lower margin of the front-piece 4; and standards or hangers 10 which depend from the end portions of the rear longitudinal member 6. Each hanger 10 preferably comprises a sheet metal member having its upper end 11 (see reversed position in Fig. 8) bent at right-angles to the body portion and attached to the member 6 of the seat-frame. The hangers are provided with slots 12 adapted to serve as guides or runways for studs carried by the extremities of the arms of the rear bed-section. A fixed truss 12^a connects the hangers 10 and has its web portion secured to the rear rail 6 of the seat-frame.

The folding bed C preferably comprises a main rear bed-section 13 having forwardly turned arms equipped at their extremities with studs or rivets 14 adapted to slide in the slots 12; an intermediate main section 15 comprising end-members which are connected, by pivots 16, with the extremities of the hangers 10; an auxiliary or spacing section 17 comprising end-members which are joined by pivots 18 to the intermediate section 15; and a U-shaped front section 19 having the extremities of its arm joined, by pivots 20, to the end-members of the auxiliary section 17.

Connected with the end members of the intermediate bed-section 15, a short distance from the pivots 16, by pivots 21, are links 22, whose opposite ends are connected by pivots 23 to the arms of the rear bed-section 13 near the slidable rivets 14. Thus, it will be understood that in the operation of raising or unfolding the intermediate section with respect to the rear section, the links 22 serve to elevate the front ends of the arms of the rear bed-section, in which operation the studs 14 slide in the slots 12. The end members of the intermediate bed-section 15 are equipped a short distance from the pivots 16 with outwardly-extending studs 24 which afford bearings adapted to be engaged by the links 22 in the latter portion of the unfolding movement of the intermediate bed-section with respect to the rear bed-section, thereby to complete the elevation of the front ends of the arms of the rear bed-section.

Applied to the inner surfaces of the end members 5 of the sofa-seat are clips or plates 25 which carry pivots 26 with which are connected links 27 whose opposite ends are equipped with studs 28 adapted to move in slots 29 with which the arms or end members of the rear bed-section 13 are provided. The studs 28 have connected therewith links 30 whose opposite ends are connected with the studs 21 of the end members of the intermediate bed-section 15. The end members of the intermediate bed-section 15 are equipped with legs 31, which are attached by pivots 32, said legs having extensions 33 with which are connected links 34 whose outer ends are joined by pivots 35 to the links 30 near the pivots 21. It will now be understood that in the operation of unfolding the bed after the seat has been overturned, the links 34 will unfold the legs 31, the links 22 will elevate the front extremities of the arms of the rear bed-section, and the links 30 will swing the links 27 to approximately standing position, in which movement the studs 28 slide in the slots 29, thereby elevating the rear bed-section with relation to the inverted seat frame.

The front main bed-section 19 has its arms or end members equipped, near the front corners of the bed-section, with legs 36, which are joined by pivots 37 to said arms. The legs 36 are equipped a short distance from the pivots 37 with arms 38 having at their free extremities notches 39 adapted to engage studs 40 with which the end members of the intermediate bed-section 15 are provided a short distance from the pivots 16, as will be seen in Fig. 3. The legs 36 have extensions equipped with inwardly-turned stops 41 adapted to engage the upper edges of the arms of the bed-section 19 when the legs are in standing position, as shown in Fig. 4. The upturned flange of the arm is notched, as indicated at 42; and the stop 41 is notched or cut away, as indicated at 43, to permit the folding action of the leg. It will be observed that the arms 38 correspond approximately in length with the length of the end members of the auxiliary or spacing bed-section 17, so that space will be afforded between the bed-sections 15 and 19 for the bedding when the outer bed-section 19 is folded over the intermediate bed-section 15, as shown in Fig. 3.

The end members of the intermediate bed-section 17 are connected by a truss 44 comprising a longitudinal member 45 having inclined arms 46 whose extremities are connected, by pivots 47, to the intermediate portions of the end members of the auxiliary bed-section 17. The web portion 45 of the truss is connected, by bent links 48, with the legs 31, so that in the operation of folding the bed the truss 44 will be turned with relation to the end members of the auxiliary bed-section 17. The free extremities of the links 48 are provided with slots 49 engaged by studs 50 with which the legs 31 are equipped. The purpose of the slots 49 is to enable the bed-section 19 to be turned to the position shown in Fig. 3 with respect to the main intermediate bed-section 15, while the legs 36 remain in standing position. In this operation, the truss 44 is partially turned; and in the operation of folding the bed-section 15 with respect to the rear bed-section 13, the truss 44 is so turned as to occupy substantially the plane of the auxiliary or spacing bed-section 17, so that the parts of the folding bed will be accommodated within the seat and back of the front-piece 4 thereof, as illustrated in Fig. 6.

The folding bed-frame is equipped with a flexible bed-bottom 50[a] (Fig. 1), adapted to be folded and unfolded in the operations of folding and unfolding the bed-frame. In the illustration given, the seat 6 is adapted to be overturned rearwardly from the position shown in Fig. 6 and in this operation, changed to the position shown in Fig. 2, the seat being elevated in this movement, so that the folded bed which normally occupies the position shown in Fig. 6 will be raised to a standard height when the bed is unfolded after the summersaulting action of the seat occurs. Applied to the outer surfaces of the end members 5 of the seat are plates 51 equipped with outturned trunnions 52 which are movable in cam-slots or runways 53 in plates 54 which are applied to the inner surfaces of the end-standards 1 of the main frame. Connected with the plates 51, by pivots 55, are levers 56 which are equipped with studs 57 removably mounted in bearings 58 with which the plates 54 are provided, in a manner now understood in the art. The rear ends of the levers 56 are connected, by springs 59, with the lower por-

tions of the end-standards 1. The levers 56 and the trunnions 52 support the plates 51 which carry the seat, in the operations of overturning or righting the seat, as the case may be; and the levers control the movement of the cam-studs 52 along the cam-slots 53. The springs 59 are under tension in the position shown in Fig. 2, and also in the position shown in Fig. 6, so that the springs aid in the operation of turning the seat. No novelty is herein claimed for the manner of mounting the seat on the main frame. The seat is equipped with locking devices D, D, of known construction, which are adapted to lock the seat to the main frame in the inverted position, and also adapted to secure the folded bed-frame within the seat, so that the bed will not unfold in the operations of turning the seat. The mechanism D need not be described in detail, inasmuch as it forms no part of the present invention.

Assuming the structure to be in sofa form, as illustrated in Fig. 6, it may be converted to bed form, as illustrated in Fig. 1, by swinging the front edge of the seat upwardly and rearwardly, in which operation the trunnions 52 will slide in the cam-slots 53, the links or levers 56 serving, in this operation, to force the trunnions to traverse the cam-slots. The springs 59 aid in effecting the revolution of the sofa-seat. After the seat has been revolved to the inverted position, the mechanism D may be operated in a well understood manner to release the folded bed. Thereupon, the operator may unfold the bed by swinging the sections 15 and 19 as a unit about the pivots 16, in which operation the links 22 will serve to elevate the front ends of the arms of the rear bed-section 13, and the links 30 will serve to elevate the rear portion of the rear bed-section through the medium of the links 27. In this operation, the legs 31 will be automatically unfolded through the medium of the links 34; and at the end of this portion of the operation the bed-sections 19 and 15 will occupy the relative positions shown in Fig. 3. The operator may then unlock the section 19 from the section 15 by swinging the legs 36 upwardly from the position shown in Fig. 3, and may then unfold the section 19 with relation to the section 15, in which operation the legs 36 will drop to the standing position shown in Fig. 2.

It will be noted, from Fig. 1, that the arms of the front and rear bed-sections and the end members of the intermediate bed-sections are preferably of angle-form, and from Fig. 1 it will be understood that the horizontal flanges of the end members of the auxiliary section 17 are adapted to rest on the horizontal flanges of the end members of the intermediate section 15; and the horizontal flanges of the arms of the section 19 are adapted to rest upon the horizontal flanges of the end members of the section 17. This expedient for preventing buckling is now understood in the art, and need not be further described.

The foregoing detailed description has been given for clearness of understanding only, and no undue limitation should be understood therefrom, but the appended claims should 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 a structure of the character set forth, the combination with a frame and overturnable seat, of a folding bed comprising a main rear section, a main intermediate section and a main front section, spacing connections between the rear section and the intermediate section, spacing connections between the intermediate section and front section, legs connected with the intermediate section and adapted to be automatically unfolded in the operation of unfolding the intermediate section with relation to the rear section, a movable truss-device at the junction between the front bed-section and intermediate bed-section, and means for automatically turning said truss-device in the operation of folding the bed.

2. In a structure of the character set forth, the combination with a frame and overturnable seat, of a folding bed comprising a main rear section, a main intermediate section and a main front section, spacing connections between the rear section and the intermediate section, spacing connections between the intermediate section and front section, legs connected with the intermediate section and adapted to be automatically unfolded in the operation of unfolding the intermediate section with relation to the rear section, a movable truss-device at the junction between the front bed-section and intermediate bed-section, and means connecting said truss-device with said legs, for the purpose set forth.

SOLOMON KARPEN.

In presence of—
J. G. ANDERSON,
R. A. SCHAEFER.

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