

S. KARPEN & C. HULTGREN.

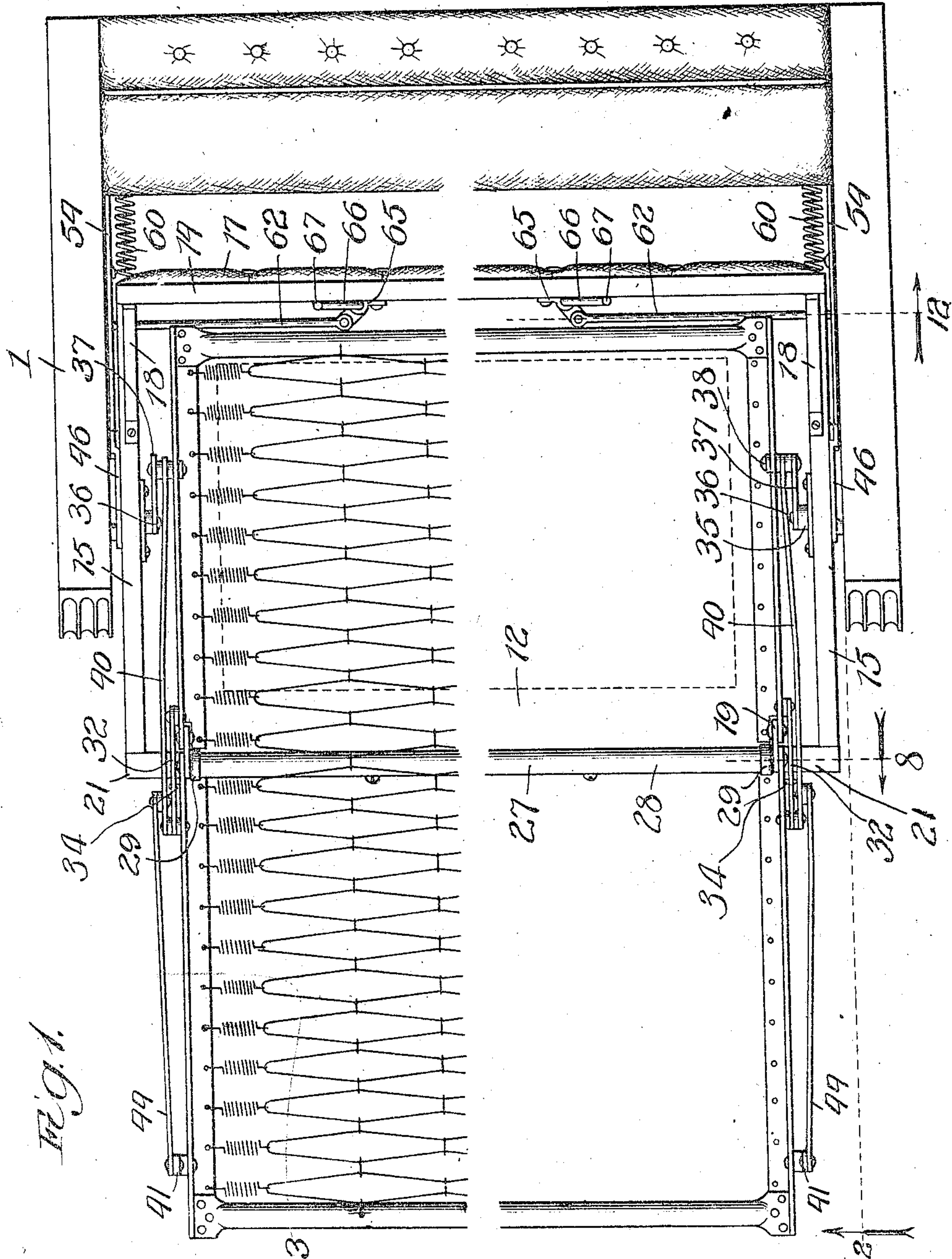
SOFA BED.

APPLICATION FILED SEPT. 2, 1910.

Patented Jan. 17, 1911.

5 SHEETS—SHEET 1.

981,926.



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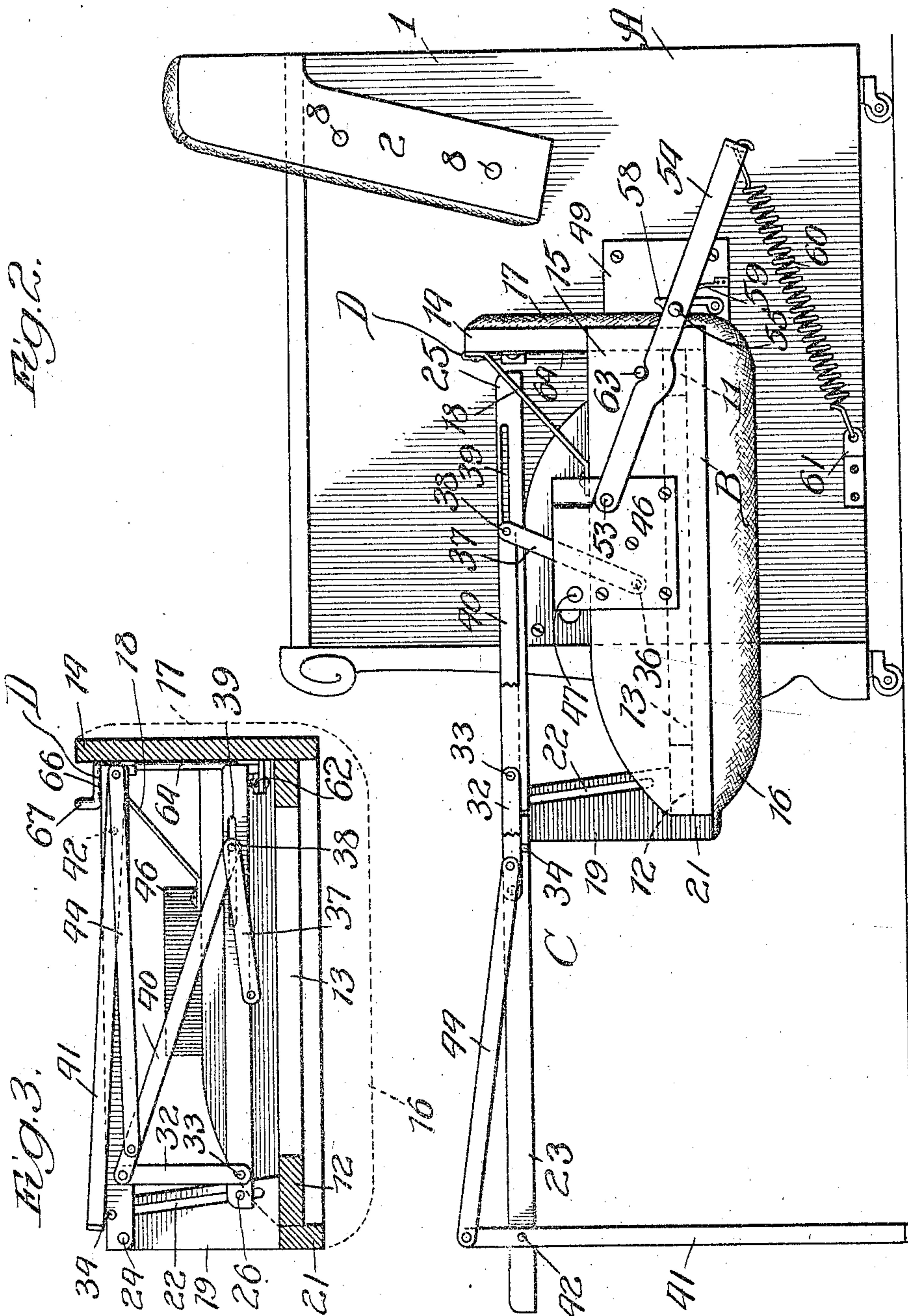
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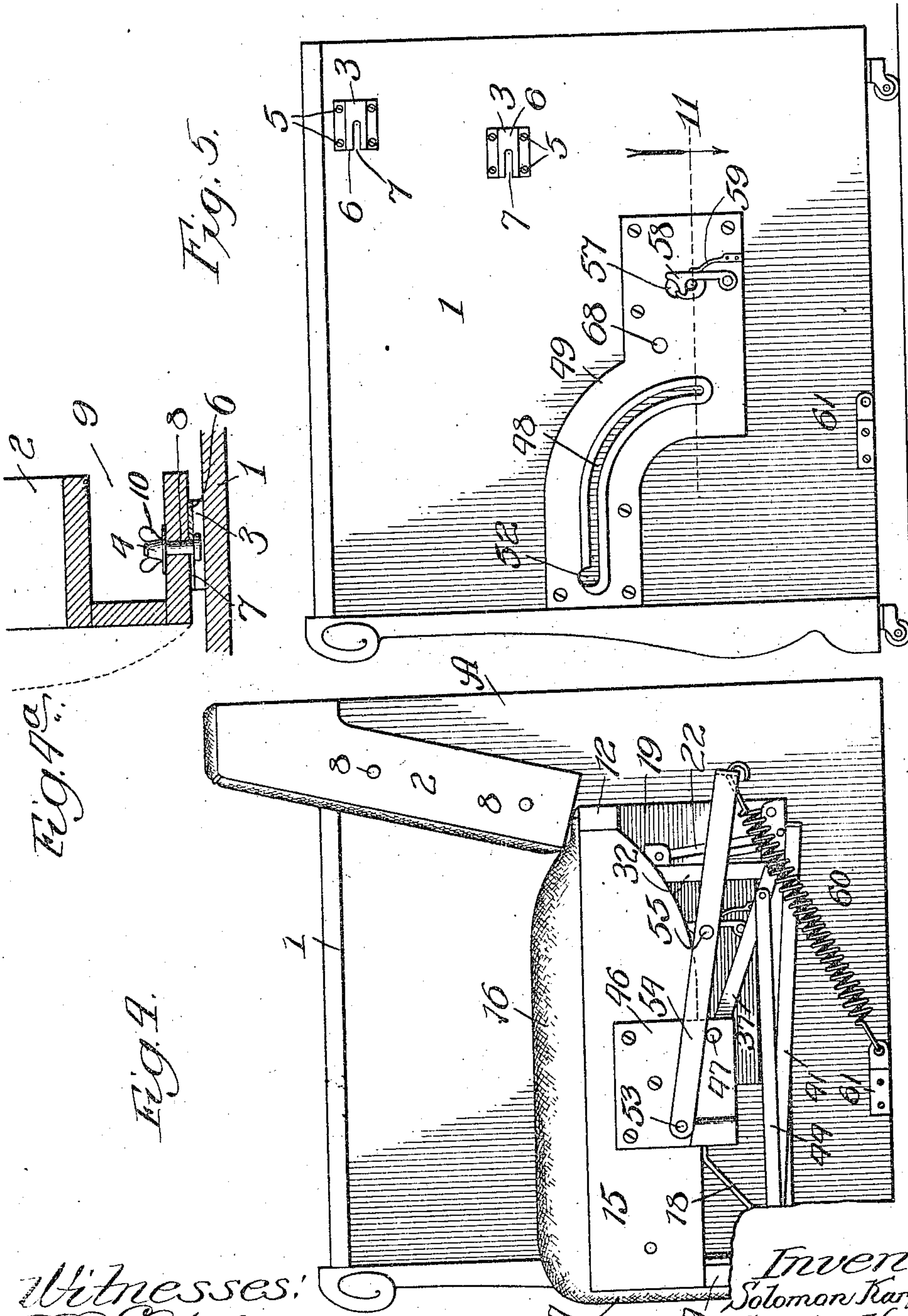
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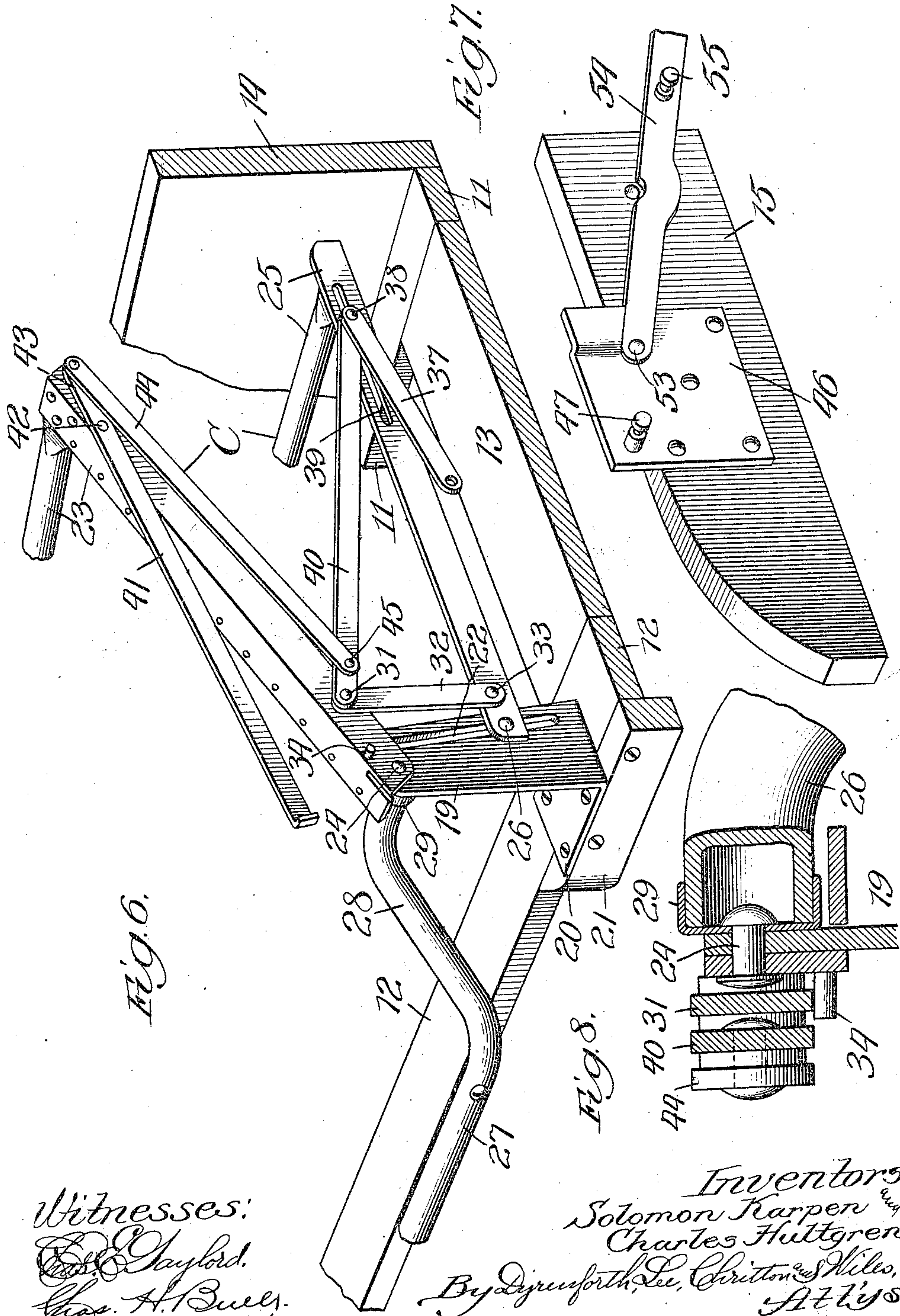
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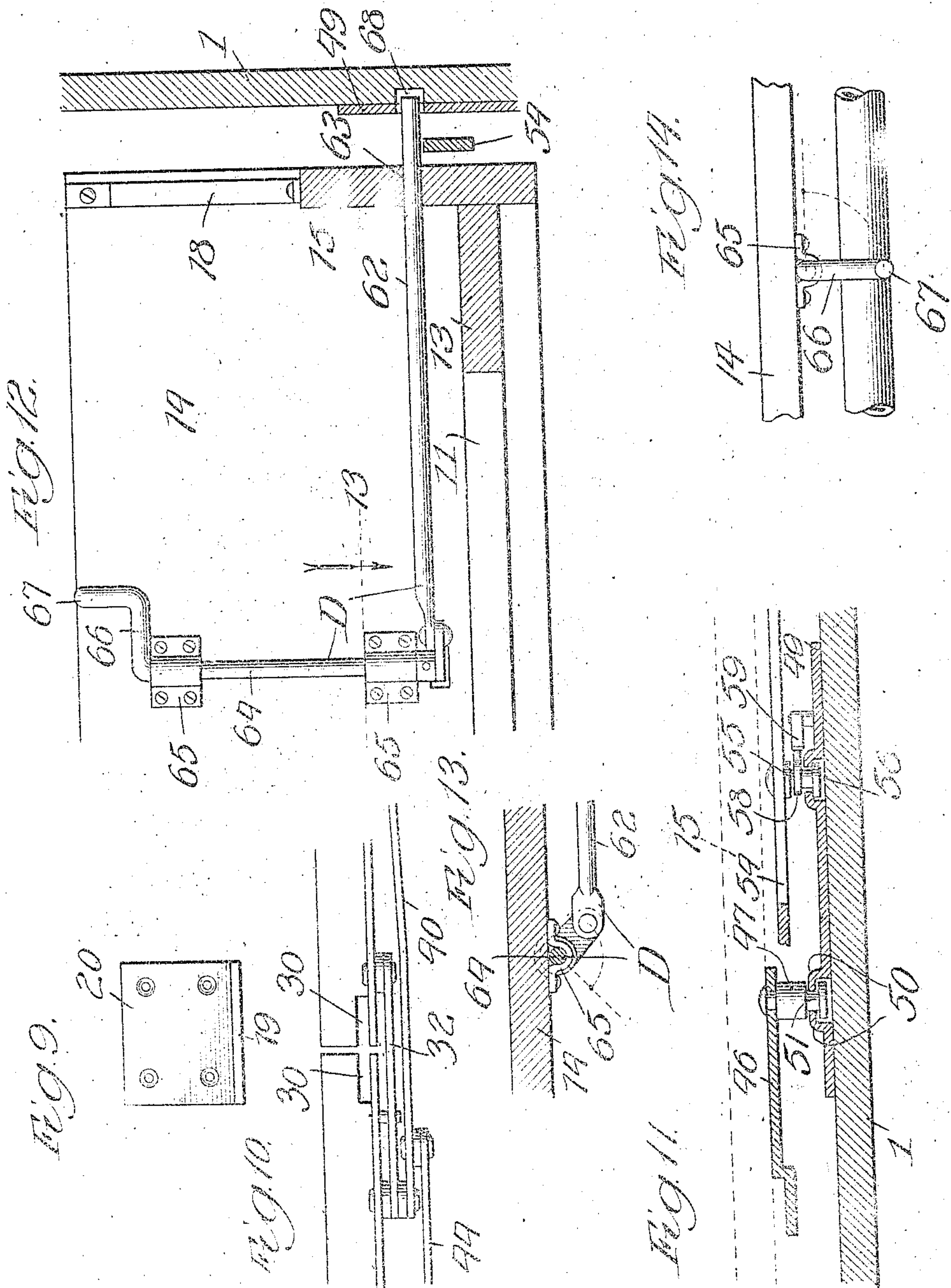
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Patented Jan. 17, 1911.

5 SHEETS-SHEET 5

981,926.



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SOFA-BED.

981,926.

Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed September 2, 1910. Serial No. 580,201.

To all whom it may concern:

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

Our invention relates particularly to combination sofas and beds, or combination
10 couches and beds, in which a foldable bed-frame is mounted on an overturnable, or reversible, sofa-seat, equipped with a foldable wire-mattress, or spring bed-bottom, having
15 the parts 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.

Our primary object is to provide an improved construction of the character indicated, which may be handily operated and in which provision is made for the disposition
20 of the bed, in the unfolded condition, at a height corresponding approximately with the height of a standard bed of the non-folding type, the structure being, nevertheless,
25 foldable into compact form and capable of being disposed beneath the sofa-seat when the latter is positioned for use at a convenient height.

It may be preliminarily stated that in the preferred construction of the invention, which is illustrated in the accompanying
35 drawings, there are employed a main frame equipped with a stationary back; a reversible, or overturnable, seat; means for elevating and carrying forward the seat with respect to the main frame in the operation of
40 overturning the seat; means for locking the seat with relation to the main frame when the seat occupies the reversed position; and a folded bed comprising a rear-section raisably mounted in the seat-frame; and a front-section pivotally mounted on standards
45 which normally depend from the rear-portion of the seat-frame when the structure is in sofa-form, said front-section being linked to and serving to elevate the rear section in the operation of unfolding the bed after the
50 seat has been turned to the inverted 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 when the device is converted to bed-form; and the mat-

tress-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
60 mattress, or flexible bed-bottom, when the device is converted to bed-form.

In the accompanying drawings,—Figure 1 represents a broken plan view of our improved combined sofa and bed, illustrating
65 the device in unfolded condition,—that is, in bed-form; Fig. 2, a view with one end of the main-frame removed, the view being taken, as indicated, at line 2 of Fig. 1; Fig. 3, a vertical sectional view of the sofa-seat,
70 in reversed position, and the folded bed mounted therein; Fig. 4, a view similar to Fig. 1, but showing the structure in sofa-form; Fig. 4^a, a broken sectional view showing a detail of the manner in which the sofa-
75 back is disconnectedly joined to the end-standards, or arms, of the main-frame; Fig. 5, an inner face view of one of the end-standards of the main-frame; Fig. 6, a sectional, perspective view of the seat-frame
80 (inverted) and the folding bed structure mounted thereon, showing the bed structure in process of unfolding; Fig. 7, a broken perspective view of one of the end-members of the seat-frame, the view showing brokenly
85 one of the links which, in connection with the trunnions control the movement of the seat in the operation of reversing the same; Fig. 8, an enlarged broken section taken, as indicated, at line 8 of Fig. 1, and illustrating
90 the manner in which the front bed-section is mounted on the seat-frame; Fig. 9, a plan-view of one of the standards on which the front bed-section is mounted, said standard appearing in Fig. 6; Fig. 10, a
95 broken plan-view showing a detail of the manner in which the end-members of the bed-sections are linked together; Fig. 11, a broken horizontal section taken, as indicated, at line 11 of Fig. 5, but showing the
100 standard at the opposite end of the structure; Fig. 12, a broken vertical section taken, as indicated, at line 12 of Fig. 1 and showing a detail of a locking-device which may be conveniently employed for securing
105 the sofa-seat with relation to the main-frame when the sofa-seat is in the reverse position; Fig. 13, a section taken, as indicated, at line 13 of Fig. 12; and Fig. 14, a broken plan view illustrating the manner in
110

which the handle of the actuating shaft shown in Fig. 12 serves to lock the front-section of the bed in the folded position shown in Fig. 3.

5 In the construction illustrated, A represents a main-frame; B, a seat reversibly mounted on the main-frame; and C, a folding-bed mounted in the sofa-seat and capable of being extended in bed-form after the
10 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
15 arms of the sofa; and a back 2 fixedly secured between said end-standards and serving to connect the end-standards rigidly together. Any desired means may be employed for securing the back firmly between
20 the end-standards. In the illustration given the sofa is of knock-down type, and the sofa-back is detachably connected with the end-standards by means of clips 3 and bolts 4 (Fig. 4^a). The clips 3 are rectangular
25 plates which are secured to the inner surface of the end-standards, as by screws 5, the clips having inwardly struck central portions 6 with slots 7 extending rearwardly from their front edges. Between the in-
30 wardly-struck portions 6 of the clips and the inner surfaces of the end-standards are afforded spaces adapted to receive the heads of the bolts 4. The bolts 4 extend through perforations 8, with which the end-members
35 of the back-frame are provided, and the back-frame is provided with channels 9 adapted to accommodate winged-nuts 10 which are applied to the inner ends of said bolts. By loosening the nuts the back may
40 be moved forwardly and disengaged from the clips 3, the bolts sliding in the slots 7 during the disengaging operation.

The seat B may be of any suitable construction. Described in its normal position,
45 in which the structure is in sofa-form, it comprises a rectangular frame having a longitudinal front-member 11, a longitudinal rear-member 12, and end-members 13; a depending front-piece, or board, 14, secured at
50 its upper edge to the longitudinal member 11; end-boards 15 secured to the end-members 13 and to the end-edges of the upper portions of the front-piece 14; a suitably upholstered seat or cushion 16 mounted on the
55 frame, comprising the members 11, 12 and 13, the upholstering being continued over the outer surface of the front-piece 14, if desired, as indicated at 17; braces 18 connecting the lower edges of the end-boards 15
60 with the lower margin of the front-piece 14; and standards 19 which depend from the end-portions of the rear longitudinal member 12. Each standard, or hanger, 19 preferably comprises a sheet-metal member hav-
65 ing its upper end 20 bent at right angles to

the body-portion and provided with perforations adapted to receive screws by means of which the member is attached to the seat-frame. As shown in Figs. 2 and 6, the outer
70 edges of the longitudinal member 12 are equipped at their ends with blocks, or members, 21 which afford part of the attaching base to which the hangers are secured. The hangers are provided with slots 22, the purpose of which will be presently explained. 75

The folding-bed C preferably comprises a front-section 23, whose end-members or arms are secured, by pivots 24, to the ex-
80 tremities of the hangers or standards 19; and a rear section 25 the extremities of whose arms are connected, by rivets 26, with the slots 22 of the hangers 19. The standards 19 are braced by a truss 27, which may be of tubular form and which has its body-
85 portion secured to the rear edge of the member 12, and which has its end-portions 28 bent downwardly and secured to the extremities of the hangers 19. As shown in Fig. 8, the extremities of the brace-portions 28 of the truss 27 are provided with caps
90 29 which are secured, by the pivotal rivets 24 upon which the front bed-section is pivoted, to the extremities of the standards 19. As will be understood, the frames of the front and rear bed-sections are of U-form, 95
the ends or arms thereof being preferably angle-bars. The extremities of the angle-bar end-members are provided with slots 30, as will be understood from Figs. 6 and 10, adapted to accommodate the end-
100 tions of the standards 19.

Connected with the arms of the front bed-section 23, a short distance from the pivots 24, by pivots 31, are links 32, whose opposite
105 ends are connected, by pivots 33, with the arms of the rear bed-section 25 near the slidable-rivets 26. Thus, it will be understood that in the operation of raising the front bed-section, as shown in Fig. 6, the links 32 will serve to elevate the front ends
110 of the arms of the rear bed-section, in which operation the studs 26 slide in the slots 22. The arms of the front bed-section 23 are equipped near their extremities with out-
115 wardly-extending studs 34 which afford bearings adapted to be engaged by the links 32 in the latter portion of the unfolding movement of the bed, thereby to complete the elevation of the front ends of the arms
120 of the rear bed-section 25. Applied to the inner surfaces of the end-members 15 of the seat-frame are clips 35 which carry pivots 36 with which are connected links 37 whose opposite ends are equipped with studs 38
125 adapted to move in slots 39 with which the arms of the rear bed-section 25 are provided near their rear ends. The studs 38 have connected therewith links 40 whose opposite ends are connected with the studs 31 carried
130 by the arms of the front bed-section 23.

The front bed-section is provided with legs 41, which are joined by pivots 42 to the end-members of the front bed-section, said legs having extensions 43 with which are connected links 44 whose opposite ends are joined by pivots 45 to the links 40 near the pivots 31. It will now be understood that in the operation of unfolding the bed after the seat has been overturned, the links 44 will unfold the legs 41, the links 32 will elevate the front extremities of the arms of the rear bed-section, and the links 40 will swing the links 37 to an approximately standing position, in which movement the studs 38 will slide in the slots 39, thereby elevating the rear bed-section with relation to the inverted seat-frame.

The seat and folded bed carried thereby are detachably mounted on the main-frame by the means now to be described. Applied to the outer surfaces of the end-members 15 of the seat-frame are plates 46 equipped with outwardly-extending trunnions 47 adapted to move in cam-slots 48, provided in plates 49 which are secured to the inner surfaces of the end-standards 1 of the main-frame. The cam-slots 48, as viewed in Fig. 5, are curved upwardly and forwardly from their lower ends and extend in an approximately horizontal direction, at their front end-portions. Adjacent to the cam-slot 48 the metal is struck inwardly, as shown at 50 in Fig. 11, and the trunnion 47 is provided with a reduced portion 51 adapted to move in the slot. At the front-portions of the cam-slots 48 the inwardly-struck metal at the upper sides of the cam-slots is cut away, as indicated at 52, so that the said trunnions may be elevated from the cam-slots or guides when it is desired to remove the seat. Connected with the front-portions of the plates 46, by pivots 53, are links 54, whose intermediate portions are equipped with outwardly-projecting studs 55 adapted to be received in bearings 56 with which the plates 49 are provided near their rear ends. Said bearings 56 are provided by striking the metal inwardly and slotting the inwardly-struck metal from the top downwardly, as indicated at 57, in Fig. 5, so that the pivots 55, which have reduced portions adapted to enter the bearings may be lowered into position. The studs or pivots 55 are locked in their bearings by dogs 58 which are pivoted to the plates 49 and are yieldingly held in position by springs 59. The rear ends of the links or levers 54 have connected therewith springs 60 whose front-ends are joined to clips 61 attached to the lower front-portions of the end-standards 1 of the main frame.

The seat B is adapted to be locked in the reversed position, by locking mechanism D, which serves, when the seat is unlocked with relation to the main frame, to lock the fold-

ed bed within the seat. The mechanism may be of any suitable construction, no claims to such mechanism being made in this application. The mechanism shown is duplicated at the two ends. Each mechanism comprises a longitudinally-disposed rod or bolt 62 whose outer end extends through a perforation 63 in the corresponding end-piece 15 of the seat-frame; and an actuating-shaft 64 secured by pivot-clips 65 to the rear surface of the front-piece 14 of the seat-frame. The lower end of the shaft 64 is provided with a crank-portion 66 equipped with a handle 67. When the bed is in the folded position shown in Fig. 3, the crank 66 may be turned to extend at right angles to the front-piece 14, in which position the cranks will lock the bed in the folded position within the seat-frame. In converting from sofa-form to bed-form, after the seat has been revolved, or turned to an inverted position, the shaft 64 may be turned by means of the handle 67, thereby unlocking the folded bed and locking the seat-frame with relation to the main frame, it being explained that when the cranks 66 are turned outwardly so as to extend parallel with the front-piece 14 the locking-bars 62 will be shifted outwardly and their outer extremities will enter the sockets 68 with which the plates 49 and end-standards 1 are provided.

The operation will be readily understood. Assuming the structure to be in sofa-form, as illustrated in Fig. 4, it may be converted to bed-form, as illustrated in Fig. 2, by swinging the front edge of the seat upwardly and rearwardly, in which operation the trunnions 47 will slide in the cam-slots 48, the links or levers 54 serving, in this operation, to force the trunnions to traverse the cam-slots as described. At the same time the springs 60, which are normally under tension when the structure is in sofa-form, aid in effecting a revolution of the sofa-seat. After the seat has been revolved to the inverted position, the shafts 64 may be turned through an angle of 90 degrees, thereby unlocking the folded bed and locking the seat with relation to the main-frame. Thereupon the operator may unfold the bed by swinging the front bed-section forwardly about the pivots 24, in which operation the links 32 will cause the studs 26 to slide in the slots 22, the links 40 will swing the links or legs 37 of the rear bed-section to the standing position, and the links 44 will swing the legs 41 of the front bed-section to the vertical position. In the last portion of the unfolding operation the links 32 will bear and slide on the studs 34, thereby causing the movement of elevation of the front ends of the arms of the rear bed-section to be completed.

In converting from bed-form to sofa-form,

after the bed has been properly made up, it is only necessary to fold the bed in the seat-frame, operate the locking mechanisms D to release the sofa-seat from the main-frame and lock the folded bed in the seat-frame, after which the front-portion (now in the rear) of the seat may be swung upwardly and forwardly to right the seat with relation to the main frame, in which operation the trunnions 47 will slide rearwardly and downwardly in the cam-slots 48, and in the last portion of the movement the springs 60 will again be placed under tension. By observing the position of the parts in Fig. 2, it will be understood that the springs 60 may also be under tension in this position of the structure, so that they will aid in the initial movement of turning the sofa-seat to right it with relation to the main-frame.

It will be understood from the description given that the seat is bodily elevated and moved forward in the operation of turning the seat to the inverted position, so that the pivots 24 carried by the standards 19 will be approximately at the height desired for the bed, and in the operation of unfolding the bed the rear bed-section will be bodily elevated to the plane of the front bed-section. The construction enables the bed to be disposed, when in the extended position, approximately the height of a standard bed of the non-folding type, and this is accomplished without giving the sofa-seat objectionable height when disposed in position for use as a sofa.

As will be understood from Fig. 2, the structure described is comparatively simple; and from the description given it will be understood that the structure is readily convertible from one form to another and is thoroughly durable and practicable.

The foregoing detailed description has been given for clearness of understanding only, hence 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 we regard as new and desire to secure by Letters Patent is—

1. In a sofa-bed, the combination of a frame, a rearwardly overturnable seat mounted thereon, and a folded bed mounted in the seat and comprising two sections, one of which is normally contained in the upper portion of the seat and has slidable connection with the seat, and the other of which is pivoted directly to the seat and linked to the first-named section.

2. In a sofa-bed, the combination of a frame, an overturnable seat mounted therein, and having hangers depending from its rear-portion, a front bed-section pivotally connected with said hangers, and normally contained in the lower portion of the seat, a rear bed-section normally disposed in said

seat above the front bed-section and slidably connected with said hangers, and mechanism connecting said sections operative to elevate the rear bed-section when the front bed-section is swung to the extended position after the reversal of the seat.

3. In a sofa-bed, the combination of a frame, an overturnable seat mounted therein, said seat equipped at its rear-portion with hangers provided with guide-slots, a front bed-section pivotally connected with the extremities of said hangers, a rear bed-section having the extremities of its arms slidably connected with said guides, and means for elevating the rear bed-section when the front bed-section is swung to the extended position after the reversal of the seat.

4. In a sofa-bed, the combination of a frame, an overturnable seat mounted therein, said seat equipped at its rear-portion with hangers provided with guide-slots, a front-bed-section pivotally connected with the extremities of said hangers, a rear bed-section having the extremities of its arms slidably connected with said guides, links pivotally connected with the seat and slidably connected with the rear bed-section, and links connecting the arms of the rear bed-section with the front bed-section.

5. In a sofa-bed, the combination of a frame, an overturnable seat mounted therein, said seat equipped at its rear portion with depending hangers provided with guides, a rear bed-section having its arms connected with said guides, a front bed-section pivotally connected with said hangers, legs connected with the swinging portion of the front bed-section, legs for the rear bed-section pivoted on the seat, and links connecting said legs and said bed-sections, whereby the legs will be turned to standing position and the rear bed-section elevated in the operation of unfolding the bed after the overturning of the seat.

6. In a sofa-bed, the combination of a frame, an overturnable seat equipped at its rear-portion with depending hangers provided with inclined guides, a front bed-section pivotally connected with said hangers, a rear bed-section having its arms slidably connected with said guides, links connecting the rear bed-section to the front bed-section, and links connecting the rear bed-section to the seat.

7. In a sofa-bed, the combination of a frame, an overturnable seat equipped at its rear-portion with depending hangers provided with inclined guides, a front bed-section pivotally connected with said hangers, a rear bed-section having its arms slidably connected with said guides, links connecting the rear bed-section to the front bed-section, links connecting the rear bed-section to the seat, and studs carried by the front bed-

section adapted to be engaged by the links connecting the front and rear bed-sections in the unfolding operation.

8. In a sofa-bed, the combination of a frame, an overturnable seat equipped at its rear portion with depending hangers provided with inclined guides, a front bed-section pivotally connected with said hangers, a rear bed-section slidably connected with said guides, links pivotally connected with the seat and slidably connected with said rear bed-section, links connecting the front bed-section with the rear section, stops carried by the front bed-section and adapted to be engaged by said last-named links in the operation of unfolding the bed, and links serving to actuate said last-named links, in the operation of unfolding the bed.

9. In a sofa-bed, the combination of a frame, an overturnable seat mounted therein and equipped at the rear portions of its ends with depending hangers provided with guides, truss means connected with said hangers, a front bed-section pivotally connected with said hangers, a rear bed-section slidably connected with said guides, links connecting the rear bed-section and seat, and links connecting the front bed-section and rear bed-section.

10. In a sofa-bed, the combination with a frame, a rearwardly overturnable seat mounted therein, a rear bed-section normally housed in the upper portion of said seat, a front bed-section normally housed in the lower portion of said seat and pivotally connected with the seat, and means whereby the rear bed-section will be elevated in the operation of unfolding the front bed-section after the reversal of the seat.

11. In a sofa-bed, the combination of a frame, equipped with plates provided with runways for trunnions, said runways having means to permit removal of the trun-

nions, a pair of levers removably pivoted on said plates, springs connecting said levers with the frame, an overturnable seat equipped with plates provided with trunnions adapted to move in said runways, said last-named plates pivotally connected with said levers, and a folded bed mounted in said seat and comprising a plurality of foldably-related sections.

12. In a sofa-bed, the combination of a frame, equipped with plates provided with runways, levers pivoted on said plates, springs connected with said levers, an overturnable seat equipped with plates provided with trunnions movable in said runways, said last-named plates pivotally connected with said levers, hangers carried by the rear portion of said seat and provided with guides, a front bed-section pivotally connected with said hangers, a rear bed-section slidably connected with said guides, links pivoted on said second-named plates and slidably connected with said rear bed-section, links connecting said first-named links to the front bed-section, links connecting said rear bed-section to the front bed-section, legs pivotally connected with the front bed-section, and links serving to actuate said legs.

13. In a sofa-bed, the combination of a frame and rearwardly overturnable seat, means for locking said seat to the frame, and a folded bed mounted in said seat and comprising a front bed-section pivotally mounted on the seat, and a rear bed-section having slidable connection with the seat and linked to the front bed-section.

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In presence of—

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