

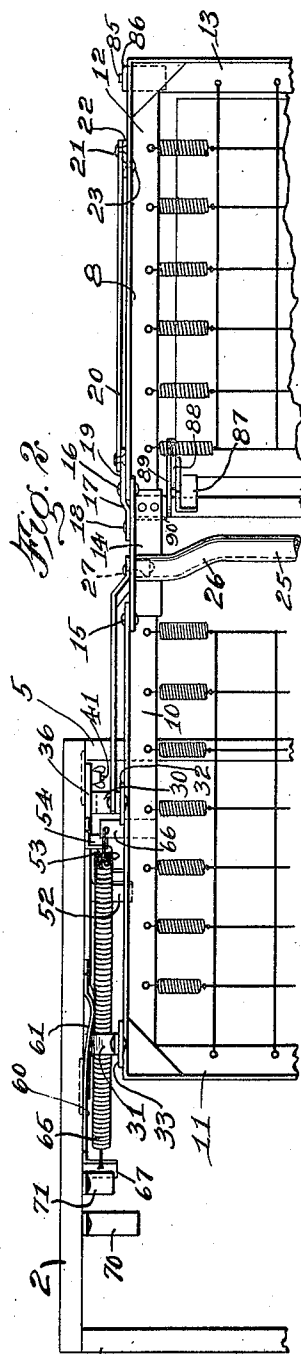
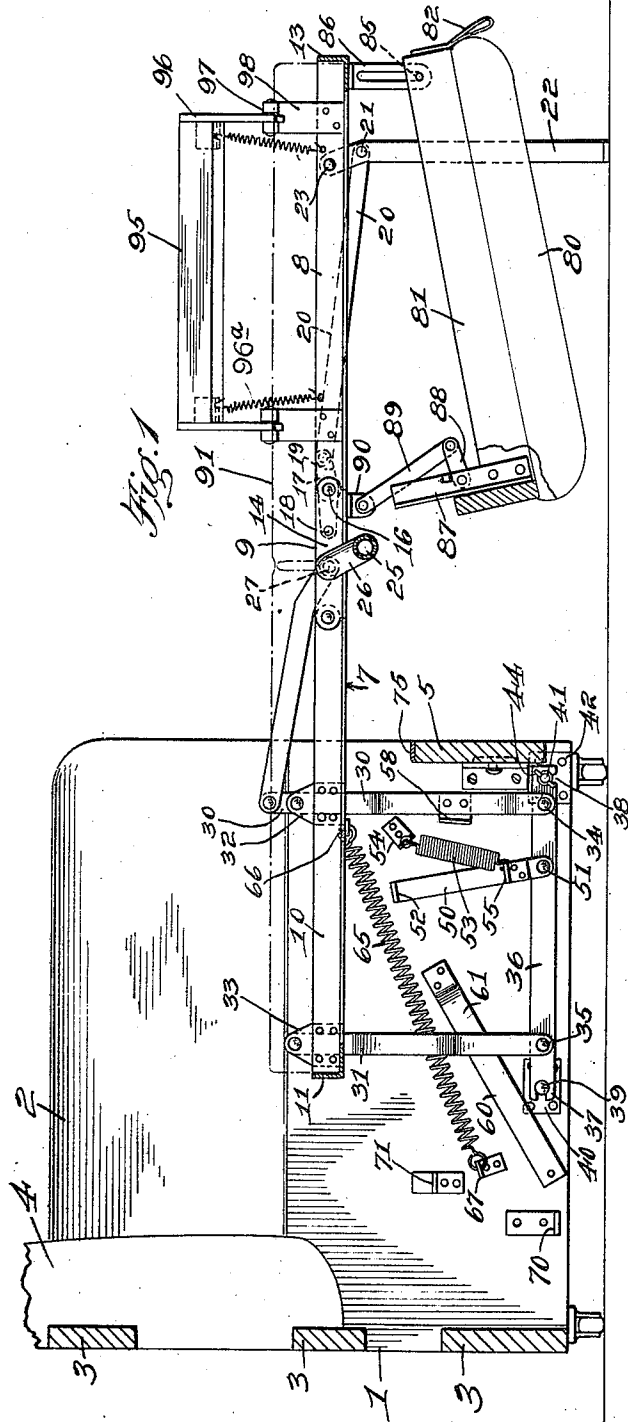
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FOLDING BED OR COUCH

Filed Aug. 18, 1924

2 Sheets-Sheet 1



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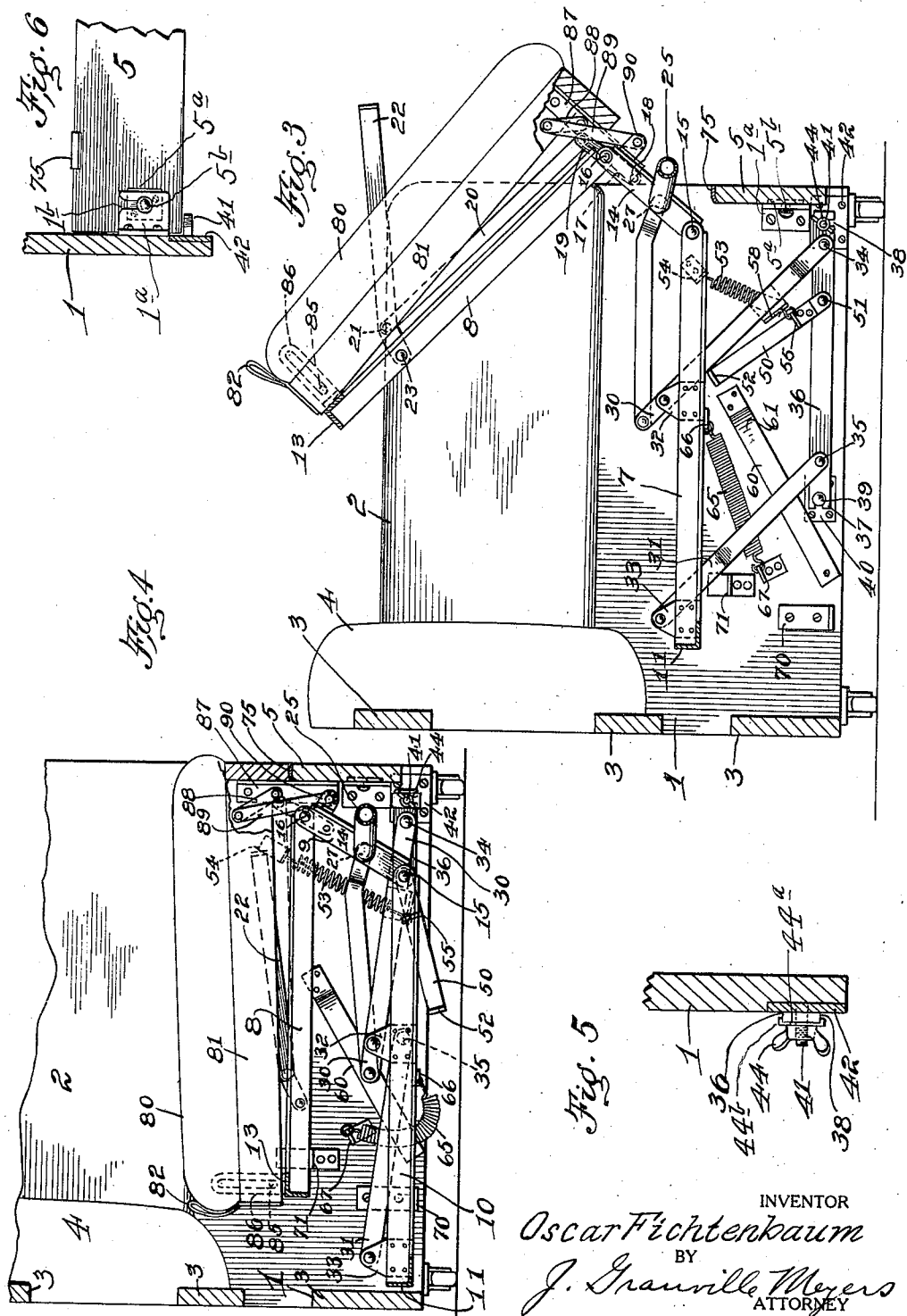
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# UNITED STATES PATENT OFFICE.

OSCAR FICHTENBAUM, OF BROOKLYN, NEW YORK.

## FOLDING BED OR COUCH.

Application filed August 18, 1924. Serial No. 732,642.

My invention relates to improvements in folding beds or couches, including the type commonly known as davenports.

An important object of the invention is to provide a simple, strong and durable folding structure which may be moved from folded to extended position and back again, with very small physical effort.

A further object is to yieldingly check or cushion the folding structure at certain points or through certain ranges of movement.

Another object is to provide in connection with other features, a new and improved foldable support for the outer frame section when in open position, and also an improved arrangement and the davenport couch seat in relation to the outer foldable frame section.

The characteristics and advantages of the invention are further sufficiently explained in connection with the following detail description of the accompanying drawings, which illustrate one exemplifying embodiment of the invention. After considering this example, persons skilled in the art will understand that many variations may be made within the principles of the invention, and I contemplate the employment of any structures that are properly within the scope of the appended claims.

Fig. 1 is a vertical transverse section of a folding couch or davenport embodying the invention in one form.

Fig. 2 is a plan view of one end of the same.

Fig. 3 is a section in the same plane as Fig. 1, showing the structure partly folded.

Fig. 4 is a section showing the structure completely folded.

Fig. 5 is a detail sectional view of a frame strip fastening device.

Fig. 6 is a detail in section of a front or base board and its connecting or supporting means.

The main frame of the couch or davenport structure may be substantially as usual, including in the present specific example, end pieces or boards 1 provided with the usual end and arm cushions 2, horizontal back connecting strips 3, the upper ends of which support the usual back cushion 4, and a front horizontal connecting member or front board 5. The front or base board 5 may be secured to the end board 1 in various ways, but preferably, as shown, angle pieces 1<sup>a</sup> are

provided, secured to the end board and provided with vertical slots 1<sup>b</sup>. Plates 5<sup>a</sup> are secured to the inner face of the front board or base board 5, and these plates are provided with headed studs 5<sup>b</sup>. To attach or properly locate the front board 5 it is only necessary to pass the shanks of studs 5<sup>b</sup> through the vertical slots 1<sup>b</sup>, as sufficiently indicated in the drawings; and the front board may at any time be quickly and easily removed in an obvious way.

The folding or bed structure includes the main frame portions 7 and 8 connected by an intermediate or link section 9. The main sections are constructed in generally rectangular form of angle iron. Section 7 includes end members 10 connected by a longitudinal back member 11. Section 8 includes end members 12 connected by a longitudinal front member 13. The link or intermediate section 9 includes short link strips 14 pivoted to the front ends of strips 10 by rivets 15 and also pivotally connected to the rear or inward ends of strips 12 by rivets 16. The last named pivotal connections desirably include the links 14 and short strips 17 secured to the link members at 18 and bent to form, in connection with the link members, clevises which embrace the ends of the vertical flanges of the strips 12, as clearly shown in Fig. 2. The forward ends of the strips 17 constitute arms 19, the ends of which are pivotally connected to links 20, the outward ends of which are pivotally connected at 21 to legs 22, which are pivotally connected at 23 to frame members 12. By this arrangement, when the structure is folded the legs are brought alongside the end frame members 12, where they lie close to the end boards 1, and when the structure is extended as shown in Fig. 1, the legs are moved to vertical position to securely support the frame section 8 and the entire outer portion of the foldable mattress frame.

The central or link section 9 also includes a tubular longitudinal bar 25, the ends of which are slightly cranked as at 26 and connected pivotally or rigidly to the link members 14 by means of lugs 27.

The inner folding section 7 is supported and moved in constantly parallel relation to any one of its positions by arms 30 and 31 located near the end boards and pivotally connected to short brackets 32 and 33 which are riveted to members 10. The lower ends

of the arms are pivotally mounted at 34 and 35 at fixed points, which may be any suitable brackets or studs secured to the end bars, but which preferably, for convenience and economy in manufacturing and assembly, or in repair and renewal of parts, are arranged as pivot studs secured to horizontal strips 36. At the rear end, each of these strips has a horizontal clevis or slot 37, and at its forward end a vertical slot or clevis 38. The rear clevis co-operates with a stud 39 extending from a plate 40 screwed to the end board and the front clevis co-operates with a stud 41 extending from a plate 42 secured to the end board and provided with a wing nut 44. A washer 44<sup>a</sup> is also desirably provided, located between the wing nut and strip 36. The washer is apertured to accommodate the screw 41 and has its upper and lower margins bent at right angles to form flanges 44<sup>b</sup> overlying the upper and lower edges of strip 36, so that when the washer is positioned as shown in Fig. 5 and the wing nut screwed down on it, strip 36 is positively locked against any accidental or forcible displacement. By this arrangement the strips 36 with their connected parts may be easily placed in position by positioning the slot or clevis 37 on stud 39 and then moving the strip about the stud as an axis until the front slot or clevis 38 embraces screw 41; and the strip is then clamped by turning up the wing nut 44, to securely hold the link or lever structure in position. Also associated with the strips 36 are levers 50 which may be identified conveniently as cushioning levers. These levers are pivotally connected to strips 36 at 51, and have upper end portions 52 turned in at right angles to engage the rear faces of levers 30 at a certain point in the folding movement. An auxiliary or tension spring 53 is provided for each of the cushioning levers. These springs are connected between brackets 54 secured to the end boards and brackets 55 secured to the levers near their pivot points. When the levers are free or in the position shown in Fig. 1, the springs are usually entirely collapsed but ready to exert yielding tension upon the levers as soon as the latter are moved rearward in co-operation with lever arms 30. The lever arms 30 are also desirably provided with lugs 58 consisting of bent flat strips arranged to co-operate with levers 50 or the spring brackets 55 thereon, during certain parts of the movement, as sufficiently explained hereafter.

Guide or brace strips 60 are angularly secured to the end boards. These have cam-like or beveled portions 61, Fig. 2, which co-operate with lever arms 31 when the structure is in extended position to brace these arms and prevent end movement of the inner portion of the bed structure.

Main operating or tension springs 65 are

connected between brackets 66 on strips 10 and brackets 67, secured to the end board.

Brackets 70 are secured to the end board to support the inward portion of the frame section 7 in folded position, and brackets 71 are also secured to the end boards to support the inner end of frame section 8 when in folded position, as best shown in Fig. 4.

Wear plates, or bearing plates, 75 are desirably fixed to the upper edge of front board 5, in positions corresponding to the location of link members 14, these link members contacting with the bearing plates in certain positions, as sufficiently explained in the operative description.

The couch or davenport seat comprises a cushion 80 secured to the usual wood seat frame 81, which may be provided with a strap 82 to assist in manipulation of the folding structure. When the structure is folded, this handle attached to what is then the rear edge of the seat frame, lies close to the lower portion of the back cushion, but is located so that it can be easily reached and grasped when the bed is to be opened.

At the rear side (with reference to the folded position) the seat frame is connected to frame section 8 by pins 85 engaging in slots in brackets 86 secured to frame 8. At the front edge (also with reference to folded position) the front seat frame member is provided with vertical angle strips 87, which project substantially beyond the lower edge of the wood frame member. These angle strips have pivoted links 88 pivotally connected to links 89 which are in turn pivotally connected to brackets 90 on the under sides of link members 14.

When the structure is folded, as shown in Fig. 4, the auxiliary or cushion springs 53 are fully tensioned, this tension pull being exerted through the spring brackets 55 and lever brackets 58 upon levers 30, but this pull is insufficient to move the folding structure without the application of manual effort. The main or tension springs 65 are collapsed and idle. To open the bed the operator grasps the strap handle 82 and pulls upward and outward. Only moderate manual effort is required and this slight effort aided by the pull of the cushion springs 53 moves the outer frame section 8 upward and outward, with pivotal movement at the pivot connections 16. At the same time the inner frame section 10 rises in parallel relation to its original position, lever arms 30 and 31 swinging up about their pivots 34 and 35. In the first upward and pivotal movement of the outer frame section, the lower ends of angle members 87 leave contact with the vertical inner face of the front board 5, and these angle pieces have a pivotal or slightly sliding bearing on the inner edges of the bearing plates 75. This provides a leverage or fulcrum to aid

in the opening movement and also prevents any injurious contact between the folding structure and the upper edge of the front board 5. The opening movement continues with the aid of the cushion or auxiliary springs 53 until the structure is in an intermediate or partly open position, as shown in Fig. 3. During this movement the changing relative positions of the spring levers 50 and supporting levers or arms 30 causes the application of the auxiliary spring effect to change from that afforded by the contact of brackets 55 and 58 to the contact point provided by the inbent ends 52 of the spring lever engaging with edges of the supporting levers 30, as clearly shown in Fig. 3. At about the point indicated in Fig. 3, there is no substantial further resistance to the opening movement, but on the contrary the weight of the parts tends to expedite the opening movement. At about this moment the main springs 65 come into action and by increasing tension pull resist the opening movement so that the structure may be easily let down into fully open position as shown in Fig. 1, without any great physical exertion on the part of the user. As the outer frame section swings around to the position shown in Fig. 3 to that shown in Fig. 1, the linkage consisting of members 88 and 89 permits the outer end of the seat frame, which is now the inner portion, to drop down, while the outer end drops down by movement of the pins 85 in slots or brackets 86. During the same movement of the outer frame portion, the legs 22 are extended to vertical position by obvious action of the links 20 in cooperation with frame connecting links 14 to support the entire outer portion of the bed structure securely, and to properly and rigidly bear the weight of occupants.

To fold the structure, the strap handle 82 is grasped and moved upward and inward, the only effort required being to move the outer frame section pivotally about the outer ends of links 14. At the same time the inner frame section swings inward by the angular movement of supporting levers 30 and 31, and the main springs 65 immediately exert a tension tending to facilitate this movement. At the proper point the cushion or retarding springs 53 come into action to prevent unduly rapid folding and also to relieve the operator of physical strain of this folding movement. The application of the force of springs 53 through the levers 50 varies or shifts in reverse manner to that described in connection with the opening movement. Finally the frame members are all folded and seated on supporting brackets and the seat structure drops down to normal position as shown in Fig. 4, with the front seat frame member resting on the upper edge of the front board 5.

The mattress 90 may be made in foldable sections as usual, and is properly located and supported on the frame members by the angle strips in connection with the usual mattress wires or springs, and may be secured in position in any suitable way, as by tapes or straps.

Foldable head and foot boards or pillow rests may be provided, which consist in the present example of horizontal members or boards 95 connected to arms 96 pivoted at 97 to brackets 98, which are secured to the end strips 12 of the outer frame member. These head and foot boards are opened and closed in an obvious way when the structure is in extended position. Springs 96<sup>a</sup> may be provided, tensioned between the boards 95 or brackets on these boards, or the arms 96 and fixed points on frame members 8, and these springs serve by their tension pull to maintain the head and foot boards either in their elevated or folded positions.

I claim:

1. A folding bed or couch comprising a couch structure, an inner mattress frame, parallel levers connecting the mattress frame at each end to the couch structure, main springs connected between the couch structure and the mattress frame to exert an inward pull, auxiliary springs and levers controlled thereby and arranged to engage certain of the parallel levers during a part of the mattress frame movement and to resist inward or aid outward movement of the frame, and at least one other mattress frame structure having an articulated connection to the mattress frame first mentioned.

2. A folding bed or couch comprising end boards and back connections, frame members secured to the end boards near their lower edges, two spaced parallel levers pivotally connected to each frame member, an inner mattress frame pivotally connected to the parallel levers and maintained by them in horizontal position during opening and folding movement, main springs connected between the end boards and the mattress frame to resist opening movement, auxiliary levers arranged to engage with certain of the parallel levers through considerable inward portions of their arcs of movement, auxiliary springs connected between the end boards of the auxiliary levers, the last named springs and levers serving to resist inward movement of the mattress frame and to aid outward movement during portions of the frame travel, and at least one other mattress frame structure having articulated connection with the mattress frame first mentioned.

3. A folding bed or couch comprising the end boards and back connections, frame members secured to the end boards near

their lower edges, two spaced parallel levers pivotally connected to each frame member, an inner mattress frame pivotally connected to the parallel levers and maintained by them in horizontal position during opening and folding movement, main springs connected between the end boards and the mattress frame to resist opening movement, auxiliary levers pivotally connected to said frame members and arranged for shifting engagement with certain of the parallel levers, auxiliary springs connected between the end boards and the auxiliary levers, the last named springs and levers serving to resist inward movement of the mattress frame and to aid outward movement during portions of the frame travel, and at least one other mattress frame structure having articulated connection with the mattress frame first mentioned.

4. A folding bed or couch comprising a couch structure including end boards, back connections and a front board, foldable inner and outer frame sections, an intermediate section connecting the inner and outer sections, springs connected between the couch structure and points on the folding structure, a seat structure movably connected to the outer section, and members projecting therefrom to co-operate with the inner face of the front board when in folded position, and to act with a leverage effect upon the upper edge of the front board dur-

ing the first part of the opening movement.

5. A folding bed or couch comprising a couch structure including end boards, back connections and a front board, studs secured to the end boards, a substantially horizontal frame strip having a horizontal slot at one end co-operating with one of the studs and a vertical slot at the other end co-operating with the other stud, a nut on the last named stud to lock the frame strip in position, a folding structure, and parallel levers pivotally connected to the frame strip and also to the folding structure.

6. A folding bed or couch comprising a couch structure, a folding structure movably connected thereto and including an inner mattress frame and an outer mattress frame, short members pivotally connected to and connecting together said mattress frames, a seat frame, slotted rigid brackets at the outer end of the outer mattress frame co-operating with pins on the seat frame, and articulated links connecting the other end of the seat frame to said short member, whereby the seat may drop below the mattress section when in unfolded position, and may fold down compactly upon the outer mattress section and to proper location in the couch structure when in folded position.

Signed at borough of Brooklyn, in the county of Kings and State of New York this 5th day of August, A. D. 1924.

OSCAR FICHTENBAUM.