March 30, 1943. V. J. BERGSTROM 2,314,864

CONVERTIBLE COUCH STRUCTURE

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Fig. 1.

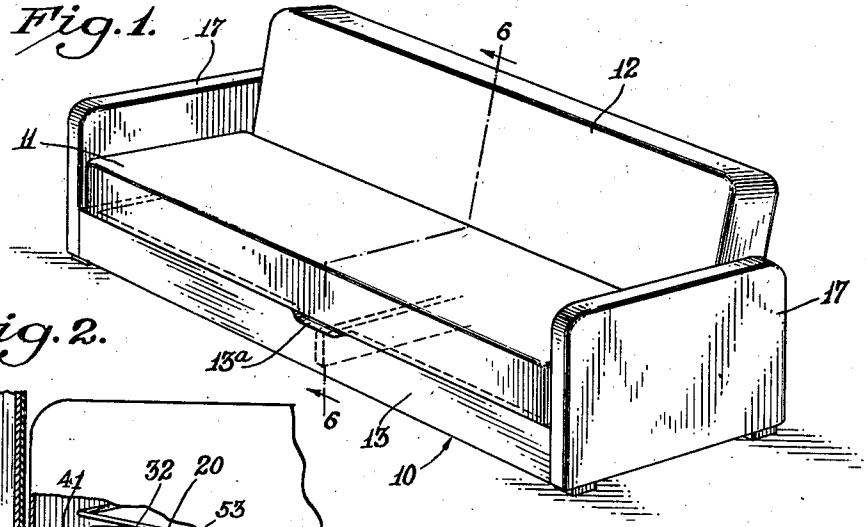


Fig. 2.

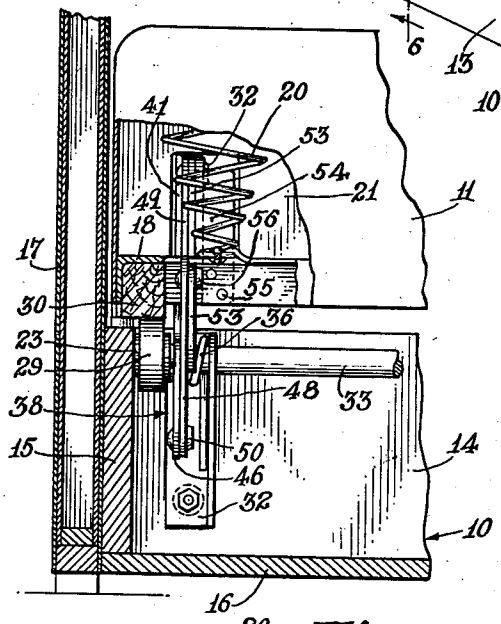


Fig. 3.

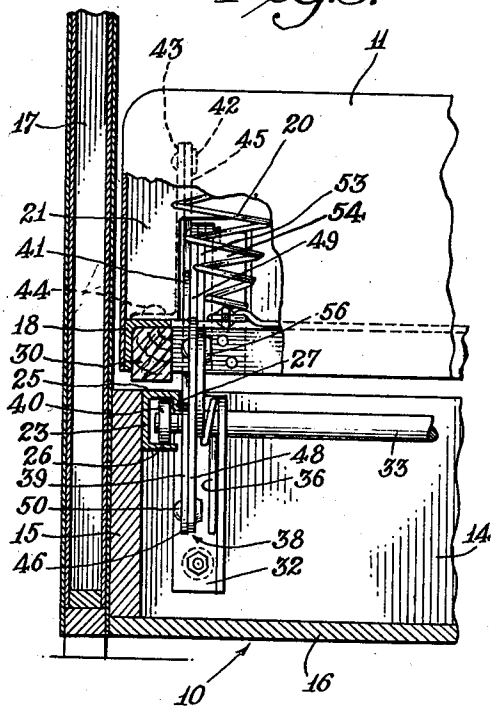
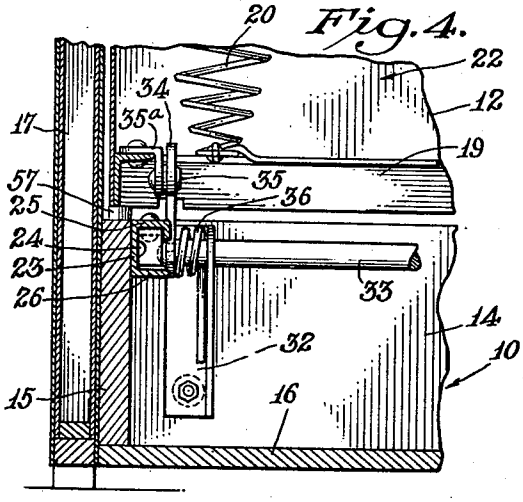


Fig. 4.



Inventor
Victor John Bergstrom
By
Parker, Carlson,
Pegram & Hubbard.
Attorneys.

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Fig. 5.

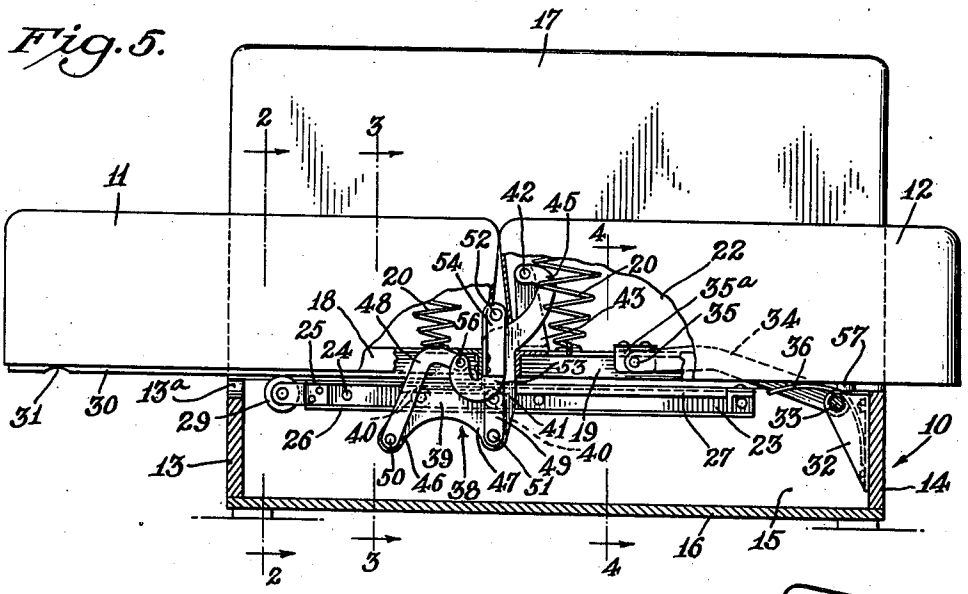
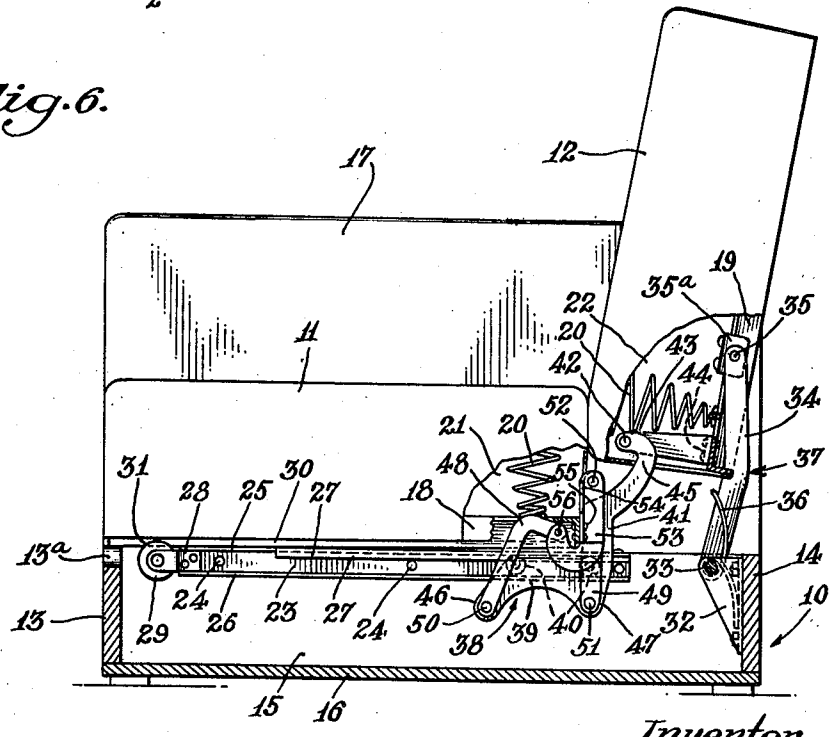


Fig. 6.



Inventor
Victor John Bergstrom
BY
Parker, Carlson, Pitzner and Hubbard.
Attorneys.

March 30, 1943. V. J. BERGSTROM 2,314,864

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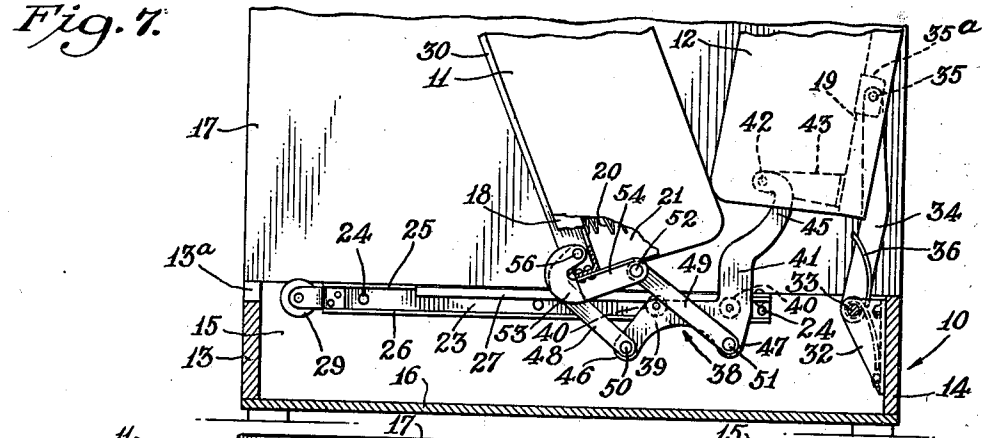
Fig. 7.



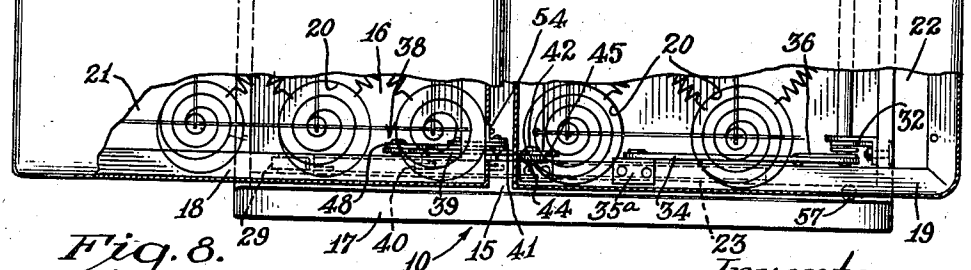


Fig. 8.

Inventor
Victor John Bergstrom
BY
Parker, Carlson, Pegues & Hubbard
Attorneys.

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UNITED STATES PATENT OFFICE

2,314,864

CONVERTIBLE COUCH STRUCTURE

Victor John Bergstrom, Chicago, Ill., assignor to Superior Felt & Bedding Co., Chicago, Ill., a corporation of Delaware

Application November 10, 1939, Serial No. 303,781

6 Claims. (Cl. 5—47)

The invention relates primarily to that type of a couch structure which is adapted for conversion into a bed and the general aim is to provide a new and improved structure that is characterized by the sturdy simplicity of its construction and by ease and convenience of operation.

Another object is to provide a convertible structure of this nature which embodies novel means operably interconnecting and correlating the relative movements of the seat and back members of the couch so that the back member is swung into its horizontal position by a pull on the seat member and is automatically returned to its upright position after the user has initiated such movement, and in which the conversion movements are in a direction forwardly of the rearmost position of the back member so that the normal position of the structure against a wall need not be disturbed in effecting the conversion.

Another object is to provide in a new and improved structure of this nature novel supporting means for the seat and back members arranged to permit movement of either member between substantially horizontal and vertical positions.

Other objects and advantages will become apparent in the following description and from the accompanying drawings, in which:

Figure 1 is a perspective view of a convertible structure embodying the invention.

Figs. 2, 3 and 4 are vertical sectional views through the left-hand end of the structure as shown in Fig. 1 and are taken on planes indicated by the lines 2—2, 3—3 and 4—4 of Fig. 5 respectively.

Figs. 5, 6 and 7 are views looking toward an end of the structure from such an intermediate position as that indicated by the line 6—6 of Fig. 1, and the seat and back members are broken away only to the extent required to illustrate respectively the positions assumed by the parts in the horizontal position of the seat and back members, in the vertical position of the back member, and in the vertical position of the seat member.

Fig. 8 is a fragmentary plan view of the structure as shown in Fig. 5, parts being broken away to illustrate internal construction.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

The exemplary form of structure which has been selected for illustrative purposes embodies a supporting base 10, a seat member 11 and a back member 12 interconnected to permit the seat and back members to be readily changed from their couch-forming relationship, as shown in Figs. 1 and 6, to their bed-forming position shown in Figs. 5 and 8 and to permit the seat member to be tipped upwardly to a self-maintained substantially vertical position affording access to a bedding compartment in the base (see Fig. 7). In this instance, the parts in the couch-forming relation simulate a twin bed arrangement. The base is a rectangular frame comprising front and back walls 13 and 14, respectively, end walls 15 and a bottom wall 16, all defining the bedding compartment. To the end walls, suitable arm members 17, such as the pressed metal assembly shown in Figs. 1 and 2, may be secured.

In general, the seat and back members are alike in construction and, as shown, comprise rectangular angle iron frames 18 and 19, respectively, which support inner spring systems 20 of substantially conventional construction. The legs of the angle iron frames 18 and 19 are directed downwardly and inwardly. The springs forming the rows of the systems are connected to tie rods 22 (see Fig. 8) and are spaced inwardly from the associated ends of the frames to provide inner clearance spaces 21 for the connecting and operating linkages. Since similar linkage arrangements are located at opposite ends of the structure, a description of the mechanism at one end will enable an understanding of the complete mechanism.

The seat member 11 is supported on the base for movement in a horizontal plane from a position directly over the base and between the arm members 17 to a forwardly extended position relative to the base. In this instance, the base end walls 15 each have a channel member 23 secured through the base of the channel, as by bolts 24, to the inner wall faces to provide parallel upper and lower horizontal rails 25, 26. The upper rail 25 is located approximately on the plane of the base top and has a depending marginal flange 27 (Figs. 3 and 6) which terminates a short distance from the front end of the rail. At its forward end, the member 23 has a bracket 28 (Fig. 6) secured thereto which is provided with an offset forming, with a projecting end of the

rail base, a bifurcation for supporting a roller 29 on a horizontal axis, the upper portion of the roller circumference being disposed above the plane of the upper rail. Secured in the angle of the end portion of the seat frame 18 is an elongated bar 30 (Fig. 2) arranged to ride on the roller. Near its forward end the bar has an arcuate recess 31 (Figs. 5 and 6) arranged in the retracted position of the seat to receive the roller and provide means for preventing accidental forward or outward movement of the seat.

The back member 12 is supported for movement from its generally upright position to a horizontal position in the plane of the seat member as the seat member is shifted to its forward extended position. In this embodiment, the back is pivotally supported through a linkage arrangement which controls movements of the back, which holds the back in its horizontal bed-forming position, and by which the back and seat may be semi-automatically returned to form the couch.

The connection between the back and the base in the present instance embodies brackets 32 (Figs. 3 and 7) mounted on the rear wall 14 of the base near each side wall thereof for supporting a rock shaft 33 extending lengthwise of the base. Each end of the rock shaft has a lever 34 rigidly secured thereto for swinging movement between an upwardly extending position (Fig. 6) and one in which it is substantially horizontal (Fig. 5). The free ends of the levers are pivoted, as at 35, to brackets 35a, on the ends of the back frame adjacent to but spaced from the front edge of said frame. Springs 36 disposed, in this instance, about the rock shaft and bearing against the bracket 32 and lever, exert their force to swing the levers to their vertical position. The springs are tensioned as the back moves to its horizontal position and exert a force ample to return the back, as well as the seat which is connected therewith by means to be described, to their couch-forming relation. The levers are intermediately offset as at 37 (Fig. 6), in the plane on the arm to locate the pivots 33 at one side of the plane of the back frame so that the levers will clear the frame and tend to utilize the force of the springs in the initial movement of the back to its upright position.

The rear side of the seat and the front side of the back are supported for movement between their vertical and horizontal positions by traveling carriers, generally designated 38 (Fig. 5) arranged for guided movement along the rails 25, 26. Thus, each carrier includes a flat plate 39 disposed in a transverse vertical plane having spaced rollers 40 arranged to run between the upper and lower rails and behind the flange 27. The spacing of the flange short of the front end of the member 23 permits assembly of the rollers with the rails. At the rear side of the plate is an upstanding arm 41 pivotally connected, as at 42, to the upper end of a bracket 43 which is secured by rivets 44, or the like, to the back frame 19. The arm 41 preferably extends upwardly between the seat and back frames and its upper end is in the form of a rearwardly directed reverse curve, as shown at 45, to locate the upper end of the arm, as well as the bracket 43, within the back structure and to dispose the axis of the pivot 42 adjacent to the front side and outer corner of the back. This pivotal point moves on a substantially horizontal line in the shifting movement of the back member.

Depending from the front and rear sides of the plate 39 are legs 46, 47 respectively to which upwardly extending links 48, 49 are secured by pivots 50, 51. The rear link 49 normally extends upwardly alongside the arm 41 between the seat and back structures and at its upper end is pivoted, as at 52, to a bracket 53 shaped somewhat like the letter J to permit the lower end of the bracket to extend around the adjoining portion of the seat frame 18. This arrangement locates the free end or shorter leg of the J-shaped bracket within the confines of the seat frame. The bracket 53 has an angular member 54 rigid therewith which is secured, as by rivets 55, to the seat frame 18.

The forward link 48 is generally L-shaped and is inverted to permit the free end of the link to be pivoted, as at 56, to the inner end of the bracket 53. The relationship of the links 48, 49 and bracket 53 to the plate 39 and to the seat structure provides a generally quadrilateral arrangement of pivotal axes whereby the seat may be swung upwardly from its normal horizontal position, as shown in Fig. 5, to the substantially vertical position shown in Fig. 7. During such movement, the links 48 and 49 shift forwardly providing clearance between the upper rear corner of the seat and the adjacent portions of the back. In the substantially horizontal position finally assumed by the bracket 53, the center of mass of the seat is so disposed that the seat will be maintained upright. This arrangement permits the seat to be tipped upwardly in any relative position of the seat and back to provide access to the interior of the base and permit convenient use thereof for storage of bedding and the like.

The arrangement and the location of the pivots 35, 42 are such that when the back is in its upright position (see Fig. 6) the pivots are horizontally spaced to support the back. When the back is in its horizontal position (see Fig. 5), with the pivots vertically spaced and the longer arm horizontal, the force of the springs 36 as exerted through the levers 34 is insufficient to overcome the weight of the back to swing it to its upright position. This relation may be overcome, however, by a comparatively light push inwardly against the front of the seat which acts through the connected linkage to tilt the front edge of the back about its supporting pivots, lift the rear edge of the back slightly and permit the force of the springs to complete movement of the back upwardly. Such movement will, of course, slide the seat rearwardly. As the back moves toward or returns from its lowered position, the linkage arrangement causes the rearmost portion of the back to travel substantially along a straight vertical line and, in consequence, the present structure need not be moved away from an adjacent wall to enable conversion.

From the foregoing, it will be evident that a new and improved convertible structure has been provided which is simple and convenient to manipulate. The user need only grasp the front edge of the seat through a central access aperture 13a in the base front wall 13 and pull the seat forwardly. During this forward movement, the back swings downwardly and forwardly on its pivots to a horizontal position in which the rear portion of the back frame rests on cushioned stop pins 57 on the base and the linkage is conditioned to prevent a return movement of the seat and back by the force of the tensioned springs 36. A push on the front edge of the extended seat releases the holding relation of the linkage and permits the parts to return to their

couch-forming position. The central portion of the base is available for the storage of bedding or the like and is accessible by merely lifting the front edge of the seat.

I claim as my invention:

1. In a couch structure, the combination of a base; movable seat and back members normally occupying respectively horizontal and substantially vertical positions relative to said base; and means supporting said members for concurrent movement of said back member from its normal position to a substantially horizontal position in the plane of said seat member and of said seat member from its normal position to an advanced position relative to said base; said means including a carrier horizontally slidable on said base, an arm rigid with said carrier and extending for pivotal attachment with said back member at a point substantially below its top surface and slightly within its front edge adjacent said seat member, and a quadrilateral linkage interconnecting said carrier and said seat member, said linkage being shiftable forwardly to carry said seat member clear of said back member during movement of said seat member upwardly to expose the interior of said base.

2. In a couch construction, the combination of a base, movable seat and back members normally occupying respectively horizontal and substantially vertical positions relative to said base, horizontally movable carrier means supported on said base, means pivotally connecting said back member with said carrier means and with said base for controlling movement of said back member between its normal position and a horizontal position in the plane of said seat member, and means connecting said seat member with said carrier means for upward swinging movement to expose the interior of said base, the last mentioned means including a pair of links pivotally connected with said carrier means and with said seat member and shiftable forwardly concurrently with the upward swinging movement of said seat member to carry it clear of said back member.

3. In a couch construction, the combination of a base, upholstered seat and back members normally occupying respectively horizontal and upright positions, means supporting said seat member for movement on a horizontal plane forwardly of said base, and means movable with said seat member for supporting said back member for concurrent swinging movement into the horizontal plane of and adjacent said seat member, the back member supporting means including a pivot about which said back member swings located substantially below the top surface of said upholstered back member and slightly within the side of said back member adjacent said seat member.

4. In a couch structure, the combination of a base, upholstered seat and back members, and means on said base supporting said members for concurrent movement relative to said base from a substantially horizontal position with their top surfaces substantially in the same plane to a folded position in which said back member is substantially upright, said means including a carrier mounted on said base for horizontal movement and connected with both of said members, said carrier interconnecting said members having an arm pivotally connected with said back member substantially below the top surface thereof and slightly inwardly of its forward edge adjacent said seat member, whereby upon upward swinging movement of said back member its top surface adjacent said seat member will be carried below the top surface of said seat member.

5. In a couch construction, the combination of a base, seat and back members normally occupying respectively horizontal and substantially vertical positions relative to said base, horizontally movable carrier means supported by said base, means pivotally connecting said back member with said carrier means and with said base for controlling movement of said back member between its normal position and a horizontal position, and means connecting said seat member with said carrier for movement of said seat member to expose the interior of said base, the last mentioned connecting means including a quadrilateral linkage shiftable to carry the seat member clear of said back member during the movement of said seat member.

6. In a couch structure the combination of a base, movable seat and back members mounted on said base and normally occupying respectively horizontal and upright positions, supporting means for said back member having movement relative to said base for bodily shifting said back member from its upright position to a horizontal position, and supporting means for said seat member having movement relative to said base for bodily shifting said seat member forwardly of said base on a horizontal plane, the supporting means for said back member and for said seat member including a common part connecting said members for conjoint movement, said supporting means for the seat member including linkage means supporting said seat member for swinging movement to a substantially vertical position independently of said back member.

VICTOR JOHN BERGSTROM.