April 10, 1962 B. B. ANDERSON 3,028,607

SOFA BED

Filed Oct. 16, 1958 2 Sheets-Sheet 1

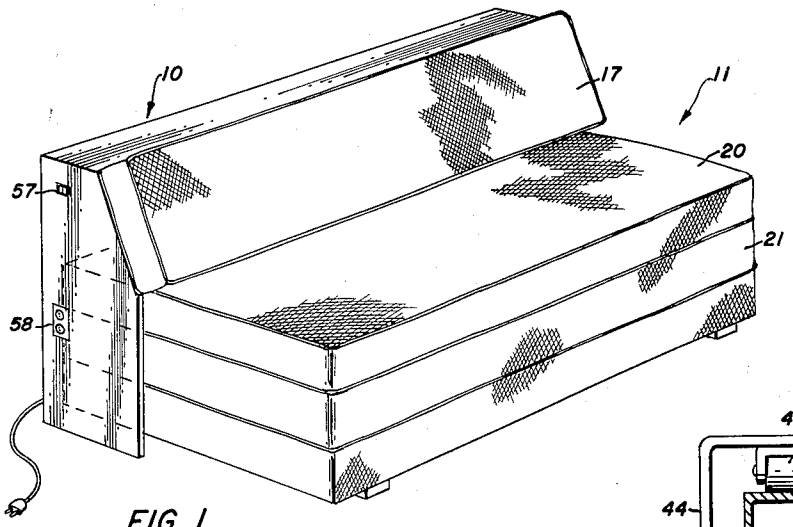


FIG. 1.

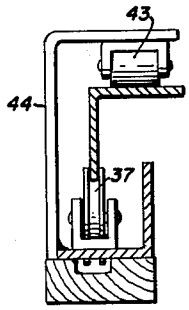


FIG. 4.

FIG. 2.

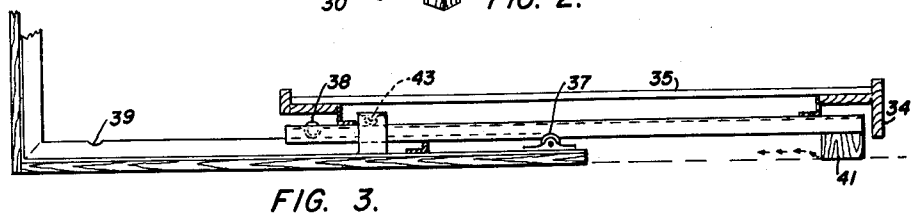


FIG. 3.

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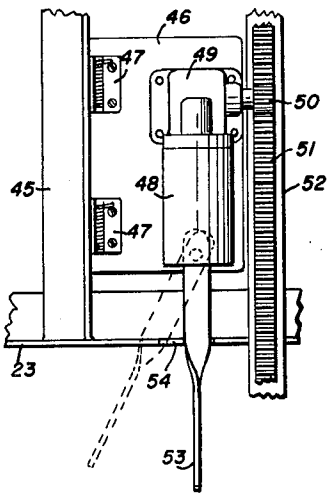


FIG. 9.

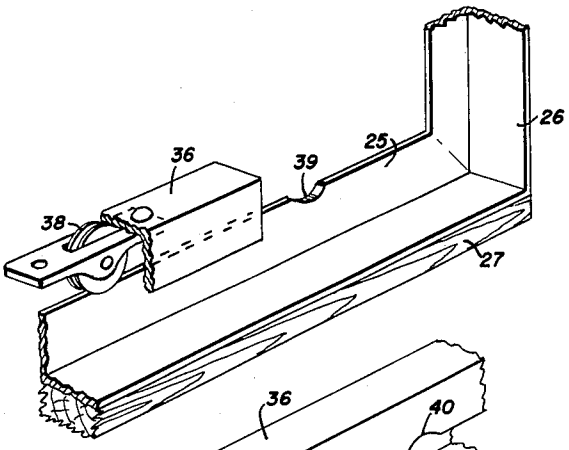


FIG. 5.

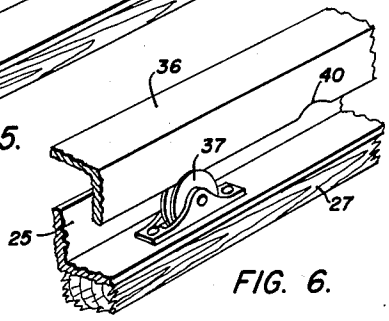


FIG. 6.

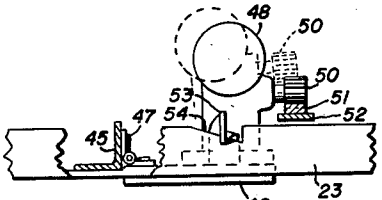


FIG. 10.

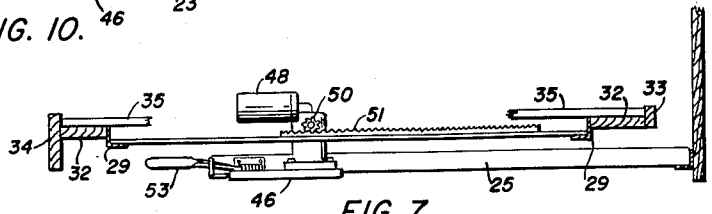


FIG. 7

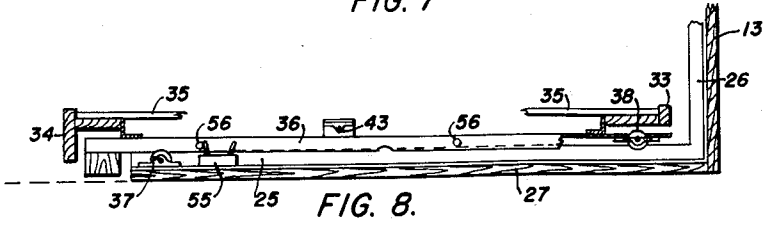


FIG. 8.

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3,028,607
SOFA BED

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Filed Oct. 16, 1958, Ser. No. 767,652
1 Claim. (Cl. 5—17)

This invention relates to sofa beds and has reference to improvements in operating mechanisms therefor.

An object of the invention is to provide a combination sofa and bed which may be easily and conveniently converted from one form of furniture to another.

Another object is to provide a sofa bed having a full box spring and mattress.

Another object is to provide a sofa bed which avoids folding the mattress thereof.

A particular object of the invention is to provide a sofa bed wherein the bed portion thereof does not drag or roll on the floor or carpet while being extended or retracted.

A further object is to provide a sofa bed having a notched track and roller construction wherein an inner pair of notches maintain the bed in its retracted position while the device is being used as a sofa, and wherein an outer pair of notches set the feet of the bed on the floor at the time the bed is fully extended.

Another particular object is to provide an overload release in a mechanized sofa as a safety precaution in the event the moving bed should encounter an obstacle in its path of movement.

An additional object is to provide a release for converting a mechanized sofa bed to manual operation, and vice versa.

These and other objects will become apparent from the following description and the accompanying drawings, wherein:

FIGURE 1 is a perspective view of a sofa bed in accordance with the invention.

FIGURE 2 is a broken perspective view of the frame structure of the invention and showing the bed frame in its extended position.

FIGURE 3 is a broken end elevation of one of the track assemblies.

FIGURE 4 is an enlarged transverse sectional view of a portion of the track assembly and particularly showing one of the hold down rollers.

FIGURE 5 is a broken perspective view of one of the rear portions of upper and lower tracks showing an inner notch and upper roller positioned for engagement therewith.

FIGURE 6 is a broken perspective view of upper and lower tracks and showing a notch in the upper track for coaction with a roller on the lower track.

FIGURE 7 is a broken end elevation and sectional view of the stationary frame and movable frame and showing the actuating mechanism connected therewith.

FIGURE 8 is a view similar to FIGURE 7 showing the upper and lower tracks which are components of the frames, and additionally showing a limit switch for limiting the extended and retracted positions of the bed.

FIGURE 9 is a broken plan view showing the rack on the movable frame and a hingedly mounted motor on the stationary frame, together with cam and lever means for disengaging the motor from the rack for manual operation when required, for example, power failure, and

FIGURE 10 is a broken elevation and sectional view of the mechanism illustrated in FIGURE 9.

The sofa bed illustrated in the drawings is comprised of two primary components, a storage back **10** and a bed **11**. The storage back **10** includes panel ends **12**, a back **13**, a top **14** and shelves **15** at a height from the floor sufficient to receive one side of the bed **11** therebeneath. The forward upper corners of the ends **12** are sloped, at

16, so as to support a cushion **17** at a reclining angle. A partition **18** between the shelves **15** is similarly inclined to support the center of the cushion **17** which extends the full length of the storage back **10** and bed **11**. The cushion **17** may be hinged, not shown, along its upper edge to the top forward edge of the storage back **10**, or it may be placed to lean against the inclined edges **16** of the storage back. It is to be noted that the lower edge of the cushion **17** rests on or is in close proximity with the upper surface of the mattress **20** which, in turn, rests on box springs **21**.

Secured to the back inner surface **13** of the storage back **10** there is a rectangular stationary frame **22** having forward and rear sides **23** and **24** parallel with the length of the storage back **10** and connecting tracks **25** at the ends thereof, and vertical supports **26** at the ends of the rear side **24**, all of angle iron and secured as described by welding. The vertical supports **26** are secured to the back **13** by suitable means, such as screws, not shown. It is to be noted that the tracks **25** forming the ends of the frame **22** are spaced from the ends **12** of the storage back **10**, and that the sides of the tracks are vertical for coaction with rollers to be described. The tracks **25** project forwardly beyond the forward frame side **23**, and both tracks have wood bases **27** extending their entire lengths.

There is a movable frame **28**, also of angle iron, and which frame has parallel sides and ends **29** and **30** with a box spring supporting frame **31** of wood around the movable frame. The box spring frame **31** consists of horizontal members **32** secured to and flush with the top edges of the movable frame sides **29** and ends **30**. The ends and back side of the horizontal wood members **32** have vertically projecting boards **33** secured to their outer edges, whereas the forward member **32** has a wood apron **34**, the top edge of which is flush with the top edges of the vertical boards **33**, but the lower edge of which apron depends below the movable frame **28**. Bed slats **35** on the frame **28** and in the box spring frame **31** support the box spring **21** and mattress **20** thereon.

Upper tracks **36** of angle iron are secured to the bottom of the movable frame **28** and extend beyond the frame sides **29**. The upper tracks **36** are above and parallel with the lower tracks **25** and are inverted with respect thereto; that is, the vertical sides of upper tracks depend, whereas the sides of the lower tracks project upwardly. As best shown in FIGURES 4–6, the upper and lower tracks **25** and **36** are in overlapping relation so that the vertical sides of the upper tracks are substantially over the bottom sides of the lower tracks, and the vertical sides of the lower track are substantially beneath the centers of the horizontal sides of the upper tracks.

Near the forward end of each lower track **25** and on the horizontal surface thereof there is an upwardly projecting circumferentially grooved roller **37** for engaging the depending edge of the upper track **36** and thereby supporting the forward side of the movable frame **28**. Similarly, there is a depending grooved roller **38** on the lower horizontal surface of each upper track **36** near the rear end thereof for rolling on the upwardly projecting side of the lower track **25**. When the movable frame **28** is in its retracted position the upper track roller **38** rests in an arcuate notch **39**, and when the movable frame **28** is in its extended position each lower track roller **37** engages a notch **40** in the lower edge of each vertical side of the upper track **36**. When the last referred to rollers **37** are so engaged, feet **41** on the forward ends of the upper tracks are in contact with the floor **42** as shown in FIGURE 3. To prevent upward tilting of the inner ends of the upper tracks **36** when the movable frame is in motion, a hold down roller **43** is provided above and is in contact with the upper horizontal surface of each upper track

36. Each hold down roller 43 is supported by inverted L-shaped brackets 44, the lower ends of which are welded to the edges of the lower track at locations spaced inwardly of the lower track rollers 37.

Referring now to FIGURES 2, 7, 9 and 10, there is a cross member 45 of angle iron intermediate the ends of the stationary frame 22, and which cross member hingedly supports a platform motor mount 46 near the forward side 23 of the stationary frame. The hinged action referred to is by means of spring loaded hinges 47 secured to one side of the motor mount 46 and one side of the cross member 45, and which hinges normally urge the motor mount downwardly. On the upper surface of the motor mount 46 there is a reversible motor 48 having a reduction gear box 49 and a laterally extending pinion 50 connected therewith. The pinion 50 engages a rack 51 mounted on the upper surface of another cross member 52 on the movable frame 28. The pinion 50 may be disengaged from the rack 51 by means of a lever 53 pivotally mounted on the motor mount 46 and forwardly extending to engage a cam slot in the upper edge of the vertical side 23 of the stationary frame 22.

As shown in FIGURE 8, a limit switch 55 may be mounted on one of the lower tracks 25 for limiting the inner and outer movement of the movable frame 28. The arrangement shown includes stops 56 spaced at required distances from each other on the adjacent movable track 36. Since the electrical wiring is conventional and obvious the same is not herein shown and described; however it is pointed out that a reversing switch 57 is located in at least one of the storage back ends 12, or at any other desired location. Electric outlets 58 may also be provided in the storage back ends 12 as shown in FIGURE 1.

In operation, the movable frame 28, box spring 21 and mattress 20 thereon are moved in and out relative to the storage back 10 by operation of the reversing switch 57. By reason of the described tracks 25 and 36, notches 39 and 40 therein, and roller arrangement 37 and 38, the feet 41 do not contact the floor 42 until the bed is fully extended. When the bed is retracted, the feet 41 automatically lift and do not drag on the floor at any time.

By reason of hinged motor mount 46, the pinion 50 will slip the rack 51 if the moving bed encounters an obstacle in its path. Operation of the lever 53 on the motor mount 46 lifts the pinion 50 from the rack 51 for manually moving the bed when required.

The invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claim.

What is claimed is:

A sofa bed comprising a back support and a bed unit, said back support adapted to receive a side portion of the bed unit therein, a stationary frame secured to said back support and in alignment with said bed unit, parallel stationary tracks on said stationary frame, a movable frame comprising the lower portion of said bed unit, upper tracks on the bottom of said movable frame and parallel with and above said stationary tracks, rollers between said stationary tracks and said upper tracks, a rack on one of said frames parallel with said tracks, a motor driven pinion mounted on the other said frame and positioned for coaction with said rack, a reversible motor actuating said pinion, vertically movable resilient means engaging said pinion in said rack in a manner whereby said pinion will disengage said rack when the outward movement of said movable frame encounters an extraneous object.

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