July 5, 1960 R. H. BLECKER ET AL 2,943,333

SOFA BED

Filed Dec. 28, 1956 4 Sheets-Sheet 1

Fig. 1.

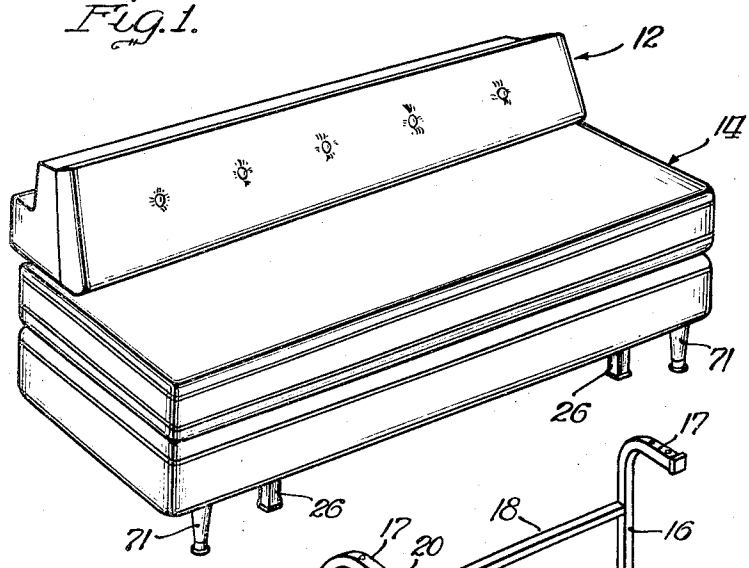


Fig. 2.

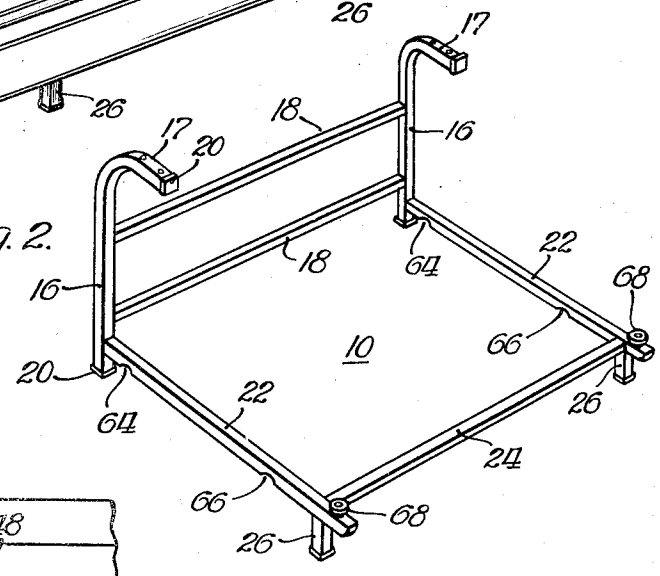
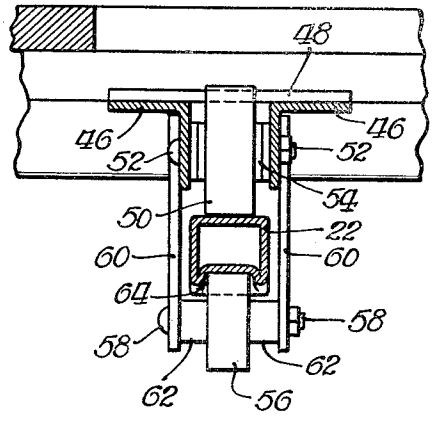


Fig. 7.



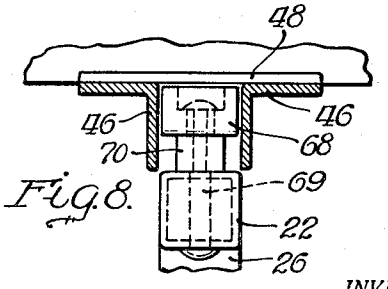


Fig. 8.

INVENTORS:
Raymond H. Blecker
John S. Petersen
Kenneth V. Unwin

By:

Soans, Anderson, Luedeka & Fitch Attys.

July 5, 1960 R. H. BLECKER ET AL 2,943,333

SOFA BED

Filed Dec. 28, 1956 4 Sheets-Sheet 2

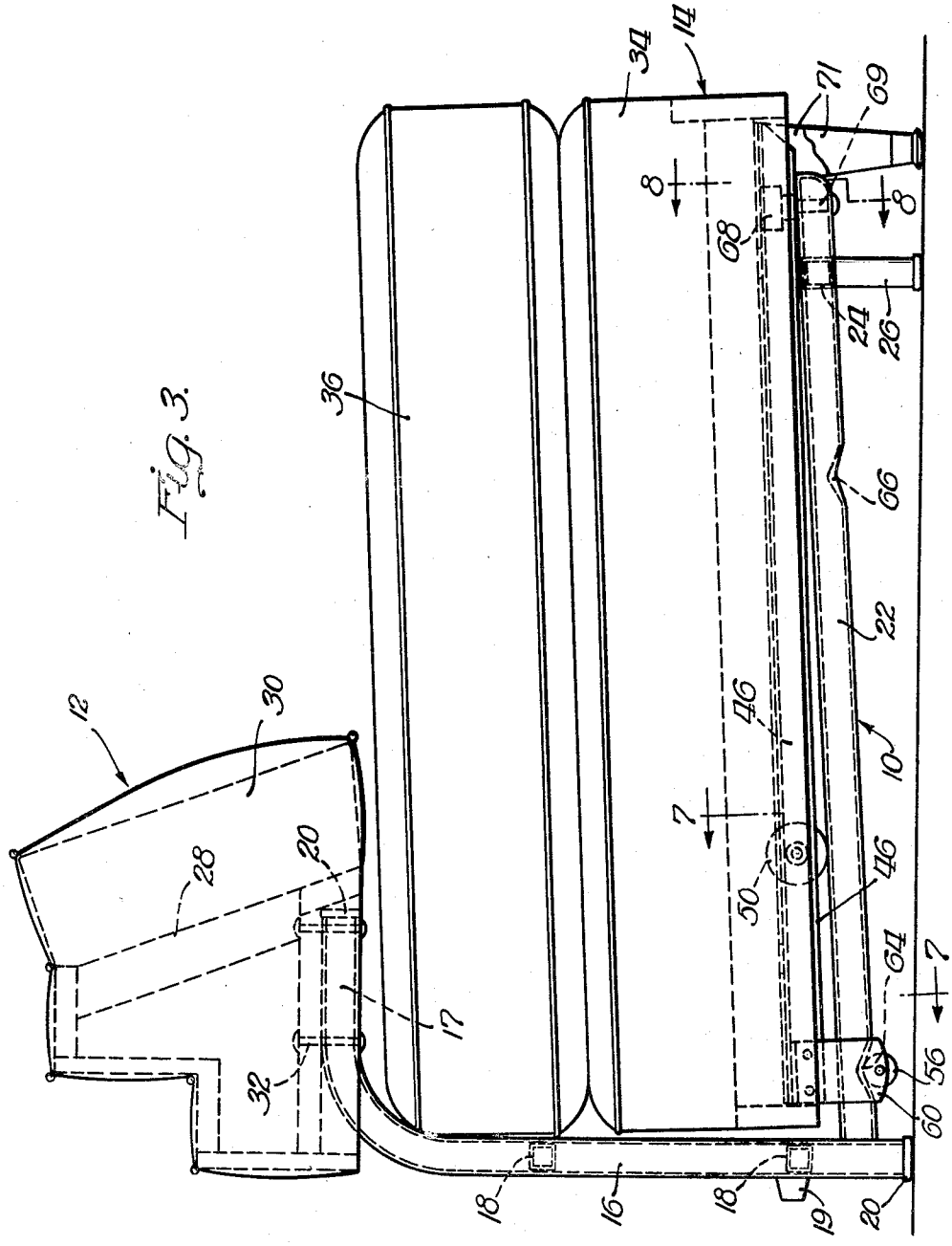


Fig. 3.

INVENTORS:
Raymond H. Blecker
John S. Petersen
Kenneth V. Unwin

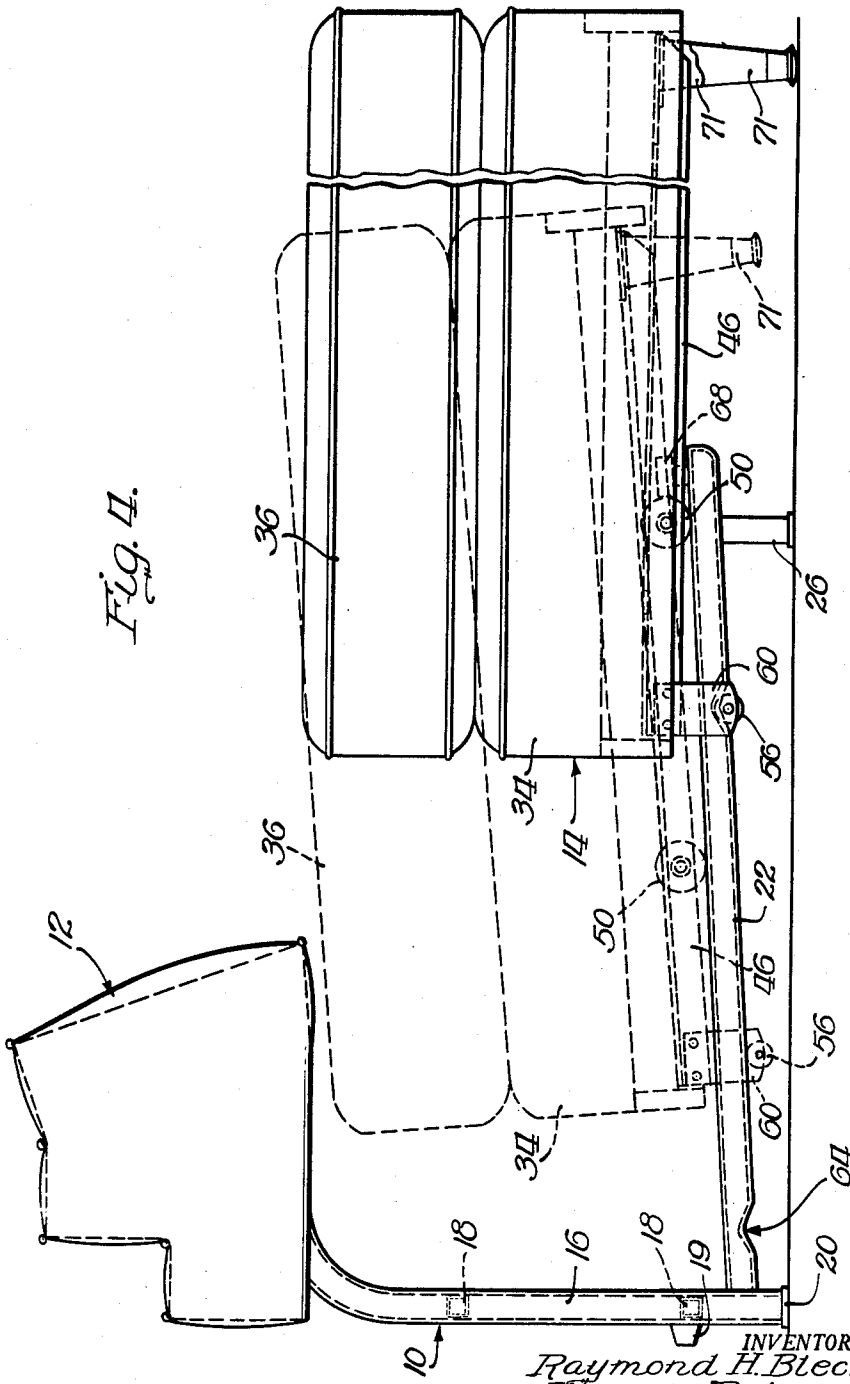
By:
Soans, Anderson, Luedeka & Fitch Attys.

July 5, 1960 R. H. BLECKER ET AL 2,943,333

SOFA BED

Filed Dec. 28, 1956 4 Sheets-Sheet 3

Fig. 4.



INVENTORS:
Raymond H. Blecker
John S. Petersen
Kenneth J. Unwin

By:
Soans, Anderson, Luedeka & Fitch Attys.

July 5, 1960 R. H. BLECKER ET AL 2,943,333

SOFA BED

Filed Dec. 28, 1956 4 Sheets-Sheet 4

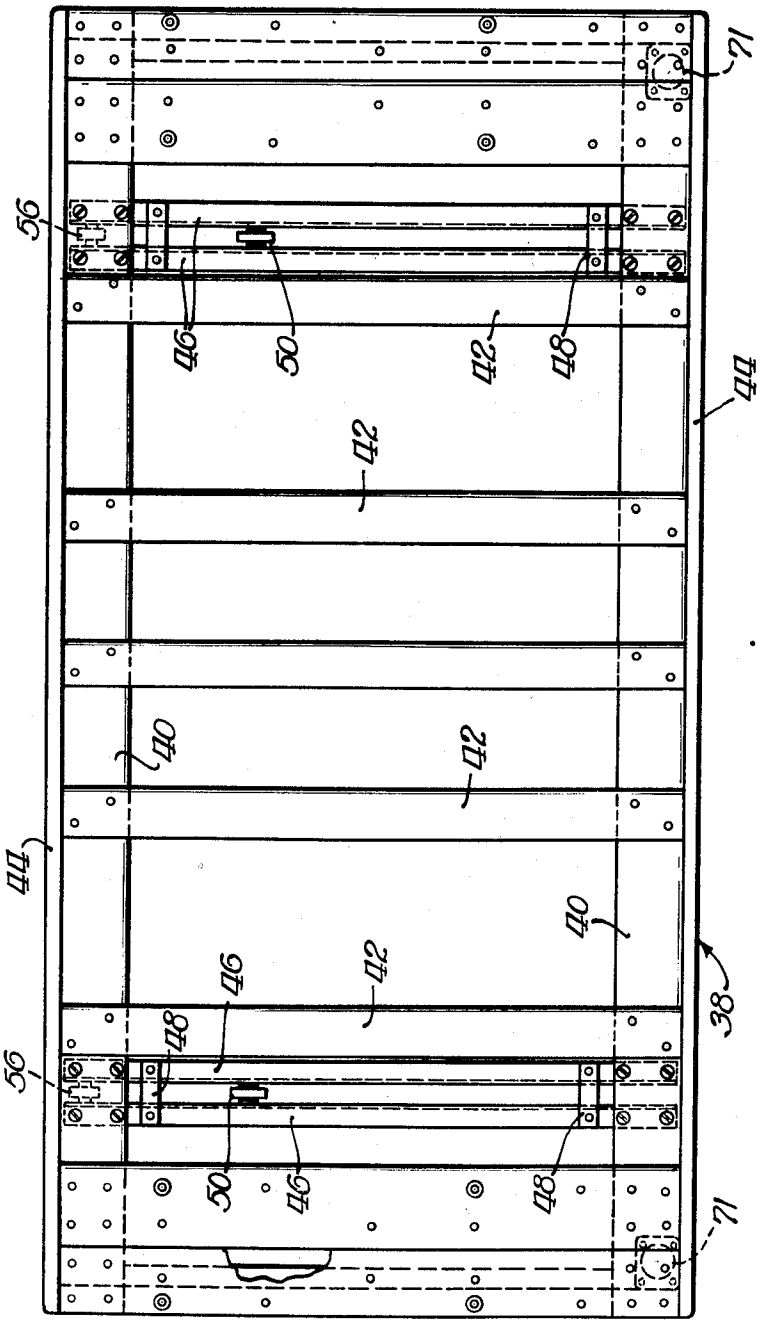


Fig. 5.

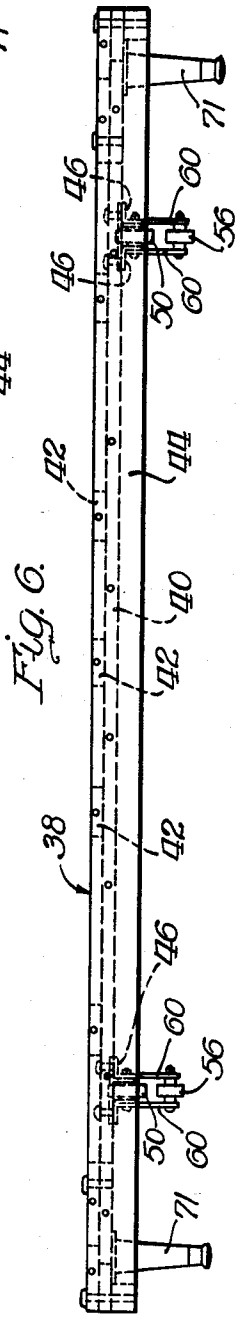


Fig. 6.

INVENTORS:
Raymond H. Blecker
John S. Petersen
Kenneth J. Unwin

By:
Evans, Anderson, Luedeka & Fitch Attys.

United States Patent Office

2,943,333

Patented July 5, 1960

2,943,333

SOFA BED

Raymond H. Blecker, John S. Petersen, and Kenneth J. Unwin, Kenosha, Wis., assignors to Simmons Company, New York, N.Y., a corporation of Delaware

Filed Dec. 28, 1956, Ser. No. 631,279

2 Claims. (Cl. 5—18)

This invention relates to sofa beds of the type in which an upholstered surface, disposed partially beneath a back rest to form a seat, is bodily shiftable forwardly of the back rest to expose the entire area of the surface for sleeping purposes.

The invention relates particularly to an improved support for the movable seat or bed structure of sofa beds of the described type, and has for its objects the automatic determination of the limit positions of the movable structure, i.e., the sofa position and the bed position, the automatic leveling of the movable structure in the bed position, and conversely, the development of proper seating pitch in the sofa position, and the utilization of the force of gravity to facilitate the conversion from bed to sofa use.

Other objects and advantages of the invention will be appreciated and the invention understood by reference to the following specification in conjunction with the accompanying drawings which illustrate a preferred form of sofa bed in accordance with the invention.

In the drawings:

Figure 1 is a perspective view of the sofa bed in sofa position.

Figure 2 is a perspective view of the skeletal supporting frame including the track members on which the movable bed unit is supported.

Figure 3 is an end elevational view of the sofa bed illustrated in Fig. 1, showing the same in sofa position.

Figure 4 is an end elevational view showing the movable bed structure in bed position by solid lines, and in an intermediate position by broken lines.

Figure 5 is a plan view of the framing of the movable bed structure with the upholstered portions thereof removed.

Figure 6 is a front elevational view of the frame shown in Fig. 5.

Figure 7 is a fragmentary sectional view taken along the line 7—7 of Fig. 3 to show certain details of the undercarriage of the movable bed structure, and

Figure 8 is a fragmentary sectional view taken along the line of 8—8 of Fig. 3 and showing particularly the inter-engagement of certain parts of the support for guiding the movement of the bed structure between its respective end positions.

The illustrated sofa bed comprises essentially a normally stationary skeletal metal frame **10**, a back rest **12** fixedly secured to the stationary frame, and a bed structure **14** which is shiftably mounted on the stationary frame for movement thereon from a sofa position (Figs. 1 and 3), in which the fixed back rest overlies a substantial portion of the bed surface to foreshorten the same to a comfortable seating length, to a bed position (Fig. 4), forwardly of the back rest, at which the entire surface of the bed is exposed for sleeping purposes.

The stationary frame **10** (Figs. 2 and 3) is of welded tubular construction, the tubular components being preferably of square cross section as indicated. The frame includes two rear post members **16**, the upper portions

17 of which are turned forwardly to provide horizontal supports for the back rest **12**. The post members **16** are connected by horizontal bracing members **18** and are closed at both ends by end caps **20**.

The base portions of the frame **10** comprises two track members **22**, each extending forwardly from one of the post members **16**, the track members **22** being connected together near their forward ends by a front cross brace **24**. Each of the track members is supported near its front end by a short leg **26** which is capped at its lower end to provide a solid floor-engaging surface. A rubber bumper **19**, secured to each post **16** at a height to engage the base board of a wall, prevents scuffing of the wall against which the sofa bed is normally placed.

Referring particularly to Figs. 3 and 4, it will be noted that the height of the legs **26** and the attachment of the track members **22** to the post members **16** is such as to provide a rearward and downward slope to the track. This, as will be later seen, serves the purpose of leveling the bed structure in bed position, and conversely, of providing a proper pitch to the seating surface in sofa position, as well as facilitating the return of the bed structure to the sofa position.

The back rest **12** is preferably unholstered, and may, as indicated in Fig. 3, comprise certain structural framing parts providing an inclined forward face **28**, to which suitable cushions **30** are preferably secured, as shown, or against which loose back cushions may be placed, to provide a properly sloped back-supporting surface. The back rest is secured to the horizontal portions **17** of the post members **16** by means of screws or bolts **32** passing through the post portions **17** and through certain of the framing members of the back rest. It will be understood, of course, that the detailed construction of the back rest itself is not material to the invention, and that the back rest structure may assume a variety of forms and may include a compartment for the storage of bedding or pillows, as may be required.

The bed structure **14** may comprise a box spring **34** carrying on its upper surface a mattress **36** which will provide comfortable support for sleeping and sitting use. The internal construction of the mattress and box spring are immaterial and not illustrated, but the structural framing portions of the box spring are indicated generally, by broken lines, in Figs. 3 and 4, and in somewhat greater detail in Figs. 5 and 6.

The box spring frame **38** comprises fore and aft longitudinal members **40** connected together by numerous cross members **42**, suitably spaced to provide the necessary support for an inner spring construction, not shown. In addition, the box spring frame is provided with peripheral apron strips **44** which tend to conceal the other portions of the frame and to serve as anchoring or tacking strips for the upholstery.

Secured to the underside of the box spring frame **38** near each side thereof, are a pair of angle iron members **46** which are secured together back to back, in spaced relation, by front and rear cross pieces **48** to which the angle iron members **46** are riveted or otherwise secured. The angle iron members themselves are attached to the longitudinal members **40** of the box spring frame by means of bolts or screws, as indicated. The connections of the angle iron members to the box spring and the spacing between them is such that they register with the track members **22** of the stationary frame **10** (Figs. 7 and 8).

Between the angle iron members **46** of each pair, and positioned rearwardly of the center of gravity of the box spring and mattress, there is a supporting roller **50** which is journalled on a bolt **52** passing through the vertical flanges of the angle iron members and centered therebetween by suitable spacing washers **54**, as shown

particularly in Figs. 3 and 7. As so positioned, the rollers 50 engage the upper surfaces of the track members 22 to support the bed structure thereon.

Positioned rearwardly of the support roller 50 near the rear of the box spring frame, there is a second and somewhat smaller roller 56 which is journalled on a bolt 58 extending between spaced plates 60 each respectively secured to one of the angle iron members 46 at the rear thereof. The smaller roller 56, being centered between the plates 60 by suitable spacing washers or collars 62 as shown in Fig. 7, engages the underside of the track member 22, being held in engagement therewith by the moment of weight of the box spring and mattress around the axis of the larger support roller 50. The undersides of the tubular track members 22 are provided at the back and adjacent the front with embossed depressions 64 and 66 respectively which serve as seats to receive the lower support roller 56 to stop the shiftable bed structure 14 in the sofa and bed positions, and to provide abutments which prevent unintentional movement of the bed structure from either of those positions.

Referring specifically to Fig. 3, it will be appreciated that by lifting the bed structure 14 at its front end, the bed structure will rock about the axis of the forward support roller 50, thereby disengaging the rearward support roller 56 from rearward depression 64 in the underside of the track 22. When the rearward roller is so disengaged, the bed structure may be pulled forwardly being supported entirely during its forward movement by the pairs of staggered rollers 50 and 56, until the rearward roller 56 engages the forward depression 66 in the underside of the track.

At its forward end, each track 22 is provided with an upwardly extending guide roller 68 which is journalled on a pin 69 extending perpendicularly upwardly from the track 22, the roller 68 being of such size as to fit freely between the spaced-apart pair of angle iron members 46. The roller 68 prevents lateral shifting of the bed structure during its forward and rearward movement on the supporting frame 10. A spacing collar 70 fitted on the pin 69 beneath the roller 68 supports the latter sufficiently high to prevent disengagement of the roller 68 from the angle iron members 46 when the bed structure is lifted at its front and to free the roller 56 from the depressions 64 or 66. The relative positions of the guide rollers 68 and the forward depressions 66 in the undersides of the supporting tracks are preferably such that when the forward support roller 50 meets the guide roller 68 at the forward end of the track, the lower roller 56 is centrally positioned in the forward recess 66 of the supporting track 22.

When the lower roller 56 reaches the depression 66 in the track at the end of its forward movement, the bed structure 14 rocks downwardly about the axis of the forward support roller 50 to the position shown in solid lines in Fig. 4. The front end of the bed structure is directly supported in this position by a pair of support legs 71 which are of a length suitable not only to level the bed structure in sleeping position, but to support the weight of the front end of the bed structure in the sofa position as well.

It will be understood by reference to the broken line intermediate position of Fig. 4, that in its passage between its two extreme positions, the bed structure 14 is supported entirely by the staggered rollers 50 and 56, with the support legs 71 of the bed structure elevated well off the floor.

To initiate the in-going movement from bed position to sofa position, the operator simply lifts the front of the bed structure sufficiently to disengage the lower roller 56 from the forward depression 66 in the underside of the track, and pushes the bed structure 14 gently rearwardly. With the lower roller disengaged from the depression 66, the bed structure rolls down hill to the rear, until the roller 56 reaches the rearward depression 64 in the track, whereupon the bed structure rocks downwardly about the axis of the forward roller 50, into the Fig. 3 position, placing the front support legs 71 of the bed structure 14 on the floor.

The foregoing sofa bed structure is simple and rugged and can be easily operated without requiring any special skill on the part of the operator. To convert from a sofa to a bed, the operator simply lifts the front end of the bed structure and draws the same forwardly as far as he can, whereupon the weight of the bed structure positions it properly, with the sleeping surface level. To reconvert to a sofa the operator simply lifts again at the forward end and moves the bed structure slightly rearwardly, whereupon gravity returns the bed structure automatically to the sofa position with its surface properly canted to the desired seating pitch.

Features of the invention believed new and patentable are set forth in the following claims.

We claim:

1. A sofa bed comprising a normally stationary sofa frame having a back rest and a base portion, and a bed structure movably mounted on said base portion for movement between a rearward seat position disposed partially beneath said back rest and a sleeping position forwardly of said back rest, said bed structure having floor-engaging support legs at the front thereof, said base portion including a pair of spaced parallel track members extending forwardly from beneath said back rest, the movable mounting of said bed structure on said base portion comprising a pair of rollers journalled on its underside for engagement with each of said track members, said rollers of each pair being positioned rearwardly of the center of gravity of said bed structure and being offset from front to rear, the forward one of said rollers of each pair engaging the upper surface of its associated track member and the rearward one of said rollers engaging the under surface of said track member, said bed structure being supported entirely by said rollers in its movement between said positions and being canted upwardly at its front end during such movement with said support legs off the floor, each of said track members having rearward and forward depressions on its underside for receiving the rearward one of its associated rollers to determine respectively said seat and sleeping positions, the movement of said bed structure being arrested at said positions by the rocking of said bed structure downwardly by gravity about said forward rollers to position said rearward rollers in said depressions and to place said support legs on the floor.

2. A sofa bed comprising a normally stationary sofa frame having a back rest and a base portion, and a bed structure movably mounted on said base portion for movement between a rearward seat position disposed partially beneath said back rest and a sleeping position forwardly of said back rest, said bed structure having floor-engaging support legs at the front thereof, said base portion including a pair of spaced parallel track members extending forwardly and upwardly from beneath said back rest, the movable mounting of said bed structure on said base portion comprising a pair of rollers journalled on its underside for engagement with each of said track members, said rollers of each pair being positioned rearwardly at the center of gravity of said bed structure and being offset from front to rear, the forward one of said rollers of each pair engaging the upper surface of its associated track member and the rearward one of said rollers engaging the under surface of said track member, said bed structure being supported entirely by said rollers in its movement between said positions and being canted upwardly at its front end during such move-

ment with said support legs off the floor, each of said tracks having rearward and forward depressions on its underside for receiving the rearward one of its associated rollers to determine respectively said seat and sleeping positions, the movement of said bed structure being arrested at said positions by the rocking of said bed structure downwardly by gravity about said forward rollers to position said rearward rollers in said depressions and to place said support legs on the floor, said forward rollers and said support legs supporting said bed structure level in sleeping position and downwardly and rearwardly pitched in seat position.

References Cited in the file of this patent

UNITED STATES PATENTS

755,089	Wersel	Mar. 22, 1904
863,365	Deimel	Aug. 13, 1907
1,115,996	Wilson	Nov. 3, 1914
1,172,711	Hunter	Feb. 22, 1916
1,783,530	Bebry	Dec. 2, 1930
1,790,884	Thum	Feb. 3, 1931
2,088,957	Hoffstetter et al.	Aug. 3, 1937

FOREIGN PATENTS

263,009	Switzerland	Nov. 1, 1949