Dec. 30, 1958 M. SMILOW ET AL 2,866,207

SOFA BED

Filed Oct. 8, 1953 2 Sheets-Sheet 1

Fig. 1.

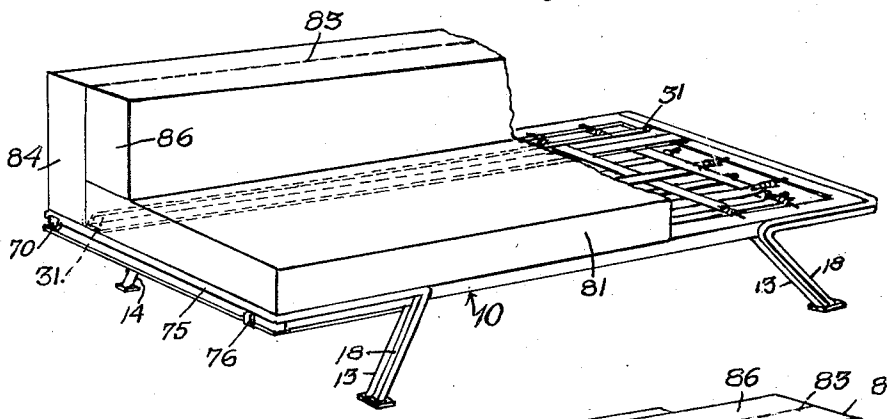


Fig. 2.

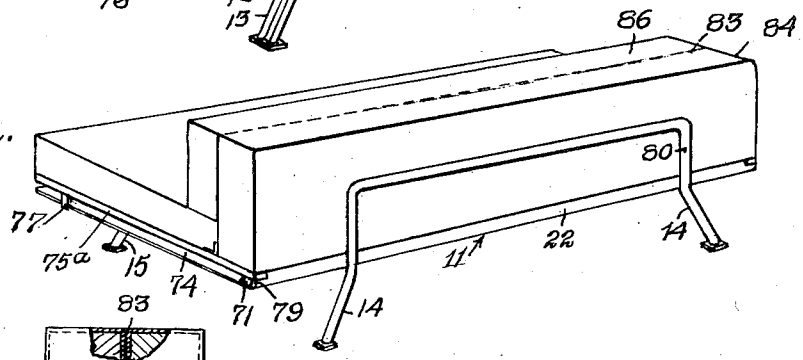
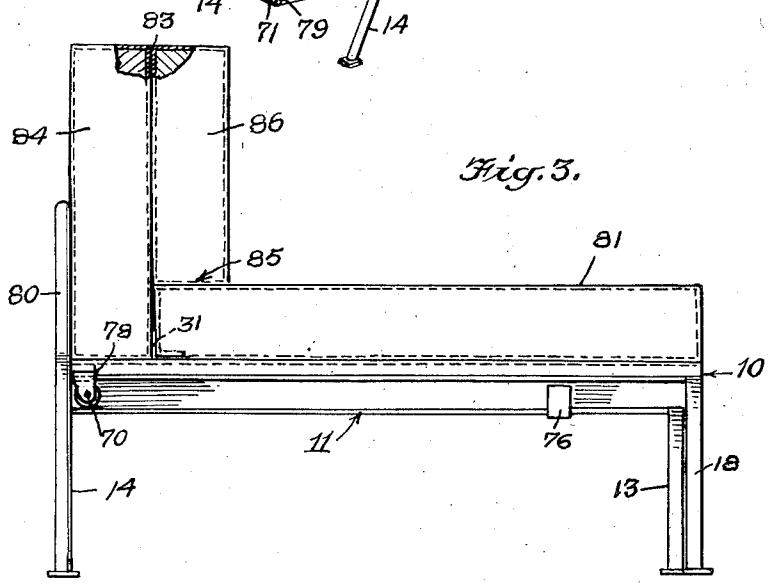


Fig. 3.



INVENTORS
Melvin Smilow and
Morton Thielle
BY
A. A. Orlinger
ATTORNEY

Dec. 30, 1958 M. SMILOW ET AL 2,866,207

SOFA BED

Filed Oct. 8, 1953 2 Sheets-Sheet 2

Fig. 4.

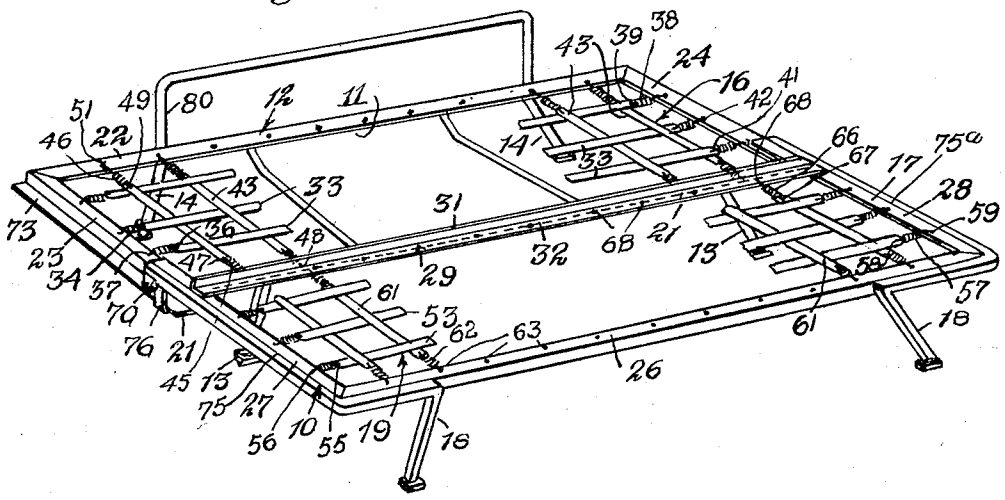


Fig. 5.

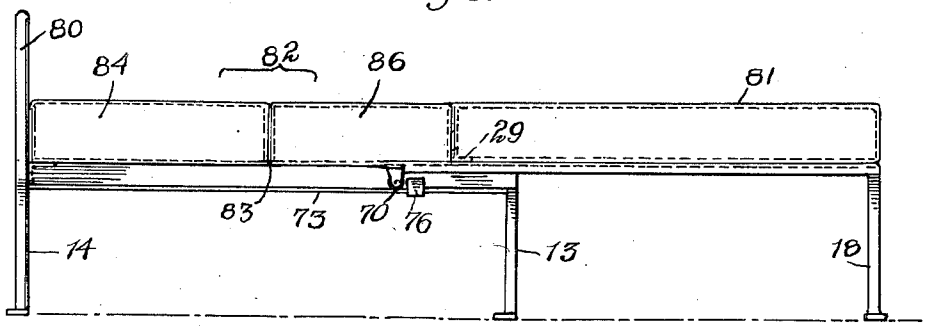
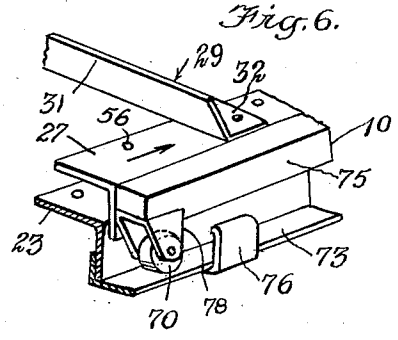


Fig. 6.



INVENTORS
Melvin Smilow and
Morton Thielle
BY
J. A. Orlinger
ATTORNEY

United States Patent Office 2,866,207 Patented Dec. 30, 1958

2,866,207

SOFA BED

Melvin Smilow, Jackson Heights, and Morton Thielle, Forest Hills, N. Y.

Application October 8, 1953, Serial No. 384,974

3 Claims. (Cl. 5—18)

This invention is that of a convertible sofa having two horizontal and super-imposable, rectangular support sections. One of them (called the extension section) can be drawn forwardly outwardly to enlarge the front to rear width, whereby the sofa is converted to serve also as a double bed. Then the entire seat cushion and the upright cushioned-back of the sofa serve as the mattresses for its double bed form. This sofa, while thus convertible to a double bed, is of relatively simple yet firm and sturdy construction and permits quick conversion from sofa to double bed and back to sofa, with minimum effort.

Viewed generally, this sofa convertible to a double bed has four principal parts. Two are the super-imposable and extendable support sections, namely, the extension section and the other which is the lower or rear section. The rest of the four are the two mattress units that alternatively serve as the seat cushion and cushioned-back respectively when the combination serves as a sofa, and then as the mattress when it is used as a double bed. The two mattress units have the same thickness and desirably the same length and preferably the same width.

Each support section is constructed of a horizontally positioned, rectangular rigid frame enclosing tautly extended from and within its four sides (front and rear, and right and left laterals) a relatively thin, flat banded spring assembly to support one of the mattress units. Both frames are of substantially identical length, essentially the same as that of the mattress units, and the length of each of their laterals is the sum of the width and thickness of a mattress unit.

All four sides of the frame of the lower support section are advantageously of angle iron with its horizontal flange at the top and extending inside of the rectangle. The extension section frame also has that same construction, but its rear does not join the ends of its laterals. Instead the horizontal flange of the angle iron of the rear rests on that of the laterals and the vertical wall of the angle iron extends above the top of the laterals and is spaced inwardly from their ends a distance of about the thickness of a mattress. The vertical wall of the angle iron serving as the rear of the frame of the extension section is much under, and even less than half, the thickness of the mattress in height. It serves primarily as a separator between the mattresses and also functions to assure that the front mattress holds its position on top of the extension section when it is drawn forward to convert the sofa to a double bed. It also functions to push the other mattress back and to be raised from its spring and to begin to fold along its hinge (as described below) as the extension section is being pushed back when the combination is to serve again as a sofa. Thus, the mattress separator performs its several functions well even if it is merely about an inch and one-half high.

The frame of the lower support section is spaced above the floor by a pair of front legs fixed to the fronth length of the frame and a pair of rear legs fixed to its rear

length. A narrow flange extends horizontally outwardly from below the top edge, and preferably along the length of the bottom edge, of the outside of both the right and left laterals of that frame. These flanges serve as supports or tracks for the rear portions of the laterals of the frame of the extension section, as is later described. Means are provided, conveniently on the forward portion of each of the horizontal tracks, to stop the forward motion of the extension section with its laterals still about the distance of the thickness of a mattress unit back of the front end of the lower support section.

The extension section, forwardly and backwardly slidably super-imposed on the lower section, has a pair of front legs fixed to the front length of its frame to hold it spaced above the floor, when it is drawn forwardly outwardly to convert the sofa to a double bed. These front legs are advantageously so positioned and shaped to conform to the front legs of the lower section that, when the sections are in closed position, both pairs of front legs appear very much as if they were a single pair. The extension section has no rear legs. Instead the rear portion of each of the right and left laterals of its frame is supported from the respective flange extending outwardly from the laterals of the lower section frame.

A back-rest is provided for the upright cushioned-back of the sofa advantageously by extending the rear legs of the lower section upwardly above its frame for a distance preferably not greater than, and desirably at least about half of, the height of the cushioned-back. It is further advantageous then for these extensions of the rear legs to be turned toward one another and to meet and be joined as one, preferably below the top of the cushioned-back.

The mattress unit serving as the seat cushion (and conveniently called the front mattress) advantageously is made in one piece. It is supported on the extension section between its front and the mattress separator (i. e. the upright wall of the rear angle iron).

However, the other mattress unit serving as the cushioned-back (and conveniently called the hinged, or foldable, or rear mattress) consists of two parts or sub-units of the same length and thickness. They differ in width by an amount about equal to their thickness, and are hinged together along the meeting edges of the length of the bottom face of each of them. This is done advantageously by means of a two-pocketed flexible cover for them, enclosing one sub-unit in one pocket and the other in the other pocket.

The division of the rear (i. e. the hinged and foldable) mattress into its two sub-units, thus hinged along its hinge-edge, is a significant feature of the combination sofa-extension-bed of the invention. This is so because it enables the foldable mattress to be used in its folded form to serve as the cushioned-back, when the combination is arranged as a sofa. In this folded form, the wider sub-unit of the foldable mattress stands upright with its free side resting on the rear-most part of the lower section and its outer-face against the back-rest. Thus the hinged-edge is at the top and the narrower sub-unit is turned down with its under-face partially covering the now vertical under-face of the wider sub-unit, leaving at the lower part a vertical strip along the length of the mattress and as wide as the mattress is thick.

Since the front or extension section is pushed back as far as it can go, when the combination serves as a sofa, the rear face of the mattress separator is against the lowermost part of that vertical strip of the wider sub-unit of the foldable mattress. Then that portion of the rear of the seat mattress above the top of the mattress separator is against the balance of that vertical strip that also is above the top of the mattress separator, and the free

side of the narrower sub-unit of the hinged mattress rests on the rear-most part of the top of the seat mattress.

Then when the combination is to serve as a double bed and the extension section accordingly is drawn forward, the lower end of the narrower sub-unit of the rear mattress, with its free side resting on the rear-most part of the top of the seat mattress, moves along with the latter and away from the lower part of the wider sub-unit. As a result, the top of the latter in turn then is inclined forwardly away from the back-rest. As the extension section proceeds forwardly outwardly, the angle formed between the sub-units of the rear mattress increases and its apex (the hinge-edge) lowers toward the taut mattress support assembly of the rear section. At the same time and as that angle nears one hundred and eighty degrees, the lower end of the narrower sub-unit begins to slip off of the rear of the seat mattress. Finally, as the extension section has been drawn forwardly almost as far as it can go, the narrower sub-unit may slip off of the seat mattress and on to the spring support of the lower section and ultimately flatten out under its own weight on that spring when the extension section has gone forward as far as it can go. The rear mattress is then in its fully open or flat condition or form and its hinge-edge is against the taut mattress support assembly.

The invention is explained in greater detail in relation to the specific embodiment shown for illustration only, and with no intention to be limited thereby, in the accompanying drawings wherein:

Figure 1 is a perspective view (looking from the front left) of the combination arranged as a sofa, and with part of the seat and cushioned-back broken off to expose the taut spring and band mattress support structure;

Fig. 2 is another perspective view (looking at the rear right) of the combination;

Fig. 3 is a left side elevation of the sofa form;

Fig. 4 is a perspective view (from the front left) of the combination extended as a double bed, but with the mattresses omitted;

Fig. 5 is a left side elevation of the double bed form; and

Fig. 6 is a fractional perspective view, looking at the left side, showing details of the relationship between the frames of the extension and lower sections and the flange-track.

In the drawings, extension section **10** is selectively forwardly and backwardly slidably super-imposed on the lower or rear section **11**. The latter consists of (*a*) the rigid rectangular frame **12** supported horizontally spaced above the floor by (*b*) a pair of front legs **13** and a pair of rear legs **14**, and (*c*) enclosing, tautly extended from and within its four sides, the relatively thin spring and flat band mattress support assembly **16**.

Extension section **10** similarly consists of its (*a'*) rigid rectangular frame **17** supported horizontally spaced above the floor by (*b'*) a pair of legs **18** depending from its front, and at its rear by the lower section **11** (in a manner later described in detail), and (*c'*) enclosing, tautly extended from and within its four sides, its relatively thin spring and flat band mattress support assembly **19**.

Rectangular frame **12**, having its front length **21**, rear length **22**, and left and right laterals **23** and **24** respectively, is strong and yet of light weight by being constructed advantageously of angle iron with its horizontal flange extending to the interior of the rectangle and its vertical wall depending downwardly from the outside edge of the horizontal flange. Rectangular frame **12** also is constructed advantageously from a single length of angle iron equal to the sum of its front and rear lengths and two laterals. This is done by cutting from its horizontal flange, at each of three points spaced apart from the ends and from one another individual distances corresponding to the respective length of each of the four sides of the rectangular frame, and equilateral triangular wedge with one side along the outer edge of the flange and the apex at its junction with the vertical wall; and then bending the length of angle iron inwardly at right angles at each of the triangular cuts to form the rectangle. It is beneficial to cut off a right triangular piece from each of the two ends that meet to complete the rectangle and then to weld those ends together. At each of the three other corners where the two edges meet where a wedge was cut out, it is helpful likewise to weld those edges together.

Rectangular frame **17** of extension section **10** has its front length **26** and left and right laterals **27** and **28** made from one length of angle iron in a manner similar to the corresponding three sides of frame **12**. However, the mattress separator rear length **29** of frame **17** is a separate length of angle iron with its vertical wall **31** rising above its horizontal flange **32** which is mounted on top of laterals **27** and **28** and advantageously welded to them with vertical wall **31** spaced forwardly of their rear ends a distance substantially equal to the thickness of a mattress used in the combination.

The spring and flat band mattress support assembly **16** consists of a plurality, say six or seven, of horizontally spaced apart steel bands **33** extending between laterals **23** and **24** and interwoven with another plurality, say about nine, such steel bands **43** extending transversely to them between front and rear lengths **21** and **22** of frame **12**.

Each band **33** is tautly suspended from, and stretched across between, laterals **23** and **24** respectively by an anchoring helical (a coil spring with an engaging hook at each end) **34** having one of its hooks engaged in an aperture **36** in one end of the band and the other hook engaged in an aperture **37** in the horizontal flange of lateral **23**, and by a second anchoring helical **38** with one of its hooks **39** engaged in aperture **41** in the other end of the band **33** and the other hook engaged in an aperture **42** in the horizontal flange of lateral **24**.

Each band **43** is similarly tautly suspended and stretched between front and rear lengths **21** and **22** by separate anchoring helicals **45** and **46** respectively, with one hook of helical **45** engaged in an aperture **47** in one end of band **43** and its other hook engaged in an aperture **48** in front length **21**; and one hook of helical **46** engaged in an aperture **49** in the other end of band **43** and its other hook engaged in an aperture **51** of rear length **22**.

Spring and flat band mattress support assembly **19** of extension section **10** consists in a corresponding set of a plurality of horizontally spaced apart bands **53** each similarly anchored by one hook of a helical **54** engaging in an aperture **55** in one end of the band, and the other hook engaging in an aperture **56** in lateral **27**; and by one hook of another helical **57** engaging in an aperture **58** in the other end of the band, and the other hook of helical **57** engaging in an aperture **59** in lateral **28**; and with these bands **53** interwoven with another such plurality of bands **61** extending transversely to them, with each band **61** being similarly anchored by one hook of a helical **62** engaging in an aperture in one end of the band, and the other hook of the helical engaging in an aperture **63** in front length **26**; and by one hook of another helical **66** engaging in an aperture **67** in the other end of the band and its other hook engaging in an aperture **68** in the horizontal flange of mattress separator **29**.

Each of the legs **18** attached to front length **26** of extension section **10**, as well as each of the legs **13** attached to front length **21** of rear section **11**, advantageously is attached to its respective front length at a location spaced inwardly from the respective end of the front length up to desirably no more than one-quarter of its length to provide a separate cantilever structure at both the left and right hand ends.

To reduce friction as extension section **10** is to be either drawn forwardly or slid backwardly over lower or rear section **11**, the tail end of each of laterals **27** and **28** is supported by a roller bearing such as **70** and **71** respectively mounted to roll along tracks **73** and **74**. In this embodiment, each such bearing is attached at the

end of one of two square cross-sectioned wrought iron piece 75 and 75*a* respectively that are welded each with its top on the same level with the horizontal flange of one of the laterals 27 and 28 and continuing out to front length 26 only along the cantilever portion and then becoming unitary with its respective leg 18.

Tracks 73 and 74 extending horizontally outwardly from laterals 23 and 24 consist advantageously of the horizontal flange of an angle iron, the vertical wall of which has been welded to the depending vertical wall of the angle iron of laterals 23 and 24 respectively.

Means are provided to prevent the complete separation of extension section 10 from lower section 11, as the former is drawn forwardly away from the latter. For example, the upper end of each of guard lugs 76 and 77, fixed respectively to tracks 73 and 74 at a location spaced backwardly about the thickness of a mattress from their front ends, inclines over their respective tracks sufficiently to contact the front of wheel yokes 78 and 79 to prevent further forward movement of extension section 10.

Rear legs 14 advantageously are continuous, and unitary, with back-rest 80 and desirably of square cross-section and welded to rear length 22 of rear frame 11.

Seat or front mattress 81 is supported on mattress support assembly 19 and frame 17 of extension section 10 between its front and mattress separator 29. When the combination of the invention is in its open form serving as a double bed, foldable or hinged mattress 82 is carried on mattress support assembly 16 and frame 12 of rear section 11.

However, when the combination is closed to serve as a sofa, hinged mattress 82 is folded with its hinge-edge 83 on top and its wider sub-unit 84 standing erect between the rear surface of the mattress separator 29 and back-rest 80, and with the outer side 85 of the narrower sub-unit 86 resting on the rear end of the top of mattress 81.

Different suitable mattress materials are useful for front mattress 81 and the two sub-units of foldable mattress 82. However, foam rubber rectangular prismatic blocks of any of the various foam rubbers are particularly advantageous because when the combination is used as a double bed, the division places between the mattresses and the sub-units are not noticeable when lying on them for the pressure on the rubber seems to press the individual parts together.

While the individual mattresses are shown as individual rectangular prisms in the various figures of the drawings, the mattresses 81 and 82 preferably are enclosed in individual corresponding, snugly fitting covers of suitable fabric. Thus, since mattress 82 consists of its two sub-units 84 and 86, its fabric cover is formed of two pockets, one for each of the sub-units, hinged together along the meeting edges of the length of the bottom face of each of them. This junction of the two pockets along the bottom meeting edges serves as the hinge-edge 83.

Accordingly, to simplify the drawings only in Figure 5 are the mattresses per se represented in dotted lines within the fabric covers shown in full lines. However, to simplify the description of the significant parts of the extension sofa bed combination of the invention, throughout the specification and claims the various references to individual mattresses can be considered as referring to them also as enclosed in their respective suitable fabric covers.

The opening of the sofa form of the combination of the invention into the double bed form, as described above (second paragraph ahead of the description of the figures of the drawings), is very simply carried out and usually in less than a minute. The closing of the combination from the double bed form to the sofa form also is done very simply.

First there are removed any blankets, sheets or pillows that may have been placed on the bed. Then the extension section is pushed backward to slide over the rear section. As that goes on, the mattress separator pushes against the free side of the narrower sub-unit of the rear mattress and tends to compress the latter, from front to rear, by the resulting pressure of the narrower sub-unit against the wider sub-unit. With the rear of the latter against the back-rest, there is the tendency for the bottom of the rear mattress to rise from the mattress support assembly and to begin to fold along the hinge edge.

As the extension section is pushed further backward, the hinge edge thus is elevated more and more and the under-face of the two sub-units approach one another more and more. Frequently, as the closing of the combination nears completion, the free side of the narrower sub-unit may be forced up the adjoining side of the seat or front mattress to come up on the rear-most part of the top of that mattress. Thus, the free side of the narrower sub-unit may be carried along on that part of the seat mattress until the under-face of both sub-units of the rear mattress are face to face. Then the rear side of the seat mattress is against the lowermost part of the now vertical outer-face of the narrower sub-unit and the mattress separator is hugged between them. The combination is then back in sofa form. When the free side of the narrower sub-unit does not readily or evenly move up on the adjoining side of the seat mattress as the combination thus is being closed, the smooth folding of the foldable rear mattress to have its two sub-units assume the positions they occupy in the sofa form, can be assisted by hand as necessary.

While the invention has been illustrated by detailed description of a particular embodiment of it, it is understood that various modifications and substitutions can be made in it within the scope of the appended claims which are intended also to cover equivalents of the described embodiment.

What is claimed is:

1. A sofa extension bed combination comprising a rear section having a horizontal rectangular frame, the shorter two sides of which are its right and left laterals, an extension section also having a horizontal rectangular frame, the shorter two sides of which are its right and left laterals, said section being selectively forwardly and backwardly slidable over the rear section, a separate narrow track flange integral with, and extending horizontally sidewardly outwardly along the length of the outside bottom edge of each of the laterals of the rear section and serving as a support for the tail end of the corresponding lateral of the extension section; friction overcoming means connected with and depending below the bottom of the tail end of each of the laterals of the extension section and rollably resting on the corresponding track flange and adapted to permit the laterals of the extension section to be moved forwardly and backwardly over the laterals of the rear section without any appreciable friction and serving as the sole means for overcoming the friction, and for supporting the tail end of said laterals, as the extension section is moved forwardly or backwardly.

2. A sofa combination as claimed in claim 1, wherein the longer pair of sides of the frame of the rear section are its rear length and front length, said rear section being supported above the floor by a pair of horizontally spaced apart rear legs fixed at the upper end of each of them to the rear length and a pair of horizontally spaced apart front legs fixed at the upper end of each of them to said front length; and the forward one of the pair of longer sides of the frame of the extension section is its front length, and the extension section is supported above the floor at its front by a pair of spaced apart legs fixed to its front length; the individual legs of each of the two pairs of front legs being so positioned along the respective front length to which it is fixed, and being of such shape, that when the combination is in closed position, the right hand leg of the extension section directly adjoins the same leg of the

rear section so that the pair of right hand legs gives the appearance of being one leg and the pair of left hand legs also directly adjoin one another to give that same appearance; and each leg of at least the two pairs of front legs is positioned, along the corresponding front length to which it is fixed, inwardly from its respective outer end of its front length a distance up to about one quarter of the front length, whereby the corresponding end portion of the sofa extension bed extends in cantilever fashion outwardly respectively from each such inwardly spaced leg to the corresponding outer end of the section.

3. A sofa extension bed combination comprising a rear section having a horizontal rectangular frame, the shorter two sides of which are its right and left laterals, an extension section also having a horizontal rectangular frame, the shorter two sides of which are its right and left laterals, said extension section being selectively forwardly and backwardly slidable over the rear section, a separate narrow track flange integral with, and extending horizontally sidewardly outwardly along the length of the outside bottom edge of each of the laterals of the rear section and serving as a support for the tail end of the corresponding lateral of the extension section; friction overcoming means connected with and depending below the bottom of the tail end of each of the laterals of the extension section and rollably resting on the corresponding track flange and adapted to permit the laterals of the extension section to be moved forwardly and backwardly over the laterals of the rear section without any appreciable friction and serving as the sole means for overcoming the friction, and for supporting the tail end of said laterals, as the extension section is moved forwardly or backwardly, a front mattress lying on top of, and carried by, the extension section;

and a foldable rear mattress detached from the front mattress and consisting of two sub-units hingedly secured to one another along their inner contiguous edges and one of the sub-units being wider than the other by about the thickness of the front mattress, said rear mattress being free of attachment with the rear section and adapted (*a*) when the combination is in closed position for use as a sofa, to serve in its folded form as a cushioned-back and having its hinge-edge on top and the narrower sub-unit standing upright with its free side resting on top of the rear-most part of the top surface of the front mattress and the free side of the wider sub-unit resting on top of the mattress support of the rear section between the tail end of the sofa and the tail end of the front mattress, and (*b*) when the combination is in open position as a doubled bed, to lie side by side and serve as the flat rear mattress carried by, and lying on top of, the rear section.

References Cited in the file of this patent

UNITED STATES PATENTS

D. 144,677	Billet et al.	May 14, 1946
1,027,007	Sisbower	May 21, 1912
1,043,736	Sisbower	Nov. 5, 1912
1,126,894	Sisbower	Feb. 2, 1915
1,271,955	Sisbower et al.	July 9, 1918
1,354,540	Dixon	Oct. 5, 1920
1,437,771	Mintz	Dec. 5, 1922
2,000,471	Moore	May 7, 1935
2,019,218	Fox et al.	Oct. 29, 1935
2,120.663	Bowersox et al.	June 14, 1938
2,189.328	Rosen	Feb. 6, 1940

FOREIGN PATENTS

144,802	Austria	Mar. 10, 1936