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3,385,631

BED-CHAIR

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2 Sheets-Sheet 1

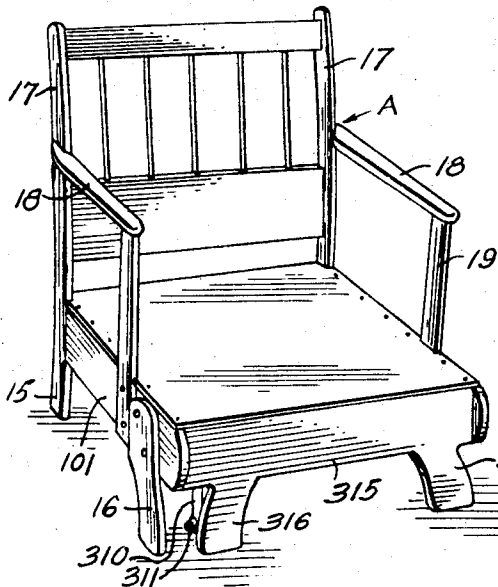


FIG. 2

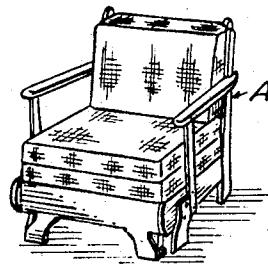


FIG. 1

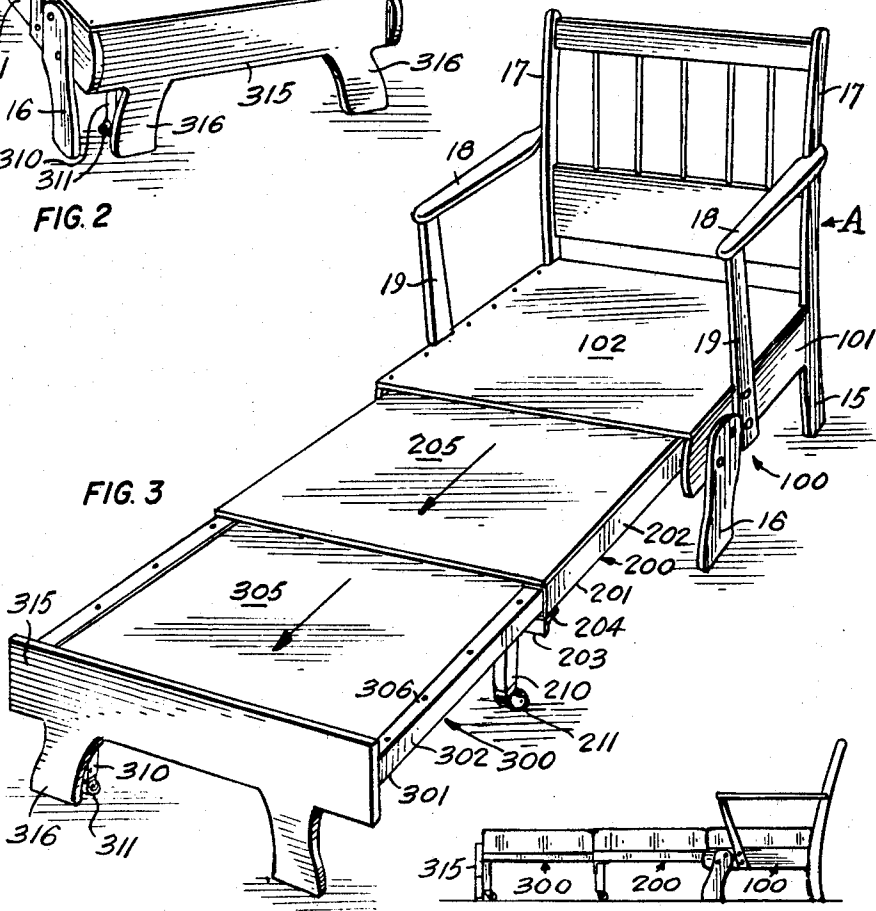


FIG. 3

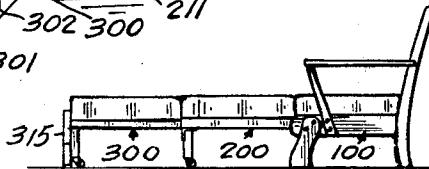


FIG. 4

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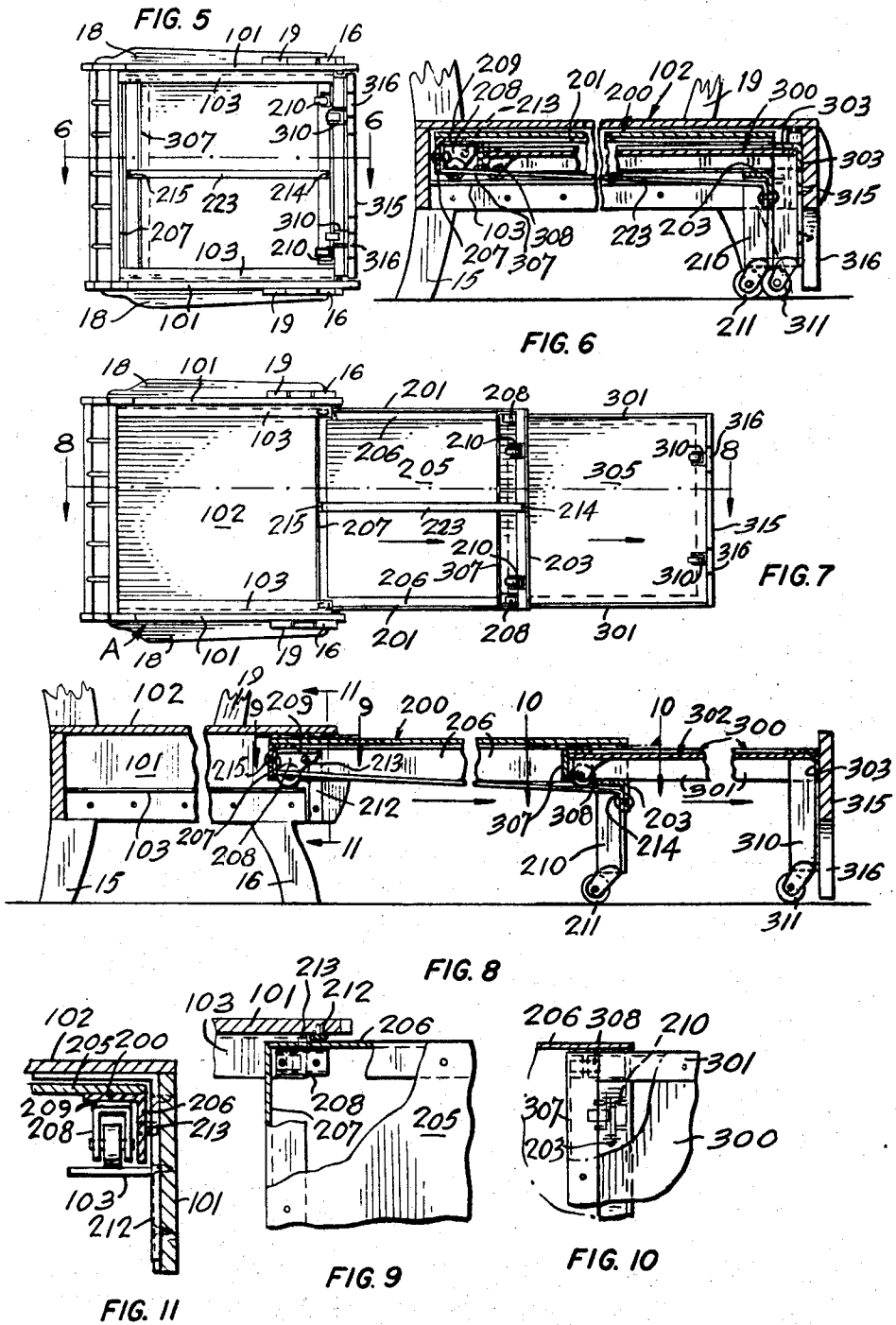
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BED-CHAIR
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ABSTRACT OF THE DISCLOSURE

A chair which is adapted to be converted into a bed. The seat portion of the chair is constructed to contain telescoped sections adapted to be withdrawn to their full extension from underneath the seat of the chair to form, together with the seat of the chair, a surface large enough to provide a sleeping area. The sections are provided with rollers at one end resting on the same ledge under the seat to allow them to be easily extended or telescoped, and stops are provided to prevent complete withdrawal of one section from the others.

The present invention relates to a bed-chair of the type having a seat frame and a number of retractable extension frames which may be pulled out from the front of the chair or seat frame to form a bed.

Numerous examples of bed-chairs of this type have been available, but all suffer from the disadvantage that the complexity of construction renders such bed-chairs unduly expensive for the market for which they are designed. Articles of this type are normally employed as a standby for the purpose of enabling an unexpected guest to be accommodated in dwelling which have insufficient space to accommodate permanent beds. Therefore, a prime requisite for such articles is that they should be of cheap and rugged construction, comfort being of secondary important in that the articles are not used as beds on a permanent basis. Hitherto, the construction of such articles has placed undue emphasis on the comfort of the bed-chair in the extended or bed position, with a result that such articles have failed in commercial exploitation.

Accordingly, it is an object of the present invention to provide a bed-chair of simple and economic construction and having a rugged and hard-wearing characteristic.

The bed-chair of the present invention has a flat surfaced seat portion and two movable sections with flat surfaces contained within the seat portion in telescoping relation. The movable sections are adapted to be withdrawn from the seat portion and provide, together with the flat seat portion, a surface suitable as a bed. The movable sections are provided with rollers at one end rolling on the same ledges in the seat portion. The other end of the movable sections is provided with supporting legs.

In accordance with one form of the invention, there is provided a convertible bed-chair comprising:

A chair section having a seat frame with front and rear ends, a back frame and legs rigid with said rear frame,

Said seat frame having a substantially flat upper surface member, a pair of forwardly extending vertical side members,

A pair of parallel horizontal shelves mounted to said side members below said surface member extending inwardly from the side members substantially along the whole length thereof,

A first extension frame having a front and rear end, a substantially flat upper surface member, a pair of legs terminating in rollers at the front end of the frame and a pair of first roller units at the rear end of the frame,

The roller units being positioned to run upon said

shelves, and the surface member and roller units of said first frame being of a size to roll snugly within the space between said shelves and the upper surface member of said seat frame,

5 A second extension frame having front and rear ends, a substantially flat upper surface member, a pair of legs terminating in rollers at the front end of the frame and a pair of second roller units at the rear end of the frame,

Said second roller units being shorter than said first roller units and being positioned to run upon said shelves forwardly of said first roller units, and the upper surface member and second roller units of said second frame being of a size to roll snugly within the space between said shelves and the upper surface member of said first extension frame,

10 The front legs of said first and second extension frames being of a vertical length to maintain the respective upper surface members horizontal with the respective roller units riding upon said shelves,

20 First abutment means preventing pulling of said first extension frame beyond a fully extended position thereof in which said first roller units are on said shelves adjacent the front end of said seat frame,

Means on said first extension frame for supporting the rear end of said second extension frame in a fully extended bed position in which said second roller units are withdrawn beyond said shelves so as to be adjacent the front end of said first extension frame, and

30 Second abutment means preventing pulling of said second extension frame beyond its fully extended position.

Preferably, the upper surface members are constituted by rigid panels, the bed-chair including at least three cushions of foamed material of depths adapted to provide a continuous horizontal surface when disposed over the upper surfaces of the frames in the fully extended position or bed position. The use of rigid panels to form the upper surface members, allows of great compaction and rigidity in the article, allowing continued use with a minimum of wear and also allowing of great simplicity in construction. The availability of foamed material minimizes the discomfort entailed through the use of such rigid panels. Indeed, the comfort is somewhat improved over bed-chairs which have sprung upper surface members interrupted by rigid lateral crosspieces at the points of division of the frames. It should be understood, however, that a substantially flat sprung framework may be substituted for the rigid panels, if desired.

Having thus generally described the invention, a preferred embodiment thereof is hereafter more particularly described and illustrated in the accompanying drawings, in which:

FIGURE 1 is a perspective view of a bed-chair in accordance with the invention in the fully retracted or chair position;

FIGURE 2 is a perspective view of the chair of FIGURE 1 in the retracted position on an enlarged scale and with the cushions removed;

FIGURE 3 is a perspective view of the chair of FIGURE 2 in the fully extended or bed position;

FIGURE 4 is a side view of the chair in the fully extended position showing the arrangement of the cushion for use as a bed;

FIGURE 5 is a bottom view of the chair in the retracted position;

FIGURE 6 is a side section along the line 6-6 of FIGURE 5;

FIGURE 7 is a bottom view similar to FIGURE 5 but with the chair in the fully extended or bed position;

FIGURE 8 is a side section along the line 8-8 of FIGURE 7;

70

FIGURE 9 is an enlarged section of part of FIGURE 8 along the line 9—9 thereof;

FIGURE 10 is an enlarged section of part of FIGURE 8 along the line 10—10; and

FIGURE 11 is an enlarged section of part of FIGURE 6 along the line 11—11.

In the drawings there is shown a bed-chair having a chair section A comprising a seat frame 100 supported by rigid rear legs 15, rigid front legs 16, and having a back frame 17, the side members of which are integral with the rear legs 15, and arm rests 18 supported by pillars 19. The seat frame comprises a pair of forwardly extending vertical side members 101, to which the legs, back frame, and arm rest supports are joined by any suitable method known in the art of joinery. The upper surface of the seat frame is constituted by a rigid panel 102, which may be, for example, of plywood, and which rests upon the side members 101 and is secured thereto, for example, by screws. The use of a rigid panel allows the chair section to be assembled without the use of cross-struts or braces below such panel, which would hinder the retraction of the extension member to be described.

The seat frame 100 also includes a pair of parallel horizontal shelves 103, which in the embodiment shown, are formed by the horizontal flanges of iron L sections, the vertical flanges of which are secured to the inside surfaces of the side members 101. The shelves 103 extend inwardly from the side members 101 substantially along the whole length thereof for the purpose of supporting the rear ends of the extension members to be described, in their retracted position.

The bed-chair includes a first extension frame 200, the greater part of which is adapted in the retracted or chair position to be housed within the space between the shelves 103 and the panel 102 and which may be extended to the position shown in FIGURE 3. The first extension frame 200 comprises a pair of parallel spaced forwardly extending inverted L sections 201, constituting the sides of the frame, and having vertical flanges 202 forming the outside boundary at the sides of the frame, a brace member 203 having a horizontal flange 204 welded under and across the vertical flanges 202, flush with the forward end of the frame 200. The upper surface of the frame 200 is constituted by a rigid panel 205 which rests on and is secured to horizontal flanges 206 of the side members 201. The rear of the frame 200 is constituted by an iron inverted L section 207 which continues the end edges of the side L sections 201 so as to form a continuous boundary with horizontal and vertical flanges. The iron L sections are preferably joined together by welding to form a rigid structure.

The rear end of the frame 200 is supported upon a pair of roller units 208. The roller units 208 are of conventional type having a generally U section frame between the flanges of which is supported the axle of a small wheel. The roller units 208 are secured by welding or bolting to the rear end of each side member 201 so as to roll upon the shelves 103. The roller units 208 should be of sufficient height to allow the first frame 200 to roll snugly within the space between the shelves 103 and the panel 102 of the seat frame with minimal clearance between the panel 205 of the first frame 200 and the panel 102 of the seat frame and thereby to conserve a maximum space between the shelves 103 and the undersurface of the panel 205. To enable the necessary adjustment of height, the roller units 208 are spaced from the panel 205 by a packing member 209, which forms part of the unit 208, it being apparent that no packing member is necessary if the units are of exactly the required height.

The front end of the first extension frame 201 is supported upon a pair of legs 210 which terminate in roller units or castors 211. In the embodiment shown, the legs 210 are constituted by U shaped members of iron, for example, formed by two L section members welded together, and with the web directed towards the front of

the bed-chair. The upper ends of the legs 210 are, for example, seated in the angle of the brace member 203 and welded thereto. The legs 210 are of such a height as to support the frame 200 horizontally with the roller units 208 rolling upon the shelves 103.

Abutment means are provided to prevent the first extension frame 200 being pulled beyond the position shown in FIGURE 3, in which, as shown more clearly in FIGURE 8, the roller units 208 are on the shelves 103 adjacent the front end of the seat frame 100. In the embodiment shown, the abutment means is constituted partly by a pair of inverted L section shelf supports 212, attached to the side panels 101, adjacent the front end of the seat frame, and which are also used for supporting the panel 102 at the front end of the seat frame. A projecting bolt 213 is arranged to project outwardly through the vertical flange 202 at a suitable position near the rear end of the first frame 200 so as to abut the rear edge of the support 212 in the desired extension position of the frame 200.

The bed-chair also includes a second extension frame 300 adapted in the retracted chair position to be housed in the space between the shelves 103 and the upper surface panel 205 of the first extension member. The second extension frame 300 comprises a pair of parallel spaced, forwardly extending, inverted iron L sections 301 having vertical flanges 302 forming the outside boundary of the frame 300 at the sides thereof. Front and rear inverted iron L sections 303, 307 respectively, continue the front and rear end edges of the side sections so as to complete the front and rear of the frame 300 with continuous horizontal and vertical flanges all around. The frame 300 includes a rigid panel 305, which like the other panels 205 and 102, may be formed of plywood or plastic laminate, the panel 305 differing from the panels 205 and 102 in being secured under against the horizontal flanges of the L sections 301, 303 and 307. It will be appreciated that this construction allows of a minimal thickness of the frame 300, the frame being arranged to fit snugly in the space between the shelves 103 and the panel 205 of the first extension frame. The rear end of the second extension frame 300 is supported upon a second pair of roller units 308 which are shorter than the roller units 208 and are positioned to run upon the shelves 103 forwardly of the roller units 208. The height of the roller units 308 is adjusted to provide a minimal clearance between the horizontal flanges 306 of the frame 300 and the lower surfaces of the horizontal flanges 206 of the first extension frame 200. Thus, in the embodiment shown, the roller units 308 are the same height as the roller units 208 without the packing 209.

The front end of the second extension frame 300 is supported upon legs 310 similar to the legs 210 of the first extension frame and terminating in roller units 311. The iron L sections making up the legs 310 are seated within the angle of the front frame section 303 and welded thereto, and the legs 310 are spaced inwardly in the lateral direction of the legs 210 so that in the retracted position of the bed-chair, the rollers on the legs of the respective frames clear one another.

The second extension frame 300, in its extended position as shown in FIGURE 3, is withdrawn from the first extension frame 200, so that the roller units 308 of the second frame are pulled clear of the shelves 103 and are eventually stopped by the transverse brace member 203 which is spaced from the horizontal flanges 206 by an insufficient distance to allow the rollers to pass in between. The brace member 203 therefore constitutes an abutment or stop.

Guidance of the rear end of the second extension frame 300 into position with the roller units 308 running upon the shelves, is assisted by a guide member 223. The guide member is interconnected between the base member 203 and the rear L section of frame 200 at a central position intermediate the side sections 201. The front

end of guide member 223 is downwardly flanged at 214 and secured to the vertical flange or brace member 203 so that the upper surface of guide member 223 is generally on a level with the horizontal flange 204. The rear end of guide member 223 is upwardly flanged at 215 and secured to the vertical flange of the rear section of frame 200, so that the upper surface at that end of guide member 223 is substantially level with the lower end of the flange to which it is attached. Thus, the guide member 223 maintains the rear end of the frame 300 at substantially the correct level for re-entry into the space provided in the frame 200, and allows the frames to be retracted with a single forward sliding motion.

It will be appreciated from FIGURE 3 that when the bed-chair is pulled out to its fully extended or bed position, the surfaces of panels 102, 205 and 305 are not exactly aligned. To counteract this difference of alignment, the chair is preferably provided with three cushions which may be arranged in the chair position as shown in FIGURE 1 and in the bed position as shown in FIGURE 2, the cushions being of slightly different depth so that when arranged as shown in FIGURE 2 or FIGURE 4, the upper surface is continuous and horizontal.

It will be apparent that the panels 102, 205 and 305 may be replaced by substantially flat spring networks, but the use of substantially rigid panels adds solidarity to the chair, and particularly to the seat frame 100. The construction of a chair allows of a maximum rigidity with a maximum economy of materials, the whole being substantially assembled from straight pieces of L-sectioned, angle-iron and wood and/or plastic.

Preferably, the front end of the second extension frame is provided with a board 315 and leg guards 316 which provide a convenient gripping means and which also provide a decorative front surface to the chair or bed. The upper edge of the board 315 stands proud of the panel 305 so as to retain the cushions from slipping forward when the bed-chair is extended. It will be apparent that many modifications may be made to the bed-chair within the scope of one skilled in the art, within the spirit and scope of the invention as set forth in the following claims.

I claim:

1. A convertible bed-chair comprising:

- a chair section having a seat frame with front and rear ends, a back frame and legs rigid with said rear frame,
- said seat frame having a substantially flat upper surface member, a pair of forwardly extending vertical side members,
- a pair of parallel horizontal shelves mounted to said side members below said surface member extending inwardly from the side members substantially along the whole length thereof,
- a first extension frame having a front and rear end, a substantially flat upper surface member, a pair of legs terminating in rollers at the front end of the frame and a pair of first roller units at the rear end of the frame,
- the roller units being positioned to run upon said shelves, and the surface member and roller units of said first frame being of a size to roll snugly within the space between said shelves and the upper surface member of said seat frame,
- a second extension frame having front and rear ends, a substantially flat upper surface member, a pair of legs terminating in rollers at the front end of the frame and a pair of second roller units at the rear end of the frame,
- said second roller units being shorter than said first roller units and being positioned to run upon said shelves forwardly of said first roller units, and the upper surface member and second roller units of said second frame being of a size to roll snugly within the space between said shelves and the upper surface member of said first extension frame,

the front legs of said first and second extension frames being of a vertical length to maintain the respective upper surface members horizontal with the respective roller units riding upon said shelves,

first abutment means preventing pulling of said first extension frame beyond a fully extended position thereof in which said first roller units are on said shelves adjacent the front end of said seat frame, means on said first extension frame for supporting the rear end of said second extension frame in a fully extended bed position in which said second roller units are withdrawn beyond said shelves so as to be adjacent the front end of said first extension frame, second abutment means preventing pulling of said second extension frame beyond its fully extended position,

said support means and second abutment means include a brace member interconnecting said front legs of said first extension frame and spaced from its upper surface member sufficiently closely to prevent said second roller units passing between, and a longitudinally extending guide member interconnecting the front and rear ends of said first extension member intermediate the sides thereof substantially at the level of said brace member for guiding the rear end of said second extension member in its travel between extended and retracted positions.

2. A bed-chair as claimed in claim 1 further comprising a generally vertical front cover board attached to the front end of said second extension member.

3. A bed-chair as claimed in claim 1 wherein said upper surface members are constituted by rigid panels, the bed-chair including at least three cushions of foamed material of depths adapted to provide a continuous horizontal surface when disposed over the said upper surfaces in the fully extended positions of the frame.

4. A bed-chair as claimed in claim 1 wherein said seat frame includes side panels and said shelves are constituted by L-sectioned metal girders secured to said panels.

5. A bed-chair as claimed in claim 1 wherein said first and second extension frame and said brace are substantially made up of L-sectioned metal girders.

6. A bed-chair as claimed in claim 4 wherein said first abutment means are constituted substantially by a pair of inverted L-sectioned supports attached to said side panels adjacent the front end of the seat frame for supporting said upper surface member thereof, and a pair of projections on said first extension frame adjacent the rear end thereof adapted to engage said L-sectioned supports to prevent further withdrawal of the extension frames.

7. A bed-chair as claimed in claim 6 wherein said first extension frame comprises:

- a pair of parallel spaced, forwardly extending, inverted L-sections constituting the sides and having vertical flanges forming the outside boundary of the frame, an inverted L-section constituting said brace member having a horizontal flange secured under and across said vertical flanges flush with the forward end of the frame,
- a rigid panel constituting said upper surface member of the frame resting on and secured to horizontal flanges of said side members,
- a rear L-section continuing the end edges of the side member L-sections so as to form the rear of the frame, and
- a metal strip constituting said guide member and having oppositely directed flanges at its front and rear ends, the front flange being downwardly directed and secured to the vertical flange of said brace member so that the upper surface of the strip is at the same general level as the horizontal flange of the brace member, and the rear flange being upwardly directed and secured to the vertical flange of the rear section of the frame so that the upper surface is sub-

7

stantially at the level of the lower edge of the rear section of said second frame when the latter is retracted.

8. A bed-chair as claimed in claim 6 wherein said second extension frame comprises:

a pair of parallel spaced, forwardly extending, inverted L-sections constituting the sides and having vertical flanges forming the outside boundary of the frame, front and rear inverted L-sections continuing the end edges of the side sections so as to form the front and rear of the frame, and

a rigid panel constituting said upper surface member of the frame, secured under and against the horizontal flanges of the L-sections.

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JAMES T. McCALL, *Primary Examiner*.

8

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