April 11, 1950 J. E. VAN CAMP 2,503,527

CHAIR CONVERTIBLE TO BED

Filed Jan. 29, 1945 2 Sheets-Sheet 1

Fig. 1.

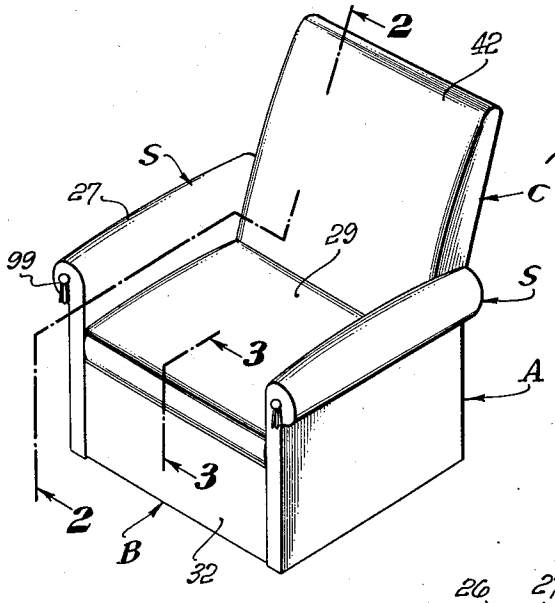


Fig. 2.

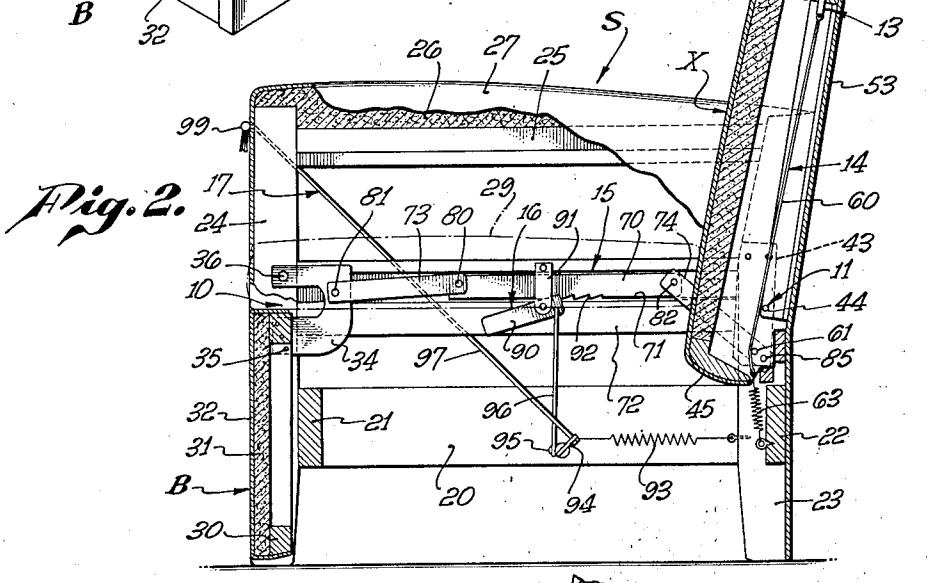


Fig. 3.

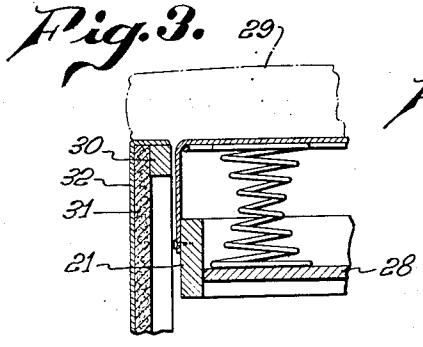
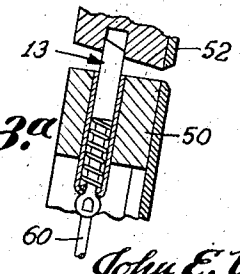


Fig. 3a.



INVENTOR.
John E. Van Camp
BY
ATTORNEY.

April 11, 1950 J. E. VAN CAMP 2,503,527

CHAIR CONVERTIBLE TO BED

Filed Jan. 29, 1945 2 Sheets-Sheet 2

Fig. 4.

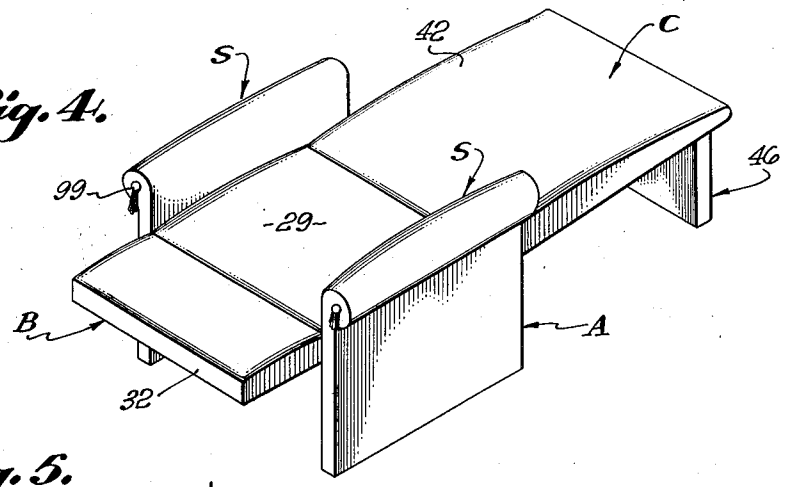
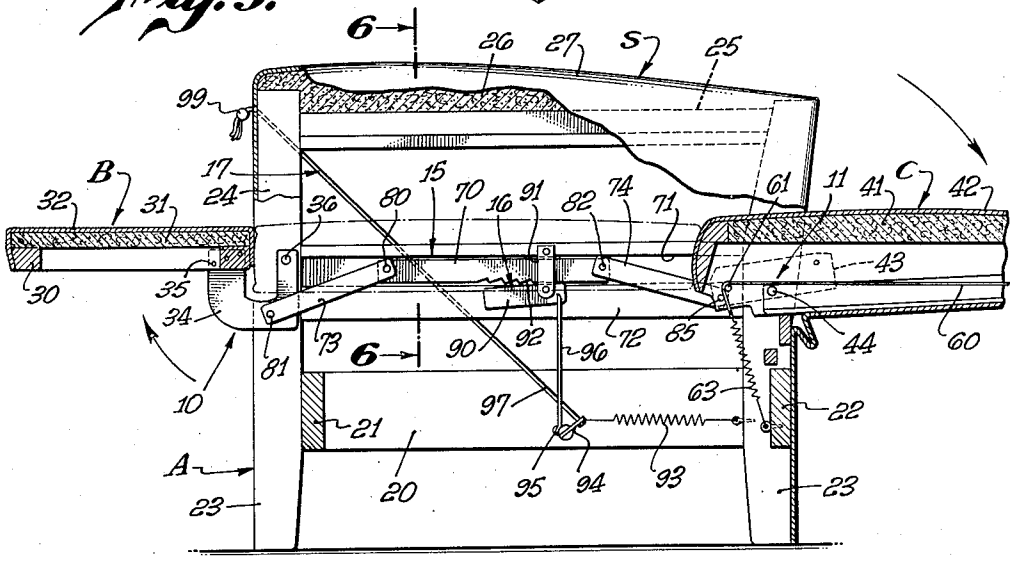


Fig. 5.



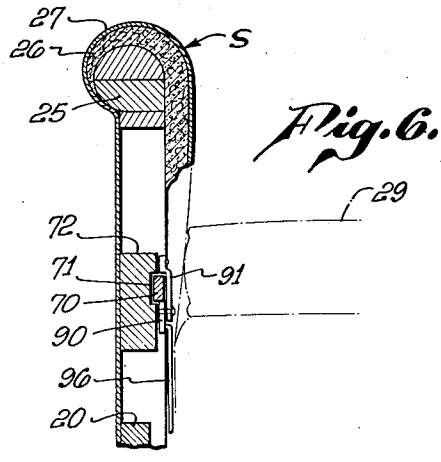


Fig. 6.

INVENTOR.
John E. Van Camp
BY
W. H. Clapp
ATTORNEY.

Patented Apr. 11, 1950 2,503,527

UNITED STATES PATENT OFFICE

2,503,527

CHAIR CONVERTIBLE TO BED

John E. Van Camp, Los Angeles, Calif.

Application January 29, 1945, Serial No. 575,028

3 Claims. (Cl. 155—45)

1

This invention relates to an article of furniture and has particular reference to an article of furniture useful either as a chair or as a bed or couch. It is a general object of my present invention to provide an article of furniture of the general character referred to which is comfortable when used either as a bed or as a chair, and which is simple and inexpensive of construction and also easily operated to convert it from a bed to a chair, or vice versa.

It is a general object of my present invention to provide an article of furniture useful either as a bed or as a chair and which involves primarily three simple parts, namely, a main or center section, a front extension, and a back, which parts are interconnected and related so that they are operable between a position where they form a continuous horizontal structure in the form of a bed, and a position where the front extension is perpendicular and forms the front of the chair while the back is substantially perpendicular and forms the back of the chair.

A general object of my present invention is to provide an extremely simple, inexpensive mechanism for mounting and interconnecting the principal parts of the structure above referred to. By my present invention I provide few simple inexpensive parts which serve to pivotally mount the front extension and the back and to interconnect these parts so that they work together.

Another object of my present invention is to provide a unique, automatically operated drop leg in connection with the back, which serves to support the outer end portion of the back when the back is horizontally disposed to act as a part of the bed.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is an isometric view illustrating the structure of the present invention as a chair. Fig. 2 is an enlarged detailed sectional view illustrating the mechanism of the present invention being a view taken substantially as indicated by line 2—2 on Fig. 1. Fig. 3 is an enlarged detailed sectional view of one part of the structure, being a view taken as indicated by line 3—3 on Fig. 1. Fig. 3a is an enlarged detailed sectional view of the spring latch shown in Fig. 2. Fig. 4 is a view similar to Fig. 1 showing the structure in the form of a bed. Fig. 5 is a view similar to Fig. 2, showing the structure in the other position or in

2

the form shown in Fig. 4, and Fig. 6 is an enlarged, detailed sectional view taken substantially as indicated by line 6—6 on Fig. 5.

The construction that I have provided involves primarily three principal parts, namely a main or center part A, a front extension B, and a back C. The center section A is formed primarily of a rectangular base supported at the desired height and having vertical extensions at either side, which form the arms of the chair, as shown in Fig. 1. The front extension B is, in effect, a rectangular panel shiftable between a folded or vertical position, as shown in Fig. 1, where it forms the front of the chair, and an extended or horizontal position as shown in Fig. 4, where it forms a horizontal continuation of the seat portion of the center section. The back C is a rectangular frame-like structure operable between an up position where it extends upward and somewhat rearward from the rear portion of the center section to form the back of the chair, as shown in Fig. 1, and a horizontal position where it forms a continuation of the seat of the center section, as shown in Fig. 4.

In addition to the general or principal parts hereinabove named the construction that I have provided involves means 10 pivotally connecting the extension B to the center section A, means 11 pivotally connecting the back C with the center section A, means 12 supporting the outer end of the back when it is in the horizontal position, means 13 normally releasably holding the means 12 in a folded or collapsed position, as shown in Fig. 2, means 14 operable to release the latch as the back is lowered to the horizontal position, means 15 interconnecting the extension and back so they work together or in unison, latch means 16 normally releasably holding the parts in position to form a chair, as shown in Fig. 2, and a control means 17 for releasing the latch 16.

The center section A of the structure, which is the main or principal element to which the other parts are attached, involves primarily a main frame which is substantially rectangular in form and which involves side rails 20, a front rail 21 joining the front ends of the side rails, and a rear rail 22 joining the rear ends of the side rails. The frame formed by the several rails just mentioned is supported at a suitable height above the front and in a horizontal position by means of legs 23 located at the corners of the frame. The legs preferably project upward above the frame to form corner posts 24 at the corners of the frame and top rails 25 extend substantially parallel with the side rails 20 between the

upper ends of the posts 24. The posts 24 and top rails 25 form the foundation or frame structure for sides S of the chair, as shown in Fig. 1. It is to be understood, of course, that the frame construction formed by the posts and top rails can be supplemented by other frame construction, as may be necessary depending upon the chair design, and that the structure thus formed can be covered with suitable padding 26 and facing or covering 27, as may be desired.

The main frame formed by the rails 20, 21 and 22, as above described, acts as the main frame of a chair to carry a spring base or platform 28 on which is supported a suitable cushion or seat 29. In the drawings I have indicated a typical chair construction wherein the platform construction carried by the frame involves helical springs and a suitable pad supported on the springs. The seat cushion 29 may be of any suitable construction, that is, it can be a mere pad or it can be a spring pad in the manner common to chair construction. The seat cushion in general is a rectangular cushion fitting between the sides S of the chair and extending to the front of the chair and to a suitable point between the rear portions of the sides S, that is, to a point where it joins the back C as shown in Fig. 1 of the drawings. In practice the seat cushion 29 may be fastened to or formed as a part of the platform supported by the frame, or it may be a detachable cushion such as is ordinarily employed in a chair of the general type illustrated.

The front extension B is a rectangular frame-like element in the nature of a flap located at the front of the main section A to be movable from a collapsed or folded position where it is vertically disposed, as shown in Figs. 1 and 2, and an extended or horizontal position, as shown in Figs. 4 and 5.

The front extension may be of simple construction involving a rectangular frame 30, a pad 31 at one side of the frame, that is, at the side which forms the front of the extension or the top of the extension, as the case may be, and a cover 32 over the pad. The pad 31 of the front extension may, if desired, be spring reinforced or it may be a simple pad, as shown in the drawings, made sufficiently thick to form a satisfactory extension of the seat cushion when the structure is used as a bed, as shown in Fig. 4.

In the particular design illustrated the rectangular frame-like structure of the front extension B fits between the front legs of the main section A and engages under the forward end portion of the cushion 29, so that when it is positioned as shown in Figs. 1 and 2 it appears as the front of the main section A. To properly accommodate the extension B the front rail 21 of the main frame is set a suitable distance from the extreme forward faces of the front legs.

The means 10 pivotally connecting sections A and B includes a pivotal connection at each end of the extension B connecting the extension with the front posts 24 of the section A. Each pivotal connection includes a U-shaped hinge bracket 34 having the forward end of its lower leg fixed to the end of the extension B at 35 to project rearwardly from the extension when the extension is in the horizontal position, as shown in Fig. 4, and having the forward end of its upper leg attached to post 24 by a pivot pin 36. The bracket 34 is shaped and proportioned and is connected to the extension and to the

frame so that when the extension is folded in or is in the vertical position, as shown in Figs. 1 and 2, its upper end is immediately below the forward end portion of the seat cushion 29 whereas when the extension is in the extended or horizontal position, as shown in Figs. 4 and 5, the said end is immediately adjacent the forward end of the seat cushion.

The back C is a suitably shaped and padded element preferably substantially rectangular in shape and padded to form an effective, comfortable back for the chair, as shown in Fig. 1, and rest or extension of the seat cushion 29 as shown in Fig. 4. In the preferred construction the back C includes a frame 40 substantially rectangular in form carrying suitable padding 41 covered by a suitable cover 42. The lower or inner end portion of the back C fits between the sides S of the center section A and is pivotally connected to the center section A by the means 11.

The means 11 includes a pivotal connection at each side or edge of the back where it fits between the sides S and, in practice, each connection may include a plate 43 fixed to the side of or edge of the back and a pivot pin 44 projecting from a rear post of the main frame and pivotally engaging the plate. The pivotal axis of the pivot pin 44 is removed somewhat from the extreme end 45 of the back and is located vertically so that when the back is in the extended position, as shown in Fig. 4, its top or forward face X joins and extends horizontally from the top of the seat cushion 29. When the back is up, as shown in Figs. 1 and 2, the end 45 is located a substantial distance below the top of the seat cushion which is desirable in that it allows for the seat cushion to be depressed a substantial amount without passing below the back.

The means 12 provided for supporting the outer end of the back when it is in the horizontal position, as shown in Fig. 4, includes a drop leg 46 pivotally connected to the outer or upper portion of the back. In the preferred construction the frame of the back has a cross member 50 located across it at a point spaced a substantial distance below the top of the frame so that there is a recess 51 in the upper end portion of the back at its rear side. The drop leg is in the form of a panel that normally occupies the recess when the back is up, as shown in Figs. 1 and 2, so that the rear side 52 of the drop leg forms a continuous surface with the back surface 53 of the main portion of the back. The panel-like leg 46 is pivotally connected to the frame part defining the upper end of the recess by a hinge 56, and it is free to swing or drop down to a vertical position, as shown in Fig. 4. A suitable tie such as a stop chain or the like 57 may be provided to limit the rearward movement of the drop leg as it swings down.

The latch means 13 provided to normally yieldingly hold the drop leg in the recess 51 may include a spring latch, such as is shown in Fig. 2 of the drawings, carried by the cross member 50 of the back frame to hold the leg in the recess 51, as shown in the drawings. A stop bar 51a on the frame of the back limits inward movement of the leg in the recess 51.

The means 14 provided for automatically releasing the latch 13 when the back is lowered may involve a line or cord 60 having one end attached to the latch and the other end attached to a suitable part of the frame of section A. The line 60 is arranged over a fixed stop 61 located with reference to the axis of the pivot pins 44 so

that the line 60 is put under strain or is pulled, as the back is lowered, thus causing the latch to be operated as the back is lowered. A tension spring 63 is preferably included in the line 60 to prevent overstraining of the line in the course of the operation just described.

The means 15 provided to interconnect the back C and the extension B so that they work or move together may involve a mechanism at either side of the structure connecting the back with the extension or there may be two units of such mechanism, one at each side of the structure. Each unit of the connecting means 15 may include a connecting bar 70 slidably mounted in a horizontally disposed guideway 71 in a horizontal frame part 72 extending between front and rear posts 24, a forward link 73 connecting the connecting bar with a hinge bracket 34, and a rear link 74 connecting the bar 70 with the frame of the back. The connecting bar 70 may be a simple elongate bar mounted in the guideway 71 to slide or reciprocate between the positions shown in Figs. 2 and 5 of the drawings. The forward link 73 is pivoted at 80 to the forward end of the bar 70 and at 81 to the hinge bracket 34, the point of pivotal connection 81 being somewhat below the axis of the pivot pin 36 which connects the bracket 34 to the post 24. The rear link 74 is pivotally connected at 82 to the rear end of the connecting bar 80 and the link extends from the connecting bar to the frame 40 of the back where it is pivotally connected by a pivot pin 85. The parts are arranged and proportioned so that the pivotal connection 85 is spaced a substantial distance below the axis of pivotal connection of the back to the center section A, or in other words, below the pivot pins 44 and when the parts are in position to form a chair, as shown in Figs. 1 and 2, the rear link 74 extends upward and forward from the pivot connection 85 to the point where it connects to the rear end of the connecting bar 70. As the back swings down from the position shown in Fig. 1 to that shown in Fig. 4 the pivotal connection 85 moves forward and up, causing the link 74 to be forced forward, thus causing the connecting bar 70 to be correspondingly moved forward. The forward movement of the connecting bar 70 causes the forward link 73 to be moved forward, which in turn swings the bracket 34 forward, causing the front extension B to be swung up to the position shown in Fig. 4. When the back is moved up from the position shown in Fig. 4 to that shown in Fig. 1 the reverse operation occurs, that is, the link 74 is moved down and rearward so that the connecting bar 70 is moved rearward carrying with it the link 73 which in turn moves the bracket 34 carrying the extension B.

The latch 16 serves to catch and retain the parts in the position in which they form a chair, as shown in Figs. 1 and 2. The latch means, as shown, involves a pivoted dog or latch member 90 supported by a suitable bracket 91 and arranged to cooperate with ratchet teeth 92 provided in the connecting bar 70. A spring 93 normally yieldingly urges the latch 90 to a position to cooperate with the ratchet teeth and the ratchet teeth are located so that as the structure approaches the chair position the teeth are engaged by the latch holding it against return to the bed position. In the arrangement illustrated the spring 93 has one end connected to the frame and the other end to arm 94 of a pivoted rocker, the other arm 95 of which is connected to the latch 90 by a connecting link 96. The control means 17 serves as a means for operating the latch means 16 to release it when desired. In the preferred construction the control means includes a suitable tie line 97 connected to arm 94 of the rocker just described, and extending to a convenient position where it can be operated when desired. In the preferred arrangement the line 97 extends to the forward end of one of the sides S where it is provided with an operating handle 98 which may, in practice, be in the form of an ornament such as a tassel, as shown in the drawings. From the foregoing description it will be apparent that when the structure is in the chair position, as shown in Figs. 1 and 2, the latch 16 effectively holds it in that position and the structure forms a comfortable, conventional type of chair. When it is desired to form a bed it is merely necessary to release the latch 16 through the means 17 and then depress the back C to the horizontal position, in the course of which operation the back C releases the latch 13 and the support 12 drops to operating position at the same time that the connecting means 15 operates the extension B from the position shown in Fig. 1 to that shown in Fig. 4. When the parts are extended, as shown in Fig. 4, the structure forms a comfortable couch or bed, since the seat cushion of the center section, the extension B and the back cooperate to form one continuous horizontal surface. It will be apparent from the foregoing description that the several parts that I have described can be constructed with suitable padding so that they form a comfortable, convenient bed. It is also to be noted that the latch means 16, by including a number of ratchet teeth 92 allows the back to be set at different angles to suit the wishes of the user, and that if the back is set at an appreciable angle the front extension will be extended somewhat, with the result that the structure forms a comfortable reclining chair including the front extension as a foot rest.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. In a device of the character described, a center section including a frame carrying a seat and having arms at the sides of the seat, a front extension pivotally connected to the center section and operable between a folded position forming a front for the center section and an extended position forming a continuation of the seat, a back pivotally connected to the center section and operable between an up position where it forms a back for the seat and a down position where it forms a continuation of the seat, and means connecting the extension and back so they operate together, a folding support for the back hinged thereto to depend from the back when it is down and to fold against the back when it is up, a releasable latch for holding the said support to the back when the back is up, and means operating to release the latch as the back is moved from the up position to the down position.

2. In a device of the character described, a center section including a frame carrying a seat and having arms at the sides of the seat, a front extension pivotally connected to the center section and operable between a folded position forming a front for the center section and an ex-

tended position forming a continuation of the seat, a back pivotally connected to the center section on a transverse pivotal axis and operable between an up position where it forms a back for the seat and a down position where it forms a continuation of the seat, and means connecting the extension and back so they operate together including a connecting bar slidably supported by the center section above said axis, a link having one end pivotally connected to the bar and the other end pivotally connected to the extension at a point below its point of pivotal connection with the center section, and a link having one end pivotally connected to the bar and having its other end pivotally connected to the back at a point below its point of pivotal connection with the center section.

3. In a device of the character described, a center section including a frame carrying a seat and having arms at the sides of the seat, a front extension pivotally connected to the center section and operable between a folded position forming a front for the center section and an extended position forming a continuation of the seat, a back pivotally connected to the center section and operable between an up position where it forms a back for the seat and a down position where it forms a continuation of the seat, and means connecting the extension and back so they operate together and including a connecting bar mounted to slide horizontally at each side of the

center section and located above said axis and a link at each end of each bar, the link at the rear end of each bar extending downwardly and rearwardly from the bar and connecting directly to the back at a point below said axis, and the link at the forward end of each bar extending downward and forward from the bar to the extension.

JOHN E. VAN CAMP.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
118,368	Hubbard	Aug. 22, 1871
166,566	Squires	Aug. 10, 1875
246,556	Reich	Aug. 30, 1881
470,251	Morrison	Mar. 8, 1892
607,538	Bergman	July 19, 1898
682,119	Seibert	Sept. 3, 1901
791,295	Sennett	May 30, 1905
792,207	Francis	June 13, 1905
911,205	Campbell	Feb. 2, 1909
941,555	Berzon	Nov. 30, 1909
2,233,797	Potter	Mar. 4, 1941

FOREIGN PATENTS

Number	Country	Date
122,691	Germany	July 20, 1901
679,644	France	Jan. 13, 1930