Jan. 3, 1956 M. D. RECHLER 2,729,277

FOLDING CHAIR

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Fig. 2

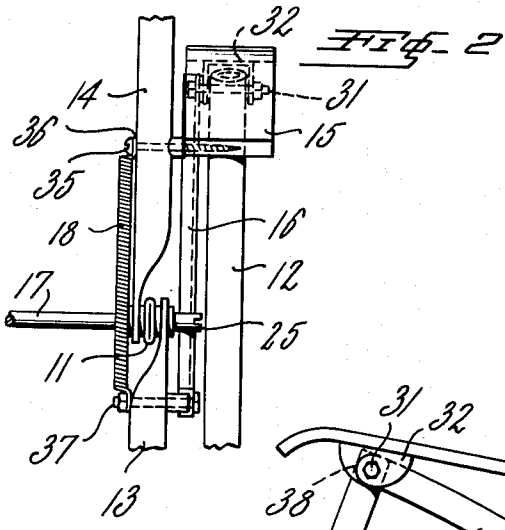
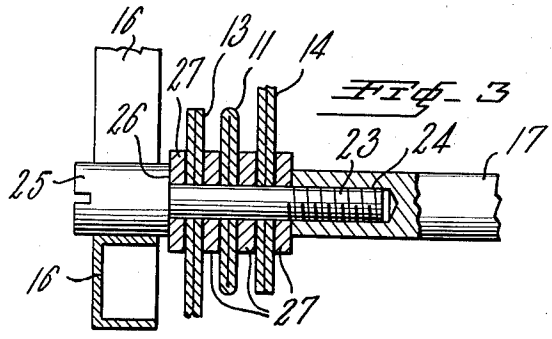


Fig. 1

Fig. 3



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Fig. 4

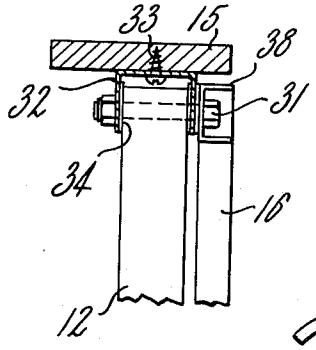
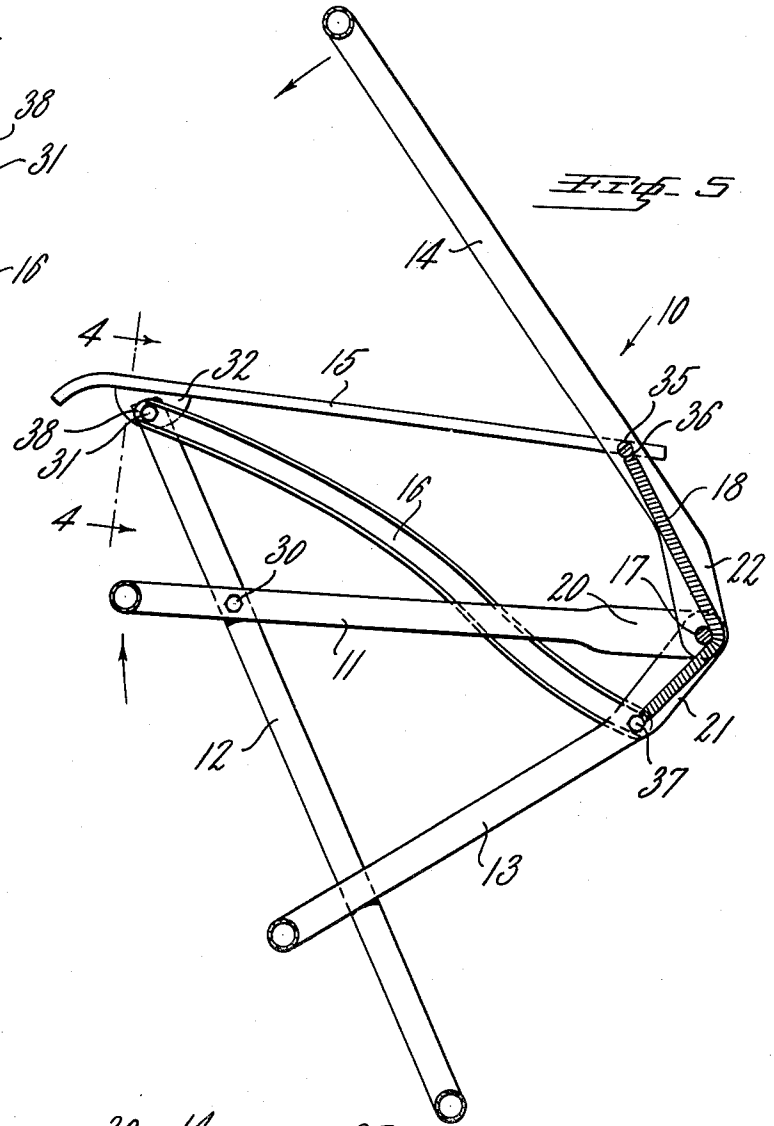


Fig. 5



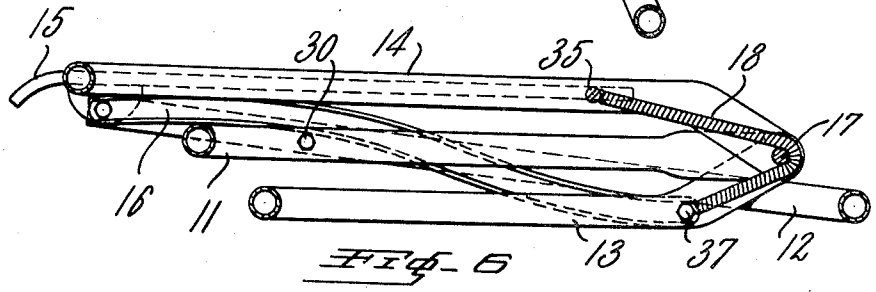


Fig. 6

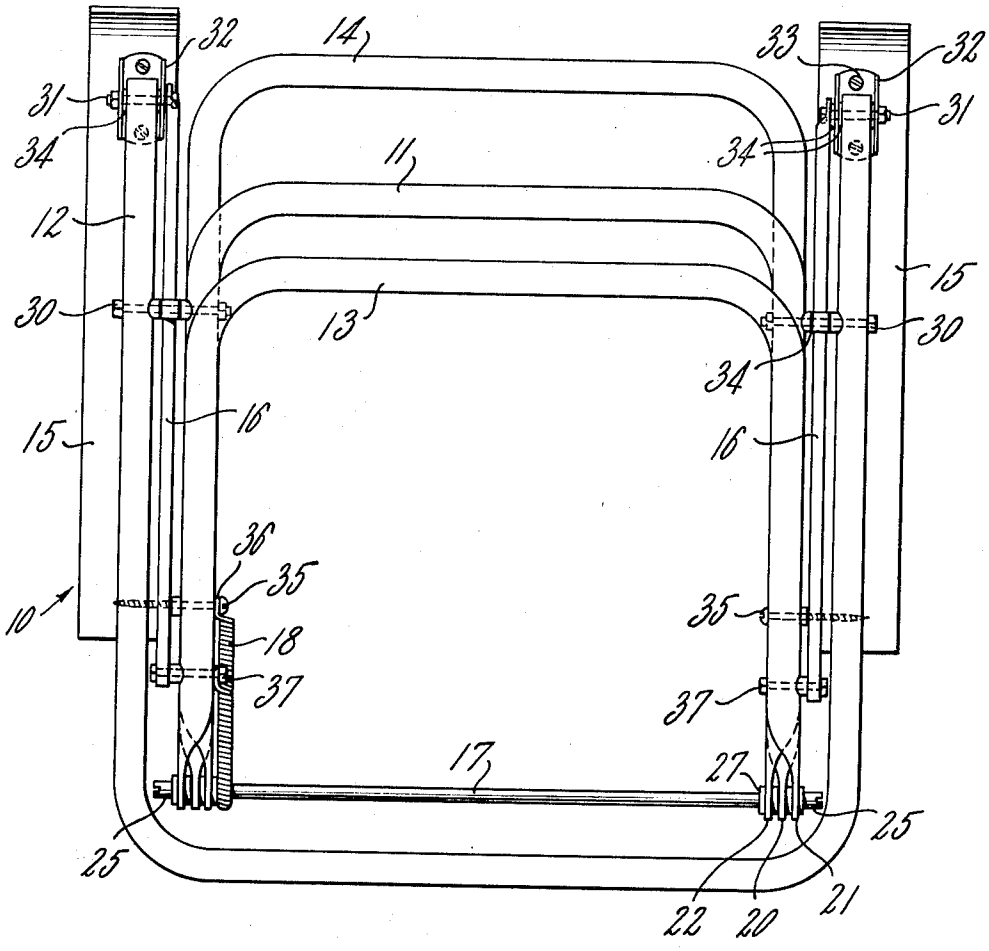
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Fig. 7



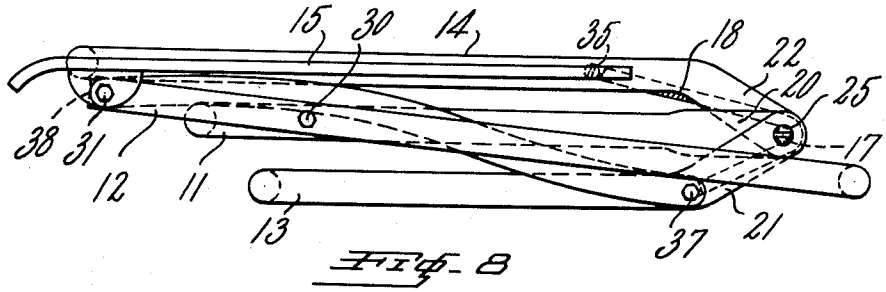


Fig. 8

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Fig. 9

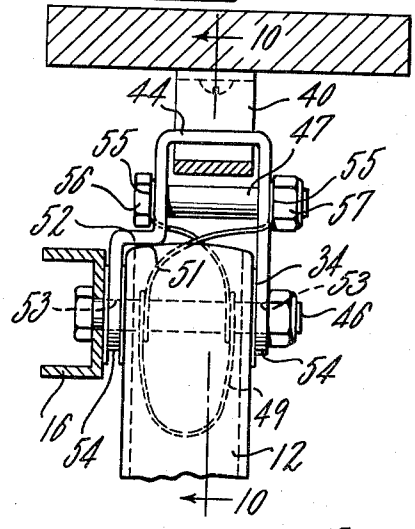
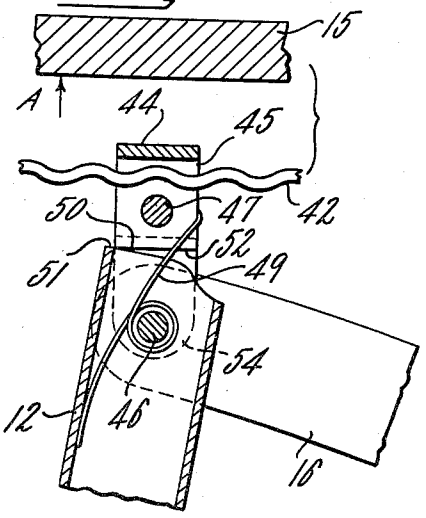


Fig. 10



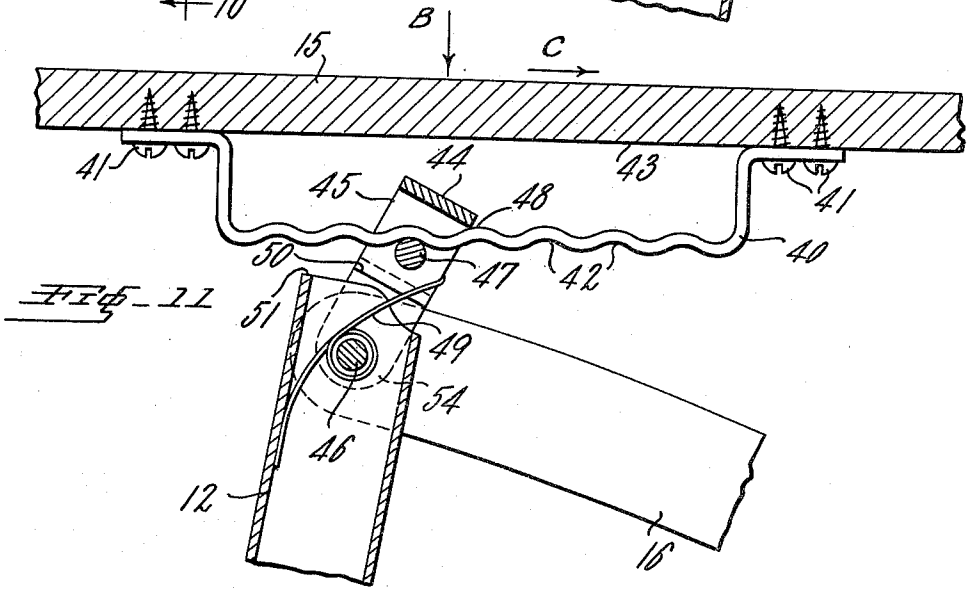


Fig. 11

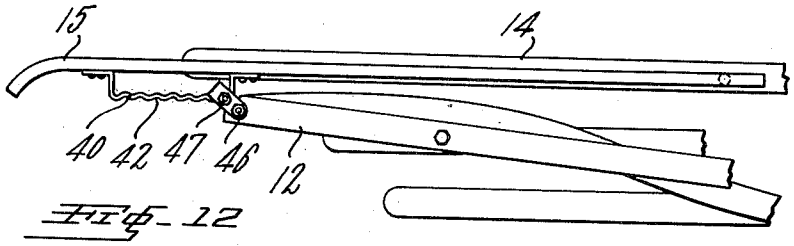


Fig. 12

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FOLDING CHAIR

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Application December 14, 1951, Serial No. 261,624

4 Claims. (Cl. 155—148)

This invention relates to folding chairs, one of the objects being to provide a light weight construction designed to operate easily and requiring small space when folded.

There is provided a pivotal arrangement at the rear of the chair for the seat, back, and rear leg frames. Stops or extensions associated with the chair furnish fulcrum points to rest upon actuating linkage which connects the front leg frame to the rear leg frame. The arrangement of these extensions with respect to the pivotal attaching point of the actuating linkage to the rear leg frame is such as not to require any locking means in the unfolded position of the chair. The linkage operates to open and close the chair with a single motion applied to the seat and back frames. When the chair is being opened the extensions come into contact with the linkage stopping the unfolding action at the right point for seating.

Another feature is the provision of a novel spring connection between the back frame and the rear leg frame. This spring exerts maximum tension at the full open position, holds the frames in that position, and prevents the chair from being tripped. The spring has only nominal action once the folding is started, and consequently the chair is easy to close. It also aids in opening the chair.

A further feature is the provision of simple adjusting means whereby the back may be easily changed to different positions of inclination while occupying the chair.

In the drawings forming a part of this specification:

Fig. 1 is a side elevation of the chair according to my invention,

Fig. 2 a fragmental detail of the frames adjacent the rear of the chair in the direction of arrows 2—2,

Fig. 3 a detail in section on the line 3—3 of Fig. 1,

Fig. 4 a detail on line 4—4 of Fig. 5 at the front of an arm rest,

Fig. 5 a central section through the chair in the act of folding,

Fig. 6 a central section of the folded chair,

Fig. 7 a plan view of the folded chair seen from underneath,

Fig. 8 a folded view in side elevation,

Fig. 9 a view partly sectioned of back adjusting means,

Fig. 10 a cross section on line 10—10 of Fig. 9,

Fig. 11 a similar section with the parts adjusted, and

Fig. 12 a side view of the folded parts.

In the drawing the numeral 10 indicates the chair in general. It has a seat frame 11, front leg frame 12, rear leg frame 13, back frame 14, arm rests 15, actuating links 16, pivot bar 17, and a tension spring 18, connected together by suitable fasteners, presenting the appearance shown in Fig. 1 when opened for use.

The bar 17 acts as a common pivotal mounting for the flattened ends 20, 21, 22 respectively of the seat, rear leg, and back frames, these being swingably mounted on the bar as shown for example in Fig. 3 where a special

machine screw 23 is tightly threaded into bore 24 to eliminate the need of pinning. This screw carries a large head 25 having shoulder 26 which confines the three frame ends and washers 27 against the end of the bar 17, there being enough play to allow the frames to swing freely during closing and opening.

The frames are preferably of one piece U-shaped tubular formation made from aluminum stock and have the same pivotal arrangement at both sides as seen in Fig. 7.

The forward portion of seat frame 11 is pivoted at 30 to front leg frame 12, the upper ends of the latter being pivoted at 31 in brackets 32 which are fastened by screws 33 to the under side of the arm rests 15. Fiber washers are desirable at 34 and at other joints throughout the structure to give smooth action in manipulating the frames.

The back frame 14 is secured by pivot screws 35 to the rear side edges of the arm rests. For simplicity the coil spring 18 is anchored at one end 36 to the screw 35, and at the other end to the pivot bolt 37 which secures the back end of link 16 to rear leg frame 13 below bar 17. The forward end 38 of the actuating link is pivoted at 31 to the bracket 32. As seen in Fig. 1 the spring 18 is bridged vertically between the frames 13, 14 and exerts tension behind the pivotal axis of bar 17 holding the chair open for use without the need of a lock up, and the chair is further prevented from being tripped. In the sitting position the head 25 of screw 23 rests upon link 16 establishing the rearward reach of rear leg 13. The spring 18 being always under tension enables the chair to be lifted or moved along the supporting surface without collapsing.

In Fig. 5 it will be noted that during the closing operation the action of links 16 caused by motion applied to the seat and back frames results in wrapping spring 18 partially around pivot bar 17. The spring therefore has only negligible resistance once the folding is started. The final position is reached in Fig. 6 where the links and the spring are contained within the outlines of the folded framework, and the pulling effort of the spring is practically neutralized. However, the spring comes into action as an aid in opening the chair when the user moves the back and seat frames apart.

Seat and back covers have not been shown since they may be of various forms and attached in different ways to fit the framework. It is to be noted that the pivot bar 17 serves to complete the seat and back frames into rectangles providing anchorage points for loops or other cover fastenings.

The inclination of the back may be made adjustable by the arrangement shown in Figs. 9 to 12 wherein a metal adjusting piece in the form of a bridge 40 is fastened by screws 41 to the under side of each arm rest 15. The bridge 40 has a line of corrugations defining notches 42 and is spaced from the face 43 of arm rest 15 to provide operating room for the clamping web portion 44 of a latch 45 pivoted at 46 to the upper end of the leg frame 12. A pin or bolt 47 extends crosswise of latch 45 and is adapted to engage a notch of the bridge while the clamping portion 44 bites down upon the upper side 48 (see Fig. 11) to hold the parts in adjusted position corresponding to a selected inclination of the back frame 14.

When another adjustment is wanted the arm rests 15 are raised slightly as indicated by arrow A (Fig. 10) where a light spring 49 has rocked the latch 45 to bring stop 50 against the top edge 51 of the leg frame 12. This holds the latch in a position to clear the pin from the notches 42 allowing the bridge to be run back and forth through the clearances between the clamp 44 and the pin 47. When a desired inclination has been chosen a down pressure (see arrow B, Fig. 11) on the arm rest engages

a notch 42 against pin bolt 47. As the occupant leans back the arm rests move back (arrow C). This rocks latch 45 about its pivot 46 to bring clamping portion 44 down angularly against bridge 40. The stop 50 is shown in the present example as an offset 52 of the generally U-shaped latch 45 which straddles the top of leg frame 12. Pivot 46 may be formed by a suitable fastener such as a bolt passed through aligned holes 53 in ends 54 and having sufficient looseness to allow free play for the latch. The spring element 49 is shown as light spring wire looped around the pivot bolt 46 and having its opposite ends 55 gripped under the head 56 and nut 57 of pin bolt 47. When the chair is being folded the latch 45 moves to the inner end of the bridge, and the parts come to the positions indicated in Fig. 12. The actuating links 16 are pivotally tied to the bolts 46 for simplicity, the joints being loose enough to allow full freedom for the adjusting elements. A person may leave or reoccupy the chair without disturbing the adjustment of the arm rests since their weight against the light springs 49 is sufficient to hold the latches in their slanting engagement with the notches.

In the present example the bar 17 forms a common axis for the three frames 11, 13, 14. However, other and individual pivots may be used. For instance either of frames 13 and 14 could be separately pivoted on frame 11 to fold and coact with spring 18. The claims are intended to embrace such modifications.

I claim:

1. A folding chair comprising a seat frame, rear leg frame, back frame, a common pivot member at the rear of the chair upon which the foregoing three frames are swingably mounted, the back frame extending rearwardly and upwardly and the rear leg frame extending rearwardly and downwardly from the pivot member when the chair is open for use, a tension spring bridged between points respectively on the back frame and the rear leg frame spaced with respect to the pivot member, said spring extending in spaced relation to and behind the pivot member when the chair is open for use, a front leg frame pivoted to the seat frame with its upper portions extending above the seat frame, arm rests pivoted to the back frame, the forward ends of the arm rests being pivoted to the front leg frame above the seat frame, actuating links respectively connecting the upper portions of the front leg frame to the respective sides of the rear leg frame below the position of the pivot member when the chair is open for use, and extensions carried by the pivot member resting respectively upon the links when the chair is open for use.

2. A folding chair comprising a seat frame, rear leg frame, back frame, means for cooperatively pivoting the three frames at the rear of the chair enabling them to be folded compactly or opened for use, the back frame extending rearwardly and upwardly and the rear leg frame extending rearwardly and downwardly from the pivot means when the chair is open for use, a tension spring bridged between points respectively on the back frame and the rear leg frame spaced with respect to the pivot means, said spring being located in a position to the rear of the pivot means where it is adapted to hold back frame and the rear leg frame open when the chair is open for use, a front leg frame pivoted to the seat frame with its upper portions extending above the seat frame, arm rests pivoted to the back frame, the forward ends of the arm rest being pivoted to the front leg frame above the position of the seat frame, actuating link respectively connecting the upper portions of the front leg frame to the respective sides of the rear leg frame, and a stop on each side of the chair resting upon said respective links when the chair is open for use under tension of the spring.

3. A folding chair as defined in claim 2, in which the pivoting means comprises a cross bar on which the seat frame, the rear leg frame, and the back frame are pivoted and around which the tension spring is partially wrapped when the parts of the chair are moved to folded closed position.

4. A folding chair comprising a seat frame, rear leg frame, back frame, pivot means at the rear of the chair upon which the respective sides of the foregoing three frames are swingably mounted on a common axis, the back frame extending rearwardly and upwardly and the rear leg frame extending rearwardly and downwardly from the pivot means when the chair is open for use, a tensions spring bridged between points respectively on the back frame and the rear leg frame spaced with respect to the common pivot axis, said spring being located in spaced relation to and behind the position of said common pivot axis when the chair is open for use, the ends of the tension spring being connected respectively to the back frame and rear leg frame at said points, a front leg frame pivoted to the seat frame with its upper portions extending above the seat frame at the respective sides of the chair, arm rests pivoted to the back frame, the forward ends of the arm rests being pivoted respectively to the upper portions of the front leg frame above the seat frame, actuating links respectively connecting the upper portions of the front leg frame to the respective sides of the rear leg frame below the position of the pivot means, and extensions respectively carried by the pivot means on each side of the chair resting respectively upon the liks when the chair is open for use, said tension spring biasing the rear leg frame, the back frame and the front leg frame to their open chair positions when the chair is open for use and the tension spring extends behind and in spaced relation to the common pivot axis of the pivot means.

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