Oct. 24, 1939. H. P. NORDMARK 2,177,186

FOLDING CHAIR

Filed Jan. 27, 1937 2 Sheets-Sheet 1

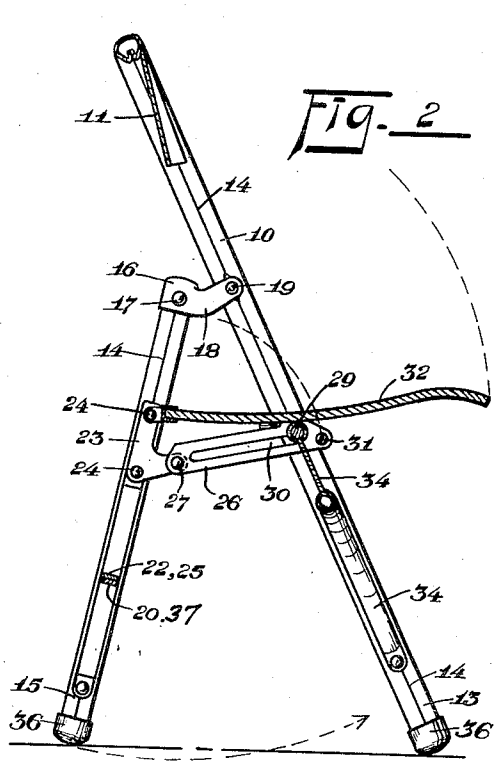


Fig. 2

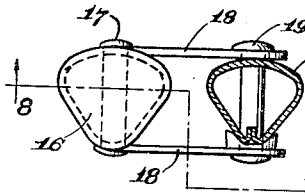


Fig. 7

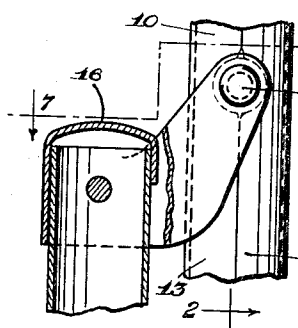


Fig. 8

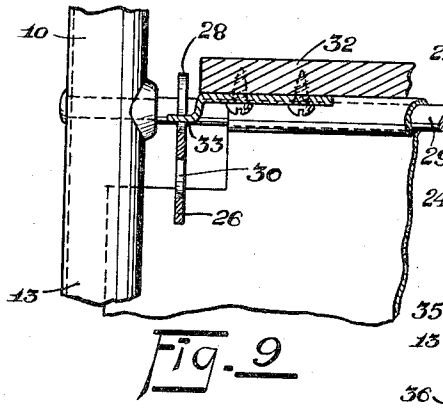


Fig. 9

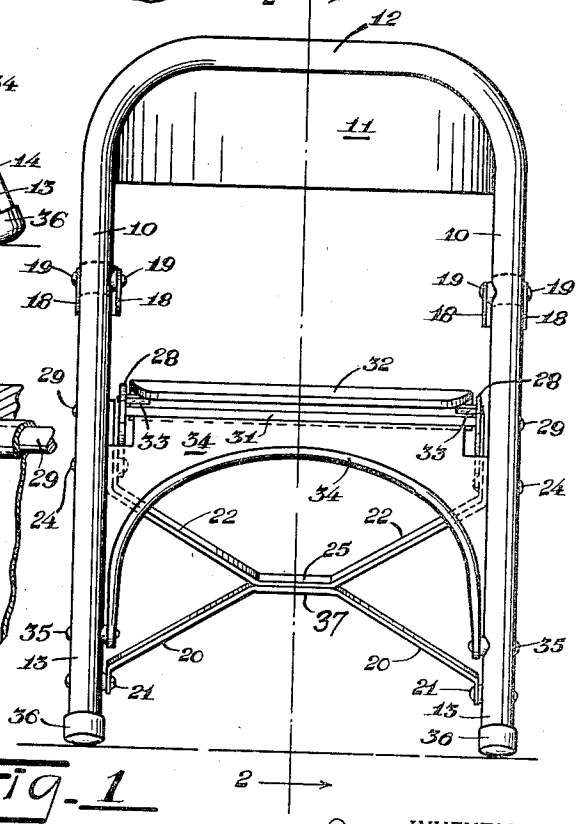


Fig. 1

Witness:
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FOLDING CHAIR

Filed Jan. 27, 1937 2 Sheets-Sheet 2

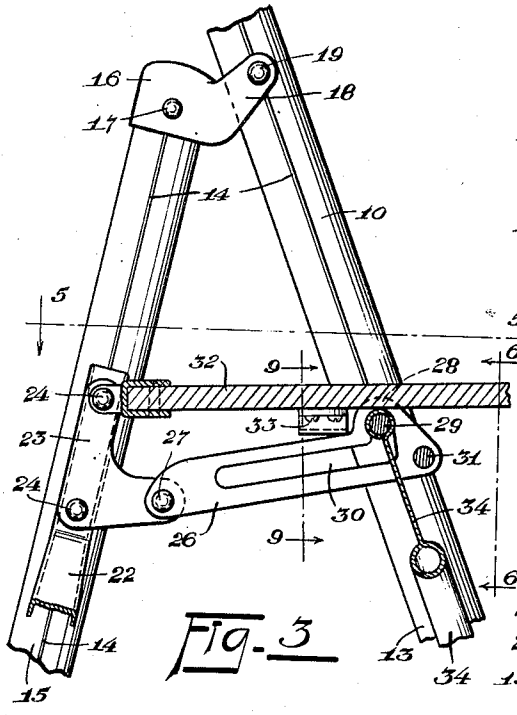


Fig. 3

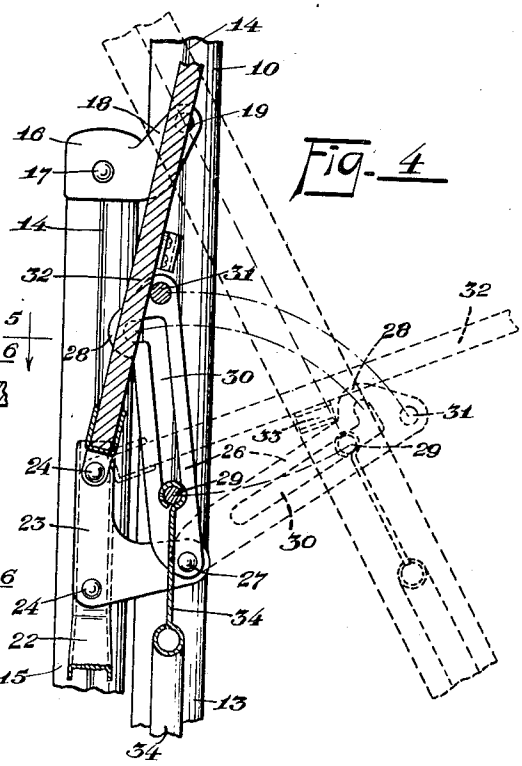


Fig. 4

Fig. 5

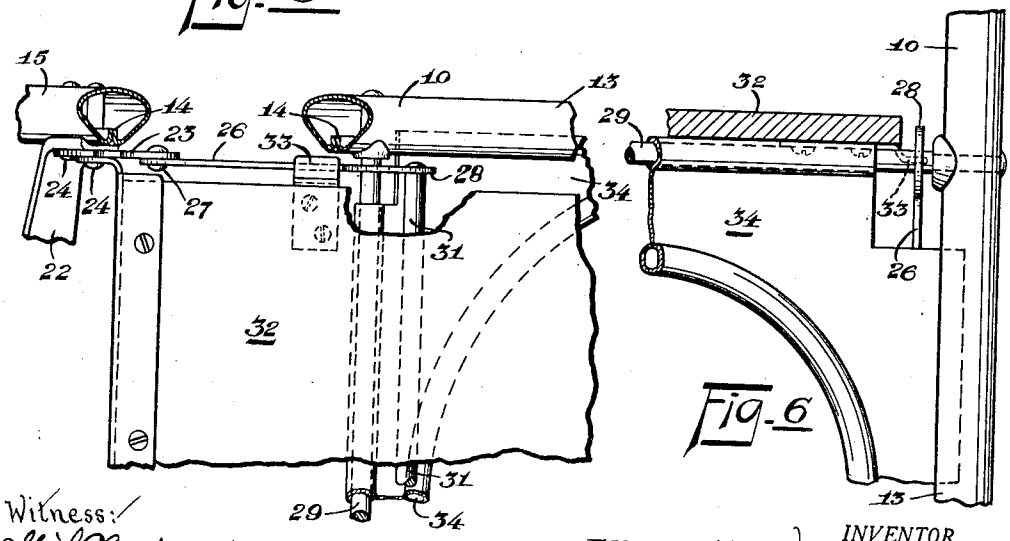


Fig. 6

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Patented Oct. 24, 1939 2,177,186

UNITED STATES PATENT OFFICE

2,177,186

FOLDING CHAIR

Henry P. Nordmark, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich., a corporation of New Jersey

Application January 27, 1937, Serial No. 122,494

6 Claims. (Cl. 155—142)

The present invention relates to folding chairs and more particularly to folding chairs of metal construction of the general character shown in my copending application, Serial No. 121,461, filed January 21, 1937.

The primary objects of the instant invention are to provide a chair of the general character above set forth which is rugged and sturdy in construction; to provide such a chair which may be readily and conveniently folded and unfolded; to provide such a chair whose seat may be folded upwardly independently of the folding of the chair supporting legs; to provide such a chair having an arched reinforcing web secured interjacent the front legs of the chair and providing leg room for an occupant of the chair when tilting the seat upwardly upon arising from the seat; and, to provide such a chair which is economical in manufacture, pleasing in appearance and utilitarian in use.

An illustrative embodiment of the invention is shown in the accompanying drawings, wherein:

Figure 1 is a front elevational view of the chair in its unfolded position;

Figure 2 is a vertical central sectional view thereof on line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary view of the link connected front and rear folding legs of the chair in the unfolded position of the legs;

Figure 4 is a view similar to Figure 3 but showing the link connected front and rear legs of the chain in the folded position of the legs from their partly folded position indicated in dotted lines;

Figure 5 is a sectional view thereof on line 5—5 of Figure 3;

Figure 6 is another sectional view on line 6—6 of Figure 3;

Figure 7 is a view of one of the front and rear legs of the chair in their folded position and on line 7—7 of Figure 8;

Figure 8 is a view thereof on line 8—8 of Figure 7; and

Figure 9 is a sectional view on line 9—9 of Figure 3.

Referring to the drawings in which like parts of the construction shown are designated by the same numerals in the several views, the folding chair generally comprises a U-shaped metal frame 10 forming a support for a curved back 11 which is preferably of sheet metal The back is positioned below the horizontally disposed medial portion 12 of the frame to which it is suitably secured and to its oppositely disposed spaced parallel portions which form spaced front legs 13. The frame 10 is here shown as tubular and triangularly formed in cross section from sheet metal stock to give it strength and rigidity at light weight, the longitudinal edges of the metal stock being flanged inwardly to form a finished and reinforcing seam 14.

A pair of tubular metal spaced rear legs 15 formed in a manner like that of the frame 10 are each provided at their upper ends with a cap 16 secured thereto by means of a rivet 17 passing through the seam of the leg and through the opposite wall thereof. This cap is provided with a pair of spaced integrally formed forwardly projecting arms 18 which arms embrace the opposite sides of each front leg 13 of the frame and to which the arms are pivotally secured as by a pin 19 passing through the seam of each front leg and through the opposite wall thereof in the manner best shown in Figures 7 and 8.

A reinforcing member 20 for the spaced rear legs 15 is U-shaped in form and is secured at its opposite ends interjacent the inner sides of the rear legs 15 in inverted position as by rivets 21 which pass through the respective seams of each rear leg and through the opposite wall of each rear leg. A second reinforcing member 22 for the spaced rear legs is likewise U-shaped in form and is secured at its opposite ends interjacent the inner sides of the rear legs 15 between each rear leg and a seat supporting bracket 23 as by spaced rivets 24 passing through the seam of each rear leg and through the opposite wall of each rear leg, the middle portions 37, 25 of the U-shaped reinforcing member 22 and of the inverted U-shaped reinforcing member 20 being secured together in any suitable manner as by spot welding.

A pair of slotted links 26, each pivotally secured to the forwardly projecting portion of the seat supporting brackets 23 as by a pin 27 are each provided with a cam portion 28 adjacent the free end of each link and a strut 29 is secured interjacent the front legs 13 of the chair and passing through the slot 30 of each link 26.

A tie 31 is secured interjacent the free ends of each link 26 for effecting the folding movement of the front legs 13 of the chair relative to the rear legs 15 thereof during the swinging movement of the tie 31 and a seat 32 pivotally secured to each seat supporting bracket 23 interjacent said brackets and adjacent the opposite rear corners of the seat by the upper rivets 24, is independently tiltable and is provided with outwardly flanged elements 33 on its opposite sides each adapted to engage the cam portion 28 of a slotted link 26 during the downward swinging movement of the seat 32 for unfolding the front and rear legs

of the chair. Thus, as the seat 32 is lowered from its folded position shown in full lines in Figure 4 to its unfolded position shown in Figures 2 and 3, the seat first contacts the tie 31, which tie is thus caused to progress forwardly with respect to the seat until the elements 33 contact the forward surfaces of cams 28. Further lowering of the seat causes the elements 33 to bear against first the forward surfaces of cams 28, and next the rearward surfaces of these cams, and finally against the flat upper surfaces of the links 26 as shown in dotted lines in Figure 4, thereby effecting unfolding of the front and rear legs of the chair. The elements 33 finally rest on links 26 to thus support the seat, and the seat may also rest upon the curled upper edge of the web 34 to thus be further supported by the strut 29.

A reinforcing web 34 whose lower edge is arched and curled to form a tubular lower edge portion and whose upper edge is curled over the strut 29 is secured at its lower corners to the front legs of the chair frame by means of a rivet 35 at each end passing through the seam of each front leg and through the opposite wall of each front leg to provide leg room for an occupant of the chair when tilting the seat 32 upwardly upon arising from his previously occupied seat and noiseless feet caps 36 or rubber or the like are preferably provided for all legs of the chair.

Thus it is seen that in the upward swinging movement of the slotted links 26, the strut 29 progresses to the lower end of slots 30 as seen in Figure 4. Thereupon farther swinging movement of the links takes place about strut 29 as a pivot, the lower ends of slots 30 serving as bearings for strut 29. Slots 30, strut 29, pins 19, and pins 27 are so arranged on each side of the chair that the fixed distance from pin 27 to the bottom of slot 30 plus the fixed distance from the strut 29 to pin 19 is slightly greater than the normal distance from pin 27 to pin 19. By this arrangement, when strut 29 moves into a line between pins 27 and 19, these pins are forced slightly apart. When strut 29 passes to the left of the line, the reactionary retracting of the pins tends to move the strut, front legs 13, links 26, tie 31 and seat 32 rearwardly toward rear legs 15. This rearward movement is checked by the contact of seat 32 against the curved back 11, so that the chair legs and seat are tensionally held in folded position. The upwardly turned portion of the slot 30 of each link 26 seats on the strut 29 when the chair is in its unfolded position as best shown in Figure 3, preventing the legs from becoming folded together when an occupant of the seat lifts the same when arising therefrom. Since the slots are disposed at an angle, weight of an occupant upon the seat when the legs of the chair are in partly folded position, causes the legs to completely unfold.

It will thus be seen that the folding chair herein shown and described is rugged and sturdy in construction, economical in manufacture, pleasing in appearance and has certain novel features over the folding chair construction of my copending application above identified.

While but one specific embodiment of this invention has been herein shown and described, it will be understood that certain details of the construction shown may be altered or omitted without departing from the spirit of this invention as the same is defined by the following claims.

I claim:

1. A folding chair comprising a frame forming a back support and spaced front legs, a pair of tied spaced rear legs pivotally secured to the frame, a seat pivotally secured between the rear legs, a slotted link pivotally secured to a rear leg, a member secured to the frame and projecting through the slot for effecting the folding and unfolding movements of the front legs of the chair relative to the rear legs thereof during the respective raising and lowering movements of the slotted link, and means on said seat resting on said link in the lowered position of the seat.

2. A folding chair comprising a frame forming a back support and spaced front legs, a pair of spaced rear legs pivotally secured to the frame, a pair of slotted links each pivotally secured to a rear leg of the chair and forming seat supports, a strut secured interjacent the front legs of the chair and passing through the slot of each link, a tie secured interjacent the free ends of each link for effecting the folding movement of the front legs of the chair relative to the rear legs thereof during the swinging movement of the tie, a seat pivotally secured between the rear legs of the chair, and means on said seat resting on said links in the lowered position of the seat.

3. A folding chair comprising a frame forming a back support and spaced front legs, a pair of spaced rear legs pivotally secured to the frame, a pair of slotted links each pivotally secured to a rear leg of the chair and having a cam portion adjacent the free end thereof, a strut secured interjacent the front legs of the chair and passing through the slot of each link, a tie secured interjacent the free ends of each link for effecting the folding movement of the front legs of the chair relative to the rear legs thereof during the swinging movement of the tie, a seat pivotally secured between the rear legs of the chair and having means thereon adapted to engage the cam portion of each slotted link during a portion of the downward swinging movement of the seat for unfolding the chair, said means resting on the links in the lowered position of the seat.

4. A folding chair comprising a frame forming a back support and spaced front legs, a pair of spaced rear legs pivotally secured to the frame, a pair of slotted links each pivotally secured to a rear leg of the chair and having a cam portion adjacent the free end thereof, a strut secured interjacent the front legs of the chair and passing through the slot of each link, a tie secured interjacent the free ends of each link for effecting the folding movement of the front legs of the chair relative to the rear legs thereof during the swinging movement of the tie, a seat pivotally secured between the rear legs of the chair and provided with outwardly flanged elements on its opposite sides adapted to engage the cam portion of each slotted link during a portion of the downward swinging movement of the seat for unfolding the chair, said outwardly flanged elements resting on the links in the lowered position of the seat.

5. A folding chair comprising a frame forming a back support and spaced front legs, a pair of spaced rear legs pivotally secured to the frame, a pair of slotted links each pivotally secured to a rear leg of the chair and forming seat supports, a strut secured interjacent the front legs of the chair and passing through the slot of each link, a tie secured interjacent the free ends of each link for effecting the folding movement of the front legs of the chair relative to the rear legs thereof during the swinging movement of the tie, a seat pivotally secured between the rear legs of the chair, a reinforcing web secured interjacent the front legs of the chair, the lower edge of said web

being arched to provide leg room for an occupant of the chair when tilting the seat upwardly upon arising from the seat, and means on said seat resting on said links in the lowered position of the seat.

6. A folding chair comprising a frame forming a back support and spaced front legs, a pair of tied spaced rear legs pivotally secured to the frame, a seat pivotally secured between the rear legs, a slotted link pivotally secured to a rear leg, a strut secured to the frame and projecting through the slot, the fixed distance from the link pivot to the bottom of the slot plus the fixed distance from the strut to the rear leg pivot being slightly greater than the normal distance from the link pivot to the rear leg pivot for tensionally locking the chair in folded position and means on said seat resting on said links in the lowered position of the seat.

HENRY P. NORDMARK.