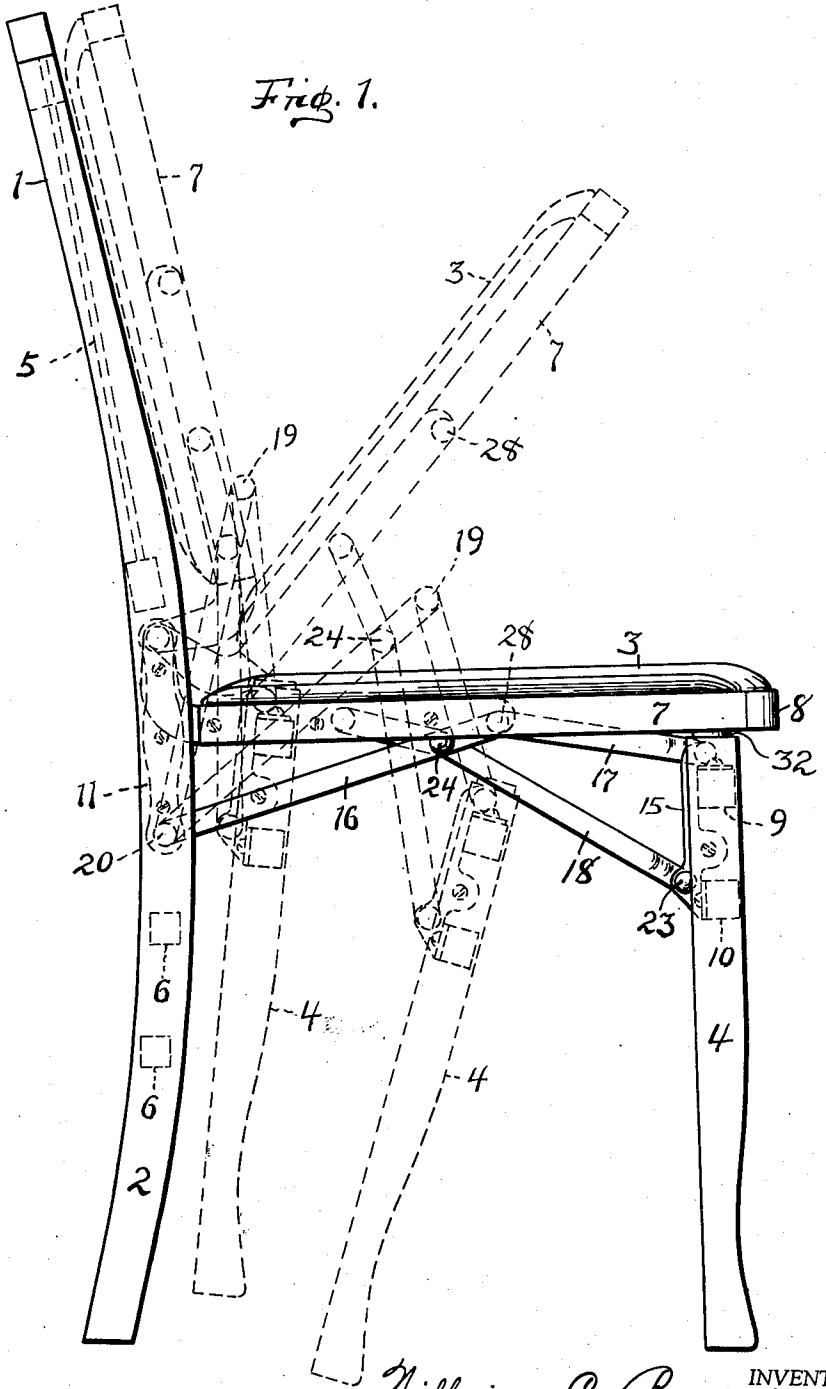
Nov. 9, 1937. W. C. RASTETTER 2,098,711

FOLDING CHAIR

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Fig. 1.



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Fig. 2.

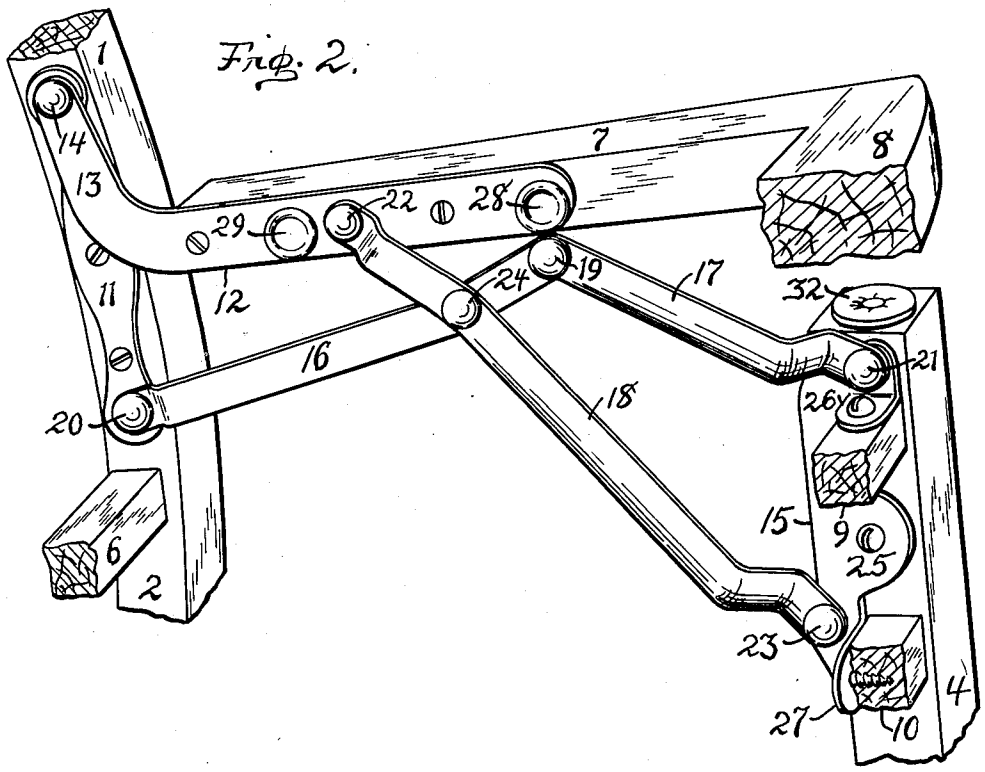


Fig. 3.

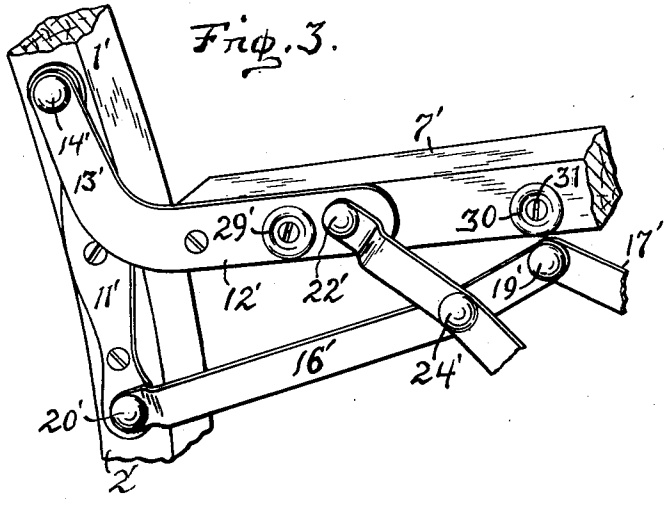
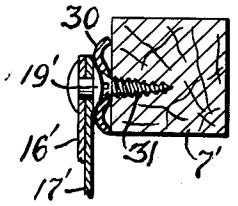


Fig. 4.



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Fig. 5.

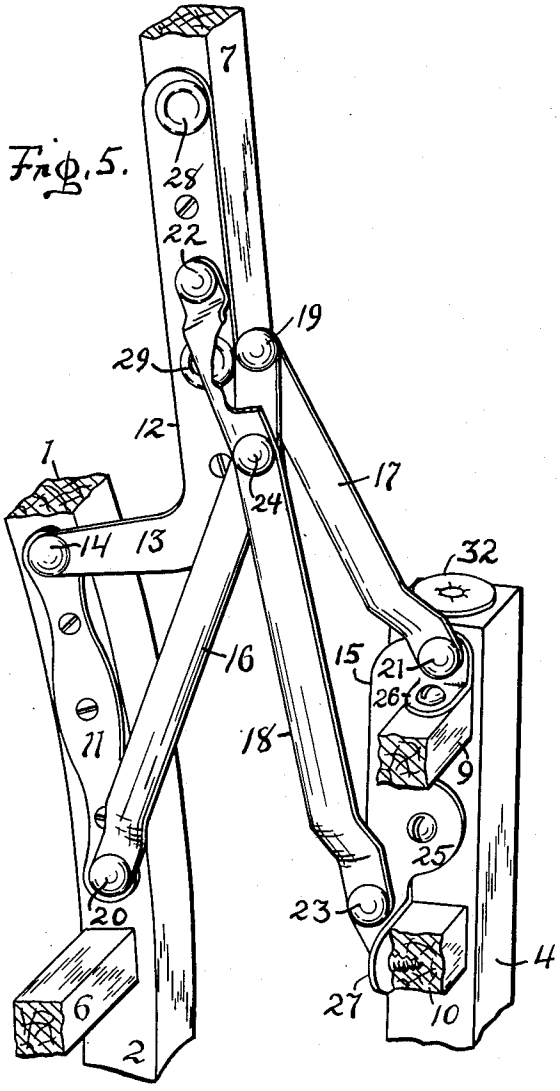
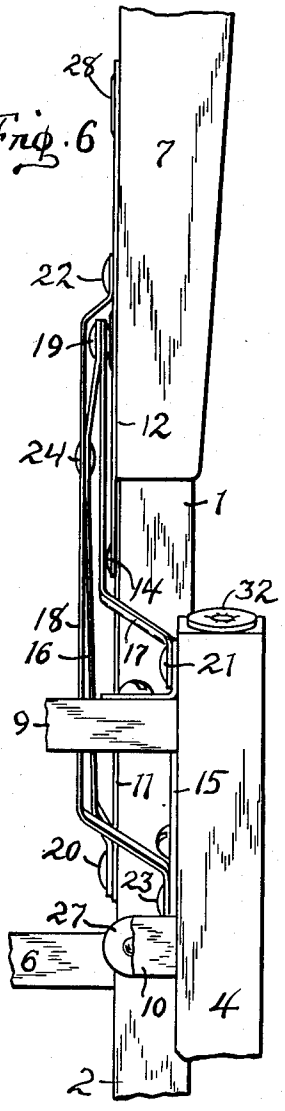


Fig. 6.



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Patented Nov. 9, 1937

2,098,711

UNITED STATES PATENT OFFICE

2,098,711

FOLDING CHAIR

William C. Rastetter, Fort Wayne, Ind.

Application May 25, 1937, Serial No. 144,670

9 Claims. (Cl. 155—141)

This invention relates to improvements in folding chairs of that type in which the part forming the back of the chair is an integral continuation of the rear legs, and the seat and forelegs of the chair, and the linkage connecting the seat, forelegs and rear leg and back structure, constitute the folding parts.

An object of the invention is to afford a chair of the conventional dining-room type with folding parts so constructed as to permit folding of the seat and forelegs against the rear leg and back structure, and also to provide connections between the seat, forelegs and rear structure, so arranged as to be inconspicuous when the chair is fully extended for use.

Another object is to form the link and hinge connections between the seat, forelegs and rear structure so that the link structure has yielding latch connection with the seat when the chair is fully unfolded.

A further object is to provide hinge plates for securing a seat of the chair to its rear structure, and linkage connecting said hinge plates, forelegs and rear structure so constituted as to have yielding latch engagement with said hinge-plates to thereby augment rigidity of the chair when extended.

It is also an object of the invention to provide linkage and associated connections with the rear leg and back structure, seat and foreleg structure so arranged as to provide yielding latch engagements between said linkage and connections when the chair is extended for use and also when it is in folded position.

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

Fig. 1 is a side elevation of a chair in which the invention is embodied, the full lines indicating the chair in fully extended position for use, the seat, forelegs and linkage being shown by dotted lines in semi-collapsed and also in completely collapsed positions;

Fig. 2 is a fragmentary perspective view showing the rear structure, seat and foreleg structure and the linkage connecting the same, the parts being shown as when the chair is partially collapsed;

Fig. 3 is another fragmentary perspective view of the back structure, seat frame and linkage with the latching means in modified form;

Fig. 4 is a cross section showing the seat frame, the latching means of the type shown in Fig. 3, and the link members in latched position;

Fig. 5 is a fragmentary perspective view of the parts shown in Fig. 2 in advanced collapsed position; and

Fig. 6 is a fragmentary front elevation of the linkage and parts to which they are connected in their positions when collapsed.

The illustrative embodiment of the invention consists of a rigid rear frame structure formed of the back 1 and rear legs 2 of a folding chair, a folding seat 3, a foreleg structure 4, and link mechanism hereinafter described connecting the seat and foreleg structure with the rear leg and back structure in folding relation therewith.

The upper portion of the rear frame structure has a suitable back-rest 5, and the rear legs are connected by cross-pieces 6 in the usual manner. The seat 3 has side and front frame members 7 and 8 and the foreleg structure 4 includes cross-pieces 9 and 10.

The mechanism for connecting the seat and the foreleg structure with the rear frame structure consists of two groups of members, the one group being the counterpart of the other, and each being assembled suitably for installation respectively in the right and left hand sides of the chair. In each assembly are included a rear anchor-plate 11, a hinge-plate 12 having an upturned extension 13 that is secured to said plate at the upper end thereof by a pivot 14, a front anchor-plate 15, a toggle formed of arms 16 and 17, and a lever 18. The forward end of the toggle arm 16 and the rear end of the toggle arm 17 are pivotally connected together by a pivot 19. The rear end of the arm 16 is connected to the lower end of the rear anchor-plate 11 by a pivot 20, and the forward end of the toggle arm 17 is connected to the upper end of the front anchor plate by a pivot 21. The upper end of the lever 18 is connected to the hinge-plate 12 by a pivot 22 and its lower end is connected to the lower part of the front anchor-plate 15 by a pivot 23. Also, said lever is connected to the toggle arm 16 by a pivot 24, the pivotal connection 24 constituting a fulcrum for the lever 18. Preferably, each anchor-plate 15 is provided with ears 25, 26 and 27 that are suitably secured respectively to the corresponding front leg 4 and the upper and lower cross-pieces 9 and 10. The forward end portion of the hinge-plate 12 has an embossment shaped to provide a socket 28 into which the projecting rounded head of the pivot 19 is adapted to be received when the seat is moved to its fully extended position. As the pivot 19 is moved into engagement with the embossment the toggle and the lever are sprung laterally inward and yieldingly hold the rounded end of the pivot in latched engagement in the socket 28. The pressure of the toggle pivots 19 against the corresponding embossments augments the rigidity of the chair when unfolded.

Each hinge-plate 12 has also another embossment providing a second socket 29 so located as to receive the rounded end of the corresponding toggle pivot 19 when the chair is folded and thus yieldingly retain the folding members of the chair in collapsed position.

In the modified form, illustrated in Figs. 3 and 4, a cup-shaped disc 30 is secured on the inner face of each seat side member 7' by means of a screw 31, which is separate and apart from the hinge-plate 12' and has yielding latched engagement with the corresponding pivot 19' that connects the toggle arms 16' and 17'. The hinge-plate 12' also is provided with an embossment providing a socket 29' for the reception of the pivot 19' when the chair is completely collapsed into folded position.

Upon the top of each foreleg 4 is secured a cushion 32 consisting preferably of a felt or rubber disc. The cushions yield to the downward pressure of the seat, when the chair is moved to extended position, to an extent that permits the rounded ends of the toggle pivots 19 to spring into latched engagement with the corresponding sockets.

In use, the chair is folded by raising the front end of the seat with sufficient force to cause the pivots 19 to spring out from the sockets 29, and upon upward swinging movement of the seat to folded position against the back-frame the rounded ends of the pivots 19 spring into the sockets 29 thus yieldingly retaining the folding members in collapsed position. The chair is unfolded into position for use by imparting outward swinging movement to the seat, whereupon the forelegs are thrust, through the medium of the toggle arms 16 and 17 and the lever 18, into operative position to support the front end of the seat which bears thereon, and as the cushions 32 yield to the downward pressure of the seat on the foreleg structure, the rounded ends of the pivots 19 spring into the sockets 29, and thereby the chair is yieldingly latched in extended position.

While it is preferable to latch the folding members of the chair in both folded and unfolded positions, in some instances, it may be desired in order to permit unfolding of the chair without restraint of the latching means to hold it in folded position. Thus, in the form shown in Fig. 1, the rear sockets 29 on the hinge-plates 12 are omitted, and the toggle pivots 19 are so disposed as to have latching engagement in the sockets 29 when the chair is completely unfolded but do not have latching engagement when the seat is completely folded. In the other forms illustrated two sockets are provided for latched engagements with the toggle pivots when the chair is completely folded or unfolded for use.

The illustrative embodiment of the invention is exemplary and is subject to variation in structure and arrangement of parts, which would still accomplish the same end, by exercise of engineering skill, without departure from the spirit of the invention. Therefore, the claims are intended to encompass such variations in structure and rearrangement of parts.

What I claim is:—

1. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms connected together by a pivot having a rounded projecting end, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, a lever pivotally connected to one of said toggle arms and at one end thereof with the corresponding hinge-plate and also connected pivotally at its opposite end with said second anchor-plate at the lower end thereof, each of said hinge plates having sockets formed thereon so located that the projecting ends of the corresponding toggle pivots have latching engagement in one or the other of said sockets accordingly when the seat and the foreleg structure are moved into extended or folded position, and cushions on the foreleg structure upon which the forward end of the seat bears when the chair is completely extended.

2. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms connected together by a pivot having a rounded projecting end, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, and a lever pivotally connected to one of said toggle arms and at one end thereof with the corresponding hinge-plate and also connected pivotally at its opposite end with said second anchor-plate at the lower end thereof, each of said hinge-plates having sockets formed thereon so located that the projecting ends of the corresponding toggle pivots have latching engagement in one or the other of said sockets accordingly when the seat and the foreleg structure are moved into extended or folded position.

3. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms connected together by a pivot having a rounded projecting end, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, a lever having pivotal connection with one of said toggle arms and at one end thereof with the corresponding hinge plate and being connected pivotally at its opposite end with said second anchor-plate at the lower end thereof, each of said hinge-plates having a socket formed thereon so located that the projecting end of the corresponding toggle pivot has latching engagement therein when the seat and the foreleg structure are moved

into extended position, and cushions on the foreleg structure upon which the forward end of the seat bears when the chair is completely extended.

4. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms connected together by a pivot having a rounded projecting end, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, and a lever having pivotal connection with one of said toggle arms and at one end thereof with the corresponding hinge-plate and being connected pivotally at its opposite end with said second anchor-plate at the lower end thereof, each of said hinge-plates having a socket formed thereon so located that the projecting end of the corresponding toggle pivot has latching engagement therein when the seat and the foreleg structure are moved into extended position.

5. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms pivotally connected at their meeting ends, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, a lever having pivotal connection with one of said toggle arms and at one end thereof with the corresponding hinge-plate and being connected pivotally at its opposite end with said second anchor-plate at the lower end thereof, and cushion means disposed to be compressed between the foreleg structure and seat when the chair is fully extended.

6. In a folding chair, a rigid rear frame structure constituting the back and rear legs of said chair, a seat, a foreleg structure, and mechanism operatively connecting said seat and foreleg structure with said rear frame, said mechanism consisting of right and left hand assembled groups of members, in each of which groups are included an anchor-plate secured to the rear frame, a hinge-plate secured to said seat and pivoted on said anchor-plate at the upper end thereof, a second anchor-plate secured to the front leg structure, toggle arms pivotally connected at their meeting ends, one of said toggle arms having pivotal connection with the lower end of the first-mentioned anchor-plate and the outer end of the other toggle arm having pivotal connection with said second anchor-plate at the upper end thereof, and a lever having pivotal connection with one of said toggle arms and at one end thereof with the corresponding hinge-plate and being connected pivotally at its opposite end with said second anchor-plate at the lower end thereof.

7. A folding chair having a rear frame constituting the back and rear legs of said chair, a seat having a frame pivoted to said rear frame, a foreleg structure, toggles connecting said rear frame and foreleg structure, each toggle consisting of two arms connected together by a pivot provided with a projecting end, one arm of each toggle having pivotal connection with one side of the rear frame at a point thereon lower than the seat pivot, and the other of said arms being pivoted to said foreleg structure at a point adjacent the top thereof, levers pivoted respectively to a corresponding one of said toggle arms at a point between its ends, one end of each lever having pivotal connection with the seat-frame, and its opposite end having pivotal connection with the foreleg structure at a point thereon lower than its pivotal connection with said toggle, means on the seat-frame having latching engagement with the projecting ends of said toggle pivots, and cushion means disposed to be compressed between the foreleg structure and said frame when the chair is fully extended.

8. A folding chair having a rear frame constituting the back and rear legs of said chair, a seat having a frame pivoted to said rear frame, a foreleg structure, toggles connecting said rear frame and foreleg structure, each toggle consisting of two arms connected together by a pivot provided with a projecting end, one arm of each toggle having pivotal connection with one side of the rear frame at a point thereon lower than the seat pivot, and the other of said arms being pivoted to said foreleg structure at a point adjacent the top thereof, levers pivoted respectively to a corresponding one of said toggle arms at a point between its ends, one end of each lever having pivotal connection with the seat-frame, and its opposite end having pivotal connection with the foreleg structure at a point thereon lower than its pivotal connection with said toggle, and means on the seat-frame having latching engagement with the projecting ends of said toggle pivots.

9. A folding chair having a rear frame constituting the back and rear legs of said chair, a seat having a frame pivoted to said rear frame, a foreleg structure, toggles connecting said rear frame and foreleg structure, each toggle consisting of two arms connected together by a pivot provided with a projecting end, one arm of each toggle having pivotal connection with one side of the rear frame at a point thereon lower than the seat pivot, and the other of said arms being pivoted to said foreleg structure at a point adjacent the top thereof, levers pivoted respectively to a corresponding one of said toggle arms at a point between its ends, one end of each lever having pivotal connection with the seat-frame, and its opposite end having pivotal connection with the foreleg structure at a point thereon lower than its pivotal connection with said toggle, and means on the seat-frame having latching engagement with the projecting ends of said toggle pivots when the chair is completely unfolded and also when the chair is completely folded.

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