

April 28, 1931.

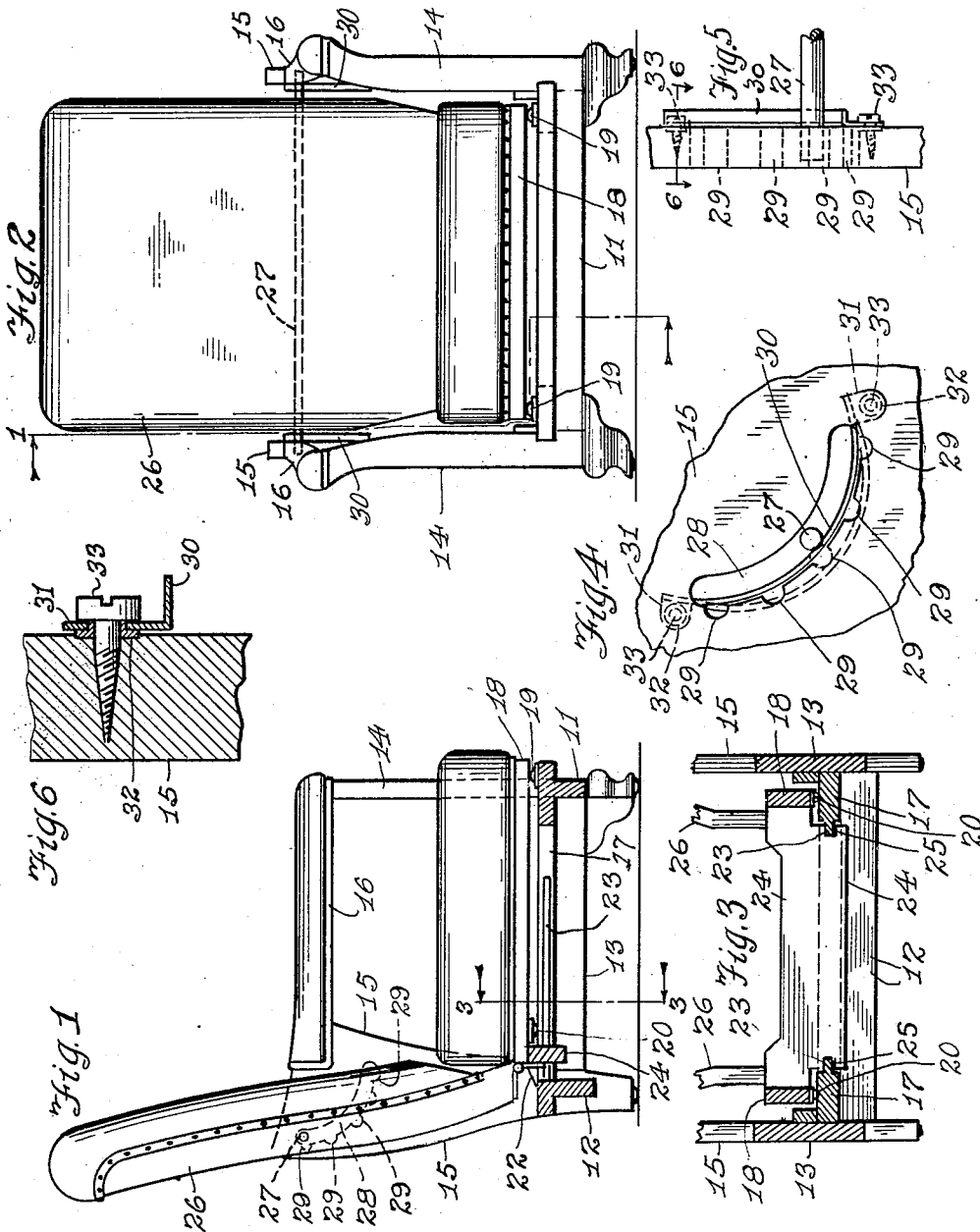
M. KRAUSE

1,802,606

CHAIR

Filed Dec. 31, 1928

2 Sheets-Sheet 1



Witness:
L. B. Graham

Inventor:
Max Krause
by *McRoberts*
his Att'y.

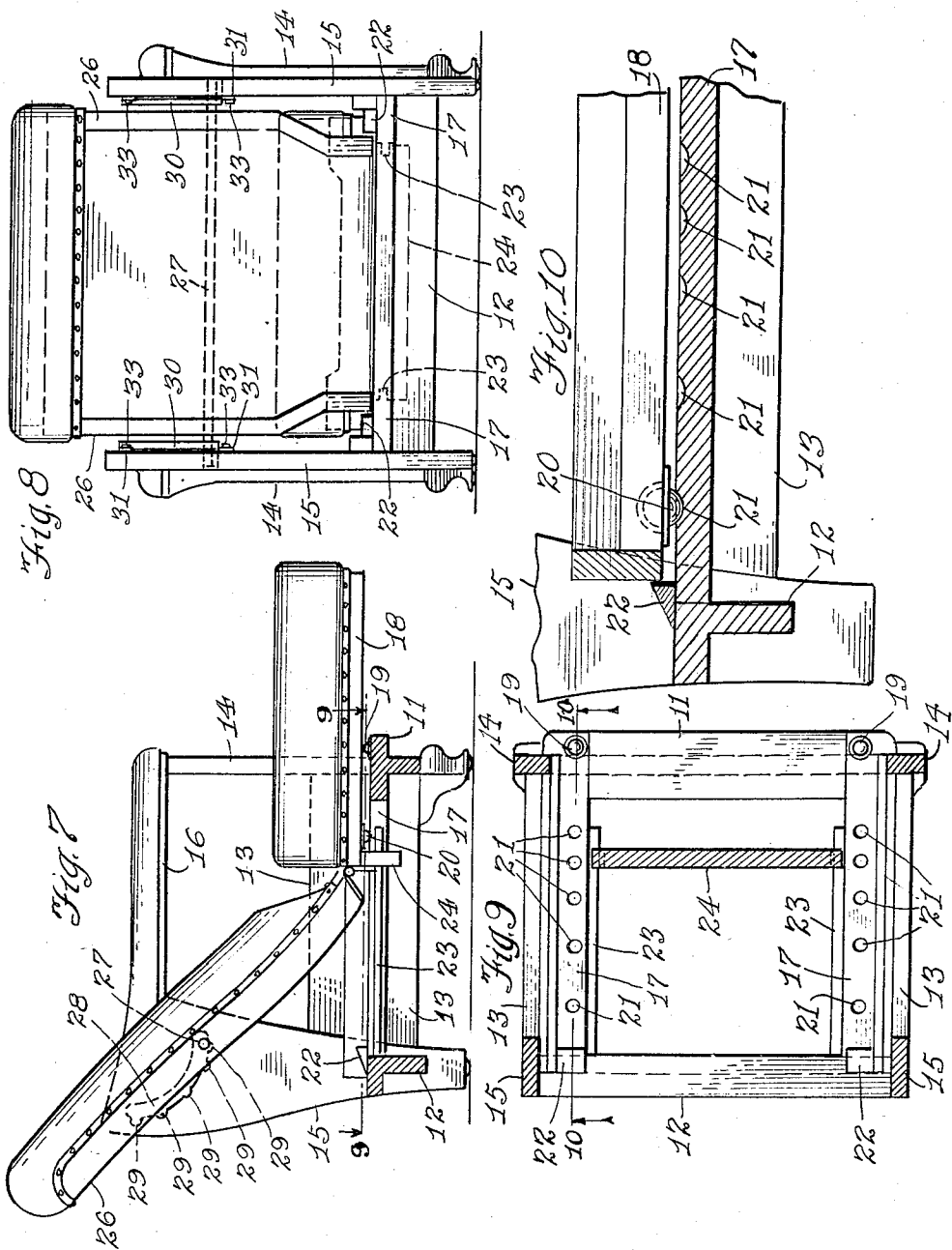
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UNITED STATES PATENT OFFICE

MAX KRAUSE, OF CHICAGO, ILLINOIS

CHAIR

Application filed December 31, 1928. Serial No. 329,635.

My invention relates to chairs, and its main object is to provide improved means whereby the connected seat and back members may be held in different positions on the supporting frame, and also means whereby the back may be automatically interlocked with the supporting frame in different adjusted positions thereon by increased pressure on it such as the weight of the user and automatically released for free adjustment on the frame when its pressure is normal or the chair is unoccupied, together with means for guiding the members and for preventing the tilting or lifting up of the seat when in any position.

With these objects in view, the invention consists in certain combinations and organizations of parts of which practical embodiments are shown in the accompanying drawings in which:

Fig. 1 is a view partly in side elevation and partly in sectional elevation on the line 1—1 in Fig. 2 showing a chair embodying my improvements;

Fig. 2 is a view of the same in front elevation;

Fig. 3 is a detail cross-sectional view on the line 3—3 in Fig. 1 looking in the direction of the arrows;

Fig. 4 is a detail side view showing a practical embodiment of means for automatically engaging and disengaging the adjustable back-frame and the supporting frame;

Fig. 5 is a detail plan view of the parts shown in Fig. 4;

Fig. 6 is a detail sectional view on the line 6—6 in Fig. 5;

Fig. 7 is a view similar to Fig. 1 showing the seat and back in fully extended position;

Fig. 8 is a view of the chair in rear elevation;

Fig. 9 is a top plan view of parts of the chair base with a cross-member of the seat-frame in position thereon, and

Fig. 10 is a detail sectional view on the line

10—10 of Fig. 9 taken in the direction of the arrows.

In the exemplification shown in the drawings the reference numerals 11, 12 and 13 indicate respectively front, rear and side pieces of a substantially rectangular chair frame having usual supporting feet and front and rear corner uprights 14 and 15, respectively, connected by arm-rails 16. On the inner faces of the opposite sides of the frame longitudinal tracks 17 are secured upon which the seat-frame 18 is supported by pairs of roller bearings 19 and 20 respectively secured at each side of the front-piece 11 and at each rear corner of the seat-frame so that the latter easily moves back and forth on the tracks, and the tracks are provided with one or more pairs of opposite seats 21 in which the rollers 20 rest in different positions of the seat-frame, and also with rear stops 22 against which that frame abuts when its rollers 20 enter the rear seats 21, as shown in Fig. 10. The tracks 17 support opposite inwardly directed guide-rails 23 upon which travels a cross-piece 24 secured on the rear end of the seat-frame 18 and having a sliding interconnection with the rails to guide the seat in its reciprocating movements and hold it against upward displacement or tipping, as by having grooves or channels 25 in its ends to engage the rails as shown in Fig. 3, there being sufficient play between these parts to permit the rollers 20 to engage and disengage their seats. The back-frame 26 is hinged at its lower end to the rear end of the seat-frame 18 and is provided above its center with lateral projections, preferably formed by the projecting ends of a cross-rod 27 fixed in the frame, which move freely in inwardly and downwardly curved guides or channels 28 located near the upper ends of the rear uprights 15 above the tracks and provided in their rear or outer walls with a plurality of outwardly extending seats 29 into which the ends of the rod 27 can enter to hold the back-

frame in any of its adjusted positions; in the form shown the guides 28 are curved slots in the uprights and the seats 29 are notches in the outer walls of the slots, the only essential feature of their organization being that the rod 27 may rest in a pair of seats when the back and seat sections of the chair are in their adjusted positions. The number of pairs of seats 21 and 29 may be varied; the outer pairs of seats 21 and the upper pair of seats 29 may be omitted, as the inner pair of seats 21 will hold the back and seat sections in their normal positions of Fig. 1, and the inner pairs of seats 29 will hold these parts in any of their extended positions; when all these seats are employed they are arranged and spaced so that when the rollers 20 rest in the rear pair of seats 21 the rod 27 aligns with the rear pair of seats 29 as shown in Fig. 1, and when the rollers 20 rest in the front pair of seats 21 the rod aligns with the front pair of seats 29 as shown in Fig. 7, and correspondingly for desired intermediate positions of the seat and back. The ends of the rod 27 rest on spring-stressed tracks which prevent them from dropping into their seats under the pressure of the weight of the back and so enable the back to be freely and easily shifted, but which yield under increased pressure, such as the weight of an occupant of the chair, and so permit the rod to enter its seat and lock the back and seat sections in position. A practical means for this purpose consists of a pair of leaf springs 30 mounted on the uprights 15 adjacent the guides 28, as shown for example in Figs. 4, 5 and 6; the springs are curved to correspond with the curvature of the guides and are arranged with their upper faces parallel with and slightly above the seats in the lower walls of the guides, and with their angular ends 31 revolvably fastened on headed bearings 32 by screws 33 so as to put the springs under sufficient tension to normally hold the rod-ends out of the seats 29 as shown in full lines in Fig. 4 under the normal pressure of the chair-back, and to yield to greater stress to allow the rod-ends to enter the seats as shown in dotted lines in Fig. 4. The springs are strong enough to resist the normal weight or pressure of the chair-back, and also when flexed or bent they overcome the chair-back's normal resistance and raise the rod-ends out of their seats and restore the parts to their full-line relation shown in Fig. 4.

When the parts are positioned as shown in Fig. 1, the rod 27 is aligned with its upper seats but is held out of engagement therewith by the action of the springs 30 which then are in their full-line positions of Fig. 4. If the seat is now moved outwardly into an extended position, as in Fig. 7 for example, the springs 30 cause the rod to ride past its seats and prevent it from entering them, and the back is not retarded in its cor-

responding travel but moves freely and easily into position to align its rod with the appropriate seats 29; and the sliding connection between the main-frame and cross-member 24 of the seat-frame guides the seat in its reciprocating movements and prevents it from tilting or being pulled up out of seating position. When the connected seat and back are adjusted to any position in which the rod 27 is aligned with a pair of its seats any increased weight or pressure on the back, as that of an occupant of the chair, will cause the rod to overcome the resistance of the springs 30 and enter the seats; the outer pairs of seats 21 assure alignment of the rod with appropriate seats 29, and if only the inner pair of seats 21 is employed a slight backward or forward movement of the seat will effect such alinement, and in either case when a person sits in the chair the back and seat are locked in position. When the chair is vacated the action of the springs 30 raises the rod 29 out of its seats, and the back is free to be easily moved with the seat into another position. As the cross-rod is above the longitudinal center of the back-member the major portion of the latter is below its fulcrum and the leverage by which the weight of the back prevents its lower end from tilting upwardly and holds the rollers 20 in their seats is increased. As the guides are inwardly curved or inclined the cross-rod serves as a downwardly and forwardly shifting fulcrum on which the back-member moves bodily down and forward and its upper portion is drawn within the supporting frame as the seat moves outwardly; the outer walls of the guides prevent rearward displacement of the cross-rod in all of its positions and hold the back-member against accidental inclination, and the stress or pressure of the back-member is always direct upon the uprights of the frame, and all the inter-engaging parts are within and inside the frame. The rollers 20 are at the rear of the seat-members and their seats are located in the rear portions of the tracks so that in all positions of the combined seat and back-members the major portion of their weight, and also that of the occupant, rests directly upon the rollers and all these parts co-operate to hold the movable members in place under all conditions.

While I prefer to employ the rod 27 and to form the guide slots 28 in the uprights 15, I may employ lateral projections on the back in place of the rod, and I may form the guide slots in separate members carried by the uprights, and omit their seats. Also, I may vary the means for holding the co-operating parts between the back and uprights out of engagement under the normal weight of the back, and permitting their engagement under increased weight or pressure on the back.

I claim:

1. In a chair, the combination with a

frame having opposite tracks and curved guides above the tracks, of a seat-section positioned to travel on said tracks, a back-section hinged to the inner end of said seat-section, lateral projections on the back-section movable in said guides, means to positively position the projections in said guides, and spring-actuated means normally holding the projections out of engagement with said positioning means. 70

2. In a chair, the combination with a frame having opposite tracks and inwardly curved slots above the tracks and recesses in the outer walls of the slots, of a seat-section positioned to travel on said tracks, a back-section hinged to the inner end of said seat-section, lateral projections on the back-section movable in said slots and constructed to engage said recesses, and leaf springs fastened on the frame adjacent the slots and normally supporting said projections out of engagement with said recesses. 75

3. In a chair, the combination with a frame having upper inwardly curved guides and lower opposite tracks provided with opposite roller-bearings near their front ends and with opposite seats near their rear ends, of a seat-section positioned to travel on said roller-bearings and having opposite roller-bearings near its rear end adapted to enter said seats, a back-section hinged to the rear end of said seat-section and having lateral projections positioned to travel in said guides, and means to interlock the projections and guides at different positions of said seat-section. 80

4. In a chair, the combination with a frame having opposite tracks and inwardly curved guides located above the tracks and provided with seats, of a seat-section positioned to travel on said tracks, a back-section hinged to the inner end of the seat-section, lateral projections on the back-section movable in said guides and adapted to enter said seats, and spring-actuated means normally holding said projections out of engagement with said seats. 85

5. In a chair, the combination with a frame having opposite tracks on its lower portion and inwardly curved guides above the tracks and having forwardly opening seats, of a seat-section positioned to travel on said tracks and having a cross-member slidably interengaged with said tracks and holding said section in position thereon, a back-section hinged to the rear end of said seat-section and having lateral projections movable in said guides and adapted to enter said seats, and resilient members positioned on the frame in rear of said projections and normally supporting them outside said seats. 90

6. In a chair, the combination with a frame having opposite tracks, of a seat-section positioned to travel on said tracks, a back-section hinged to the inner end of said seat-section, interengaging back-supporting means between the frame and back-section located above the tracks and arranged to guide the back-section downward and forward in the frame as the seat-section moves outwardly on its tracks, means to positively connect said back-supporting means in different positions of the back-section, and spring-actuated means normally holding said back-supporting means out of engagement. 95

In testimony whereof I affix my signature.
MAX KRAUSE.

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