April 13, 1943. K. G. MAURER 2,316,484

FOLDING CHAIR

Filed May 25, 1940

FIG. 1

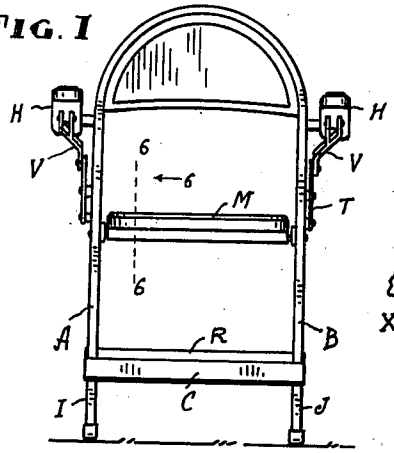


FIG. 2

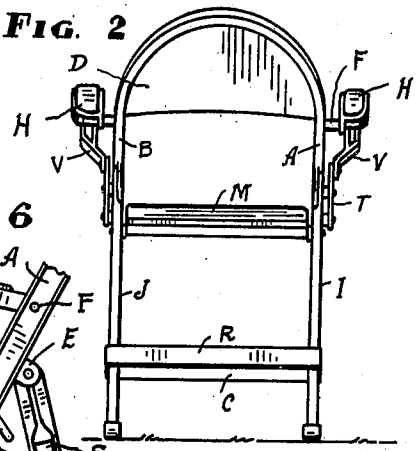


FIG. 6

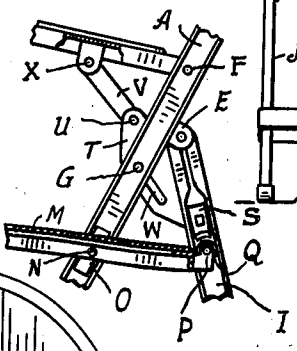


FIG. 4

FIG. 5

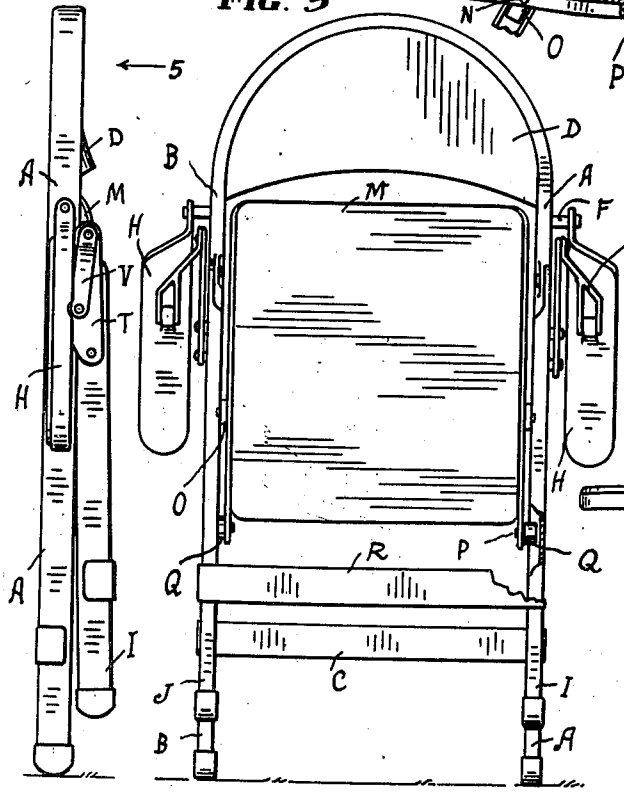
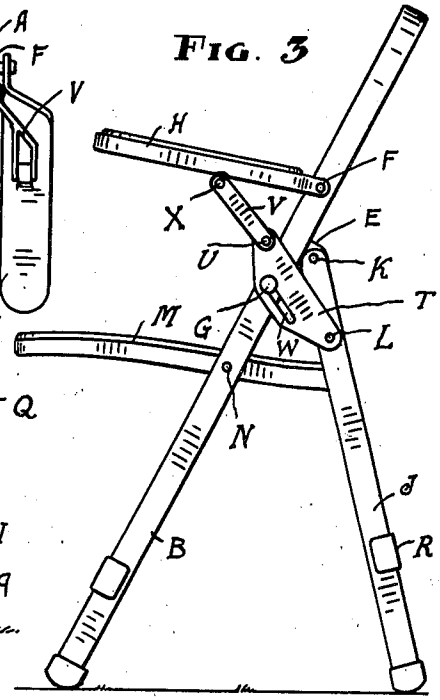


FIG. 3



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FOLDING CHAIR

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Application May 25, 1940, Serial No. 337,126

5 Claims. (Cl. 155—142)

This invention relates to improvements in folding chair construction of the type in which arm rests are embodied.

Objects of the invention are to provide a chair which will be substantial in structure, attractive in appearance, capable of being easily manipulated from the folded status to the unfolded status, and vice versa, and capable also, of having its parts to so function, that when in the folded status they are in closely aligned and practically parallel relation.

Advantages sought are, that in such folded status, the arm rests may be in such position that the device in its entirety lends itself to convenient handling by the user. Also that it lends itself to economy in handling and of packing, in the business of the merchandising of same.

The above general objects, as well as other and more specific aims of the invention which will presently be apparent, are accomplished by the new construction, combination, and arrangement of parts described in the following specification, and illustrated in the accompanying drawing.

The several parts of my invention are identified by suitable characters of reference applied to them in the different views in the drawing, in which—

Figure 1 is a front view of my improved folding chair.

Figure 2 is a rear view of Figure 1.

Figure 3 is an enlarged side view of the invention.

Figure 4 is an enlarged side view showing the appearance of the chair when in the folded status.

Figure 5 is a view of Figure 4, taken in the direction of arrow 5.

Figure 6 is a detached enlarged detail view taken on the broken line 6—6, and in the direction of arrow 6 in Figure 1.

A metal bar, preferably of steel, channel shaped in cross section, and about one inch in width and of predetermined length, bent into U shaped formation, its side members A and B being in opposed spaced relation and stayed by a suitable cross bar C, I designate as a main frame. A sheet metal plate D integrated with the arched portion of this main frame and whose lower area is bowed rearwardly, constitutes a back rest. Integrated with the rear face of each of the said side members, and located a predetermined distance from the foot of each side member, is a lug E. Projecting from each of said side members and at a location a predetermined distance above the lug E, is a stud F. Spaced below, is a fulcrum stud G. Similar arm rests H and H are pivotally retained at their rear ends on the studs F.

A rear frame consists of opposed spaced side members I and J, channel shaped in cross section, their channels being in facing relation. The upper end of each of these side members is reduced in thickness and it is connected by a pivot pin K to the said lug E of the main frame. At a predetermined distance from the upper end of each of these side members I and J, is a stud L.

Rectangular seat structure M, at a predetermined distance from its rear edge, and at its side edges, is pivotally connected to the side members A and B of the main frame, by stud pins N. Clearance between each of the side edges of the seat, and the adjacent side member of the main frame is assured by the providing of a washer O.

On a lateral pin P which projects from each of the rear corners of said seat structure is journaled a roller Q. These rollers are engaged in the channels of the side members I and J of the said rear frame; and said side members are stayed in their spaced relation, by cross piece R. Stop block S which is secured on the inner face of each of the rear frame side members, functions to limit the travel of each of said rollers when the several parts of the chair are transposed from the folded status, to the unfolded status as in Figure 3.

A metal plate T which at its lower end is pivotally connected to the stud L of the rear frame, and at its upper portion is pivotally connected by pin U to a joint member designated as link V, has a slot W which is parallel with but is offset from a straight line bisecting the centers of L and U. In this slot is received the fulcrum stud G of the said main frame. The upper portion of link V is forked and its fork ends are articulated with the underside of the arm rest by a cross pin X. The parts just described I designate as a lock device. So called because said parts function to stay and support the arm rest when the chair is in the unfolded status as in Figure 3; and to lock the arm rests, seat and frames when the chair is in the folded status as indicated in Figure 4. When the chair is being folded, the said parts function to draw the arms downwardly. Also the said parts themselves become collapsed or folded into parallelism with the main-frame of the chair when the chair will have been completely folded, as shown in Figure 4 and Figure 5.

My improved chair, as supplied to the market, is in the folded status, as appearing in Figure 4 and in Figure 5. It lends itself to being packed economically either in bulk, or in individual car-

tons, and to being conveniently handled in all the phases of the merchandising thereof.

Transposing the chair to the status in which it is in readiness for use, consists in doing the obvious thing namely—placing the feet of the main frame on the floor, grasping the upper portion of the said main frame with one hand, and then with the other hand, pulling forwardly at the frontal or top edge of the seat and then pressing downwardly thereon. As the seat reaches the completely lowered position, the rollers will have risen to engagement with the stop blocks S while the rear frame will have been swung rearwardly, whence—as the main frame is naturally slanted rearwardly, the feet of the rear frame become engaged with the floor surface. Simultaneously with the above described manipulation, the stay plate T acting upon the fulcrum stud G as a lever, and through the link V acting as a power transmitting element, will have elevated the arm rest to the desired position. The rear portion of the seat structure, interconnecting, as it does, the main frame and rear frame at pivot pins N, rollers Q, and stop blocks S, and functioning now as a tie; and the stay plates T and links V being rendered immovable, the arm rest is stayed against being dislodged from its said position.

The several parts so cooperate while the chair is in the unfolded status, as in Figure 3, that while the seat is resting, as it does, on the pivot pins *n* (the rear portion of said seat at the rollers Q within the channels of the rear frame, bearing against the stop blocks S), as indicated in Figure 6, the frames are held against spreading.

So long as the position of the seat, maintained, as it is, by gravity, in the lowered status above described, remains unchanged, (its rollers Q within the channels of the rear frame, impinging against the stop blocks S, and the plates T being immovable) there can be no change of the relative positions of the frames and the arm rests. The arm rests and the frames being thus mutually stayed in their relative positions, there is rendered practicable the picking up of the chair in its unfolded status, by taking hold of it in a natural way—either with one hand at the upper portion of the main frame and with the other hand at one of the arm rests, or, by taking hold of one or both of the arm rests. In this picking up of the chair in either of the ways just referred to, each of the studs F acts as a fulcrum. In the upward lifting of the arm rest and the upward pull of the link V, the effect upon plate T is to cause an impinging of an edge of its slot against the fulcrum stud G. The plate T being immovable (because of the fact that the seat during this act of lifting the chair, remains in the lowered position maintaining the frames in the spread position), the several parts constituting the chair are stayed against collapse.

Collapsing of the chair is accomplished only, upon the swinging of the seat upwardly, whereupon as the link V and plate T fold, the slot W rides upon the fulcrum stud G and its lower end engages said stud G just before the cross pin X comes into the line that bisects pin U and said fulcrum stud G. As the cross pin X meets said line, the plate T is tensioned, and said cross pin X is forced past the dead center of fulcrum stud G and the pin U. The arm rests will have been drawn downwardly to parallelism with and adjacent to the main frame. Now the several parts are in the relative positions indicated in Figure 4. The said several parts cooperate while the chair is in the folded status just described, to mutually hold each other against dislodgement, the seat being stayed by the impinging engagement of the slot W of plate T with the fulcrum stud G of the main frame. At the same time, the tension present in the link V, retains the arm rests. The said arm rests, seat, and frames being thus held in their relative positions, it is practicable to pick up the chair in its folded status, by taking hold of it in a natural way, with one hand or with both hands.

So long as the seat, in its raised position, remains unchanged there is accordingly no change of the relative positions of the frames and the arm rests. Unfolding of the chair is accomplished only, by pulling the seat aside from its upright position and then swinging it downwardly on its pivot pins N whereupon, through the rollers Q, the rear frame is moved to the expanded position. At the same time, the plates T, sliding at the slots W on the fulcrum studs G and acting through links V cause the arm rests to be moved outwardly and thence upwardly to the raised position indicated in Figure 3.

A chair, in accordance with my invention, while capable of being constructed of metal parts of relatively slight dimensions and weight, is strong and durable, and it is dependable for all purposes for which a chair of its kind may be subjected. It is economical of manufacture, pleasing in appearance, and safe and comfortable in use. By reason of its several parts being automatically stayed against dislodgement from their correct relative positions, both in the folded status and in the unfolded status, the chair is capable of being naturally and readily handled in carrying it from place to place, whether it is folded, or whether it is unfolded. And too, it is capable of natural and convenient manipulation in the transposing of its parts from the folded status to the unfolded status, and vice versa; and of practicable handling in all of the phases of packing, transporting and merchandising.

Whereas I have shown the different parts of my invention in what I consider a preferred form in arrangement and detail, it will be understood that modifications may be made, within the scope of the invention as it is defined in the appended claims, without departing from the spirit or nature of my invention or sacrificing any of its advantages.

What I claim as my invention is:

1. A folding chair of the kind described, comprising a main frame embodying opposed side members, each having a lug on its rear side located a predetermined distance from the top of said main frame, and being provided with a lateral arm rest stud located a predetermined distance above said lug, and being also provided with a fulcrum stud located a predetermined distance below said arm rest stud, a rear frame embodying opposed side members each being channel shaped in cross section their channels being in facing relation, and the upper ends of said side members being pivotally connected to the said lugs of the said main frame, a seat pivotally connected at each of its side edges at a predetermined distance from the back edge of said seat, to the opposed side members of said main frame, and having an antifriction device projecting laterally from each of the rear corners of said seat, said antifriction devices being received in the channels of said rear frame side members, stop blocks in said channels to constitute abutments against which said antifriction devices may come to engagement, an arm rest having its rear end

pivotally retained on the arm rest stud of each side member of the main frame, a lock device embodying a stay plate and a joint member pivotally interconnected, the joint member forked and having its fork end pivotally connected with the underside of said arm rest, and the stay plate being pivotally connected at its lower portion to the side member of the rear frame at a predetermined distance from the upper end of the latter and having a slot therein in which is received the fulcrum stud of the said main frame.

2. A portable foldable structure comprising a main frame, a rear frame pivotally connected thereto at its upper end, a seat pivoted to the main frame and pivotally and slidably connected to the rear frame whereby the frames may be moved from expanded to proximate relation, means to limit the extent of the pivotal movement of said seat, an arm rest pivotally connected at its rear end to said main frame at the upper portion of the latter, and a foldable device slidably pivotally interconnecting the said arm rest, main frame, and rear frame, to stay said arm rest in raised position when the frames are in the expanded relation, but which functions when the seat is swung upwardly and the rear frame is drawn adjacent to the main frame, to have drawn said arm rest down and interlocked it and the main frame and the rear frame in closely collapsed condition.

3. A chair of the kind described, consisting of a main frame embodying opposed side members, a rear frame embodying opposed side members that consist of channels, and which are pivotally connected to said main frame at their upper ends, stop blocks on the said channels and which are spaced from the upper ends of the latter, a seat pivoted at its sides to the side members of said main frame, at a line spaced a predetermined distance from the rear edge of said seat, a roller at each rear corner of said seat and which are movable in the channels of the said rear frame, an arm rest stud on the upper portion of each of the side members of the said main frame, a fulcrum stud on each of the side members of said main frame at position intermediate said arm rest stud and the pivotal connection of said seat, an arm rest pivotally connected at its rear end to each of said arm rest studs, a stay plate and a link member pivotally interconnected, the said stay plate having a slot therein in which is received said fulcrum stud of the main frame, the outboard end of the link member being pivotally connected with the underside of said arm rest, and the lower end of the stay plate being pivotally connected to a side member of the said rear frame.

4. A chair of the kind described, comprising a main frame, a rear frame hinged thereto, a seat pivoted to the main frame and pivotally and slidably connected to the rear frame whereby the frames may be moved from expanded to proximate relation, arm rests hinged to the upper portion of the main frame and swingable downwardly, devices on the rear frame to limit the distance of the downward swing of the seat on the main frame, and at each of said arm rests a foldable device slidably pivotally interconnecting said arm rest, main frame and rear frame to stay said arm rest in raised position when the frames are in the expanded relation and, when the seat is swung upwardly, to draw said arm rest downwardly, and the rear frame forwardly adjacent to the main frame, and to interlock said arm rests, main frame and rear frame in collapsed condition.

5. A chair of the kind described consisting of a main frame, a rear frame hinged thereto, a seat pivotally connected at its sides and toward its rear portion, to the main frame, and at each corner of the rear edge thereof being slidably pivotally connected with said rear frame, whereby the said frames may be moved from expanded to proximate relation, an arm rest hinged to the upper portion of the main frame, devices on the rear frame to limit the downward swing of the seat on the main frame, a fulcrum stud on each of the side members of the main frame at position intermediate the arm rest hinge connection and the pivotal connection of said seat, a stay plate and link member pivotally interconnected, said stay plate having a slot therein in which is received the said fulcrum stud, the outboard end of the link member being pivotally connected to the underside of said arm rest, and the lower end of the stay plate being pivotally connected to a side member of said rear frame, the said slot being so located that when the seat is swung upwardly and the rear frame forwardly, the arm rest is drawn down, and said slot being of such length, that upon the passing by the outboard end of the link, of the line of dead center of the fulcrum stud and the inboard end of said link, the said arm rests, main frame and rear frame are caused to be interlocked, and the said seat to be retained, in closely collapsed position.

KENNETH G. MAURER.