June 4, 1957 B. F. HAMILTON ET AL 2,794,492

FOLDING CHAIR

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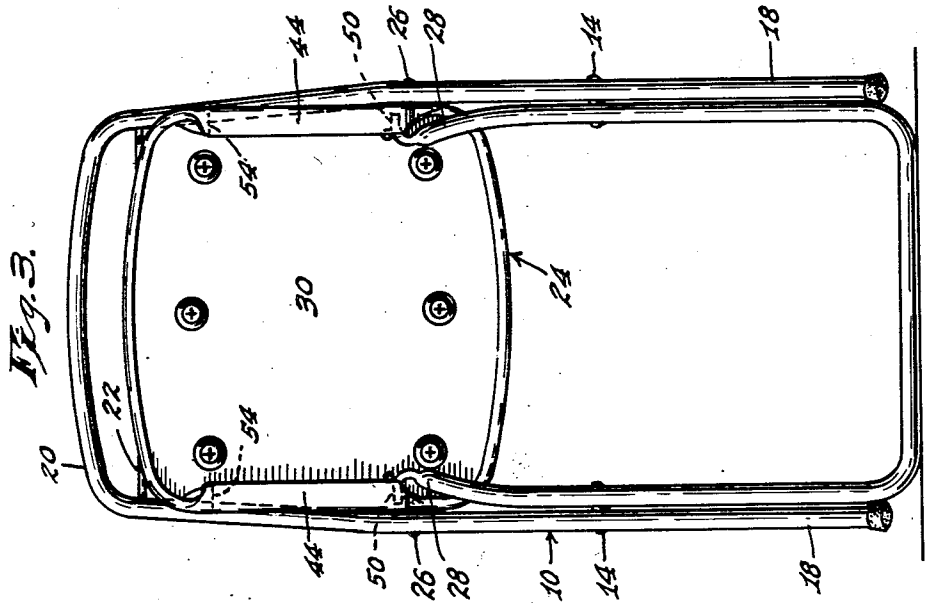


Fig. 3.

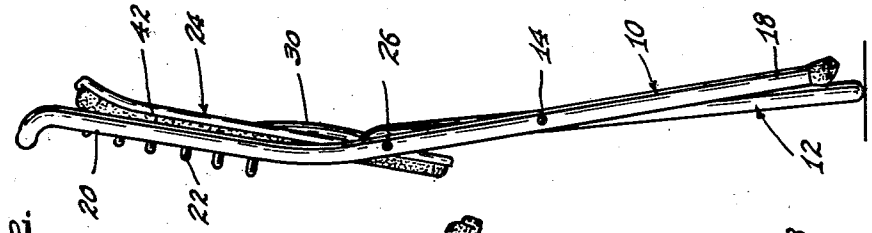


Fig. 2.

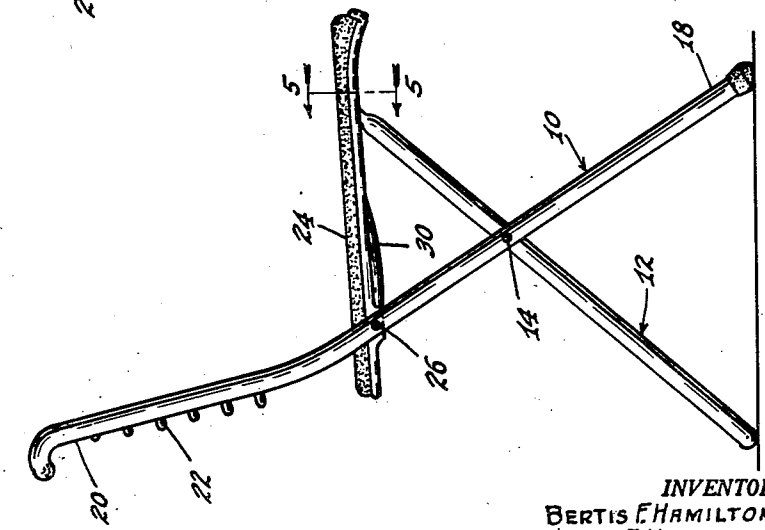


Fig. 1.

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Fig. 4.

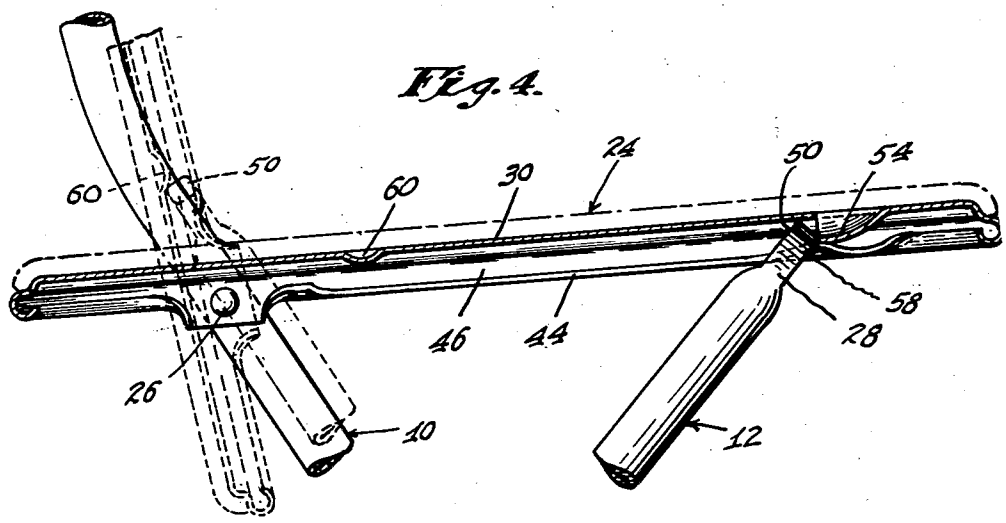
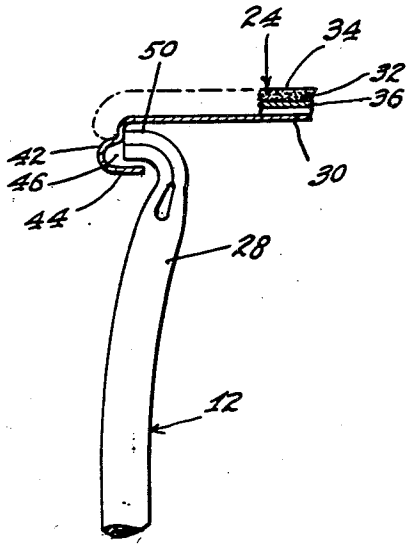


Fig. 5.



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FOLDING CHAIR

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Application May 16, 1955, Serial No. 508,598

8 Claims. (Cl. 155—146)

This invention relates to folding chairs, and has for its object the provision of a folding chair which may be economically constructed yet which will prove sturdy and durable in use. A further object is to provide a chair which may be formed largely of sheet-metal and metal tubing. A still further object is the provision of a chair which may be readily folded and unfolded as desired, but which is releasably maintained in each of its collapsed or extended positions. These and other objects of the general improvement of folding chairs will become apparent as the description of our invention is understood.

In carrying out our invention in a preferred form, we provide desirably from metal tubing a pair of generally U-shaped leg-forming members pivotally interconnected to provide a so-called scissors or X-type seat support. In that type support, one leg-forming member forms the chair back and the front legs of the chair, and the other member forms the rear chair legs and the front support for the chair seat. The seat desirably comprises a sheet-metal seat plate covered as desired with upholstery, and the side edges of the seat plate are folded back underneath the main span of the seat plate to form integrally with the seat plate a laterally opposed pair of inwardly facing channels; and in each of those channels is slidingly received the upper end of the associated one of the legs which form the front seat-support.

Other features of an illustrative embodiment of our invention will be apparent from the more detailed description which follows and in which:

Figs. 1 and 2 are side elevations showing, respectively, extended and collapsed positions of a chair according to our invention;

Fig. 3 is a front elevation of such a chair in collapsed position;

Fig. 4 is a vertical section taken longitudinally of the chair seat, showing in full lines the parts in extended position and in broken lines the parts in collapsed position; and,

Fig. 5 is a section, taken on the line 5—5 of Fig. 1, showing a detail of construction.

The folding chair shown comprises a pair of leg-forming members 10—12 pivotally interconnected, as by pivot pins 14, to provide a so-called scissors- or X-type folding chair frame. Each of the leg-members is desirably formed from metal tubing into a general U-shape. The first (10) of such members is disposed with its free ends downward to provide front legs 18 for the chair. The bight portion 20 of that leg-member 10 frames the chair back, and a pattern of bars 22 desirably is provided to traverse the bight to form a back-rest for the chair.

A seat 24 is provided, and is pivoted adjacent its rear to the leg-member 10, as by pivots 26. The front portion of the seat 24 is supported by the free end portions 28 of the second U-shaped leg-member 12.

The seat 24 is shown as comprising a rigid, sheet-metal bottom-plate 30 onto which may be secured padding as by a known construction employing layers of padding 32 and finish upholstery 34 overlying an upper seat-plate 36

which is secured as by screws to the bottom-plate 30. The bottom-plate 30 is provided with a downwardly extending peripheral flange 42 which stiffens the seat and avoids a visible raw metal edge.

Along each side edge of the seat 24, the lower portion of the flange 42 is turned inwardly to provide integrally with seat-plate 30 a horizontally disposed lip 44 parallel to but spaced from plate 30, the lip 44 and plate 30 thereby providing an inwardly-facing channel 46 extending fore-and-aft of the seat. In this channel is slidably received a finger 50 extending outwardly from the upper end of the associated leg portion 28. That finger 50 as shown is provided integrally with the leg 12 by collapsing the tubing of the leg-portion 28 into substantially solid cross-section and then bending it horizontally outward.

Relative movement of the fingers 50 along the seat 24, with relative swing of the two leg-members 10—12, of course accompanies pivoting of the seat about axis 26 between its generally vertical retracted position and its generally horizontal extended position, the fingers 50 traveling rearwardly with respect to the seat as the seat is swung into retracted position and traveling forwardly as the seat is swung into extended position.

To accommodate travel of the fingers 50 along the seat 24, the flanges 42 carry the lips 44 spaced from the plate 30 a distance such that the fingers 50 may slide freely along channels 46 during all positions intermediate their extreme limits of travel during collapse or erection of the chair.

To restrict the extent of downward swing of the seat and spreading of the leg-members 10—12, means are provided to limit the forward movement of the fingers 50 along the channels 46. For that purpose, portions of the plate 30 near the front ends of such channels are struck downwardly to provide rearwardly facing abutments 54 so positioned as to be engaged by fingers 50 just as the chair attains fully extended position.

For a slight distance rearwardly from the abutment 54 of each channel 46, a portion of the lip 44 is offset upwardly to constrict the channel vertically, as at 58, to an extent such that the associated finger 50, instead of being freely slidable, will bind therein. This binding action opposes, without preventing, movement of the fingers into and out of engagement with the abutments 54. In the operation of extending the chair, the channel constrictions 58 cushion the impact of the fingers on the abutments; and once the chair is fully extended they tend to hold it in that condition until a definite chair-collapsing effort is applied. To retain the chair releasably in collapsed condition, portions of the plate 30 are offset downwardly to form channel-constricting bosses or detents 60 located just short of the rear limit of travel of the fingers 50 as provided by engagement of the seat 24 against the back 20. Those detents 60 releasably hold the fingers 50 in position to maintain collapsed condition of the chair until definite chair-extending effort is applied. Thus the chair is releasably held in either its extended or collapsed condition, by the elastic distortion incident to travel of fingers 50 through the constricted zones adjacent constrictions 58 and detents 60, respectively. The grip resiliently effected thereby is such that a more definite effort must be applied to release the finger than the mere force accompanying a lifting of the chair by its back and other normal handling forces.

The sheet-metal of the plate 30 is easily formed to provide the walls of the channels 46; and the abutments 54, constrictions 58, and detents 60 are all economically produced as portions integrally pressed from those walls. Moreover, the sheet-metal provides the desired resiliency of parts to effect the releasable position-maintenance described.

We claim as our invention:

1. A collapsible chair, comprising a seat movable between retracted and extended positions, said seat including a rigid plate of sheet-metal extending transversely of and below the surface of said seat, said plate having at each side an integral depending flange the lower portion of which is turned inwardly to provide a lip spaced from said plate, said lip and the adjacent portion of said plate constituting spaced walls providing therebetween an inwardly-open channel, relatively movable supporting legs for said chair, each of certain of said legs being provided with guide means slidably received in one of said channels above said lip and slidable therealong as an incident to movement of said seat between its retracted and extended positions, said guide means being engageable by said lip in upward movement of the seat to cause relative movement of said supporting legs, and abutment means limiting forward movement of said guide means in each channel.

2. The invention set forth in claim 1 wherein said abutment means is pressed from the metal of said channel-defining walls limiting the travel, forwardly of said seat, of said slidable means along said channel.

3. The invention set forth in claim 2 wherein said abutment means is pressed from said plate toward said lip.

4. The invention set forth in claim 2 wherein at least one of the walls defining said channel is formed in the region of said abutment to provide means binding upon said slidable means when said slidable means is adjacent said abutment, thereby to releasably maintain the slidable means in association with said abutment.

5. The invention set forth in claim 1 including detent means pressed from the metal of said channel-defining walls adjacent the point therealong occupied by said slidable means when said seat is in retracted position, said detent means extending into said channel an amount sufficient to force the parts to undergo an elastic distortion as said slidable means travels rearwardly thereof during full retraction of said seat, thereby to resiliently maintain said slidable means rearwardly thereof to maintain retracted condition of said seat.

6. The invention set forth in claim 1 wherein said slidable means comprises an out-turned end-portion of the associated chair-supporting leg.

7. The invention set forth in claim 6 wherein said chair-supporting leg is formed from metal tubing having the walls thereof at its upper end collapsed, said collapsed portion being bent outwardly to provide said slidable means.

8. In a collapsible chair of the type having a seat movable between retracted and extended positions, a first leg pair pivoted to said seat, and a second leg pair pivoted to said first leg pair, each leg of said second leg pair having at its upper end means slidably associated with said seat, the improvement comprising, a horizontally-open channel means carried by and extending longtiudinally of said seat, underneath and adjacent each side thereof, slidably receiving said slidable means, each leg of the second leg pair being formed of metal tubing and having the walls thereof at its upper end collapsed, said collapsed portion being bent outwardly to provide said slidable means and abutment means limiting forward movement of each collapsed leg-end in its associated channel.

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