March 12, 1929. J. SILVERMAN 1,704,712

FOLDING CHAIR

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Fig. 1.

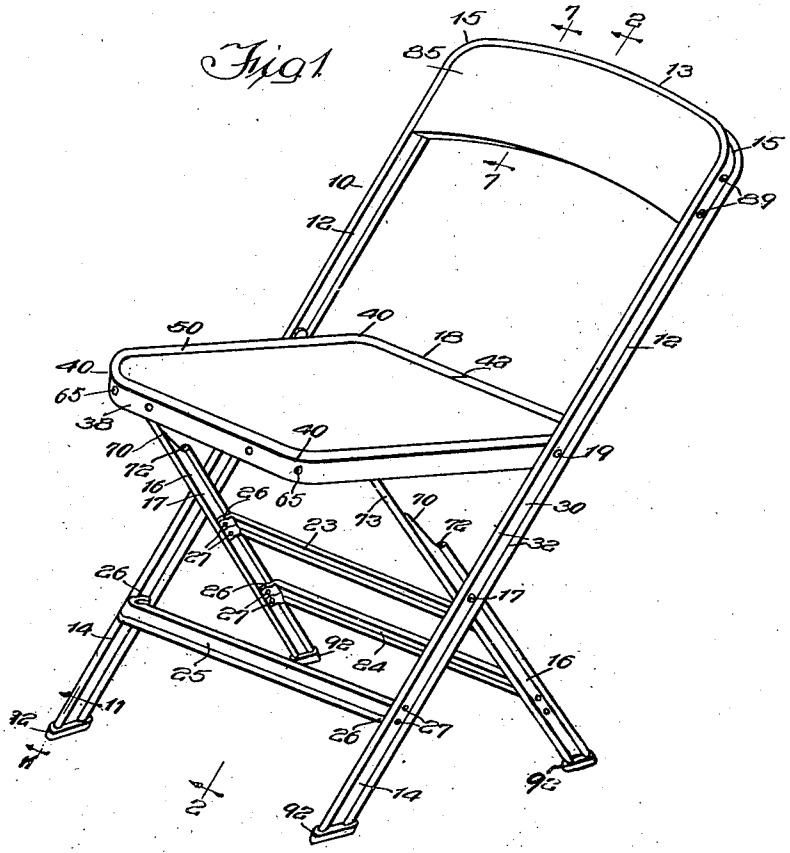


Fig. 7.

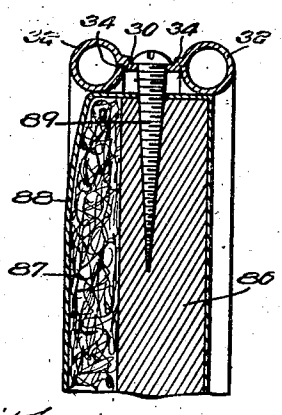
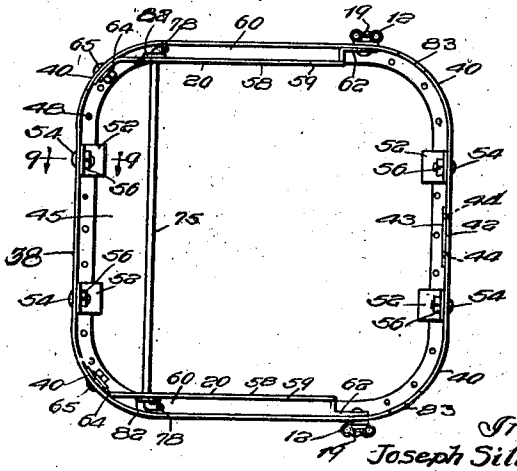


Fig. 6.



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Fig. 8.

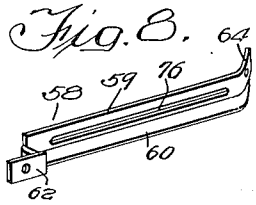


Fig. 2.

Fig. 3.

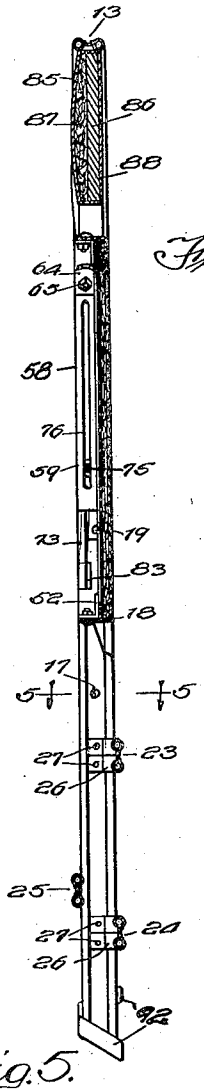


Fig. 4.

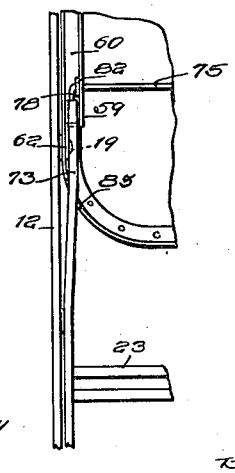
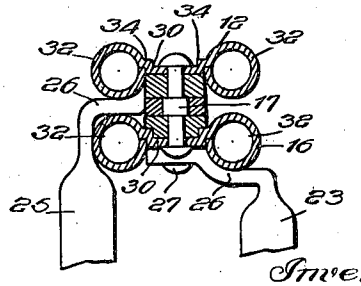


Fig. 5.



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FOLDING CHAIR

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Fig. 9.

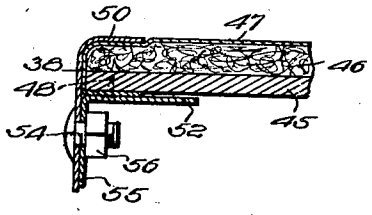


Fig. 10.

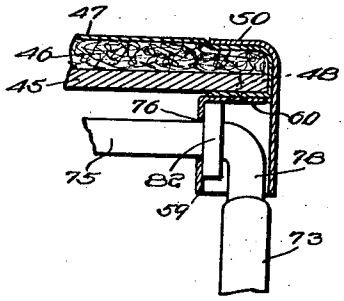
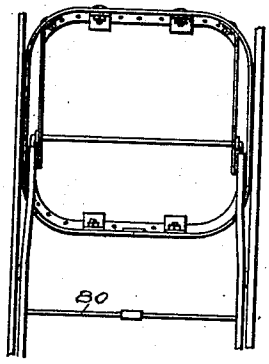


Fig. 12

Fig. 11



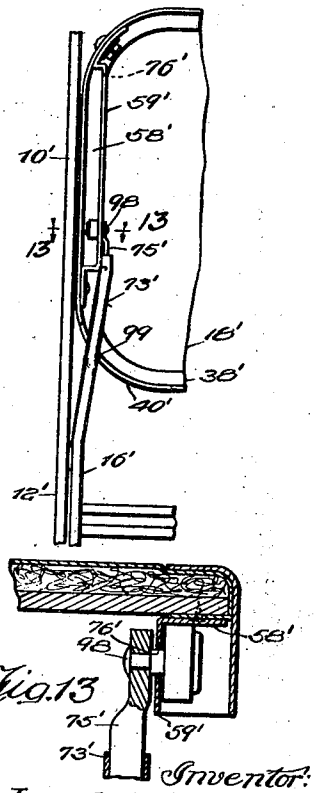


Fig. 13

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Patented Mar. 12, 1929. 1,704,712

UNITED STATES PATENT OFFICE.

JOSEPH SILVERMAN, OF CHICAGO, ILLINOIS.

FOLDING CHAIR.

Application filed March 3, 1927. Serial No. 172,321.

This invention relates to folding chairs and its objects are the provision of a generally improved and simplified construction that may be economically produced and which will have great strength and be adapted to fold flat with all of the parts in the plane of the main frame of the chair.

While it is to be understood that the invention is not limited to a particular type of chair, it has particular utility in chairs of metal frame construction in which the seat is detachably secured in the seat frame, and a further object of the invention in this connection is the provision of a construction that will permit convenience and expeditious installation and removal of the seat from the seat frame.

The entire chair is adapted for convenient assembling and is adequately reinforced with a minimum of additional reinforcing members and the necessity of a sliding movement in the frame of the pivotal support for the seat is eliminated.

The invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a chair embodying the invention;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1 and showing the chair open and in position for use;

Fig. 3 is a section similar to Fig. 2 showing the chair in folded condition;

Fig. 4 is a fragmentary detail elevation looking toward the bottom of the seat in its folded position;

Fig. 5 is a detail section through one of the leg pivots on the line 5—5 of Fig. 3.

Fig. 6 is a bottom view of the seat in open position on the line 6—6 of Fig. 2;

Fig. 7 is a detail section taken on the line 7—7 of Fig. 1;

Fig. 8 is a perspective view of one of the links or bars through which the upper ends of the pivoted legs have pivoted and sliding connection with the seat;

Fig. 9 is a detail section taken on the line 9—9 of Fig. 6;

Fig. 10 is a detail section taken on the line 10—10 of Fig. 2;

Fig. 11 is a view similar to Fig. 4 showing the rod which forms the pivotal and sliding connection between the upper ends of the legs and the seat led out from the tubular portions of the legs and extended therebetween to reinforce the same;

Fig. 12 is a fragmentary view similar to Fig. 4, showing another form of pivotal and sliding connection between the pivoted legs and the seat; and

Fig 13 is a detail section taken on the line 13—13 of Fig. 12.

Referring to the drawings, the chair shown comprises generally an inverted U-shaped frame 10, having parallel sides 12, closed at the top at 13 and open at their lower ends at 14. The lower free ends 14 of the sides of the frame 10 form one pair of legs of the chair and the upper ends of the sides 12 may be rounded at 15 into the closed top 13.

A second pair of legs 16 are pivoted between their ends at 17 between and to the opposite sides 12 of the frame 10. A seat 18 has fixed pivotal connection at 19 between and to the sides 12 of the frame 10, and this seat 18 has sliding pivotal connection through the bars or links 20 and a suitable rod 75 with the upper ends of the pivoted legs 16.

The lower leg forming ends 14 of the sides 12 and the legs 16 may be braced by cross braces 23, 24 and 25. These braces extend between the legs and their opposite ends may be flattened together to double thickness and turned laterally at 26 and riveted or otherwise suitably secured at 27 to the legs of the chair. The laterally turned ends of the brace 25 disposes the cross part of the brace at the front of the frame and upon folding the chair the legs 16 are received between these laterally turned ends of the cross brace 25 and lie in the plane of the frame 10.

The frame 10, legs 16 and cross braces 23, 24 and 25 are preferably of the construction disclosed in my copending application, Serial No. 128,737, filed August 12, 1926, being formed of sheet metal and having central longitudinal flat portions 30 with tubular margins 32 along opposite edges thereof.

The tubular margins 32 of generally circular section may be formed by rolling back the margins of flat stock forming these parts and generally square angular portions 34 are preferably provided between the flat portions 30 and the rolled margins 32. The angles 34 form seats for the rolled back marginal edges and with the tubular marginal edges provide a double reinforcement, the rolling of the

marginal edges at the same time finishing these parts and providing a pleasing appearance.

The seat 18 has a generally square frame 38, the corners of which may be rounded at 40. The frame 38 is of angle iron or sheet angle construction formed into the desired configuration and joined at its ends at 42 to provide a substantially continuous frame. The joint at 42 may be closed (Fig. 6) by an internal strap of plate 43 bridging the meeting ends 42 of the frame and spot welded or otherwise suitably secured at 44 to the meeting ends of the flange of the frame which is disposed vertically when the chair is open for use.

The seat proper comprises a base board 45, which may be of wood with its upper surface suitably padded at 46 (Figs. 9 and 10) and provided with a covering 47 which may be of leatherette, cloth or any other suitable preferred material. The margin of the covering 47 is turned down around the margin of the seat and beneath the baseboard 45 and tacked or otherwise suitably secured thereto at 48.

The seat proper is shaped marginally to fit in the frame 38 and is secured in the frame and up against the top flange 50, which is disposed horizontally when the chair is open by angle members 52. The flanges of the angle members 52 which are disposed horizontally when the chair is open underlie the flange 50 of the frame 38 and the seat proper is secured marginally therebetween. The angle members 52 are detachably secured to the inside of the frame 38 by bolts 54, the heads of which are disposed at the outside while the shanks pass through the depending flange of the frame 38 and through the depending flanges 55 of the bracket members 52 and engage in suitable nuts 56 by means of which the angle members 52 are securely clamped internally to the depending flange of the frame 38. The nuts 56 are removable to permit removal of the bolts 54 and thereby removal of the angle brackets 52. This permits convenient assembling and permits removal of the seat proper from the frame as desired.

The fixed pivots 19 which pivotally secure the seat 18 to the sides 12 of the frame 10 may be in the form of rivets passing through the flat intermediate webs 30 of the sides 12 of the frame, and through the depending vertical side flange of the seat frame. The opposite ends of these rivets may be permanently headed or removable nuts may, of course, be provided to permit detachment of these connections if desired. Suitable washers may be disposed between the frame sides 12 and the seat frame 38 as desired.

One of the bars 58, shown in detail in Fig. 8, is disposed on the inside of each side of the frame 38, as shown in Fig. 6, and up in the plane of the depending flange of the frame 38, as shown in Fig. 2. These bars have the inner depending vertical flanges 59, which are spaced from the adjacent side flanges of the frame 38 and the integral horizontal flanges 60 extending at substantially right angles from the upper edges thereof and disposed between the depending flanges 59 and the adjacent side flanges of the frame 38. The flanges 60 fit up against the bottom of the seat proper and may form suitable tracks for the sliding action of the upper ends of the legs 16. At the ends of the bars 58 disposed adjacent the upper ends of the legs 16, said bars 58 have integral flanges 62 depending from the outer edges of the flanges 60 and disposed adjacent the side flanges of the frame 38 and pivoted to the frame 38 through the pivotal connections 19.

The outer or free ends of the flanges 59 of the bars 58 are curved at 64 to conform with the rounded corners 40 of the seat frame and are detachably secured to the depending flange of the seat frame as by means of bolts and nuts 65. The bolts 65 are removable and when removed the bars 58 may be swung about the pivots 19 to swing the free ends of the bars from the seat frame so that when or until the angle brackets 52 are secured in place the seat proper may be conveniently removed from and inserted into the seat frame and up above the bars 58 into position between said bars and the horizontal flange 50 of the seat frame. This mounting of the bars 58 performs a very important function in permitting easy assembly and removal of the seat from the frame and when the seat proper is in place in the frame the free ends of the bars are swung up into the plane of the frame and detachably secured by the bolts 65.

The flat intermediate webs 30 at the upper ends of the legs 16 are cut away at 70 and the upper ends of one of the tubular sides or marginal edges of the legs 16 are cut away at 72 to permit the inner end of the seat to swing between the sides 12 of the frame 10 and into the plane thereof when the chair is folded. The other tubular margin of each leg 16 continues upwardly at 73.

The pivotal and sliding connection between the upper ends of the legs 16 and the seat of the chair is formed by a cross rod 75, which extends transversely across the bottom of the seat frame 38 and through longitudinal slots 76 in the depending flanges 59 of the bars 58. Outwardly of the flanges 59 the rod 75 at each side of the chair is turned at substantially right angles at 78 and extend into and are suitably secured in the tubular extensions 73 of the legs 16.

The opposite ends of the rods 75 may even extend down through the tubular sides of the legs 16 and out therefrom toward the bottom of the legs and transversely therebetween, as shown at 80 in Fig. 12. In this case the meet-

ing ends of the rods 80 may be suitably joined to form, in effect, a continuous rod which at its upper end forms the pivotal and sliding connection between the upper ends of the legs 16 and the seat 18, and at the same time provide an effective reinforcement for maintaining the legs 16 in proper parallel relation and against distortion by the stresses imposed in sitting upon the chair. The ends of the rod 75 need not extend entirely through the tubular sides of the legs 16 and out transversely across the same at 80, but may be terminated anywhere within the tubular portions of the legs within which they fit. This securing of the ends of the rod in the tubular sides of the legs forms an effective anchoring for the rod and the inserted ends of the rods reinforce the legs through the portions within which they extend.

Between the flanges 59 of the bars 58 and the adjacent side flanges of the seat frame 38 the transversely extending portion of the rod 75 may be provided with rollers 82 adapted to track upon the horizontal flanges 60 and provide a free sliding action of the upper ends of the legs 16 in folding and opening the chair.

The depending side flange of the seat frame 38 is notched at the rear corners at 83 to receive the tubular extensions 73 of the legs 16 when the chair is folded, so that the seat 18 and legs 16 will assume a parallel relation and lie between the sides 12 of the frame 10 and in the plane of the frame 10 when the chair is folded.

To fold the chair, from the open position shown in Fig. 2, the outer end of the seat 18 is swung upwardly about the pivots 19 into position between the sides 12 of the frame 10 and into the plane thereof, as shown in Fig. 3.

This upward swinging of the seat 18 is accompanied by a combined pivotal and sliding action of the rod 75 in the slots 76, the upper ends of the legs 16 closing into the plane of the seat frame and the transverse pivotal and sliding portion of the rod 75 sliding inwardly in the slots 76 to the position shown in Fig. 3, whereupon the legs 16 and seat are disposed parallel and both between and in the plane of the frame sides 12.

The compact folding is especially advantageous in storing away a number of chairs of this sort and very easy opening and closing of the chair is permitted.

The particular chair shown is provided with a short back 85 at the top of the frame 10, this back being shown as comprising a base board (Fig. 7) 86, padded at 87 and the padding and base board suitably covered at 88. The back 85 is shown as secured in the frame by suitable screws 89 which pass through the intermediate flat web part 30 of the frame and into base board 86 of the back.

In the embodiment shown in Figs. 12 and 13, another form of pivotal and sliding connection between the upper ends of the legs 16′ and the sides 12′ of the frame 10′ is provided. In this case the upper tubular extensions 73′ of the legs 16′ instead of extending between the flanges 59′ of the bars 58′ and the depending side flanges of the seat frame 38′, lie inwardly of the flanges 59′. Separate rods 75′ secured in the tubular sides 73′ carry pins 98 which extend outwardly through the slots 76′ and carry rollers 99 which track on the horizontal flanges of the bars 58′.

As before, the depending flange of the seat frame 38′ is notched or cut away at the inner corners 40′, as shown at 99, to receive the tubular extensions 73′ of the legs 16′ so that the seat and pivoted legs may be folded parallel and lie in the plane of the frame 10′ when the chair is folded.

I claim:

1. In a folding chair, a frame having leg forming sides, a seat having fixed pivotal connection to said frame, a pair of legs pivoted to the leg forming sides of said frame, said legs having tubular margins, longitudinally slotted members attached to said seat and a rod extending across the bottom of the seat and through said longitudinally slotted members and having pivotal and sliding connection therewith, the ends of said rod being turned laterally and extending into and secured in the tubular margins of said last legs.

2. In a folding chair, a frame having leg forming sides, a seat having fixed pivotal connection to said frame, a pair of legs pivoted to the leg forming sides of said frame, said legs having tubular margins, longitudinally slotted members attached to said seat, and a rod extending across the bottom of the seat and through said longitudinally slotted members and having pivotal and sliding connection therewith, said rod being turned into and extending through the tubular margins of said last legs and out from said tubular margins and transversely between the legs below the pivotal and sliding connection portion of the rod to reinforce and brace said legs.

3. In a folding chair, a frame having leg forming sides, a pair of legs pivoted to the leg forming sides of said frame, a seat frame having fixed pivotal connection to said first frame, a seat in said seat frame, longitudinally slotted members having pivotal and sliding connection with said last legs, said longitudinally slotted members being pivoted to the seat frame at one end and releasably secured to said frame at their opposite ends to be released and swung about their pivoted ends to permit the insertion of the seat into the seat frame and removal therefrom.

4. In a folding chair, a frame having leg forming sides, a pair of legs pivoted to the leg forming sides of said frame, a seat frame having fixed pivotal connection to said first frame, a seat in said seat frame, longitudinally slotted members having pivoted and sliding

connection with said last legs, said longitudinally slotted members being pivoted to the seat frame at one end and releasably secured to said frame at their opposite ends to be released and swing about the pivoted ends to permit the insertion of the seat into the seat frame and removal therefrom, said seat frame being of angle construction with a horizontal top flange and a depending marginal flange and angle members detachably secured to the seat frame for clamping the seat up in said frame and against the bottom of said horizontal flange.

In witness whereof, I hereunto subscribe my name this 26th day of February, 1927.

JOSEPH SILVERMAN.