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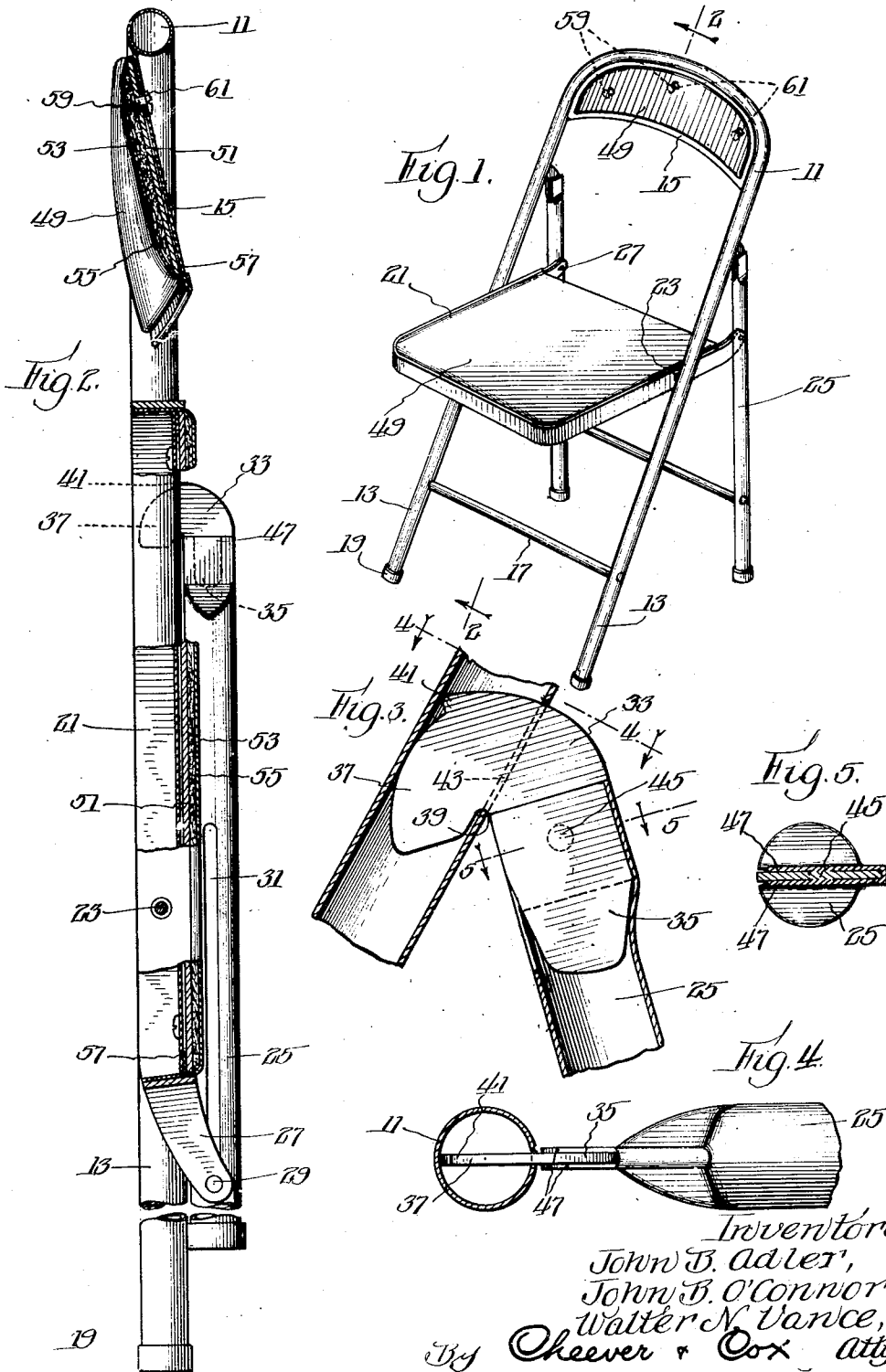
J. B. ADLER ET AL

1,813,653

FOLDING CHAIR

Filed Aug. 24, 1928

2 Sheets-Sheet 1



Inventors-
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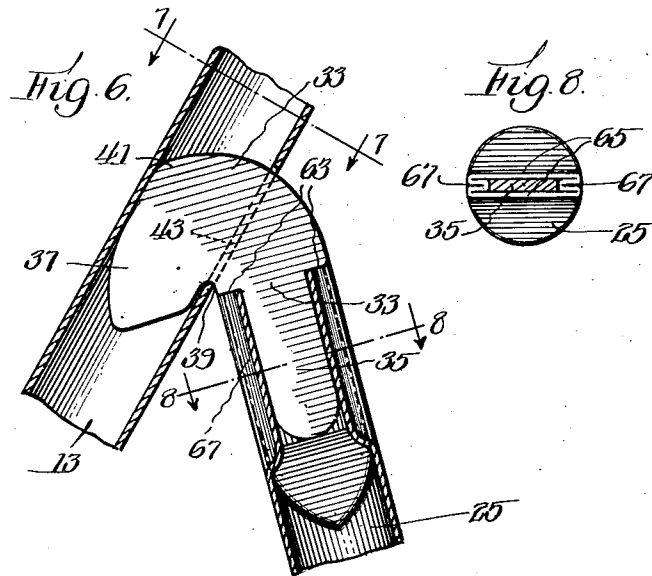
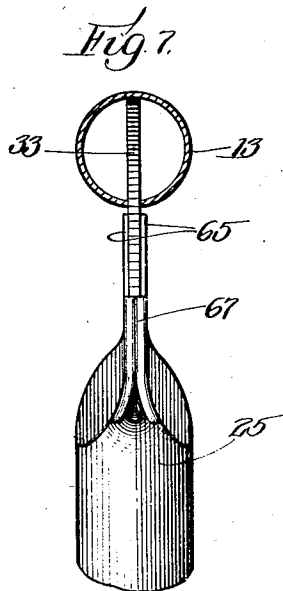
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UNITED STATES PATENT OFFICE

JOHN B. ADLER AND JOHN B. O'CONNOR, OF AURORA, AND WALTER N. VANCE, OF CHICAGO HEIGHTS, ILLINOIS, ASSIGNORS TO LYON METAL PRODUCTS, INCORPORATED, OF AURORA, ILLINOIS, A CORPORATION

FOLDING CHAIR

Application filed August 24, 1928. Serial No. 301,726.

Our invention relates in general to a folding chair and has more particular reference to novel means and methods of connecting chair parts whereby a folding chair having improved characteristics may be provided.

An important object of our invention is to provide a folding chair having an improved hinge for pivotally connecting relatively movable portions of the chair.

Another important object of our invention is to provide improved means for pivotally connecting tubular members.

Another important object of our invention is to provide a folding chair wherein a back leg is pivoted to the frame of the chair by means of a single member permanently secured to the leg and having interlocking rocking engagement with the chair frame whereby the cost of forming such chairs is reduced while their appearance is improved.

Still another important object of our invention is to provide an improved hinge of great simplicity and ruggedness which is inexpensive and which at the same time has a neat finished appearance.

Still another important object of our invention is to provide an improved method of attaching upholstery to a folding chair.

Still another important object of our invention is to provide a novel means for attaching upholstery to sheet metal surfaces.

Numerous other objects and advantages of the invention will be apparent as it is more fully understood from the following description which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is a perspective view of a chair embodying our invention, the chair being shown in open position;

Figure 2 is an enlarged vertical cross section taken substantially along line 2—2 in Figure 1, the chair being shown in closed or folded position and having parts broken away to reveal details of its construction;

Figure 3 is an enlarged vertical cross section taken through the frame of the chair at a point where a back leg is pivotally con-

nected thereto in order to illustrate the novel connection of my invention;

Figure 4 is a cross section taken substantially along the line 4—4 in Figure 3;

Figure 5 is a cross sectional view taken substantially along the line 5—5 in Figure 3;

Figure 6 is an enlarged vertical cross section similar to Figure 3 in order to illustrate a modification of the novel chair leg connection of my invention;

Figure 7 is a cross section taken substantially along the line 7—7 in Figure 6; and

Figure 8 is a cross section taken substantially along the line 8—8 in Figure 7.

To illustrate our invention we have shown on the drawings a folding chair comprising a main frame portion 11 of tubular construction. The main frame 11 is formed, in the illustrated embodiment, of a tubular member bent substantially to the shape of an inverted U, the sides of the U forming front chair legs 13 and the intermediate or connecting portion 15 forming a chair back. A piece of sheet metal 15 is arranged in the bight of the U to form a back rest and is secured at its edges in any convenient manner such as by spot-welding or the like to the main frame. A cross brace 17 is arranged between the front legs 13 being connected thereto at points spaced from the bottom of the legs, the lower ends of which are provided with ferrules 19. A seat 21 which may be of any preferred or convenient form is pivotally mounted between the front legs 13 at approximately their mid-portions by means of pivot pins 23 secured to the sides of the seat and extending outwardly thereof to seat in bearing apertures formed in the front legs. The back legs 25 may be formed of tubular material similar to that comprising the main frame and may be formed in any convenient manner. The legs are pivoted to the upper portions of the front legs 13 and extend rearwardly thereof, while the sides of the seat 21 are extended rearwardly in the form of arms 27 carrying outwardly extending pins 29 at their extremities. The back legs are provided with lateral slots 31 in their opposed faces, the slots being formed at approximately the mid-portions of the back legs.

The slots 31 are adapted to receive the outwardly extending pins 29 carried by the rearward extensions 27 of the sides of the seat 21, the upper ends of the slots being terminated at a point such that when the chair is in open position, the pins 29 engage the upper end of the slots whereby to support the seat in approximately horizontal position with respect to the main frame 11 when the chair is in open position. The slots extend downwardly in the back legs a distance sufficient to permit unhampered longitudinal movement of the pins 29 with respect to the back legs when the chair is collapsed to the folded position shown in Figure 2, that is to say, when the seat is rotated with respect to the main frame until entirely within the zone thereof, the back legs folding parallel and behind the front legs. The back legs 25 are provided with ferrules 19 similar to those which are applied to the lower ends of the front legs, and are connected by a cross brace arranged therebetween adjacent their lower ends.

Each back leg is pivotally connected to the chair frame by means of a rocking connection which I have illustrated in detail in Figs. 3 and 6 of the drawings. This connection is entirely new and has several features of advantage. It provides for rapid assembly of the relatively pivoted parts and permits these parts to be readily separated when swung or shifted to a predetermined relative angular position. When in such position, the parts may be freely disassociated by direct separational movement and the relatively pivoted parts are provided with additional co-operating means which prevent disassociation and disassembly of the parts whenever they are swung to a relative angular position other than that in which they may be disassociated by direct separational movement. Of course, any suitable means or combination of devices for so limiting the swinging movement may be employed although it is preferable to utilize necessary parts of the structure such as the seat or the folding legs, or both, for this purpose.

In the illustrated embodiment, we have shown a folding chair construction, wherein each of the legs 25 is supplied with an intermediate or pivot piece 33, which has a part co-operating with the frame to provide pivotal engagement of the parts and permitting the same to be swung to a predetermined angular position in which the parts may be disassociated by direct separational movement. The piece 33 also has portions which co-operate with a portion of the frame to retain the parts in pivotal and rocking engagement when the parts are in relative angular positions other than that in which direct disassociation of the parts is permitted, and the parts are so formed that, by applying the leg 25 to the portions of the piece 33 extending outwardly

of the frame 13, key means is provided for limiting the swinging movement of the piece 33 with respect to the frame 13 within the limits of the relative angular positions in which direct separational movement of the parts is prevented. As shown in Figure 2 of the drawings, the leg 25, when the chair is in folded position, co-operates with the frame 13 to form key means limiting the movement of the part 33 with respect to the frame so that after the assembly of the key means, the part 33 is prevented from assuming a relative angular position with respect to the frame in which direct separational movement of the parts is permitted. The intermediate member or piece 33 may be struck from a sheet of material and is provided with a particular peripheral conformation. The tubular frame of the chair is provided longitudinally with a rectangular slot 43 at the point in the top of the front legs 13 to which the back legs are connected. The member 33 consists of a shank portion 35 whereby it may be firmly secured to a back leg and a laterally extending nose portion or hook 37 which is adapted to be inserted into the slot 43. Intermediate the shank portion 35 and the nose portion 37, the member 33 is provided with a notch or seat 39 which is adapted to receive the lower edge of the slot 43 of the front leg in which the nose is inserted. The member 33 also is provided with a curved portion forming a rounded crown which may terminate in a shoulder 41. The member 33 is preferably assembled in the front leg before the back leg is attached to the shank portion 35 by hooking the nose portion 37 into the slot 43 which is formed in the rear side of the front leg, the nose 37 being introduced until the lower edge of the slot 43 is received by the notch 39 at which time the shoulder 41 will clear the upper edge of the slot 43 whereupon the member 33 may be rotated with respect to the front leg into the position shown in Figs. 3 and 6, in which the rounded crown or curved edge portion of the piece 33 extends closely adjacent the upper edge of the slot 43, the lower end of the slot 43 acting as a pivot point about which the member 33 rocks and the rounded crown in co-operation with the upper edge of the slot 43 acts as means to retain the notch or seat 39 rockingly upon the lower edge of the slot. The back leg 25 may then be secured to the shank portion 35 which extends outwardly from the front leg. This may, of course, be accomplished in any convenient or desired manner, and we have illustrated two preferred constructions whereby the legs may be attached most easily and conveniently. In the construction shown in Fig. 3, we prefer to slit the upper end of the back leg longitudinally along its front side and to flatten the upper end of the tube to the substantial U-shaped cross section illustrated in Figure 5 to form parallel spaced

arms 47 between which the shank portion 35 of the intermediate member 33 may be secured in position in the top of the leg by spot-welding or other convenient method as indicated at 45 in the drawings.

In Figure 6 we show a somewhat simpler construction which is novel and advantageous. In this construction the leg is not slit at its upper end and the edges of the shank portion 35 are cut away to provide shoulders 63. The upper end of the back leg is pressed around the shank in such a manner that two flat parallel portions 65, formed by flattening the end of the leg, engage the opposed faces of the shank 35, and the intermediate portions 67 joining the edges of those flat portions are folded inwardly and press resiliently upon the edges of the shank 35. In this manner the leg may be attached to the shank firmly and securely without welding or other fastening means merely by pressing the parts firmly together. After the back legs are thus secured to the hinge portions 33 they may be rotated with respect to the front legs, the member 33 rocking on the lower edge of the slot 43 and sliding at its crown edge across the upper edge of the slot 43. The sides of the notch 39 diverge so that the nose of the member 33 may be introduced into the slot 43 without interference from the shoulder 41, however, after the back leg is attached, the member 33 cannot be rotated sufficiently far to disengage the shoulder 41 from beneath the top of the slot 43. The member 33 is thus interlockingly engaged in the slot and cannot be removed from the front leg after the back leg is attached.

The back rest 15 and the seat 21 are provided with upholstered pads 49 to make the chair comfortable and slightly. These pads comprise a baseboard 51, which may be cardboard or similar light material having a peripheral outline conforming to the surface to be upholstered, a resilient padding 53 arranged on the board 51 and held thereon by means of fabric material 55, the edges 57 of which extend and are fastened behind the board. The pads are secured to the metal surfaces of the back rest by means of internally threaded plugs 59 secured in the boards 51 and opening rearwardly thereof and wide headed studs 61 having threaded shanks adapted to pass from the back through apertures formed in the metal surfaces to which the pads are attached and to engage the plugs 59 on the front side of the surface. By predetermining the position of the plugs 59 and the chair surface apertures through which the studs 61 pass in engaging the plugs, it is possible to quickly align the upholstery pads in place upon the chair back and seat.

The hinge construction which we have

provided is extremely simple and inexpensive to manufacture since it consists of a minimum of parts all of which are particularly adapted for quantity production. The hinge does not have to be preassembled but may be made as an integral part of the chair assembly operation. The joint itself consists of but a single flat piece and provides a neat compact hinge of great strength and slightly appearance.

It is thought that the invention and numerous of its attendant advantages will be understood from the foregoing description and it is apparent that numerous changes may be made in the form, construction and arrangement of the numerous parts without departing from the spirit and scope of the invention or sacrificing any of its manifest advantages, the form herein described being a preferred embodiment for purposes of illustration.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a folding chair, a frame and a member pivoted, to the frame, said member being formed at its upper end with a hook portion having interlocking rocking engagement with the frame, said frame being formed with opposing abutments and said hook portion having a rounded portion and a remote notched portion, the latter interlockingly receiving one of the abutments of the frame and the former riding upon the opposite abutment to lock the notched portion on the abutment received therein.

2. In a folding chair, a frame and a member pivoted to said frame, said frame being provided with a slot and said member having a hooked portion, said hooked portion being provided with a notch having rocking engagement upon one edge of the slot and having a bearing portion riding upon the opposite edge of the slot whereby to retain the notched portion on the slot edge.

3. In a folding chair, a frame having an opening providing opposed abutments and a member pivoted to said frame, said member having a formation at one end, said formation having interlocking pivoted engagement in the opening of the frame, said formation having a notched portion rockingly seated upon one of said abutments and a remote bearing portion slidably engaging the other abutment whereby to retain the notched portion in rocking engagement upon the abutment on which it is seated.

4. In a folding chair, a frame provided with a slot, a member and means connecting said member to said frame, said means comprising an intermediate piece having a portion extending into said slot and notched for pivotal engagement with an edge of the slot, said intermediate piece having another portion to which the member is attached after

said piece is positioned in the slot, said piece having a shoulder whereby to retain the piece interlockingly in the slot after the member is attached thereto.

5 5. In a folding chair frame having a slot, a member and means to pivotally connect the member to said frame, said means comprising an intermediate flat piece having a projecting portion extending into the frame
10 slot and another portion to which the member is attached, said piece being notched intermediate said portions to receive an edge of the slot in said notch, said piece being provided with a shoulder adapted to engage another edge of said slot in order to prevent disengagement of the piece from the frame after
15 the attachment of said member.

6. In a folding chair, a frame having a slot, a member and means pivotally connecting said member to said frame, said
20 means comprising an intermediate flat piece having a projecting portion inserted into the frame slot and another portion to which the member is attached, said piece being notched intermediate said portions to receive an edge
25 of the frame slot in said notch, said piece being provided with a shoulder engaging another edge of said frame slot in order to prevent disengagement of the piece from the frame, said member being flattened at its upper
30 end upon the intermediate piece.

7. In a pivoted construction, a pair of hollow members to be pivotally connected, one of said members being provided with a lateral slot, and means for connecting said
35 members comprising an intermediate piece having a projecting nose extending in said slot and having a groove and shoulder engaging remote edges of said slotted portion whereby the intermediate piece may be interlockingly secured in said slotted portion, said
40 intermediate piece being provided with a portion adapted for attachment to the other member.

8. In a pivoted construction, a pair of hollow members to be pivotally connected, and an intermediate piece interlockingly and rockingly engaging one of said members and secured to said other member, one of said
45 members being laterally slotted and said intermediate piece having a projecting portion received in the slotted portion of the first member, and another projecting portion to which the second piece is secured, said intermediate piece being provided with a notch
50 in its edge, the notch receiving one edge of the slotted portion whereby the piece is rockingly mounted thereon, said piece having a curved edge opposite said notch, said edge engaging a remote edge of the slotted portion to maintain the notched portion in rocking engagement with the edge of the slotted portion, the other member being attached to the
55 intermediate piece and means to limit the relative pivotal movement of the members

whereby to prevent the piece from being disengaged from the member in which it is interlockingly connected, whereby an interlocking pivoted connection is provided between the members.

9. In a pivoted connection, a hollow member provided with a lateral slot, a second hollow member and a pivot lug having a portion interlockingly and rockingly secured in the slotted portion of said member, said portion
70 having a notch rockingly receiving one edge of the lateral slot and having a remote bearing portion gliding upon a remote edge of the slot whereby to retain the notched portion in interlocking rocking relationship with respect to the edge of the slot on which it is
75 mounted, said lug extending outwardly of the hollow member and being secured to the second member.

10. In a folding chair, a tubular frame having a slot, a tubular member and means to connect the tubular member to said frame, said means comprising an intermediate flat piece having a projecting portion providing
80 pivotal engagement with the slot, said piece being notched intermediate said portions to receive an edge of the slot in said notch, said piece being provided with a curved portion adapted to engage a remote edge of said slot in order to prevent disengagement of the
85 piece from the frame after the attachment of said member, said member being flattened at its upper end upon the intermediate piece and having frictional engagement therewith.

11. In a pivoted construction, a pair of tubular members to be pivotally connected, one of said members being provided with a lateral slot, and means for connecting said members comprising an intermediate piece
90 having a projecting nose adapted for insertion in said slot and having a groove and curved portion formed therein to engage the edges of said slotted portion whereby the intermediate piece may be interlockingly secured in said slotted portion, said intermediate piece being provided with a portion adapted for attachment to the second member and said second member being pressed
95 firmly upon the said portion to frictionally engage the same.

12. In a folding chair, a frame formed with a slot and a member pivoted to said frame, said member being formed with a portion having a nose extending into the slot and
100 having a notched portion, rockingly mounted upon an edge of the slot, and an opposed portion bearing against an opposed edge of the slot to keep the notched portion assembled on the edge of the slot.

13. In a pivoted construction, a pair of pivotally connected tubular members, and an intermediate piece interlockingly and rockingly engaging one of said members and secured to said other member, one of said mem-
105

bers being laterally slotted and said intermediate piece having a projecting portion extending in the slotted portion of the first member, and another projecting portion to which the second piece is secured, said intermediate piece being provided with a notch in its edge and an oppositely extending curved shoulder in an opposite edge, the notch receiving an edge of the slotted portion and rocking thereon, and said curved shoulder engaging a remote edge of the slotted portion to maintain the notched portion in rocking engagement with the edge of the slotted portion of the slotted member.

14. In a pivoted construction, a pair of tubular members and connecting means for pivotally connecting one of said members to the other, one of said members having a lateral slot and said connecting means having a projecting portion in said slot and provided with a notched portion rockingly receiving an edge of said slot whereby to form an interlocking rocking engagement therewith, said means having an extending portion to which said other member is fastened in order to secure the parts together, said projecting portion being assembled in the lateral slot by suitably angling the connecting means, said means having a portion engaging a remote edge of said slot to retain the notched portion in interlocking rocking engagement upon the edge of the slot and means to restrict the rocking movement of the connecting means with respect to the slotted member to prevent disengagement of the rocking portion from the remote edge of the slot whereby to lock said portion to the edge of the slot and thus prevent removal of the connecting means from its assembled position in the slot.

15. In a pivoted connection, a hollow member having a lateral slot, a formed pivot lug having a notched portion rockingly engaging one edge of the slotted portion of said member, said lug having an outwardly extending portion and a second tubular member having an end crimped upon said outwardly extending portion, said lug having a rounded portion disposed thereon opposite said notched portion and slidingly abutting a remote edge of the slotted portion to retain the notched portion in rocking engagement with the edge of the slot engaging therein.

16. In a pivoted construction, a pair of members and a lug for pivotally connecting one of said members to the other, at least one of the said members being of hollow formation and having a lateral slot and said lug comprising a flat member having a forwardly projecting nose extending into the slot and a rearwardly extending portion to which the other member is fastened, said forwardly projecting nose and rearwardly extending portion defining an intermediate notch rockingly receiving an edge of said slot when the

lug is assembled therein, other portions of said nose and rearwardly extending portion forming a curved surface riding upon a remote edge of the slot after the lug is assembled therein, whereby to retain the notched portion interlockingly in rocking engagement upon the edge of the slot received by the notched portion.

17. An article of furniture having relatively foldable parts, each part having cooperatively associating means providing pivotal engagement of said parts so that said parts may be swung to predetermined angular positions and be freely disassociated by direct separational movement thereof when said parts are in one of said predetermined relative angular positions, said parts having additional means operative whenever said parts are swung to the other of said predetermined relatively angular positions for preventing disassociation and disassembly of said parts, and other means applied to at least one of said parts to limit the swinging movement of said parts within the limits of said predetermined angular positions.

18. An article of furniture having relatively foldable parts, each part having cooperatively associating means providing pivotal engagement of said parts, whereby said parts are movable to a predetermined relative angular position, and may be freely disassociated by direct separational movement thereof, additional means operative whenever said parts are swung out of said predetermined relatively angular position for preventing disassociation and disassembly of said parts, and other means applied to one of said parts after assembly of said parts for limiting the rotation of said parts in order to prevent the parts ever from assuming the position in which they can be disconnected.

19. An article of furniture having two cooperating members hinged together, one constituting a leg and the other a member supported thereby, one of said members having a slot of limited length, and the other having a hook projecting through the slot and comprising convex and concave portions, the concave portion of the hook seating on the first member at one end of the slot, and the convex portion of the hook being spaced from the concave portion a distance slightly less than the length of the slot, whereby the hook is retained in the slot when in certain relative angular positions of the parts with respect to each other, and stop means to normally restrict the motion of the parts within said relative angular positions.

In witness whereof, we have hereunto subscribed our names.

JOHN B. ADLER.
JOHN B. O'CONNOR.
WALTER N. VANCE.