Feb. 16, 1954 W. L. SHEPHERDSON 2,669,295

KNOCKDOWN CHAIR

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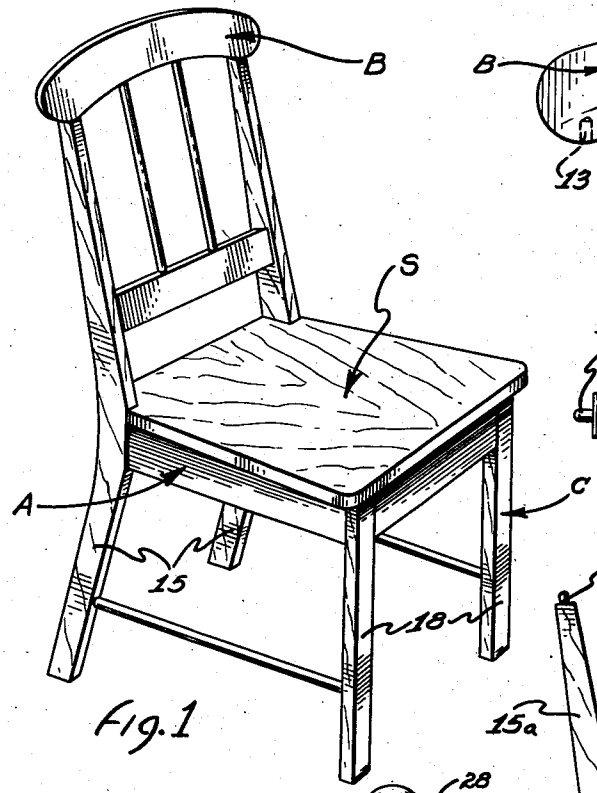


Fig. 1

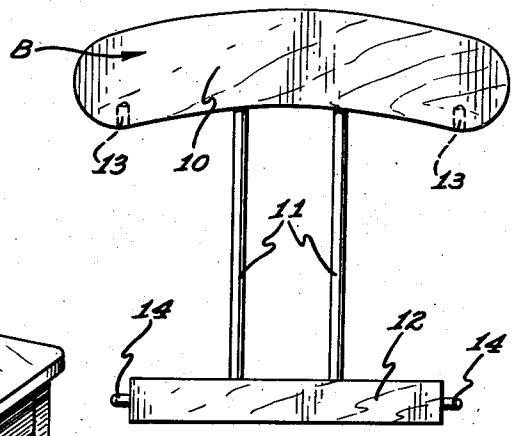


Fig. 2

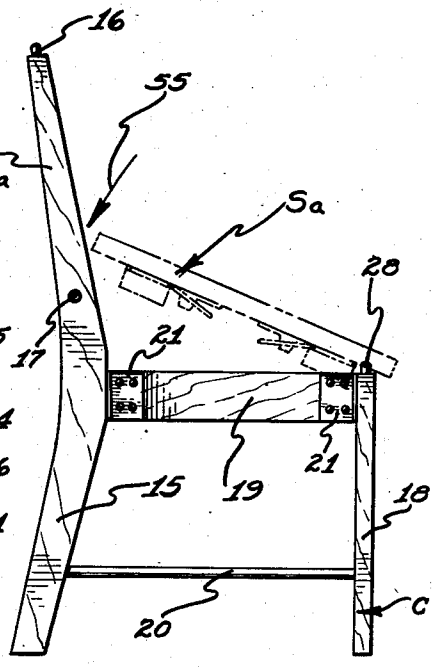


Fig. 3

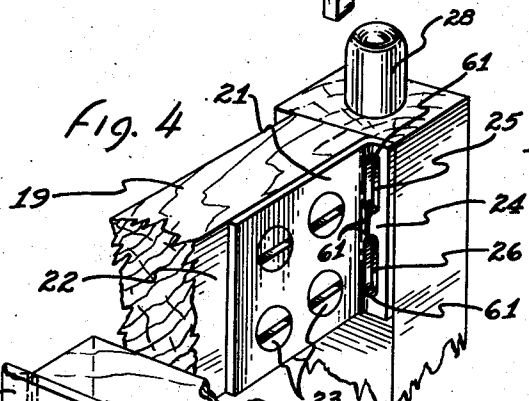


Fig. 4

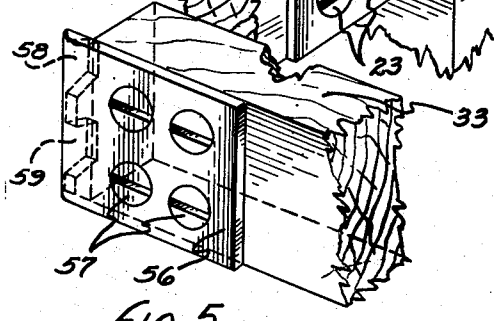


Fig. 5

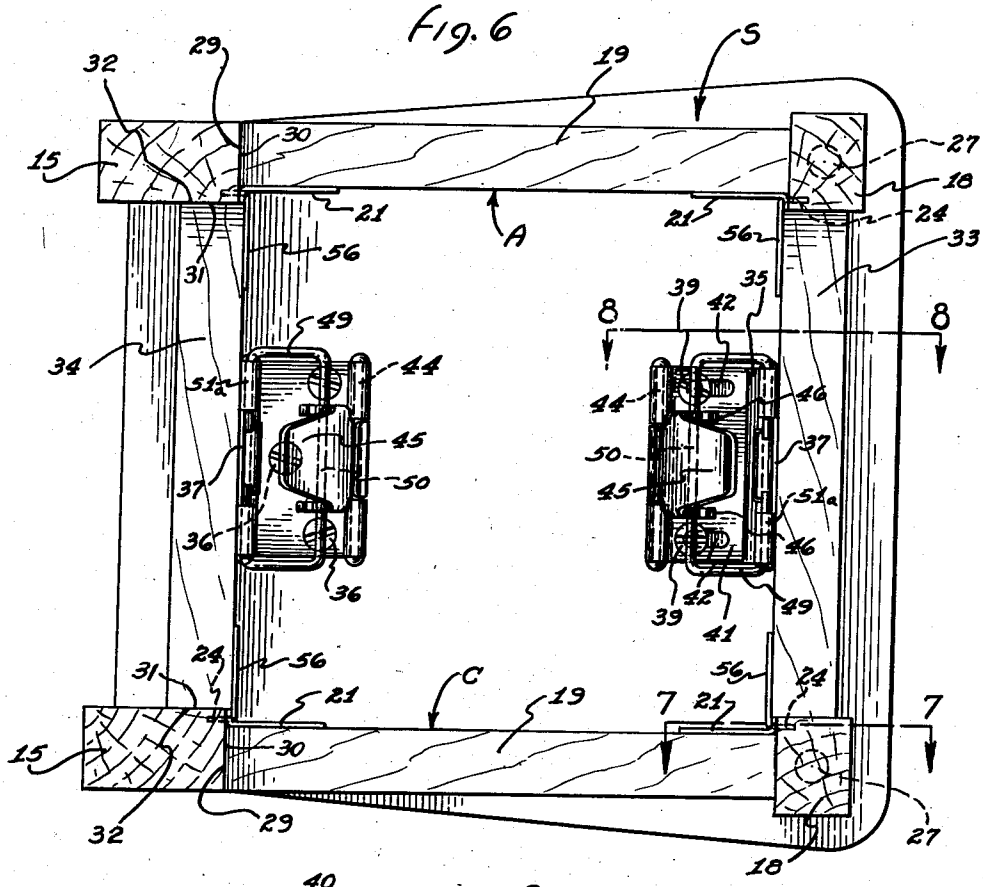
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Fig. 6



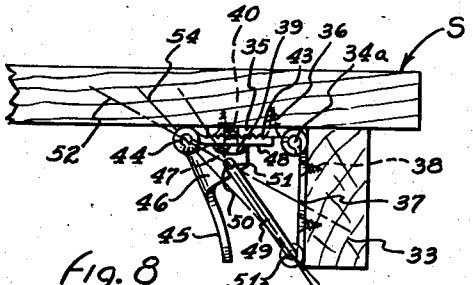


Fig. 8

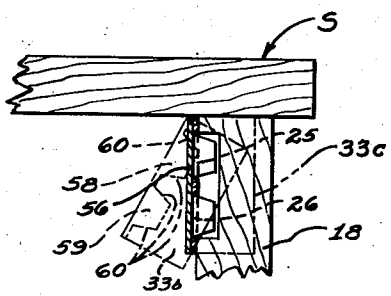


Fig. 7

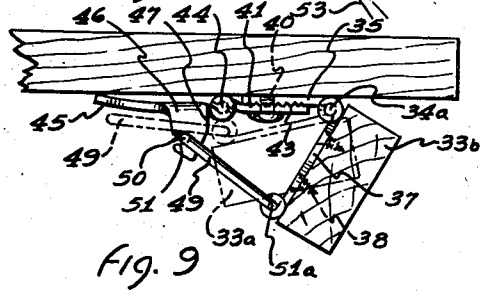


Fig. 9

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KNOCKDOWN CHAIR

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7 Claims. (Cl. 155—196)

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This invention pertains to improvements in articles of furniture and is more particularly directed to knock-down type of furniture which may be readily assembled into a rigid inter-locked solid structure without the use of special tools or fastenings of any kind.

One of the objects of this invention is to provide an improved knock-down type of furniture having a rigid inter-locking structure and self contained locking devices which may be adjustably arranged to at all times hold the furniture in rigid condition.

Still another object of this invention is to provide an improved knock-down type of furniture in which there is provided novel corner locking and supporting devices together with improved toggle action clamp mechanism of adjustable character adapted to maintain a rigid structure for the knock-down item of furniture under all conditions.

Still another object of this invention is to provide furniture of a knock-down type having interlocking mechanism for holding the assembled furniture in rigid condition while at the same time permitting its rapid and quick disassembly for purposes of packaging, shipping and storage with a minimum of wasted space.

Still another object of this invention is to provide a basic furniture structure having a minimum series of elements which may be assembled or disassembled and which are interlocked into a rigid positive assembly when in use.

Still another object of this invention is to provide a basic furniture element such as a chair with a series of three essential elements and a seat member, the seat member of which is assembled by suitable mounting means associated with the seat and which interlocks with the remaining chair elements as the seat is swung rearwardly and downwardly to a locked position and wherein suitable latching and locking devices of novel design are brought into play to hold the entire chair structure together without the assistance of tools, loose parts or special clamping devices separate from the chair structure.

Still another object of this invention is to provide an improved latching and pressure clamping device for holding the chair structure together while at the same time lending itself to immediate release of the chair members and folding of the various parts for placement in a shipping carton or container with a minimum of space and effort being required.

Further features and advantages of this invention will appear from a detailed description of the drawings in which:

Fig. 1 is a perspective view of one exemplary embodiment in a chair structure of the novel features forming this article of furniture.

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Fig. 2 is a front elevation of the back element of the chair of Fig. 1.

Fig. 3 is an inside elevation of the left hand side frame member of the chair of Fig. 1.

Fig. 4 is an enlarged fragmentary perspective view of one of the latching elements of the chair side frame of Fig. 3.

Fig. 5 is an enlarged fragmentary view of the mating latch element carried on the chair seat.

Fig. 6 is an under side view partly in section of the legs of the chair, showing the bottom of the chair seat and associated latching and clamping and locking devices associated therewith.

Fig. 7 is an enlarged fragmentary sectional view on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged fragmentary view on the line 8—8 of Fig. 6.

Fig. 9 is an enlarged view similar to that of Fig. 8 but showing the locking device completely released for removal of the chair seat and disassembly of the chair structure.

For illustrative purposes this invention is shown applied to a chair, and it is to be understood that various other forms of furniture both as to design and construction may readily be adapted to the utilization of the features and principles of this invention.

As exemplary of one embodiment of this invention there is shown a chair having a back member or element B and a pair of leg members A and C and a cooperating seat member S which is arranged to be placed on and secured to the aforementioned back and side frame members by novel latching and locking means to provide a rigid chair structure. The back member B comprises the top rail member 10 having depending spindles 11 which are rigidly connected at their lower end to the back cross rail 12. Dowel receiving holes 13 are formed on the outer under edges of the back member 10 and dowel pins are formed at 14 on the lower rail member 12.

A pair of side frame members are also provided such as the left hand member shown in Fig. 3 comprising the back supporting leg member 15 having an upstanding portion 15a on top of which is formed a dowel 16 for engagement in the holes 13 of the back member B and also provided with a dowel receiving hole 17 for receiving the dowels 14 of the member 12. Front legs 18 are also provided for the side frame members A and C which are connected at their upper ends by side rails 19 securely fixed in a well known manner to the leg members 15 and 18, the legs 15 and 18 being further tied together by the usual rung 20. Fixed on the inside of the side rails 19 of the side frame members A and C adjacent each of the legs 15 and 18 are the latching plates 21 secured to the inside face 22 of the side rails 19 by suitable wood screws 23.

The plate 21 has an edge 24 turned over at 90 degrees to the plate portion 21 and in which there are provided elongated perforations 25 and 26 adjacent the outward face of the member 21, as best seen in Fig. 4.

Associated with the back member B and the side frame members A and C is the seat member S, as best shown in Fig. 6. The seat member S is provided with a pair of dowel receiving holes 27 which snugly fit over the upstanding dowels 28 rigidly fixed in the tops of the legs 18 of the side frames of the chair. The back portion of the seat has abutment surfaces 29 which engage the front faces 30 of the legs 15 of the side frames A and C. Side contacting surfaces or interfaces 31 on the legs 15 engage the end faces 32 of the rear rail 34 and the faces of the rear portion of the seats.

On the under side of the front and rear of the chair seat member S there are pivotally mounted the front rail 33 and the rear rail 34 each of which is carried for swinging movement around an axis 34a forming the hinge pin of a member having a base plate 35 secured to the under side of the seat member S as by suitable screws 36 and having the other member 37 secured by screws 38 to the inside surfaces of the respective members 33 and 34. Adjustably mounted on the base member 35 by adjusting screws 39 carried in tapped holes 40 in the member 35 is the toggle clamp carrying member 41 having elongated holes 42 through which pass the screws 39 which, when loosened, permit bodily adjustment of the member 41 to and from the respective front and rear rails 33 and 34. Preferably serrated surfaces are provided at 43 between the members 35 and 41 so as to effect rigid holding of the two members together when the screws 39 are appropriately tightened.

On the outer end of the member 41 on a suitable hinge pin 44 is mounted the latching finger 45 which has a pair of integral lugs 46 and an abutment stop surface 47 which engages the top surface 48 of the member 41 when in fully locked in position. On the outer end of the member 37 is a U-shaped wire hasp member 49 having a longitudinal bar member 50 which snugly fits in mating notches 51 formed in the lugs 46 of the member 45, the outer end of the hasp member 49 being pivotally mounted on a suitable hinge pin at 51a on the member 37. Thus when the member is fully clamped up the hinge pin 44 and the bar portion 50 lie in a line 52 while the bar member 50 and the hinge pin 51 lie in a line 53 which is bent inwardly or in toggle action position of locking from the normal outward swung position regarding a line 54 extending between the two hinge pins 44 and 51 when in clamped up position so as to normally cause the finger member 45 to be biased and urged into position with its stop surface 47 up against the surface 48 of the member 41 holding the side members in outward swung position.

When assembling the chair, the side frame members A and C are assembled with their respective dowels 16 and holes 17 with the respective dowel holes 13 and dowels 14 of the back member B. The seat member is then placed in tilted position Sa shown in Fig. 3 with its dowel receiving openings 27 placed over the dowels 28 on top of the front legs 18. At this time the front and rear rail members 33 and 34 are swung to retracted position as shown in Fig. 9 where the front rail is shown for example at 33a with the hasp member 49 out stretched against the clamp finger 45 which has also been swung up against the seat as shown around its axis of pivoting 44. The seat is then swung down into position with its abutment surfaces 29 and 31 engaging the respective surfaces 30 and 32 of the back leg members of the side frames A and C as described. After the seat has thus been forced home by downward swinging movement as indicated by the arrow in Fig. 3, the front and rear rail members 33 and 34 are then swung downwardly and outwardly to a position such as 33b shown in Fig. 9 and the hasp member 49 brought into engagement with the notches 50 and the lugs 46. The front and rear rail members 33 and 34 are then swung finally home so that the latch tongue members 56 secured to each end of the front and rear rail members 33 and 34 by suitable wood screws 57, Fig. 5, and having the tongues 58 and 59, swing into full engaged position 33c, Fig. 7, with the elongated notches 25 and 26 respectively of the plate members 21 so as to securely lock the front and rear rail members with the side frame members, as best seen in Figs. 4, 5, and 7. The tapered edges 60 associated with the tongues 58 and 59 wedge into the ends 61 of the elongated slots 25 and 26 to form a positive locking structure which is maintained in positive compression in the slots 25 and 26 by the aforementioned toggle clamping arrangement shown in Fig. 8. Thus shrinkage of the wood or constant use of the chair cannot cause the chair to become loose and wiggly. Further, any excessive use of the chair or shrinkage of the wood can be readily taken care of by loosening the screws 39 and readjusting the member 41 to give the proper toggle action for forcefully holding at all times the front and rear side rail members 33 and 34 with their tongues 58 and 59 into positive engagement with the slots 25 and 26 of the member 21 of the side frame members of the chair.

There has thus been provided a highly efficient and adjustable apparatus for at all times maintaining a rigid chair structure for a knock-down chair or furniture arrangement.

While the apparatus herein disclosed and described constitutes a preferred form of the invention, it is also to be understood that the apparatus is capable of mechanical alteration without departing from the spirit of the invention and that such mechanical arrangement and commercial adaptation as fall within the scope of the appendent claims are intended to be included herein.

Having thus fully set forth and described this invention what is claimed as new and desired to be obtained by United States Letters Patent is:

1. In an article of furniture comprising a chair structure having, a back member, and a pair of side frame members including front and back legs, means for interconnecting said back and side frame members, a seat member, dowel means in the top of the front legs of said side frame members engaging mating dowel holes in the under side of the front portion of said seat member, abutment surfaces on the rear portion of said seat member facing rearwardly and outwardly engaging the front and interfaces of the back legs of said side frame members, interconnecting front and rear rail members pivotally mounted on the underside of said seat member latchingly engaging the legs of said side frame members, and locking means interconnected between the underside of said seat and each of said front and rear rail members for holding said front and rear rail

members in engagement with said legs of side frame members.

2. In a chair structure comprising a back member, a pair of side frame members, front and rear legs and side rail on said side frame members, means for demountably interconnecting said back and side frame members, a seat member, a front and rear rail, means for pivotally mounting said front and rear rail on the underside of said seat member, latching means on the outer ends of said front and rear rail adapted to engage mating latching means fixed on said side rails of said side frame members, and a locking device interconnected between the underside of said seat and said front and rear rail members for securing said latching means on said rail members to said mating latching means on the side rails of side frame members.

3. A knock-down chair assembly comprising, a seat member, a back member, a pair of side frame members, legs on said side frame members, means for demountably interconnecting said back and side frame members, side rails on said side frame members, a front rail, a rear rail, means for pivotally mounting each of said rails on the under side of said seat member, latch means on the outer ends of said front and rear rail members, mating latch means fixed on the inner sides of said side rails of said side frame members having elongated perforations adjacent said legs adapted to receive the latch means on the ends of said front and rear rail members when swung to a downwardly depending locked position, and locking means interconnected between said seat and said front and rear rail members for moving said front and rear rails into downwardly swung depending latched position.

4. A knock-down chair assembly comprising a seat member, a back member, a pair of side frame members, means for demountably interconnecting said back and side frame members, side rails on said side frame members, a front rail, a rear rail, means for pivotally mounting each of said rails on the under side of said seat member, latch means on the outer ends of said front and rear rail members, mating latch means on the inner sides of said side rails of said side frame members adapted to receive the latch means on the ends of said front and rear rail members when said front and rear rail members are swung from a horizontal to a downwardly pending locked position, and locking means for moving said front and rear rails into downwardly swung latched position, comprising a toggle action clamp device having a hinge connection on said seat and a second hinge connection on said front and rear rail members, an intermediate hasp member having a toggle pivot with a clamp finger, and stop means on said clamp finger to limit said toggle motion to a predetermined locked position.

5. A knock-down chair assembly comprising a seat member, a back member, a pair of side frame members, means for demountably interconnecting said back and side frame members, side rails on said side frame members, a front rail, a rear rail, means for pivotally mounting each of said rails on the under side of said seat member, latch means on the outer ends of said front and rear rail members, mating latch means on the inner sides of said side rails of said side frame members adapted to receive the latch means on the ends of said front and rear rail members when said front and rear rail members are swung from a horizontal to a downwardly pending locked position, and

locking means for moving said front and rear rails into downwardly swung latched position, comprising a toggle action clamp device having a hinge connection on said seat and a second hinge connection on said front and rear rail members, an intermediate hasp member having a toggle pivot with a clamp finger, stop means on said clamp finger to limit said toggle motion to a predetermined locked position, and means for relatively adjusting the pivotal connections on said seat and said front and rear rail members for any desired tension of toggle action in said locking device.

6. In a knock-down chair assembly comprising a back member, a pair of side frame members, means for demountably interconnecting said back and said side frame members, a seat member, dowel means interconnecting the front edge of said seat at each corner with said side frame members, abutment surfaces on said seat member engaging between and the front faces of the back supporting portion of said side frame members, a front and a rear rail member, hinge means for mounting said rail members on the under side of said seat, toggle action locking means associated with said hinge connection of said front and rear rail members on said seat including a toggle clamping finger, a hasp member associated with said finger including stop means for limiting the movement of said hasp and clamp finger members, and means for relatively adjusting said clamp finger relative to said hasp member.

7. In a knock-down chair assembly comprising a back member, a pair of side frame members, means for demountably interconnecting said back and side frame members, a seat member, dowel means interconnecting the front edge of said seat at each corner with said side frame members, abutment surfaces on said seat member engaging between and the front faces of the back supporting portion of said side frame members, a front and a rear rail member, hinge means for mounting said rail members on the under side of said seat, toggle action locking means associated with said hinge connection of said front and rear rail members on said seat including a toggle clamping finger, a hasp member associated with said finger including stop means for limiting the movement of said hasp and clamp finger members, and means for relatively adjusting said clamp finger relative to said hasp member, latch means on the outer ends of said front and rear rail members including a plurality of tapered tongues, mating latch means having slotted openings mounted on said side frame members so that said tongue members engage in wedging relationship therewith under the influence of said toggle acting locking device.

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