May 31, 1955 D. S. HAVEN 2,709,485

KNOCK-DOWN CHAIRS

Filed Jan. 7, 1952

FIG. 1.

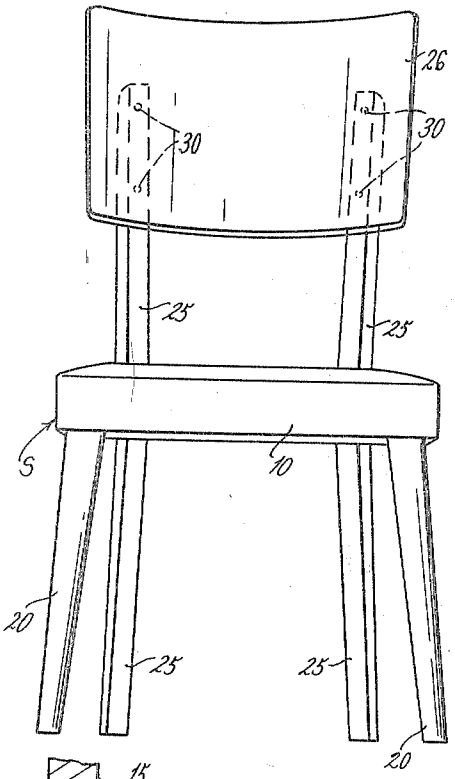
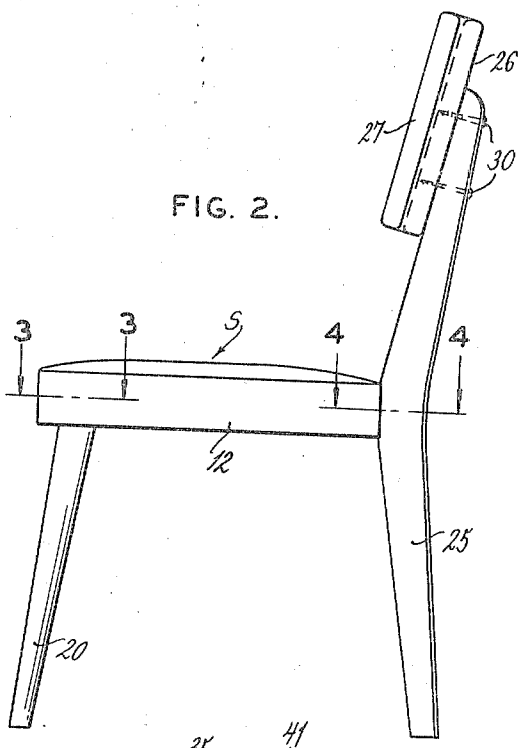


FIG. 2.



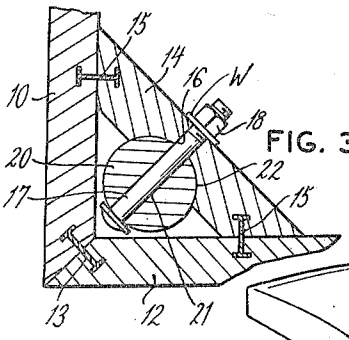


FIG. 3

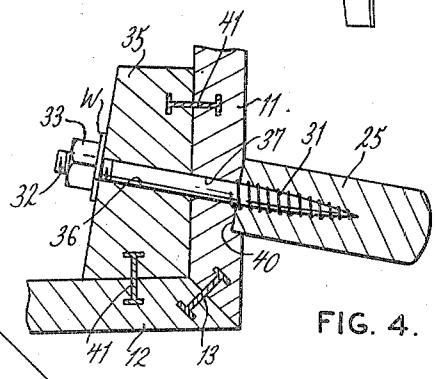


FIG. 4.

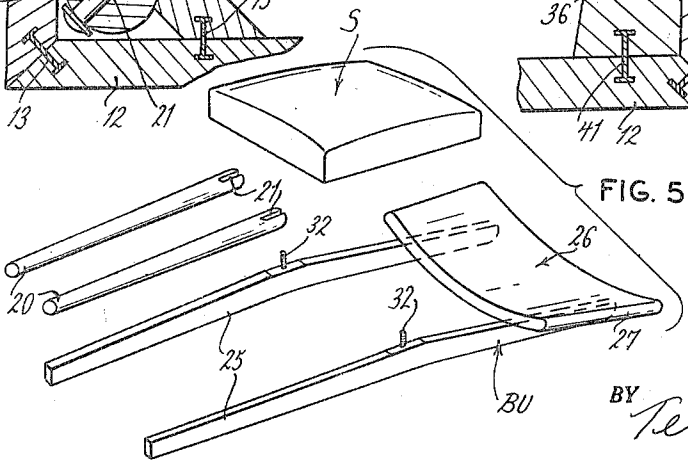


FIG. 5.

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KNOCK-DOWN CHAIRS

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2 Claims. (Cl. 155—196)

This invention relates to improvements in knock-down chairs, and more particularly to an improved series of subassemblies together with improved assembly provisions therefor, such that the chairs may be packaged, distributed and sold in the form of a flat, compact parcel thereby conducing to savings in charges for packaging, shipment and the like, the improved construction of the chair likewise enhancing the rigidity and stability of the assembled unit.

Numerous designs of knock-down furniture have heretofore made their appearance in the trade, but all of such units, particularly chairs of knock-down type thus far available, fail in some one or more important respects to result in a minimum package size when disassembled, or alternately, sacrifice rigidity, life or best appearance to realize a suitable knock-down construction. In other prior articles of furniture of knock-down type, there is required an inordinate period of time and degree of skill for erection and disassembly. The present invention has as its principal object the realization of a chair of knock-down construction which possesses, in an optimum degree, good appearance, rigidity, ease of assembly and disassembly without any special tools, and which is of such character that the chair may be fully upholstered at the factory or other situs of preassembly, without in anywise detracting from its knock-down features. The present developments embody certain features of, and certain changes with improvements, over the subject matter disclosed and claimed in Letters Patent No. 2,580,707 issued January 1, 1952, to Norman R. Underhill, and of common ownership with the present application.

More particularly stated, an important objective of the present improvements is realized in a knock-down chair construction which comprises as its major elements, a back panel, a seat panel and a plurality of readily removable and easily assembled legs, all of which subassemblies may be quickly and readily finally assembled after purchase without any disturbance whatever of upholstery, and entirely by easily manipulable elements beneath the seat panel.

The foregoing and numerous other advantages and objects will more clearly appear from the following detailed description of a presently preferred embodiment, particularly when the description is considered in connection with the accompanying drawing, in which:

Fig. 1 is a front elevational view of a typical chair embodying the present improvements, showing the chair fully assembled;

Fig. 2 is a side elevational view of the chair of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view taken in a horizontal plane, and located by line 3—3 of Fig. 2;

Fig. 4 is a view similar in nature to Fig. 3, but showing certain features of assembly at the rear of the seat panel frame, Fig. 4 being located by line 4—4 of Fig. 2, and

Fig. 5 is an exploded view showing the major subassemblies of the chair, prior to final assembly, and substantially in the relation in which the subassemblies are disposed for storage or shipment.

Referring now by characters of reference to the drawing and first to Fig. 5, it is a preference to form the subassembly S at the situs of manufacture, as a fully upholstered, substantially rectangular seat frame comprised of a front rail **10**, a rear rail **11** and a pair of side rails **12**. These rails are mitered and their cornering ends securely joined as by the use of one or more clamp nails **13**.

Located internally of each corner region of the substantially rectangular seat frame, is a corner brace, the brace elements such as **14** in the forward portion of the seat frame serving to bridge the front rail **10** and one of the side rails **12**, these corner braces being generally secured at their ends to the adjacent rails, as by clamp nails **15**. Each of the forward corner braces is horizontally and depthwise apertured as at **16** to receive an assembly bolt **17** provided with a washer W and a nut **18**. The upper end of each of the front chair legs **20** is transversely slotted at its upper extremity, each of such slot being indicated at **21**, and being open at its top so that it is not necessary to remove and reinsert the assembly bolt **17** incident to assembly or disassembly of the adjacent chair leg. The rigidity of the fore legs of the chair is greatly enhanced by the provision in each of the corner braces **14**, of a vertical, part cylindrical recess **22**, which recess partly embraces and securely grips the slotted upper end of the adjacent chair leg. It is highly desirable that the recess or leg seat **22** conform closely to the external shape of the upper part of the leg to be received therein, in the present example such upper portion of the leg being substantially cylindrical, and curved on a radius uniform with that characterizing the leg seat or recess **22**. The bolt opening **16** as will be noted, is extended through an intermediate part of the recess **22**.

The foregoing detail of description of elements and features of the corner construction and detachable leg mounting in the forward corner of the chair, is included herein for completeness of present disclosure. It is to be noted, however, that this much of the present subject matter is fully disclosed and claimed in the Underhill Patent No. 2,580,707, hereinabove mentioned.

The subassembly S will be hereinafter further described, prior to which, for better understanding, further reference is now made to the remaining subassemblies, these including a back unit generally indicated at BU and which comprises a pair of vertical supporting posts **25**. These are normally substantially vertical as indicated in Figs. 1 and 2, and are bridged and tied together across their upper portions by a back rest or back element **26** which may, if desired, be upholstered in any desired or conventional manner, thus including the overlying or covering structure **27**. Wood screws or the like **30** extend through the upper portions of the posts **25** and engage the back element **26**.

In order to impart a more comfortable back angle and in order to augment the area of base of support as well as for more acceptable styling, the lower part of each element **25** bears somewhat of a dog-leg relation to the upper portion thereof as will best appear from Fig. 2. However, throughout the length of each element **25** in the selected example, its cross section is substantially rectangular as best shown in Fig. 4.

These supporting posts **25** extend above the seat frame generally indicated at S, and in the example shown are continued below the seat frame to constitute the rear chair legs. In the intermediate region of the members **25** these are affixed at the situs of preassembly such as the factory, hanger bolts. As well known, each hanger bolt includes a lag screw end indicated at **31** (Fig. 4) which is threaded into the intermediate portion of the supporting post **25** preferably centrally thereof so as to intersect the axis of the post, as will appear from Fig. 4. The remainder of the length of the hanger bolt includes the usual unthreaded portion, and a machine thread por-

tion 32 carrying a nut 33 preferably with a washer W. Thus the subassembly BU as thus far described, will appear as shown as a portion of Fig. 5. It will appear from this figure that for purposes of packaging and storage, the unit BU may be overlain by the upholstered seat frame S and boxed in a flat package or other container. The front chair legs 20 may be placed between posts 25 without requirement of extra space, and a small package of assembly hardware may be placed between posts 25 in case these items are not carried by the units S or BU.

Referring to the features of the seat frame S, it will be noted from Fig. 4 that the rear corner braces, indicated at 35, are trapezoidal in cross section. Each of these rear braces is drilled to provide a bolt passage depthwise therethrough as indicated at 36, the bolt passage 36 being adapted to receive the hanger bolt 31—32. The bolt passage 36 extends horizontally through the corner block 35, and is arranged at an acute angle to the adjacent rear rail 11 of the seat frame. Bolt passages 37 extend through the rear rail 11 of the seat frame, the bolt passages 37 serving as a continuation of bolt passages 36, and serving to receive hanger bolts 31—32.

Repeated experiments have indicated that the rigidity and general stability of the assembled chair are greatly enhanced by providing externally of the corner region of the seat frame S, specifically in the outer face of the rear rail 11, a pair of vertical channels, recesses or seats, one for each of the supporting posts 25, these channels being indicated at 40. It is further a preference to form these channels as by routing or otherwise so that the side of each channel nearer the adjacent corner of the seat frame, is at a more abrupt angle with respect to the side of the frame than the opposite side of the channel, as will appear from Fig. 4. The width of the channel 40 is such as closely to conform to the width of the adjacent marginal portion of the supporting post 25, so that the latter snugly interfits the channel or recess, with a distinct bracing effect, particularly when the hanger bolt is tightened up through actuation of the nut 33. The channel 30 may be referred to as obliquely formed in the rear rail 11, from which, as will appear from Fig. 4, there results an oblique setting of each of the supporting posts 25, and a relative divergence thereof, with each such post canted appreciably toward the adjacent corner of the seat frame.

Similarly to the front corner braces 14, each of the rear corner braces 35 is securely anchored in its end regions to the cornering rails 11—12 of the seat frame, for example as through clamp nails 41 both, as will be noted, remote from the bore 36 and hanger bolt through the adjacent block, thus making for a rigid and stable corner structure.

The manner of assembly and disassembly of the major subassembles comprised of the unit BU, the upholstered seat frame S, and fore legs 20, is thought now to have become apparent from the detailed description of the parts and features thereof, but it may be noted for completeness that, although the exact order of assembly steps is not critical, the unit BU may if desired, be first assembled to the seat frame, by removal of the nuts 33 and washer W and applying the seat frame S to the hanger bolts so that the latter extend, in order, through the bores 37 and 36 with the forwardmost margin of the supporting posts 25 firmly and tightly seated in the channels 40 therefor. Nuts 33 may now be applied over the washers and threaded up. There remains the assembly of the fore legs 20 to the seat frame, for which purpose the nuts 18 are backed off if necessary, but preferably without removal, so as to provide plenary clearance for application of the slotted end of the adjacent leg 20 over the bolt. The slot 21 of each front chair leg is cut only to a depth such that, as preferred, when the leg is at correct height the bolt 17 will bottom in the slot 21, and has its upper end firmly seated in and considerably stabilized by the closely conforming recessed seat 22. Each of the nuts 18 may now be tightly threaded up over the adjacent washer so as permanently to retain the fore legs in place. The chair is now fully assembled ready for use, and exhibits a degree of stability and load-supporting capacity fully equal to the better factory assembled chairs of comparable size, materials and general design.

The steps incident to knock-down operations or disassembly of the major subassembly is, now obviously, the reverse of that described. It should be noted that, if desired, the nuts 18—33 may be replaced by wing nuts in which case no tools whatever are required for assembly and disassembly.

It will have appeared that the final assembled chair as described and the several subassemblies thereof will fully realize each of the several objectives hereinabove stated, as well as others implied from the more detailed description. Although the improvements have been described by particularized reference to a single exemplary embodiment, the detail of description should be understood solely in an instructive rather than in any limiting sense, many variants being possible withihn the scope of the claims hereunto appended.

I claim as my invention:

1. Means for connecting a leg and post member of a chair with a substantially rectangular seat-supporting frame, comprising a brace member engaging two adjacent sides of the seat frame adjacent a corner thereof, means connecting each end portion of said brace member with one of said sides, respectively, said brace member having a bore formed transversely and substantially horizontally therethrough, a screw thread element attached to said post member and extending freely through the bore in the brace member and likewise extending freely through one of the adjacent sides of the frame adjacent the corner occupied by the associated brace member, the last said side of the frame being provided with a channel having one side at a more abrupt angle to the side of said frame than the other side of said channel, and thereby providing an inner seat that is oblique to the frame side, the post member interfitting said channel and engaging said seat, said brace member having a surface adjacent the bore which is substantially parallel to the inner seat, and a nut on said screw element and operatively engaging said surface.

2. In a knock-down chair, a back assembly and a seat assembly constituting the major chair elements; the seat assembly being comprised of opposite side rails, a front rail and a rear rail substantially rectangularly related as a seat frame, a corner brace internally of each rear corner of the substantially rectangular seat frame, clamp nails securing the ends of the seat frame rails to each other, a clamp nail engaging each end of the rear corner braces and the rear and side rails of the seat frame respectively, each of the rear corner braces and the rear rail being provided with a substantially horizontal bolt aperture at an acute angle to the rear rail of the seat frame, said rear rail being provided with a vertical, outwardly-opening channel close to each of its corner regions, said channel being at a more abrupt angle along one side than the other side thereof, and thereby providing an inner seat disposed obliquely to the rear rail traversed by the adjacent bolt aperture; the back assembly comprised of a pair of vertical supporting posts, a back rest bridging the upper end portions of the posts and secured thereto, the posts being continued to and below the seat frame to constitute the rear legs of the chair, a pair of hanger bolts, one affixed to an intermediate region of each of the supporting posts and projected substantially horizontally forwardly thereof, thence, in assembly, freely through the bolt apertures in the rear rail of the seat frame and the adjacent corner brace, and a nut threadedly received on each hanger bolt, the vertical supporting posts of the back assembly being of a substantially rectangular section and snugly and closely interfitting the

vertical channel of the adjacent part of the rear seat frame rail, and engaging said oblique seat, each corner brace being provided with a surface adjacent the bolt aperture which is substantially parallel to the inner oblique seat, the nut operatively engaging said surface.

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