April 30, 1963 C. U. DEATON 3,087,758

CHAIR

Filed Aug. 7, 1961 2 Sheets-Sheet 1

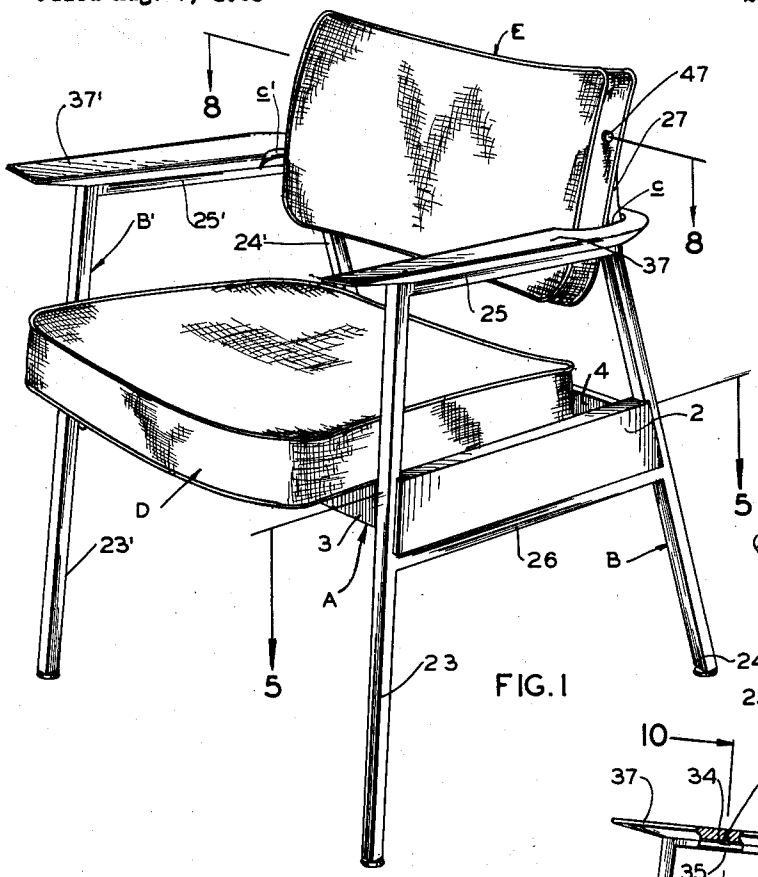

FIG. 1

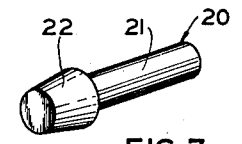

FIG. 7

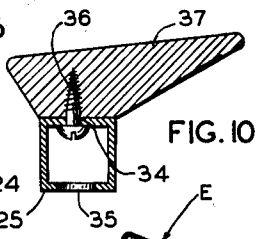

FIG. 10

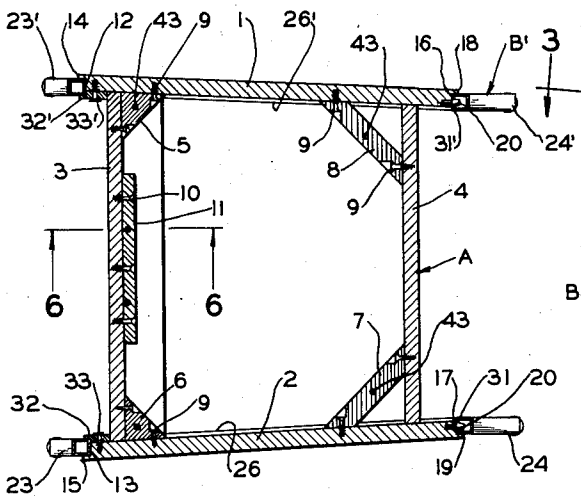

FIG. 3

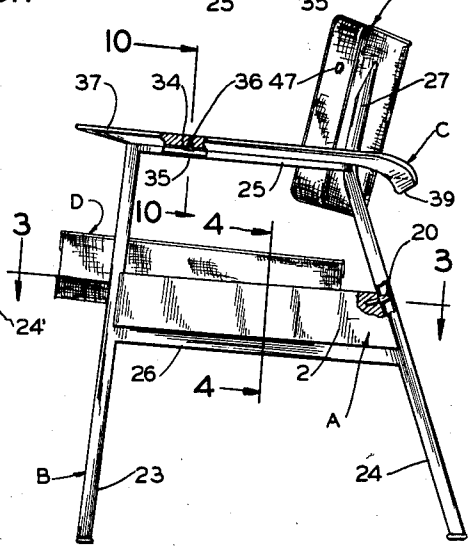

FIG. 2

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CHAIR

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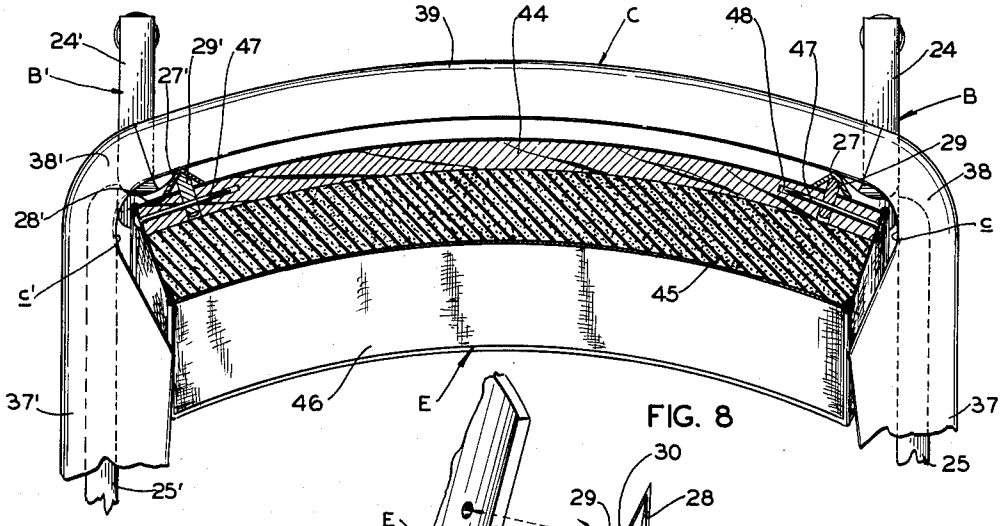

FIG. 8

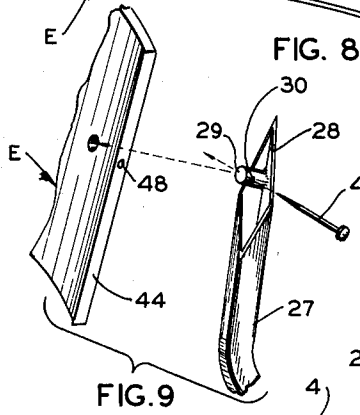

FIG. 9

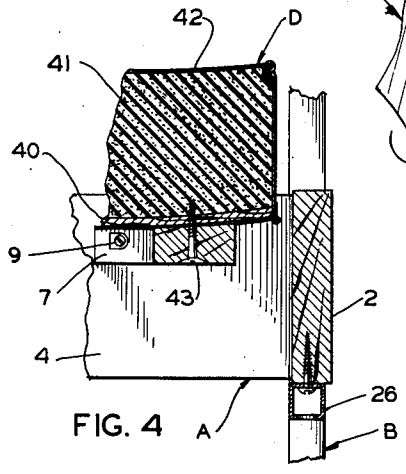

FIG. 4

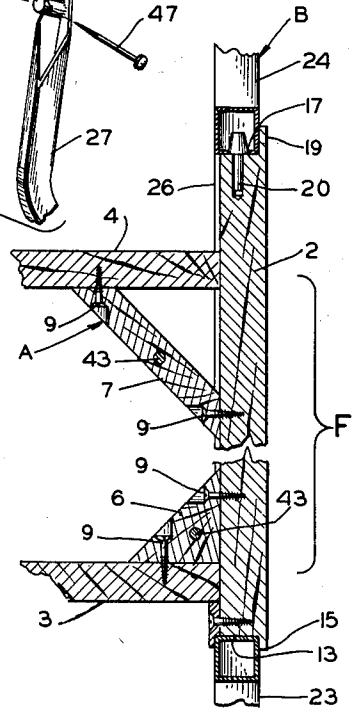

FIG. 5

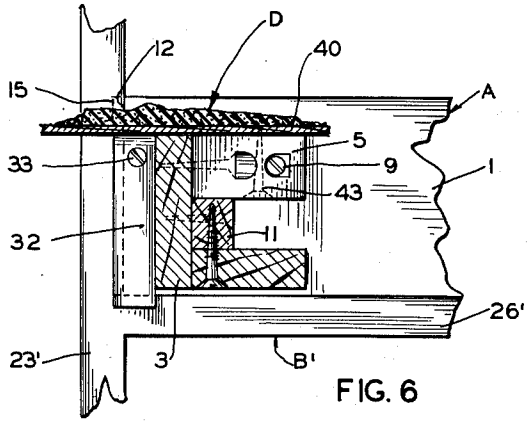

FIG. 6

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3,087,758

CHAIR

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2 Claims. (Cl. 297—445)

This invention relates in general to furniture and, more particularly, to a chair having a frame which is a combination of metal and wood components.

In developing and designing modern furniture, and particularly furniture which embodies a combination of wood and metallic elements, it is difficult to interconnect the wood and metallic members without the use of some type of visible fastening elements. Such fastening elements are usually unattractive in appearance and interfere with the clean sweeping flow of line which is considered essential in contemporary designs. Many designers of modern furniture have actually developed fastening elements with very large oversized heads of starkly geometric configuration, endeavoring by this means to make the visible portion of the fastener element a prominent part of the design. Such efforts, however, are rarely, if ever, successful from the aesthetic point of view. Indeed, such expedients are usually employed in making very low-priced so-called "modern" furniture.

On the other hand, in the case of fine well-designed contemporary furniture, every effort is made to use concealed jointing. This is no particular problem where metal elements are concerned, since metal elements can be welded together and the weld-joints ground off or buffed down so as to be virtually invisible after the article is finally finished. Similarly, woden elements can be tenoned, dove-tailed, or otherwise joined by conventional furniture-marking techniques, and such joints are also invisible from the outside surfaces of the furniture after the finishing operations have been completed. The really difficult problem is encountered in joining metal to wood. Usually this is accomplished by designing the furniture so that the wood element, whatever it may be, is fastened to the top side of the metallic member, so that the under, or left visible, side of the metallic member can be drilled and a screw inserted therethrough. Such techniques, however, seriously limit the designer and do not always effectively conceal the joint-forming or fastening means.

It has also become a widespread practice in the furniture industry to ship furniture in a partially disassembled or so-called "knocked-down" condition. Usually, the retail furniture dealer can perform the final assembly operation with his own employees much less expensively than it can be done at the factory. The chief advantage, however, resides in the saving of shipping and storage costs. A piece of furniture which can be shipped in "knocked-down" form can be packaged much more compactly and safely than a fully assembled piece of furniture. Not only does this result in material savings in shipping costs, but also reduces the damage which inevitably seems to occur in the shipment of furniture. In addition to this, it is possible for the retail furniture dealer to store a much larger quantity of knocked-down furniture in a given amount of warehouse space. Thus, the retail furniture dealer can assemble floor samples, from which sales can be made, and the final assembly operations can be completed at the time the merchandise is shipped from the warehouse to the ultimate consumer. This procedure makes it possible to achieve substantial economy in inventory keeping and warehousing costs.

It is, therefore, the primary object of the present invention to provide a chair having a frame consisting of a combination of wood and metal elements with substantially concealed fastening means between the wood frame and the metallic frame.

It is another object of the present invention to provide a chair of the type stated in which fastening means is structurally strong and relatively inexpensive.

It is also an object of the present invention to provide a chair of the type stated in which the various components or elements can be shipped in a compact or so-called "knocked-down" form and can be very quickly and inexpensively assembled for ultimate use.

It is a further object of the present invention to provide a chair of the type stated in which the various connecting elements or fastening means are, for the most part, substantially concealed and do not, in any way, affect the aesthetic appearance of the overall design.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the drawings (two sheets)—

FIG. 1 is a perspective view of a chair constructed in accordance with and embodying the present invention;

FIG. 2 is a side elevational view of a chair;

FIG. 3 is a horizontal sectional veiw taken along line 3—3 of FIG. 2;

FIG. 4 is a fragmentary vertical sectional view taken along line 4—4 of FIG. 2;

FIG. 5 is a horizontal sectional view taken along line 5—5 of FIG. 1;

FIG. 6 is a fragmentary sectional view taken along line 6—6 of FIG. 3;

FIG. 7 is a perspective view of the fastener stud forming a part of and employed in the present invention;

FIG. 8 is a transverse sectional view taken along line 8—8 of FIG. 1;

FIG. 9 is a fragmentary exploded perspective view showing the means by which the chair back is attached to the upright portion of the rear chair leg; and

FIG. 10 is a fragmentary sectional view taken along line 10—10 of FIG. 2.

Referring now in more detail and by reference characters to the drawings which illustrate a preferred embodiment of the present invention, the chair consists essentially of a seat-frame A, two matching side-frames B, B', an arm-frame C, an upholstered seat D, and an upholstered back E.

The seat-frame A is fabricated preferably from wood members approximately four inches wide and one inch thick and includes two side-rails **1**, **2**, and two cross-rails **3**, **4**, which are arranged in endwise abutting relationship in the form of a trapezoid, the cross-rail **4** being somewhat shorter than the cross-rail **3**. Moreover, the cross-rails **3**, **4**, are located inwardly from the forward and rear ends, respectively, of the side-rails **1**, **2**, and are secured thereto by means of angular corner braces **5**, **6**, **7**, **8**, the latter being conventionally secured in place by means of a series of wood screws **9**, all as best seen in FIG. 3. It is also usual in the furniture-making art to apply glue to the various abutting ends of the cross-rails **3**, **4**, and corner braces **5**, **6**, **7**, **8**, and this may be done in the present instance if desired. Also secured, by means of wood screws **10**, essentially across the inwardly presented vertical face of the forward cross-rail **3**, is a reinforcing block **11** which is flush across its top face with the top face of the cross-rail **3**.

Along their forwardly presented upright margins, the side-rails **1**, **2**, are rabbeted in the provision of abutment faces **12**, **13**, and forwardly projecting narrow side flanges **14**, **15**. Along their rearward margins, the side-rails **1**, **2**, are similarly rabbeted in the provision of abutment faces **16**, **17**, and narrow side flanges **18**, **19**, as best seen in FIG. 3.

Set securely into the abutment faces **16**, **17**, approxi-

mately midway of the vertical height thereof are connection pins **20**, each including an elongated cylindrical shank **21** and an enlarged head **22** of frusto-conical shape, the inner or attached end of which is of substantially larger diametral size than the diametral size of the shank **21**, all as best seen in FIG. 7.

The connection pins **20** are mounted so that the inwardly presented shoulder-forming faces of the head **22** abut against the faces **16, 17**, as seen, for example, in FIG. 5.

It will be noted by reference to FIG. 2 that the forwardly projecting end of the side-rails **1, 2**, that is to say the abutment faces **12, 13**, and the flanges **14, 15**, are cut off at a slightly upwardly and rearwardly inclined angle. Similarly, the rearwardly projecting ends of the side-rails **1, 2**, that is to say, the abutment faces **16, 17**, and the flanges **18, 19**, are cut off at a somewhat more sharply oblique upwardly inclined angle.

The two matching side-frames B, B′, are geometrically similar in shape, but are "mirror images" of each other, so to speak, so as to form the right and left sides of the chair. In other words, the frame B integrally comprises a forward leg **23**, a rearward leg **24**, a top-rail **25** and an intermediate cross-rail **26**, all formed preferably of metal tubing of square cross-sectional shape and rigidly welded together. It should be noted in this connection that the weld-joints, after having been formed, are ground down to form substantially smooth flush surfaces and the frames are given either an overall fine polish or buffing or some other suitable surface finish so that the weld-joints are, in effect, invisible. As will be noted by reference to FIGS. 1 and 2, the front leg **23** inclines upwardly and rearwardly at a slight angle to the vertical, whereas the rear leg **24** inclines upwardly and forwardly at a somewhat sharper oblique angle to the vertical. It will also be noted that the top-rail **25** and the intermediate cross-rail **26** are substantially parallel. Finally, it will be evident that the rear leg **24** projects upwardly, at its upper end, above the top-rail **25** and, in the region of its juncture with such top-rail **25**, is bent backwardly at a rearwardly inclined oblique angle to the vertical in the provision of a back supporting post **27**, which is cut off at its upper end in a forwardly-facing oblique end-surface **28** and, at such upper end, is provided with a forwardly projecting relatively heavy stud **29** which is, in turn, provided with a horizontal diametrally extending pin-hole **30**, all as best seen in FIG. 9.

Similarly, the frame B′ integrally comprises a forward leg **23′**, a rearward leg **24′**, a top-rail **25′**, and an intermediate cross-rail **26′**, all formed preferably of metal tubing of square cross-sectional shape and rigidly welded together. It should be noted in this connection that the weld-joints, after having been formed, are ground down to form substantially smooth flush surfaces and the frames are given either an overall fine polish or buffing or some other suitable surface finish so that the weld-joints are, in effect, invisible. As will be noted by reference to FIG. 1, the front leg **23′** inclines upwardly and rearwardly at a slight angle to the vertical, whereas the rear leg **24′** inclines upwardly and forwardly at a somewhat sharper oblique angle to the vertical. It will also be noted that the top-rail **25′** and the intermediate cross-rail **26′** are substantially parallel. Finally, it will be evident that the rear leg **24′** projects upwardly, at its upper end, above the top-rail **25′** and, in the region of its juncture with such top-rail **25′**, is bent backwardly at a rearwardly inclined oblique angle to the vertical in the provision of a back supporting post **27′**, which is cut off at its upper end in a forwardly-facing oblique end-surface **28′** and, at such upper end, is provided with a forwardly projecting relatively heavy stud **29′** which is, in turn, provided with a horizontal diametrally extending pin-hole **30′**, also as best seen in FIG. 9.

The back legs **24, 24′**, are each provided, at properly spaced distances above the intermediate cross-rails **26, 26′**, with apertures **31, 31′**, which are somewhat larger than the smaller end of the head **22** of the connection pin **20**, but substantially smaller than the larger end thereof. Thus, the seat-frame A can be fitted into, and between, the side-frames B, B′, by placing the bottom or downwardly presented faces of the side-rails **1, 2**, upon the upper faces of the intermediate cross-rails **26, 26′**, so that the heads **22** of the connection pins **20** will fit into the apertures **31, 31′**. By forcing the seat-frame A rearwardly, the heads **22** will be jam-fitted tightly into substantially permanent engagement with the apertures **31, 31′**. Since the peripheral edges of the apertures **31, 31′**, are relatively sharp, as a result of having been punched or drilled, these edges will bite into the frusto-conical surfaces of the heads **22** and form a retentive seat therewith. The position of the connection pins **20** is also such in reference to the side flanges **18, 19**, that the latter will be pulled into snug-fitting engagement against the outwardly presented or lateral faces of the rear legs **24, 24′**. Similarly, the flanges **14, 15**, will fit against the outwardly presented or lateral faces of the forward legs **23, 23′**, and the abutment faces **12, 13**, will fit snugly against the rearwardly presented faces of the forward legs **23, 23′**. The side-rails **1, 2**, are, finally, held snugly in such position by means of elongated attachment plates **32, 32′**, which are mounted upon the inwardly presented faces of the forwardly extending portions of the side-rails **1, 2**, by means of wood screws **33, 33′**, also as best seen in FIGS. 3 and 6.

The top-rails **25, 25′**, are suitably provided with a series of pairs of upper and lower aligned apertures **34, 35**, the latter being in substantially vertical alignment with, and substantially larger in diametral size than, the former for receiving round-headed screws **36**, by which the U-shaped arm-frame C is secured in overlying relationship upon the top-rails **25, 25′**. It will be noted by reference to FIGS. 1 and 2 that the arm-frame C is integrally formed preferably of a single piece of wood which is bent to its U-shape by the usual furniture-making procedure and integrally includes forwardly projecting arm rest elements **37, 37′**, which are cut away at their rear ends, as at *c, c′*, to clear the vertical margins of the upholstered back E and are integrally connected by downwardly offset rearwardly curved elbows **38, 38′**, which merge integrally with a curved cross-bight **39**, the latter being disposed in rearwardly spaced relation to the upholstered back E, as best seen in FIG. 8.

The upholstered seat D comprises a substantially oblong-rectangular base panel **40** formed of suitably curved plywood having its four corners rounded off to conventional radii or curves and provided upon its upper face with a relatively thick sponge rubber or foam plastic pillow **41**, the entire structure being enclosed within a suitable covering or casing **42** formed of fabric, leather, or synthetic film. The upholstered seat D is suitably secured upon the corner braces **5, 6, 7, 8**, by means of conventional wood screws **43**, all as best seen in FIGS. 4 and 6.

The upholstered back E similarly comprises an arcuately shaped base panel **44** formed of plywood, pressed-wood or other suitable material and provided upon its forwardly presented face with a sponge rubber or foam plastic pillow **45**, the entire structure being housed within a suitable covering or casing **46** matching the casing **42**. The rearwardly presented wall of the casing **46** and the base panel **44** are suitably apertured for snug-fitting accommodation of the studs **29** and are rigidly held in attachment thereto by means of nail-like pins **47** which are inserted sidewise through small-diameter pilot holes **48** drilled in the lateral edges of the base panel **44**, all as best seen in FIG. 8.

It will thus be evident that the chair of the present invention can be shipped in its disassembled form. In other words, the seat-frame A, the two matching side-frames B, B′, the arm-frame C, the upholstered seat D, and the up-

holstered back E can be enclosed within a relatively compact carton or shipping container at the factory and can be assembled in the form shown in FIG. 1 by the furniture dealer or, for that matter, by the ultimate purchaser in a relatively simple, convenient, and speedy manner without any high degree of skill or training and without any special tools or equipment. When assembled, the chair of the present invention is extremely attractive in appearance and all of the fastening elements are completely concealed so that the chair presents an extremely attractive streamlined appearance.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the chair may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A chair comprising a pair of laterally spaced side-frames, each having front and rear legs rigidly connected by upper and lower cross-rails, an arm rest element rigidly secured to the upper cross-rails and connecting the side-frames at an upper level, said upper cross-rails and said arm rest element having sets of vertically aligned apertures, screw means mounted within said aligned apertures for rigidly securing the arm rest element to the side-frames, said rear legs being provided with forwardly presented apertures spaced upwardly from the lower cross-rails, a seat-frame having a pair of side-rails adapted to fit snugly between the front and rear legs of the side-frames and rest upon the lower cross-rails thereof, a rearwardly projecting pin in each of said side-rails of the seat-frame, said pins being located for entry into the apertures of the rear legs and being sized for snug-fitting engagement with such apertures, an attachment plate rigidly secured to each of the side-rails at their forward margins, said attachment plates and said front legs having aligned apertures, screw means mounted in said apertures, means for rigidly attaching said side-rails at their forward ends to the front legs whereby the side-frames are rigidly interconnected at a lower level, a seat secured upon the seat-frame, said rear legs being provided with upwardly extending back supporting posts, said posts being provided at their upper ends with forwardly projecting pins, and a back member secured to and extending transversely between said back supporting posts, said back member being mounted upon and secured to said pins.

2. A chair comprising a pair of laterally spaced side-frames, each having front and rear legs rigidly connected by upper and lower cross-rails, an arm rest element rigidly secured to the upper cross-rails and connecting the side-frames at an upper level, said upper cross-rails and said arm rest element having sets of vertically aligned apertures, screw means mounted within said aligned apertures for rigidly securing the arm rest element to the side-frames, said rear legs being provided with forwardly presented apertures spaced upwardly from the lower cross-rails, a seat frame having a pair of side-rails adapted to fit snugly between the front and rear legs of the side-frames and rest upon the lower cross-rails thereof, a rearwardly projecting pin in each of said side-rails of the seat-frame, said pins being located for entry into the apertures of the rear legs and being sized for snug-fitting engagement with such apertures, an attachment plate rigidly secured to each of the side-rails at their forward margins, said attachment plates and said front legs having aligned apertures, screw means mounted in said apertures, means for rigidly attaching said side-rails at their forward ends to the front legs whereby the side-frames are rigidly interconnected at a lower level, a seat secured upon the seat-frame, said rear legs being provided with upwardly extending back supporting posts, said posts being provided at their upper ends with forwardly projecting studs, a back member extending transversely between said back supporting posts, said back member having a matching aperture sized for accommodation of each of said studs, said studs being inserted in said aperture, and pin means inserted through each of said studs and the apertures in said back member for securing said back member to said back supporting posts.

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