March 2, 1971 W. C. MILLER ET AL 3,567,284

CHAIR ASSEMBLY

Filed Nov. 14, 1968

FIG-1

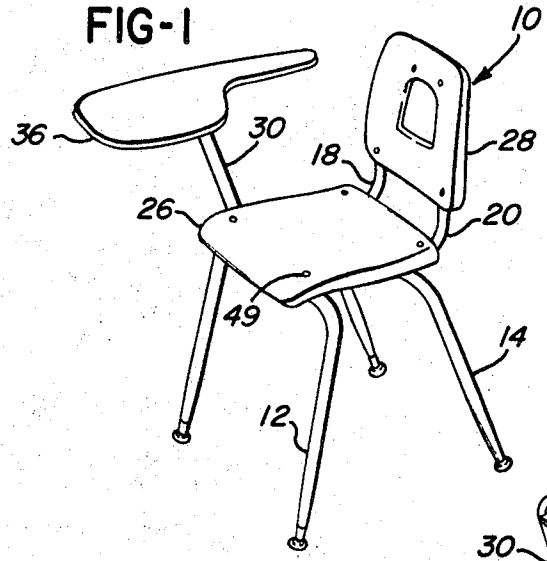


FIG-2

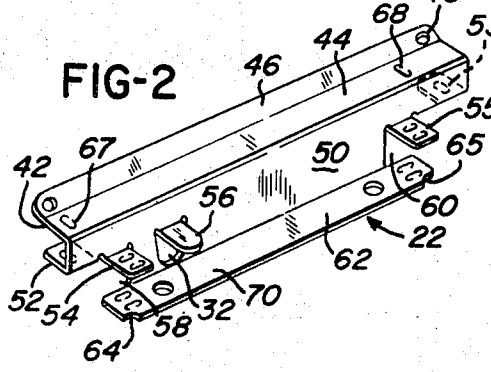


FIG-3

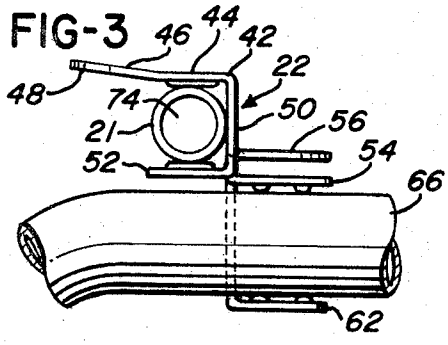


FIG-4

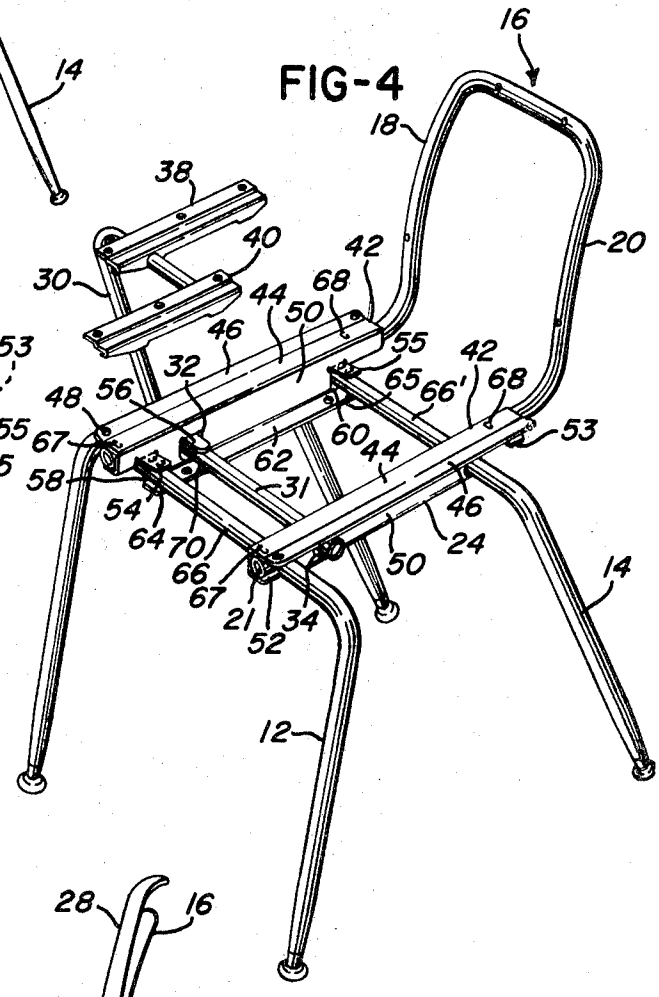
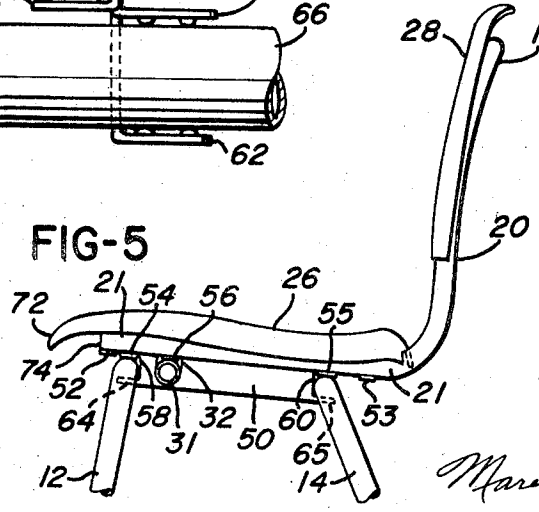


FIG-5



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CHAIR ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A chair has a pair of spaced parallel aligned Z-shaped brackets formed for receiving the horizontal portions of a pair of inverted U-shaped leg members in slots at either end of the center section of the brackets and receiving the support arm of a tablet table through an aperture in each center section, and provided with a number of integral tabs which are bent over the lower surface of the back brace tubes and a number of tabs which are bent over the upper surface of the leg members for holding these members in position by forming regions for welding. The back brace tubes extend the full length of the bracket and are received above the horizontal leg members. A seat rests on both brackets and is formed with an overlying front edge which conceals the forward ends of the back brace tubes.

BACKGROUND OF THE INVENTION

This invention is directed to an improvement in metal furniture and particularly to the type of metal furniture in which the legs and back brace are comprised of tubular members, and in which the leg and back members are joined by brackets which underlie the seat portion and which form a support for a seat which is commonly a plastic molding. Chairs of this type must be made for exceedingly rugged usage in schools and other types of public buildings and yet must be light in weight and low in cost.

SUMMARY OF THE INVENTION

The present invention relates to an improved chair, and frame construction for each chair, and more particularly to a chair which employs tube type legs and back supports and a pair of frames or brackets which underlie the seat and which join the legs and the back brace into a unitary structure.

The improved arrangement of the present invention employs a pair of generally Z-shaped brackets which are positioned in underlying relation to the seat. The brackets receive the leg portion below the back brace tubes and further form rigid attachments by means of which the horizontal portions of the tubular U-shaped legs may be attached.

An unusually sturdy and compact structure is provided which may be readily and easily welded into a unitary construction with assembly line techniques and which presents pleasing and attractive appearance. Integral tabs are formed in the bracket and are positioned to overlying portions of the legs, and back brace, and a tablet arm, to provide a convenient means for welding these items to the brackets. The tabs are preferably punched out of the bracket material through which the tubular members extend. Another advantage of the present invention resides in a bracket in which the horizontal portions of the back brace are recessed within the confines of the seat member, with forward ends which are concealed and therefore need not be closed or pinched off to prevent injury to children or to prevent insertion of unwanted items into the tubular structure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a chair and tablet arm assembly;

FIG. 2 is a perspective view of the bracket;

FIG. 3 is an end view of the bracket showing a fragment of a leg member and the forward end of the back brace;

FIG. 4 is an enlarged perspective view of the chair frame with the seat, back, and tablet arm removed; and

FIG. 5 is a side view of the chair showing the overlying relationship of the seat with respect to the open-ended back brace tubes.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the illustrations of FIGS. 1–5, a chair **10** is shown as having a tubular front leg member **12** of inverted U-shape and a tubular rear leg member **14** also of inverted U-shape. A unitary back brace tube **16** consists of two laterally spaced vertical portions **18** and **20** having horizontal lower ends **21** extending forwardly below the full length of a pair of sheet metal brackets **22** and **24**. A seat **26** is affixed to brackets **22** and **24** and a back **28** is affixed to the vertically extending portions **18** and **20** and the horizontal top portion of the back brace tube **16**. A tablet arm member **30** has a lower transverse horizontal portion **31** received through apertures **32** and **34** in the brackets **22** and **24**, and supports on its upper end a tablet table **36** on brackets **38** and **40**.

FIGS. 2 and 3 illustrate the preferred embodiment of the brackets **22** and **24**. Each of the brackets is generally Z-shaped in cross sectional configuration as shown by the bracket **22** in FIG. 3 and comprises an upper outwardly projecting flange **42** having a horizontal portion **44** and a slightly upwardly sloped portion **46**. The flange portion **46** is provided with holes **48** at the front and rear extremities for affixing the seat **26** thereto, such as by rivets **49** (FIG. 1). A web portion or center section **50** is vertically aligned with respect to the upper flange **42**. At the outer extremities of the center section **50** (FIG. 2) there are a first pair of integral tabs **52** and **53** extending transversely in an outwardly direction and a second pair of integral tabs **54** and **55** adjacent the first pair of tabs and extending in an inwardly direction. Another integral tab **56** extends in an inwardly direction and is located directly above the aperture **32**. These tabs are preferably punched out of the sheet metal bracket material through which the tubular members extend.

The aperture **32** is located between the slots **58** and **60** at either end of the center section **50**. A lower inwardly projecting flange **62** completes the generally Z-shape of the brackets **22** and is horizontally aligned with respect to center section **50**. As can be seen in FIG. 2, the slots **58** and **60** are formed by the outer extremities **64** and **65** of the lower flange **62** and by the second pair of tabs **54** and **55**. The opposite bracket **24** is symmetrically identical to bracket **22** in all respects.

Referring to FIG. 4, it can be seen that the two brackets **22** and **24** are in parallel and spaced relation. The transverse middle section **66** of the inverted U-shaped leg member **12** is received in the front slots **58** and is secured to brackets **22** and **24** by welds at tabs **54** and at the front extremities **64** of each bracket. Similarly, the horizontal transverse middle section **66'** of inverted U-shaped leg member **14** is received in rear slots **60** and is likewise secured to brackets **22** and **24** by welds at tabs **55** and at the rear extremities **65** of each bracket.

The back brace tube **16** is shown as a unitary member consisting of two vertically extending and laterally spaced portions **18** and **20** having horizontal parallel lower ends **21** extending forwardly and horizontally below the full

length of the upper flanges **42** of the brackets **22** and **24**. The lower ends **21** of the members **18** and **20** are secured to the brackets **22** and **24** by welds at outwardly extending tabs **52** and **53** and at the front and rear extremities **67** and **68** of the upper flanges **42** of each bracket. As shown, these members are secured to the brackets fore-and-aft of the leg members **12** and **14**.

The horizontal portion **31** of the optional tablet arm member **30** is received through apertures **32** and **34** and is secured to the brackets **22** and **24** by welds at tabs **56** and at points **70** where the member **30** crosses the lower flanges **62** of the respective brackets.

FIG. 5 illustrates the overlying relationship of the front edge **72** of the seat **26** with respect to the lower end **21** of tube **20**. As shown, when the chair is in a normal upright position, the overlying portion **72** will conceal and obscure the open forward open ends **74** of the back brace portions **21** and thereby prevent injury to children or prevent a user of the chair from inserting trash into the open tube ends. In turn, this also eliminates the added fabrication step of pinching these tubes closed. The latter operation is not only unnecessary, but, depending upon the construction and design, unsightly. The present invention overcomes this disability by virtue of its design.

The leg tubes, back brace tube, and tablet arm tubes may be utilized in any arrangement of diameter sizes. In the preferred embodiment, however, the diameter of the leg tubes **12** and **14** is greater than the diameter of the back brace tube **16** and less than the diameter of the tablet arm tube **30**.

It can thus be seen that the present invention provides a chair which is light in weight and low in cost. The brackets receive the back brace tubes above the legs, and permit elimination of the added step of pinching the forward ends of the back brace tubes and also permit the back brace tubes and legs to be secured to integral parts thereof. This construction is exceedingly rugged and capable of withstanding punishing use in classrooms.

While the article herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise article, and that changes may be made therein without departing from the scope of the invention.

What is claimed is:

1. In a chair frame construction which includes a pair of laterally spaced and longitudinally extending back brace members and a pair of U-shaped leg members having middle portions which extend transversely of said back brace members, the improvement comprising:

a pair of spaced and longitudinally extending generally Z-shaped brackets, each including an outwardly-projecting upper flange with fore-and-aft extremities, an inwardly-projecting lower flange with fore-and-aft extremities, and a vertically aligned center section having a first pair of inwardly-extending tabs spaced above said lower flange extremities and a second pair of outwardly extending tabs spaced below said upper flange extremities, said first pair of tabs forming slots at each end of said center section for receiving said middle portions of said leg members inwardly of said upper and lower flange extremities,

first means securing the middle portions of said leg members between said first pair of tabs and said lower flanges, and

second means securing said back brace members to said bracket above said middle portions and between said upper flanges and said second pair of tabs.

2. The chair frame construction as defined in claim **1** in which said brackets have means defining transversely aligned apertures in said center sections between said slots and include aperture tabs spaced from said lower flanges, a horizontally extending tablet arm member received through said apertures, and third means securing said tablet arm member to said aperture tabs and said lower flanges.

3. In a chair assembly including a back brace with a pair of laterally spaced and longitudinally extending horizontal members and a vertical member which supports a back, and also including a pair of inverted U-shaped leg members with middle portions which extend transversely of said horizontal back brace members, the improvement comprising:

a pair of spaced and longitudinally extending generally Z-shaped brackets, each including an outwardly-projecting upper flange with fore-and-aft extremities, an inwardly-projecting lower flange with fore-and-aft extremities, and a vertically aligned center section having a first pair of inwardly-extending tabs spaced above said lower flange extremities and a second pair of outwardly-extending tabs spaced below said upper flange extremities, said first pair of tabs forming slots at each end of said center section for receiving said middle portions of said leg members inwardly of said upper flange extremities,

means securing the middle portions of said leg members between said first pair of tabs and said lower flanges,

means securing said back brace members to said bracket above said middle portions and between said upper flanges and said second pair of tabs,

a seat mounted on said upper flanges and having a forward edge projecting downwardly and of sufficient overlying length to obscure the longitudinal ends of the horizontal back brace members, and

means securing said seat to said upper flanges.

4. The chair assembly as defined in claim **3** wherein each bracket includes means defining a transversely aligned aperture between said slots and an aperture tab above said aperture and spaced from said lower flange, and wherein said chair assembly includes a tablet arm with a horizontally extending section received through said apertures, and fourth means securing said horizontal section to said aperture tabs and said lower flanges.

5. A Z-shaped bracket for a chair assembly having leg members and back brace members comprising an outwardly-projecting upper flange with fore-and-aft extremities, an inwardly-projecting lower flange with fore-and-aft extremities, and a vertically aligned center section having a first pair of inwardly-extending tabs spaced above said lower flange extremities and a second pair of outwardly-extending tabs spaced below said upper flange extremities, said first pair of tabs forming slots at each end of said center section and cooperating with said lower flange to receive said leg members therebetween and said second pair of tabs cooperating with said upper flange to receive a back brace member therebetween.

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U.S. Cl. X.R.

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