

Oct. 7, 1958

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2,855,260

METAL CHASSIS FOR FURNITURE

Filed Oct. 10, 1955

4 Sheets-Sheet 1

FIG. 1.

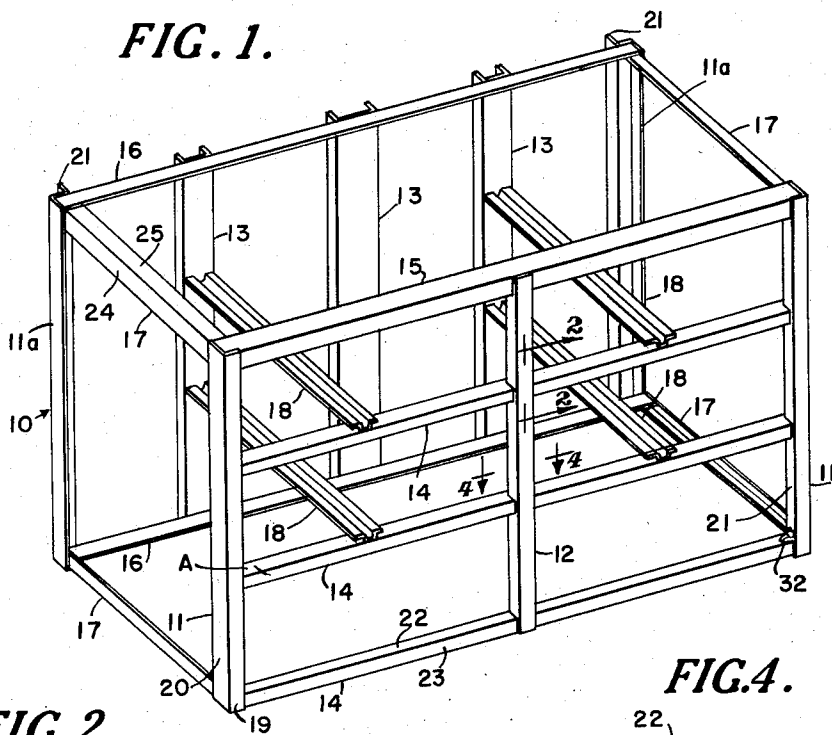


FIG. 2.

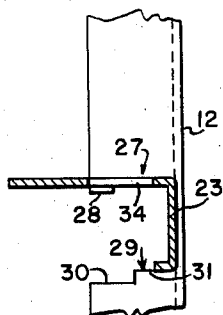


FIG. 3.

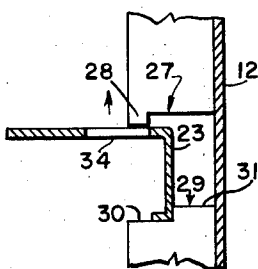


FIG. 4.

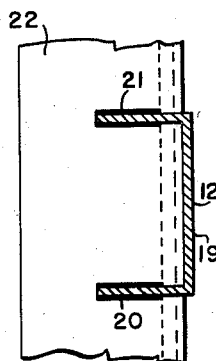
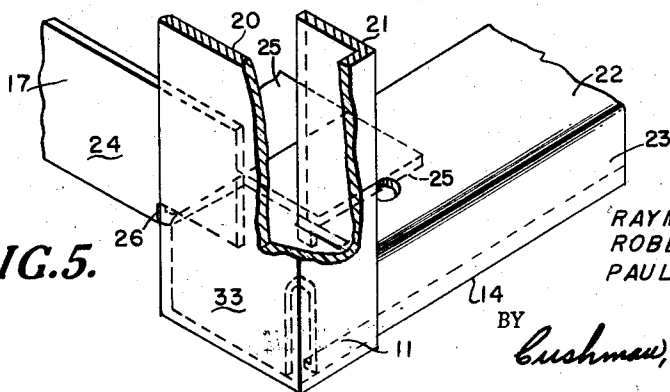


FIG. 5.



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4 Sheets-Sheet 2

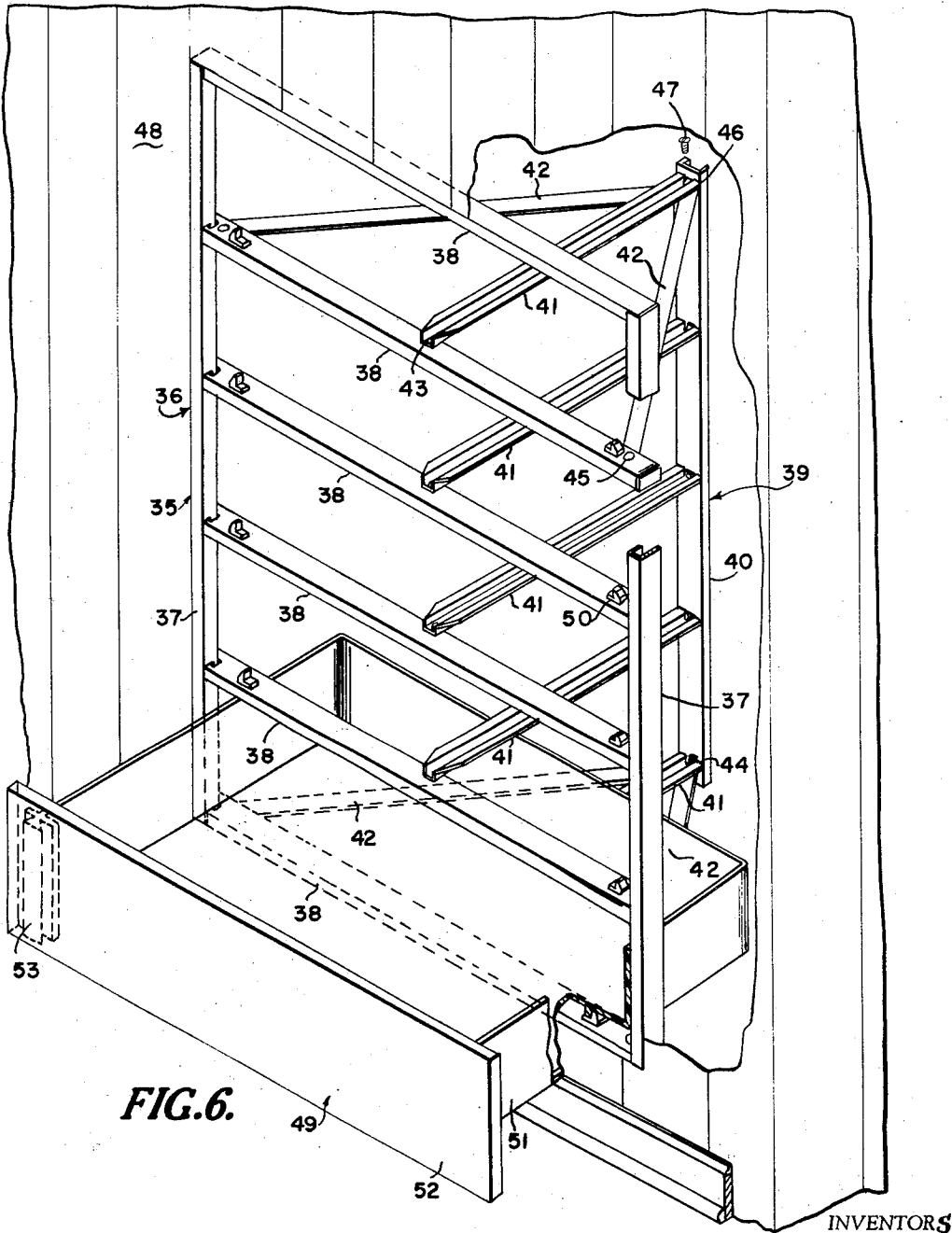


FIG. 6.

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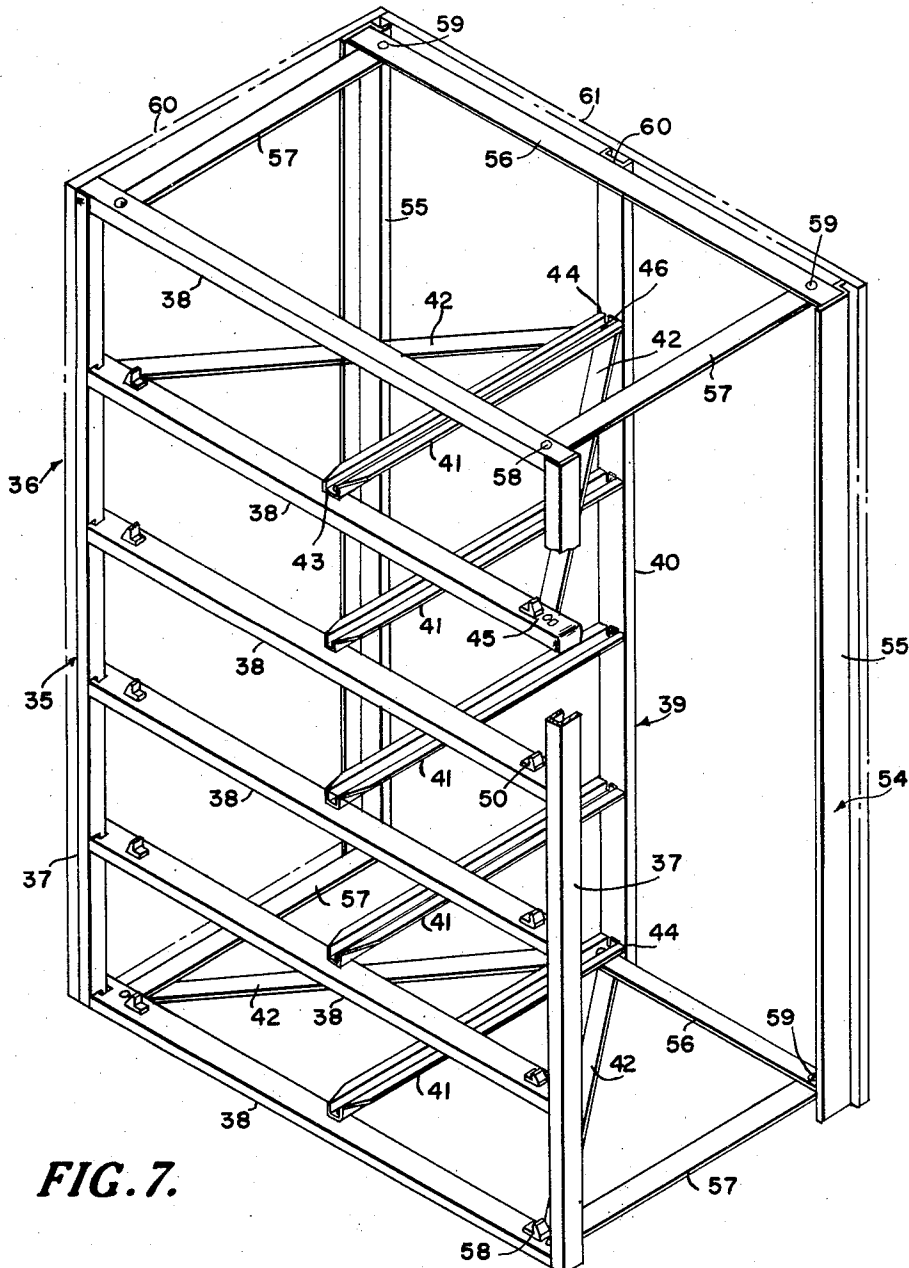
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4 Sheets-Sheet 3



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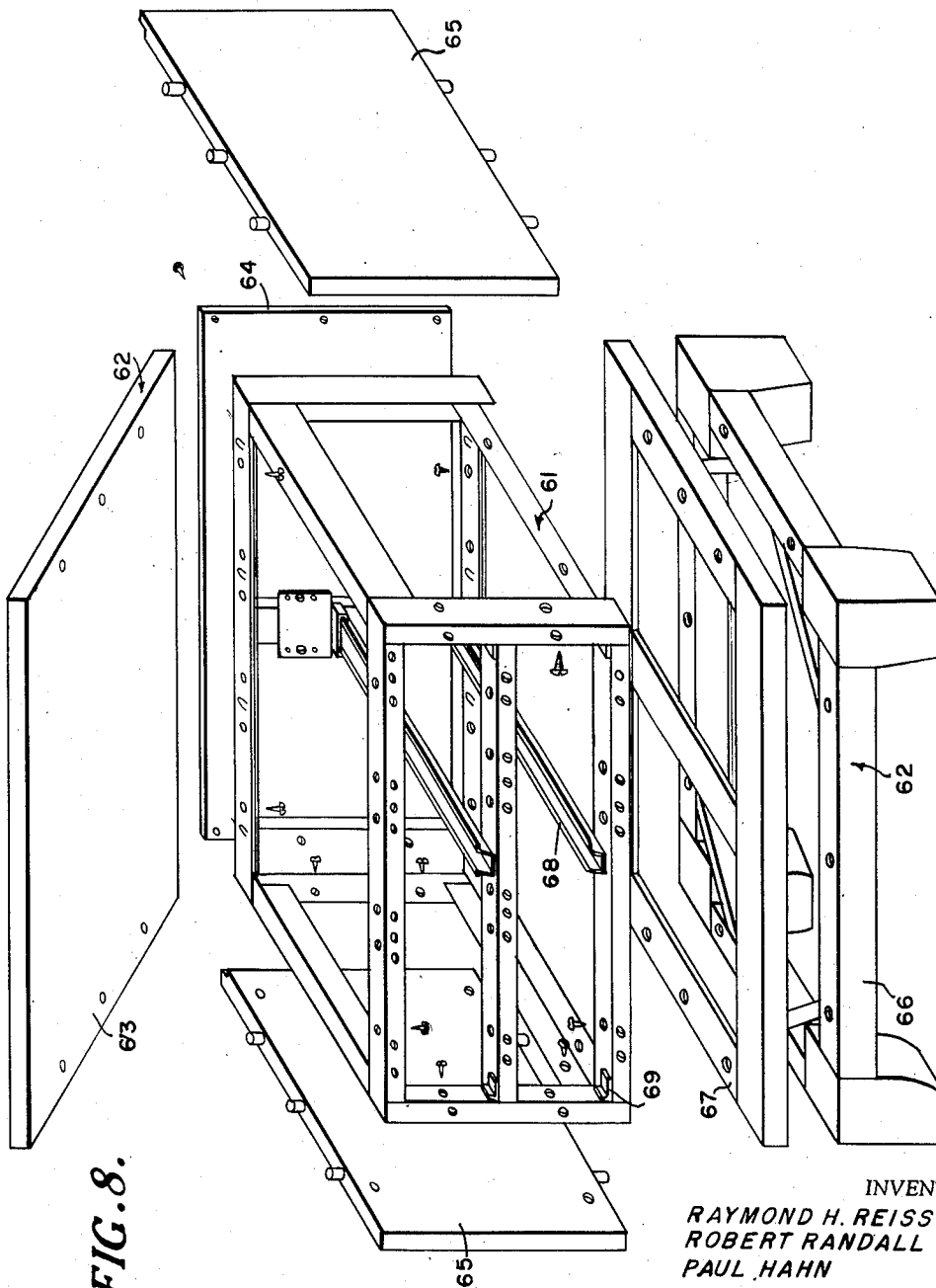
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METAL CHASSIS FOR FURNITURE

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4 Sheets-Sheet 4



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METAL CHASSIS FOR FURNITURE

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16 Claims. (Cl. 312—257)

This invention relates to metal chassis constructions of the type used in furniture, and particularly, in bureaus, cabinets, and desks. The novel chassis constructions include improved means for forming a metal chassis of enhanced strength and durability, means for forming a metal chassis capable of being transported and sold in the knocked-down state, and improved means for utilizing such metal chassis in actual furniture construction.

One of the principal difficulties encountered in the utilization of a metal chassis for furniture construction is the fact that such structures, if fabricated on a production scale, have not been effectively united at their joints thus resulting in defective overall construction after a relatively short period of use. Further, the metal chassis utilized in the past were primarily confined to factory use with little or no chance for the home builder to utilize a prefabricated metal chassis in his home improvement efforts. It can be appreciated that a prefabricated metal chassis is normally quite unwieldy and does not lend itself to commercial sale for subsequent use by home makers.

A further and significant difficulty previously associated with the use of metal chassis for furniture involved the relatively great difficulty encountered in attaching the wooden furniture panels to the chassis proper. Little if any tolerance were afforded in the wooden members without realizing a poorly fitted exterior.

Efforts have been maintained to develop a metal chassis of enhanced strength after prolonged use, particularly at the joint portions of the chassis and a collapsible metal chassis. Also, attempts have been made without success to make easier the application of wooden paneling to a metal chassis, again with no measurable success due to the fact that the necessity for a narrow tolerance in the wooden members could not be eliminated.

To our knowledge, no previous efforts have been aimed at developing a collapsible metal chassis for use by the home builder in handicraft around the house. However, the successful achievement of such a collapsible metal chassis affords commercial advantages that will be made quite obvious in the discussions to follow.

With the above in mind, the primary object of this invention is to provide a metal chassis for furniture possessing enhanced strength and durability after prolonged use.

A more specific object of the invention is to provide a metal chassis for furniture including joint structures imparting enhanced strength characteristics and ease of fabrication to the metal chassis.

An additional object of the invention is to provide, in a metal chassis for furniture, a vertical member having a longitudinal wall, a first transverse wall extending inwardly from one side of said longitudinal wall and a second transverse wall extending from the opposite side of said longitudinal wall, a longitudinal member having a horizontal wall and a vertical wall extending downwardly from one side of said horizontal wall, said vertical member being secured in abutting relation with the verti-

2

cal wall of said longitudinal member, and one of said transverse walls of said vertical member including a cut-out portion defining an upper edge portion provided with a downward projection, the horizontal wall of said longitudinal member having a slot arranged to receive said projection.

A further object of the invention is to provide a knock-down metal chassis for furniture capable of being easily fabricated and of being shipped and commercially sold in the knocked-down state for subsequent assembly and use by the consumer.

Still another object of the invention is to provide a knock-down metal chassis for furniture comprising, in combination, a front frame-forming means including two first vertical members and a longitudinal member, a collapsible rear frame-forming means including a second vertical member and a transverse member, and two diagonal members, said first vertical members being secured to said longitudinal member, said transverse member being pivotally mounted at one end on said front frame and attached to said second vertical member at its other end, and one end of each of said diagonal members being pivotally mounted on said front frame with the other end of each of said diagonal members being attached to the back end of said collapsible rear frame.

Still another object of the invention is to provide a knock-down metal chassis as noted heretofore including an auxiliary back frame-forming means, said means including two vertical auxiliary back frame members, two longitudinal auxiliary back frame members and two pairs of metal tie straps, said longitudinal auxiliary back frame members being secured to said vertical auxiliary back frame members and to said second vertical member, and said metal tie straps being pivotally mounted on one end to said front frame and being attached at the other end to said auxiliary back frame.

An additional object of the invention is to provide a case construction for furniture whereby the wooden panels of said construction are easily and securely applied to the metal chassis.

A further and more specific object of the invention is to provide a case construction for furniture comprising a metal chassis and wooden parts to be attached thereto, one or more of said wooden parts not being directly attached to said metal chassis so as to permit a wide tolerance in the fabrication and utilization of said wooden parts.

Still another object of the invention is to provide improved structures to accomplish the foregoing objectives which can be applied to an existing structure without major modifications.

Other and further objects and advantages of the present invention will be apparent from a consideration of the following description of specific embodiments shown for purposes of illustration in the accompanying drawings in which:

Figure 1 is a perspective view of the embodiment showing the metal chassis construction;

Figure 2 is a sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a sectional view in the area of line 2—2 of Figure 1 showing a step in the assembling of the joint structure illustrated in Figures 2—4;

Figure 4 is a sectional view taken along the lines 4—4 of Figure 1;

Figure 5 is a fragmentary perspective view of a corner structure of the metal chassis;

Figure 6 is a perspective view of one embodiment of the knock-down metal chassis in assembled state, positioned in a wall recess and showing use of plastic drawers;

Figure 7 is a perspective view of another modification

3

of the knock-down metal chassis in assembled state, showing the auxiliary back frame and illustrating, in dotted line, utilizing of cabinet walls; and

Figure 8 is an exploded view of one form of our novel case construction.

In the accompanying drawings, the various elements are shown diagrammatically and only those parts are illustrated which are required to show the cooperative relation of the instrumentalities of the present invention.

Metal chassis and joint construction therefor

The improved metal chassis and joint construction therefor embodying this invention are shown with respect to metal frame 10 illustrated in Figure 1. This metal frame includes vertical members 11, 11a, 12 and 13, longitudinal members 14, 15 and 16 and transverse members 17 and 18.

The vertical members 11 and 11a include a longitudinal wall 19 and a first transverse wall 20 extending inwardly from one side of said longitudinal wall and a second transverse wall 21 extending from the opposite side of said longitudinal wall. The vertical members 12 and 13 are similar in basic construction in the inclusion of the longitudinal wall 19 and the two transverse walls 20 and 21.

The longitudinal member 14 has a horizontal wall 22 and a vertical wall 23 extending downwardly from one side of said horizontal wall 22. Longitudinal members 15 and 16 are similar in structure in the inclusion of horizontal wall 22 and vertical wall 23.

The transverse member 17 has a vertical wall 24 and a horizontal wall 25, and a notch 26 (see Figure 5), formed at one end thereof. Transverse member 18 is a drawer guide rail.

Vertical members 11 and 12 also include a cut-out portion in one or both of the transverse walls thereof, respectively, said cut-out portion defining an upper edge portion 27 provided with a downward projection 28 (see Figures 2 and 3). Still referring to said cut-out portion and Figures 2 and 3, this cut-out also includes a lower edge portion 29 provided with a first step 30 opposite the said downward projection 28 and defining therewith a width corresponding to the height of the vertical wall 23 of the longitudinal member 14. A second step 31 is provided opposite the upper edge portion 27 and also defines therewith a width corresponding to the height of the said vertical wall 23 of longitudinal member 14.

The frame 10 may be of any suitable structural metal, the components of which have the configuration noted heretofore. The transverse member 18 is designed to function, not only as an integral part of the frame, but, primarily, as a guide rail adapted to slidably mount a tier of drawers. In this respect, a guide member, not illustrated, is mounted on the drawer and coacts with the transverse member 18. In addition, a nylon wear block 32 also cooperates with the slidable drawer to insure smooth operation. This block 32 is prevented from pivotal movement by transverse wall 21.

The various points of juncture of the members making up the metal chassis 10 are designed to insure maximum rigidity and strength over a long period of time. Referring to Figure 5, there is shown the particular corner joint construction of our invention, that primarily imparts desired characteristics to the metal chassis as a whole.

The vertical member 11, longitudinal member 14 and transverse member 17 join at the lower corner illustrated in Figure 5. It should be stressed that, with respect to the corner joint construction, the longitudinal member can be considered as either member 14, 15 or 16, such being interchangeable with respect to this aspect of the development.

A vertical flange 33 (illustrated in dotted line in Figure 5) is disposed at each end of said longitudinal mem-

4

bers and is secured to the first transverse wall 20 of the vertical member 11 in abutting relation thereto. The vertical member 11 is also secured in abutting relation with vertical wall 23 of the longitudinal member 14. Transverse member 17 has a notch 26 formed at its end and said notch permits the aforementioned vertical flange 33 to abut the vertical member 11 as noted heretofore.

The horizontal wall 25 of the transverse member 17 abuts the underside of the horizontal wall 22 of the longitudinal member 14. The transverse wall 21 of vertical member 11 includes the said cut-out portion defined heretofore, which defines the upper edge portion 27 and downward projection 28. This downward projection 28 is inserted in the slot 34 on the horizontal wall 22 of the longitudinal member 14, thus providing a rigid and permanent union but one that is easily fabricated. Of course, as noted above, this projection and slot arrangement also permits abutment of the vertical member 11 with the vertical wall 23 of the said longitudinal member 14.

In connection with the above, it should be understood that all of the abutting surfaces are secured by spot welding. However, such permanent juncture can be realized by other means such as mechanical attachment and the like.

It might also be noted that the cut-out arrangement of the corner joint need not be included in the lower-rear and upper corners. However, the remainder of the joint structure is as described above.

Turning to Figures 2-4, it should be noted that the projection and slot construction utilized between vertical member 12 and longitudinal member 14 makes possible ease of fabrication in addition to the achievement of strong and permanent structural features. This projection and slot construction is, of course, the same arrangement which was previously described in connection with the junction of the horizontal member 14 and vertical member 11 of the corner joint structure of Figure 5, but with application thereof to both transverse walls of the vertical member.

Specifically, the first step 30 and the projection 28 define a width corresponding to the height of the vertical wall 23 of said longitudinal member 14. This width is sufficient to permit insertion of said longitudinal member 14 between said projection 28 and said first step 30, as illustrated in Figure 3. The projection 28 is then inserted in the slot 34 and the longitudinal member is thus permitted to advance into the area defined by the second step 31 and the upper edge portion 27 to therefore abut the longitudinal wall 19 of the vertical member 12. In this connection, it can be appreciated that the second step 31 and the upper edge portion 27 also define a width corresponding to the height of the vertical wall 23 of the longitudinal member 14.

Figures 2 and 4 illustrate the final joint utilized in uniting vertical member 12 and longitudinal member 14. As noted heretofore, the only difference between this joint and the portion of the illustrated corner joint utilizing slot and projection is the fact that vertical member 11 has only one transverse wall thereof joined in this way, whereas vertical member 12 has both of such transverse walls thus joined to the longitudinal member 14. This structure is equally applicable to the juncture A of vertical members 11 and longitudinal members 14 where such junctures do not involve corner joints, but rather, joints intermediate said corners not including a transverse member.

The remaining aspects of the metal chassis illustrated in Figure 1 are conventional. The vertical members 13 merely abut longitudinal members 16 as illustrated and are secured thereto, for example, by spot weld. Likewise, the upper juncture of the vertical member 12 and longitudinal member 15 is a mere abutting relationship with spot welding for permanent attachment. The guide rail 18 can be attached in any conventional manner.

Knock-down metal chassis

Figures 6 and 7 illustrate two modifications of our knock-down metal chassis. Again, the frame 35 may be of any suitable structural material. It is herein shown as formed of metal frame members.

Figure 6 shows the basic modification and this structure is common to both Figures 6 and 7. The front frame 36 includes two first vertical members 37 and longitudinal members 38. Collapsible rear frame 39 includes a second vertical member 40, transverse members 41 and diagonal members 42.

The first vertical members 37 are secured to the longitudinal members 38 by appropriate joint structure. Shown in Figures 6 and 7 is the joint construction illustrated in connection with the junctures of longitudinal members 14 and 15, and vertical members 11 and 12 of Figure 1. The transverse member 41 is pivotally mounted at one end 43 on said front frame 36 which, as illustrated, can be on longitudinal member 38. The transverse member 41 is also attached to the second vertical member 40 at its other end at 44.

One end of the said diagonal member 42 is pivotally mounted on the front frame at 45 and the other end thereof is attached to the back end of the collapsible rear frame 39 at 46.

As can be appreciated, this basic structure is collapsible in that bolts 47 can be removed from the juncture 44 thus permitting the diagonal members 42 to be pivoted to a position substantially parallel to the longitudinal member 38. Likewise, the rear frame made up of the transverse members 41 and the second vertical member 40 can be pivoted into such position.

The advantages of this structure are quite apparent as are illustrated in Figure 6. The knock-down chassis can be sold as a kit to the home owner or home builder. This kit can be assembled by positioning the diagonal members 42 and the rear frame 39 and then inserting bolts 47 to provide a rigid structure. The assembled chassis then can be inserted in a wall recess and wall board 48 built therearound, the end result being a wall cabinet of enhanced strength and durability, yet having been made with minimum of skill and cabinet making knowledge.

Referring once again to Figure 6, it can be appreciated that transverse member 41 is normally a drawer guide rail to coact with a tier of drawers such as drawer 49. Nylon wear blocks 50 are also illustrated and coact with this drawer.

The drawer 49 can be made of plastic and wood. We have in mind a plastic body 51 that can be molded very easily and subsequently sold as a part of the kit with removable drawer front member 52 made of wood. The drawer front member 52 is joined to the plastic drawer body 51 by the home builder or home owner at the time of assembly. Means for joining these two members may be a dovetail joint generally illustrated in dotted line at 53, such joint being prefabricated in the members 51 and 52, respectively.

Turning now to Figure 7, the modification illustrated includes an auxiliary back frame 54. This back frame is comprised of two vertical auxiliary back frame members 55, two longitudinal auxiliary back frame members 56 and metal tie straps 57. The longitudinal auxiliary members 56 are secured to the vertical auxiliary members 55 and to the second vertical member 40 of the basic frame. Further, the metal tie straps 57 are pivotally mounted on one end 58 to the front frame and attached at the other end at 59 to the auxiliary back frame.

This auxiliary back frame with the exception of the metal tie straps 57, can be detached from the basic frame by removing bolts from the points 59 and from points 44, noted heretofore as well as point 60. This permits the basic structure to collapse as described above, and, in addition, metal tie straps 57 can likewise be pivoted to a position parallel to longitudinal member 38.

Again, the basic chassis and the auxiliary back frame 54 can be sold as a kit to the home owner or home builder. The auxiliary back frame is provided in the case where a rectangular chassis is to be utilized to form a standard furniture cabinet. It can be appreciated that with such a structure, ready installation of side, back, top and bottom panels to the chassis, can be accomplished. These panels are illustrated at 61 and are attached by any standard means. Further, the auxiliary frame provides additional structural strength that is not needed in the case of the basic structure of Figure 6 wherein the wall in which said structure is mounted can be relied upon to provide, in part, strength and rigidity required for use.

Case construction

Illustrated in Figure 8 is a metal furniture chassis 61 and application thereto of wooden or plastic panels and base member generally designated 62. In this construction the metal chassis 61 is attached to the top panel 63, to the back panel 64, and to the side panels 65. There is no direct connection between the metal chassis 61 and the base 66 and intermediate base 67 (comprising base member 62), the juncture being accomplished through illustrated dowels on side panels 65. This method of attachment allows for a wide tolerance in the various members since the metal chassis actually hangs from the top and sides of the finished case.

As can be appreciated from the above, the principal novelty of this method of case construction involves the fact that the metal chassis is disassociated from one of the integral parts of the case, to wit, the base member 62. This fact enables a wide tolerance in the associated panels 63-65, since any slack and necessary adjustment are remedied through the positioning and variability of the unconnected base member 62.

A modification of the above is envisaged in that the side members 65 could be disassociated from the metal chassis 61 with the base 66 and intermediate base 67 being affixed directly to said chassis. In such case, the side members would provide the necessary variability.

The general construction of the metal chassis in Figure 8 is not critical to this aspect of our invention. As illustrated, guide rails 68 and nylon wear blocks 69 can be used. Likewise, the joint structures fully discussed heretofore in connection with Figure 1 can also be utilized.

In summation, it can be appreciated that our invention contemplates a metal chassis for furniture including ease of fabrication plus enhanced strength and rigidity over a long period of use. In addition, we contemplate a knock-down modification of this general type of chassis for ready use by the home owner or home builder. Further, our invention contemplates a case construction such as wood, for use on this type of metal chassis whereby significant tolerances of construction in the wooden paneling are afforded.

It must be understood that the invention is not limited to the details of construction shown in the accompanying drawings and described above, but includes all the modifications coming within the scope of appended claims and their equivalents.

We claim:

1. In a metal chassis for furniture, a vertical member having a longitudinal wall, a first transverse wall extending inwardly from one side of said longitudinal wall and a second transverse wall extending from the opposite side of said longitudinal wall, a longitudinal member having a horizontal wall and a vertical wall extending downwardly from one side of said horizontal wall, said vertical member being secured in abutting relation with the vertical wall of said longitudinal member, and one of said transverse walls of said vertical member including a cut-out portion defining an upper edge portion provided with a downward projection, the horizontal wall

7

of said longitudinal member having a slot arranged to receive said projection.

2. The metal chassis of claim 1 wherein the said longitudinal member has a vertical flange disposed at one end thereof and secured to the first transverse wall of said vertical member in abutting relation thereto.

3. The metal chassis of claim 2 including a transverse member having a vertical wall and a horizontal wall and a notch formed at one end thereof, said notch permitting said vertical flange of said longitudinal member to abut the first transverse wall of said vertical member, and said horizontal wall of said transverse member abutting the undersurface of the horizontal wall of said longitudinal member.

4. The metal chassis of claim 1 wherein each of said transverse walls of said vertical member extends inwardly from the longitudinal wall and includes a cut-out portion defining an upper edge portion provided with a downward projection, the horizontal wall of said longitudinal member having a slot arranged to receive said projection.

5. The metal chassis of claim 4 wherein the cut-out portion of said vertical member includes a lower edge portion provided with a first step opposite the said downward projection and defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member and sufficient to permit insertion of said longitudinal member between said projection and said lower edge portion, and a second step opposite the upper edge portion and also defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member to thereby permit insertion of said projection in said slot and abutment of said vertical member with the vertical wall of said longitudinal member.

6. The metal chassis of claim 1 wherein the cut-out portion of said vertical member includes a lower edge portion provided with a first step opposite the said downward projection and defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member and sufficient to permit insertion of said longitudinal member between said projection and said lower edge portion and a second step opposite the upper edge portion and also defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member to thereby permit insertion of said projection in said slot and abutment of said vertical member with the vertical wall of said longitudinal member.

7. In a metal chassis for furniture, a first vertical member having a longitudinal wall, a first transverse wall extending inwardly from one side of said longitudinal wall and a second transverse wall extending inwardly from the opposite side of said longitudinal wall, a longitudinal member having a horizontal wall and a vertical wall extending downwardly from one side of said horizontal wall, a vertical flange disposed at one end of said longitudinal member and secured to the first transverse wall of said first vertical member in abutting relation thereto, said first vertical member also being secured in abutting relation with the vertical wall of said longitudinal member, a transverse member having a vertical wall and a horizontal wall and a notch formed at one end thereof, said notch permitting said vertical flange of said longitudinal member to abut the first transverse wall of said first vertical member and said horizontal wall of said transverse member abutting the underside of the horizontal wall of said longitudinal member, a second vertical member secured in abutting relation with the vertical wall of said longitudinal member and having a longitudinal wall, a first transverse wall extending inwardly from one side of said longitudinal wall and a second transverse wall extending inwardly from the opposite side of said longitudinal wall, the sec-

8

ond transverse wall of said first vertical member and the transverse walls of said second vertical member including a cut-out portion defining an upper edge provided with a downward projection, the horizontal wall of said longitudinal member having a slot arranged to receive said projection.

8. The metal chassis of claim 7 wherein the cut-out portion of said first and second vertical members includes a lower edge portion provided with a first step opposite the said downward projection and defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member and sufficient to permit insertion of said longitudinal member between said projection and said lower edge portion and a second step opposite the upper edge portion and also defining therewith a width corresponding to the height of the said vertical wall of said longitudinal member to thereby permit insertion of said projection in said slot and abutment of said vertical members with the vertical wall of said longitudinal member.

9. A knock-down metal chassis for furniture comprising, in combination, a front frame-forming means including two first vertical members and a longitudinal member, a rear frame-forming means including a second vertical member and a transverse member, and two diagonal members, means for securing said first vertical members to said longitudinal member, means for pivotally mounting said transverse member at one end on said front frame and for attaching said transverse member to said second vertical member at the other end of said transverse member, and means for pivotally mounting one end of each of said diagonal members on said front frame and for attaching the other end of each of said diagonal members to the back end of said rear frame.

10. The knock-down metal chassis of claim 9 wherein said transverse member is a drawer guide rail.

11. The knock-down metal chassis of claim 10 including nylon wear blocks at each end of said longitudinal member.

12. The knock-down metal chassis of claim 9 and further comprising: means for pivotally mounting said transverse member at one end on said longitudinal member; means for pivotally mounting one end of each of said diagonal members on each end of said longitudinal member and for detachably securing the other end of each of said diagonal members to the end of the transverse member that is secured to the second vertical member.

13. The knock-down metal chassis of claim 12 wherein means are provided for securing said other end of said transverse member to the top end of said second vertical member and including a second longitudinal member, a second transverse member and two additional diagonal members, means for securing said first vertical members to said second longitudinal member, means for pivotally mounting said second transverse member at its one end on said second longitudinal member and for securing said second transverse member to the bottom end of said second vertical member at its other end, and means for pivotally mounting one end of each of said additional diagonal members on each end of said second longitudinal member and for detachably securing the other end of each of said additional diagonal members to the end of the second transverse member that is secured to the said second vertical member.

14. The knock-down chassis of claim 9 wherein said first vertical members have a longitudinal wall, a first transverse wall extending inwardly from one side of said longitudinal wall and a second transverse wall extending from the opposite side of said longitudinal wall, and said longitudinal member has a horizontal wall and a vertical wall extending downwardly from one side of said horizontal wall, means for securing said first vertical members in abutting relation with the vertical wall of said longitudinal member, and one of said transverse walls of said

first vertical members including a cut-out portion defining an upper edge portion provided with a downward projection, the horizontal wall of said longitudinal member having a slot arranged to receive said projection.

15. The knock-down metal chassis of claim 9 including an auxiliary back frame-forming means, said means including two vertical auxiliary back frame members, two longitudinal auxiliary back frame members and two pairs of metal tie straps, means for securing said longitudinal auxiliary back frame members to said vertical auxiliary back frame members and to said second vertical member, and means for pivotally mounting said metal tie straps on one end to said front frame and for attaching

said metal tie straps at the other end to said auxiliary back frame.

16. The knock-down metal chassis of claim 15 wherein said two pairs of metal tie straps are pivotally mounted on one end to the top and bottom corner joints of said front frame, respectively.

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