United States Patent [19]

Beaver

[11] **3,809,449**

[45] **May 7, 1974**

[54] **FOUNDATION FRAMEWORK FOR METAL OFFICE FURNITURE**

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[22] Filed: **Sept. 21, 1972**

[21] Appl. No.: **290,777**

Related U.S. Application Data

[63] Continuation of Ser. No. 80,835, Oct. 15, 1970, abandoned.

[52] **U.S. Cl.** **312/194**

[51] **Int. Cl.** **A47b 96/20**

[58] **Field of Search** 312/194–196, 312/257; 248/188

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Primary Examiner—Paul R. Gilliam

Attorney, Agent, or Firm—Mann, Brown, McWilliams & Bradway

[57] **ABSTRACT**

A foundation framework for office furniture desks, tables and the like comprising a torsionally rigid top structure, a pair of torsionally rigid panel leg structures supporting either end of the top structure and disposed in parallel spaced relation adjacent either end of the top structure and extending transversely thereof, a pair of spaced apart brackets on the upper edges of each panel leg structure that are secured by screws to the top structure, and a tie plate, such as a back panel, secured between the top structure and the panel leg structures and extending normally of same, at each end of the top structure to make the panel leg structure resistant to hinging action relative to the top structure. This basic foundation framework may be used as such to provide tables, or augmented by the application to same of standardized furniture forming components to provide desks of various types, bookcases, filing cabinets, and the like.

4 Claims, 16 Drawing Figures

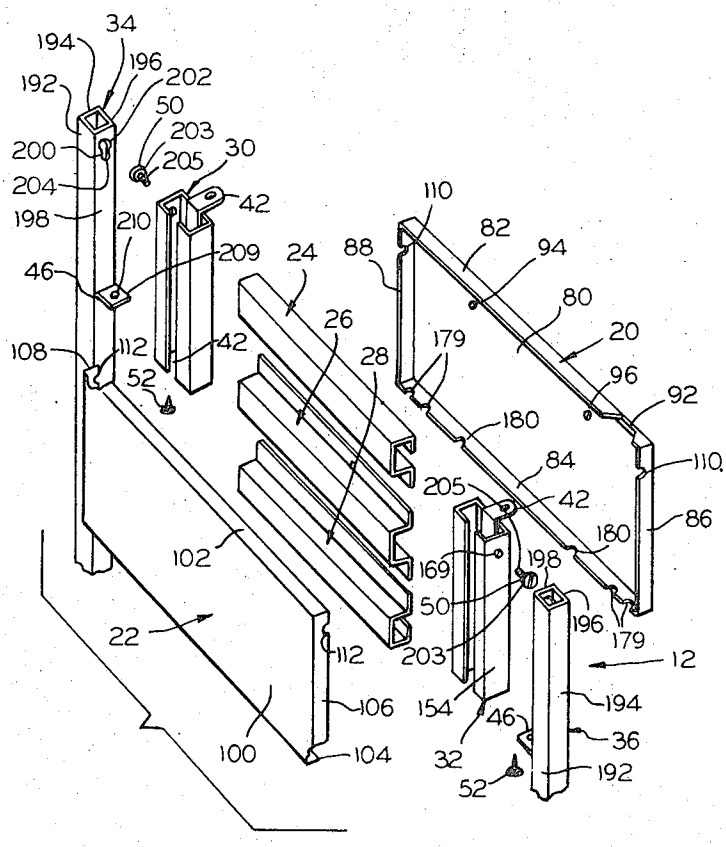
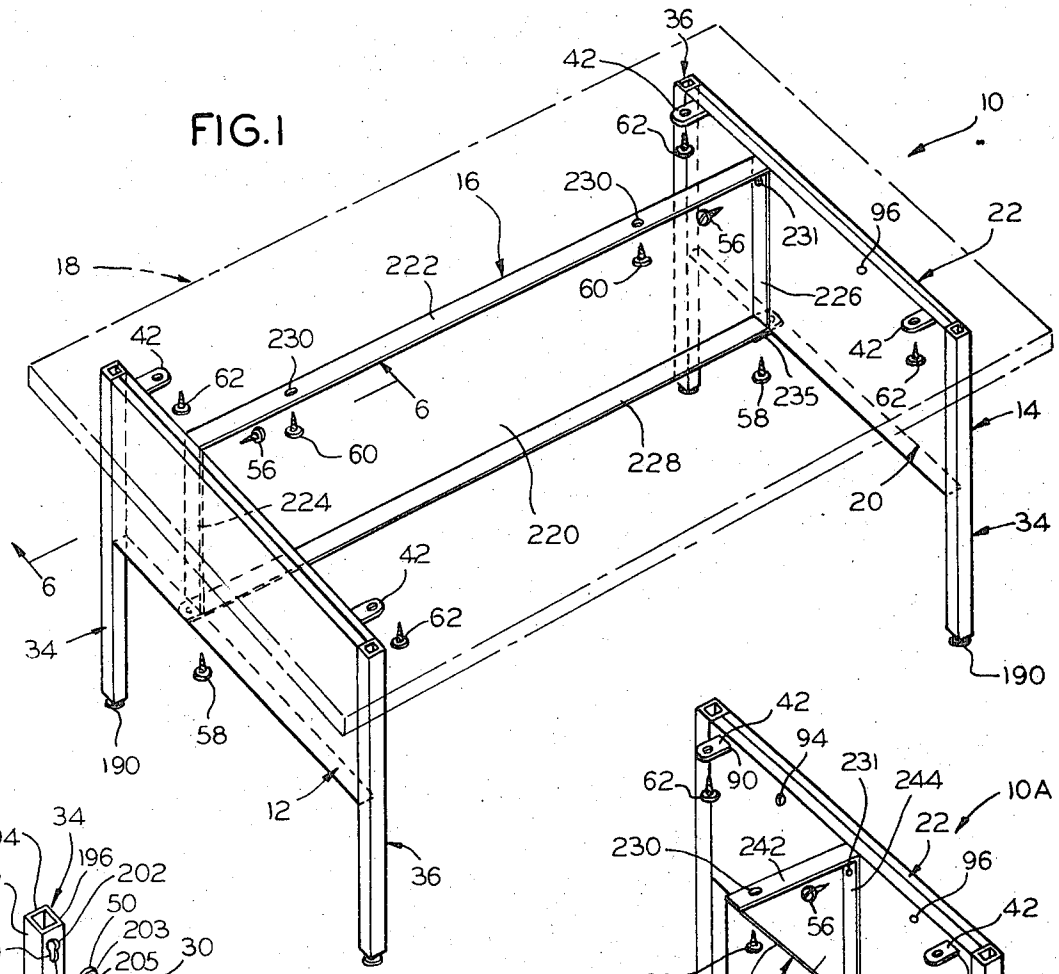


FIG.1



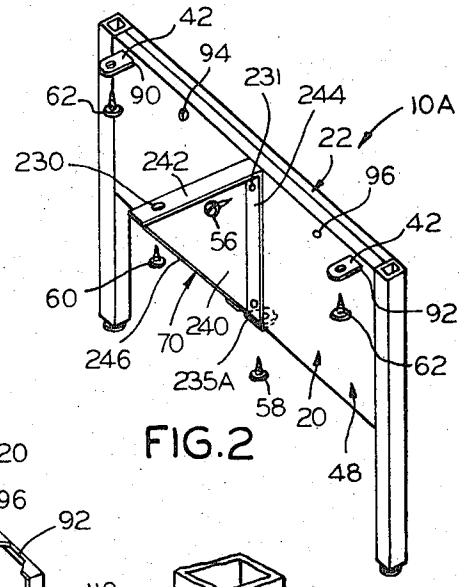


FIG.2

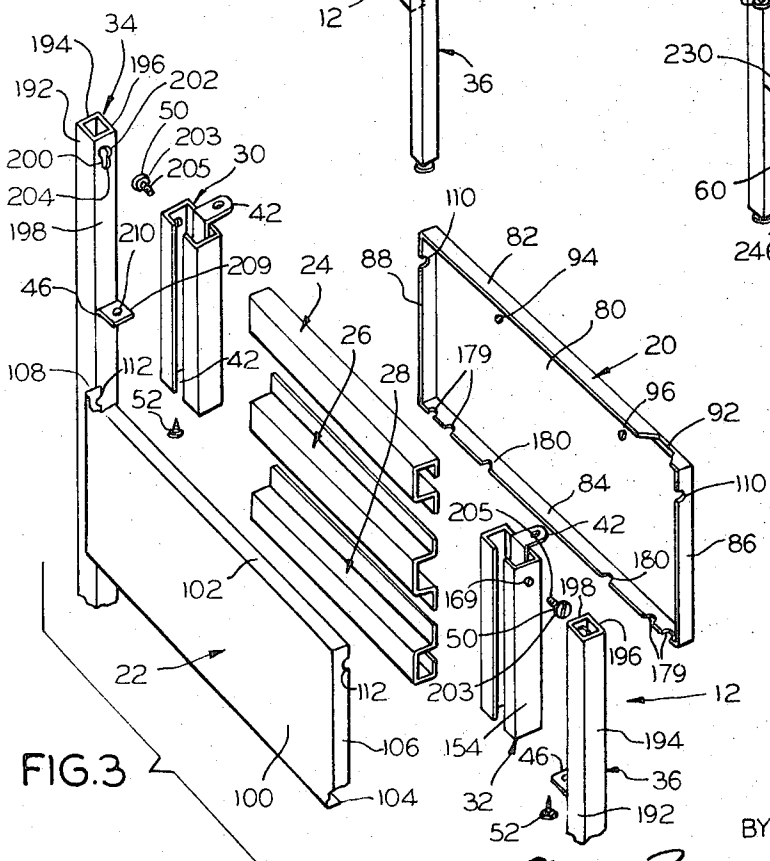


FIG.3

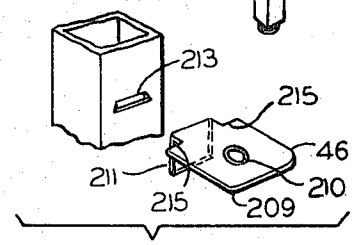


FIG.3A

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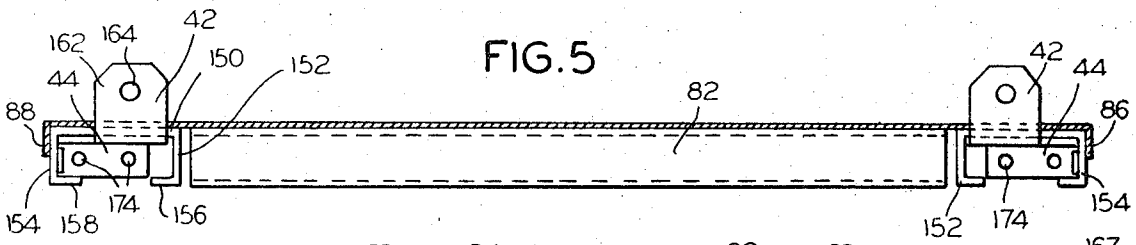
FIG.5



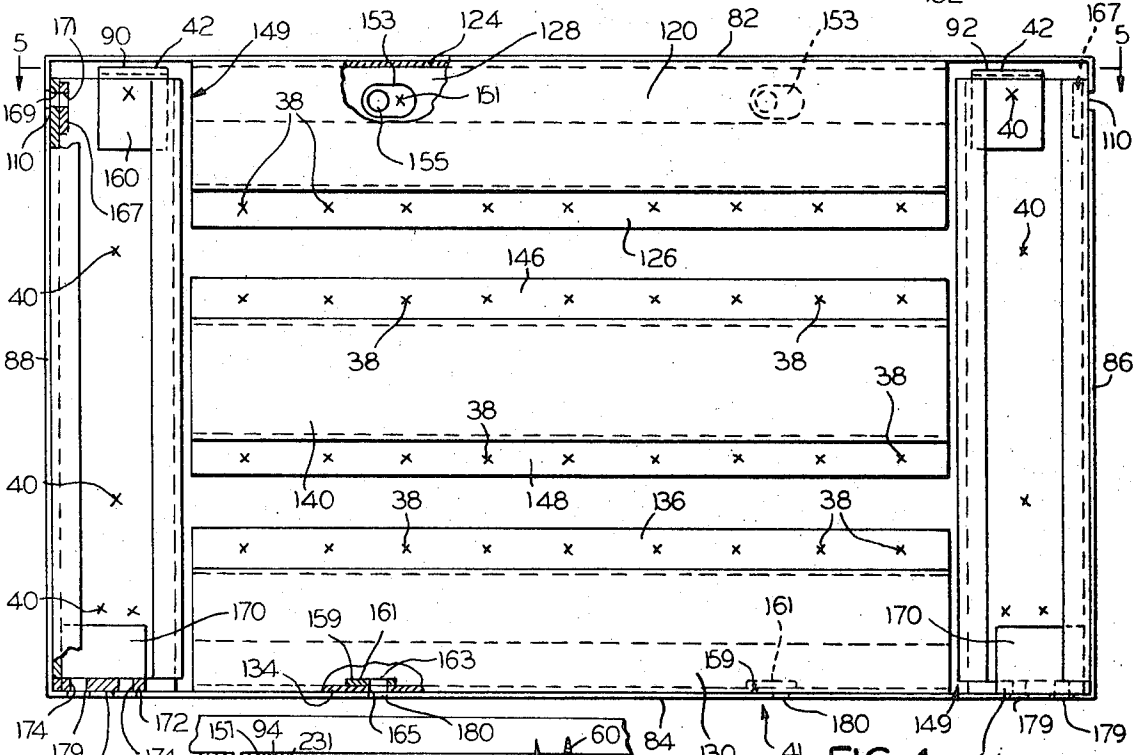


FIG.4

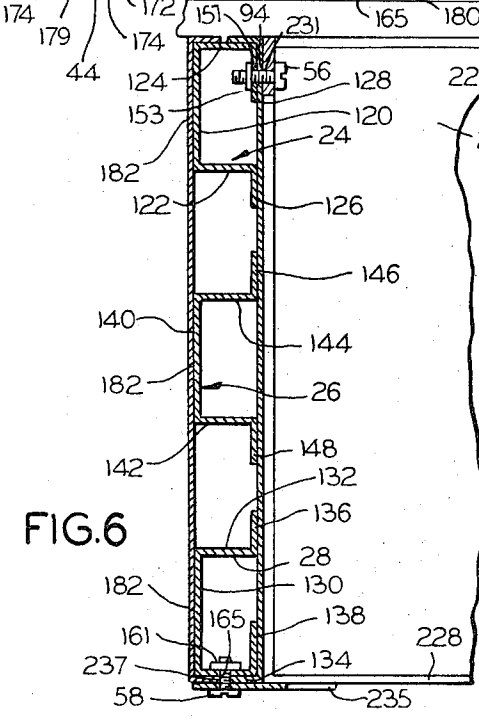


FIG.6

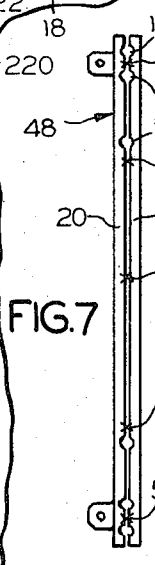


FIG.7

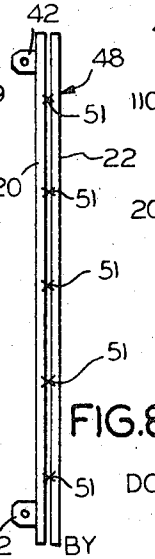


FIG.8

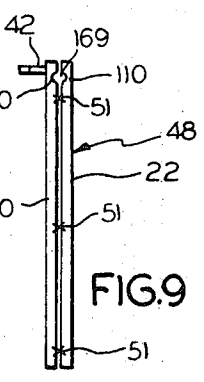


FIG.9

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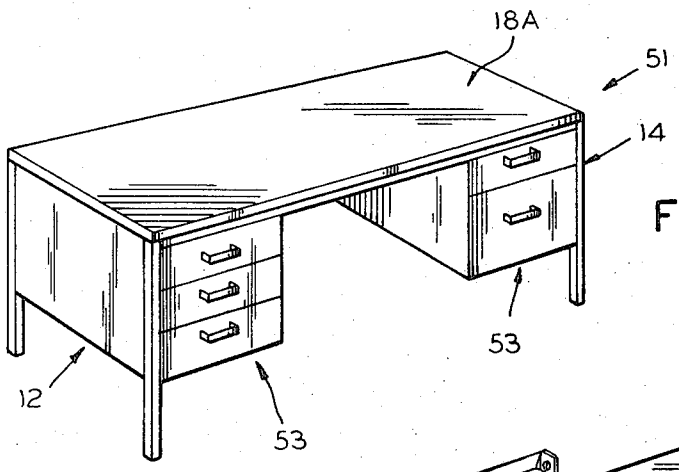

FIG. 10

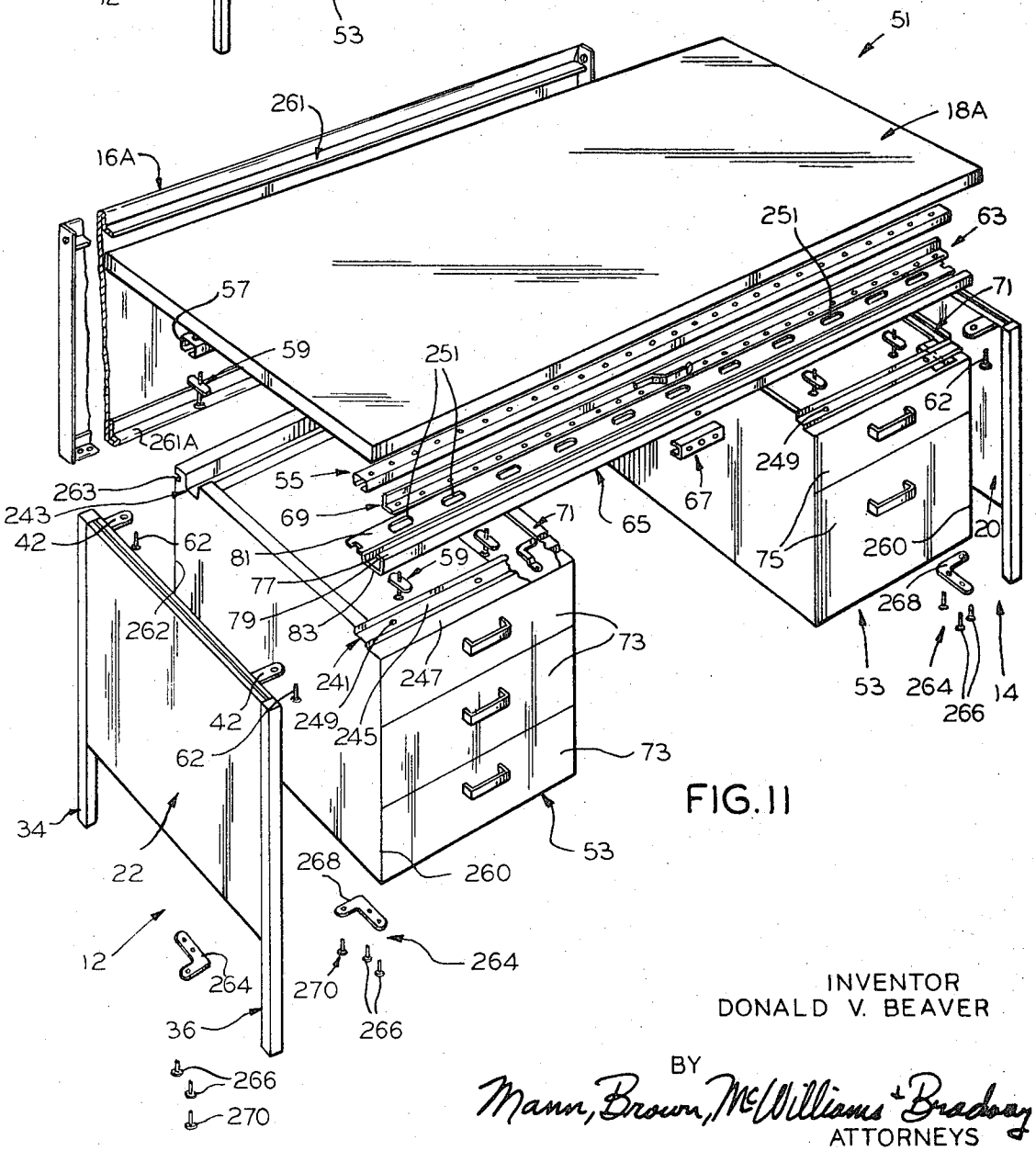

FIG. 11

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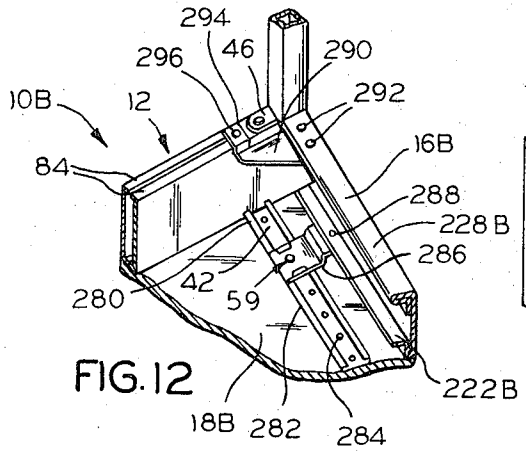

FIG.12

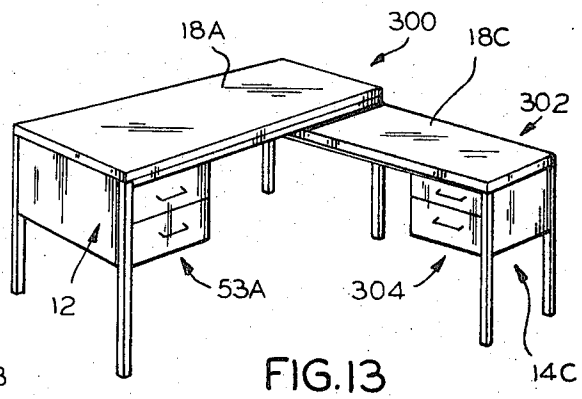

FIG.13

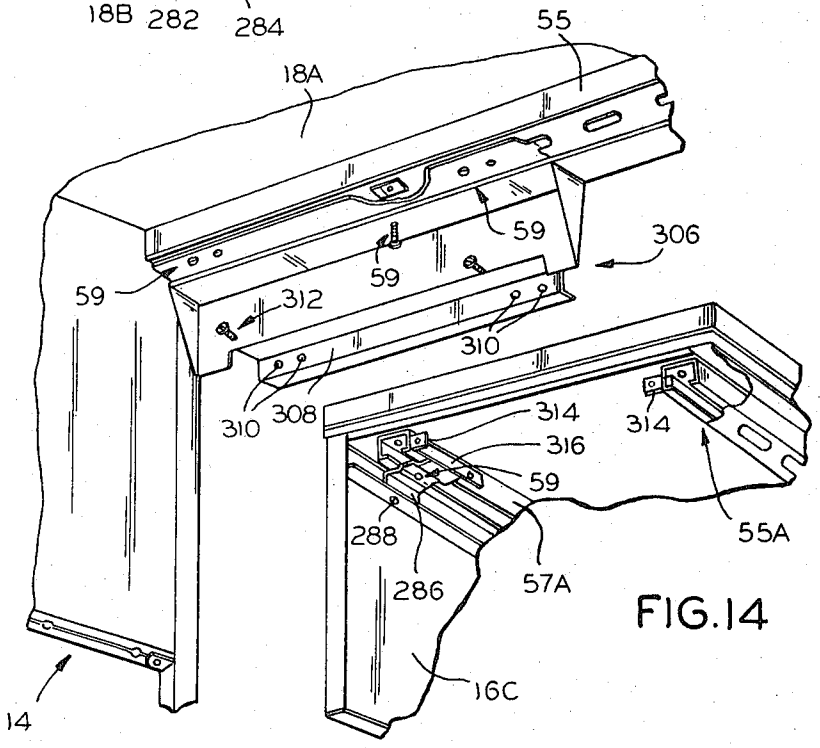

FIG.14

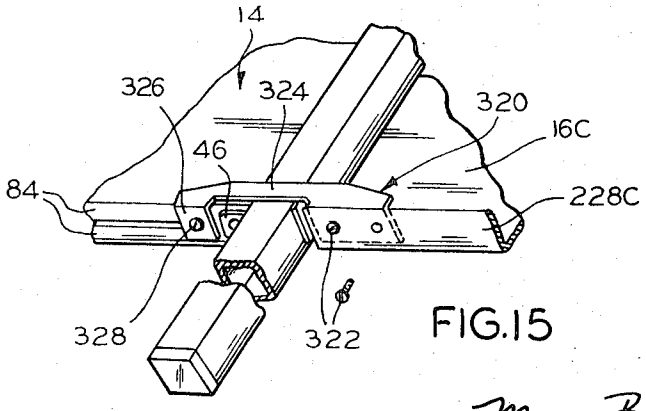

FIG.15

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FOUNDATION FRAMEWORK FOR METAL OFFICE FURNITURE

This application is a continuation of my application Ser. No. 80,835, filed Oct. 15, 1970 (now abandoned).

This invention relates to a unitary panel leg construction for office furniture and the like, and to a method of making same.

Office furniture such as desks, tables, and chairs are frequently subject to stresses acting laterally of the length thereof to tending to twist them out of line, make them "walk" across the floor or both. The leverage that such forces act through in connection with office furniture of standard heights results in distortion and displacement of the furniture legs with the resulting weakening of an uneven support for the furniture. This is particularly a problem in contemporary style furniture wherein the simplicity of design requires that reinforcement structures for the legs be minimized.

A principal object of this invention is to provide a unitary panel leg arrangement for office furniture and the like and a method of making same.

Another principal object of the invention is to provide a unitary panel leg arrangement for office furniture that may be employed as desired with desks, tables and credenzas, and the like, of various sizes and heights and requires only a simple back plate or gusset plate to secure it in operating relation with the top of the piece of furniture involved.

Other objects of the invention are to provide a leg arrangement for office furniture that has significant resistance against twist and "walking," that involves simple structural elements that may be readily secured together and in a manner which does not leave weld marks or the like that would distract from the aesthetics of the final product, that is adapted for usage in a wide variety of furniture constructions, and that is economical of manufacture, convenient to apply, and long lived and multi-ultilitarian in character.

Other objects, uses, and advantages will be obvious or become apparent from a consideration of the application drawings and the following detailed description.

In the drawings:

FIG. 1 is a diagrammatic perspective view illustrating a table arrangement in accordance with this invention and made up of a pair of the panel leg arrangements of this invention joined together by a back plate;

FIG. 2 illustrates a modification of the arrangement of FIG. 1 in which the back plate is replaced by a pair of gusset plates that secure the panel legs to the table top;

FIG. 3 is an exploded perspective view of one of the panel legs of this invention, illustrating the left hand panel leg construction of FIG. 1;

FIG. 3A is a fragmental exploded perspective view illustrating a detail of the connection of the individual legs into each panel leg construction;

FIG. 4 is a plan view of the inner pan of the panel arrangement and the parts that are affixed thereto by welding;

FIG. 5 is a top view of the subassembly shown in FIG. 4;

FIG. 6 is a diagrammatical cross-sectional view taken substantially along line 6—6 of FIG. 1;

FIG. 7 is a bottom edge view of the panel employed in the panel leg construction, prior to application of the legs thereto;

FIGS. 8 and 9 are top and side edge views, respectively, of the panel of FIG. 7;

FIG. 10 is a perspective view of a double pedestal desk arranged in accordance with this invention;

FIG. 11 is an exploded perspective view illustrating the basic desk components and framing elements embodied in the desk of FIG. 10;

FIG. 12 is a diagrammatic fragmental perspective view illustrating a flush type back panel application in accordance with this invention;

FIG. 13 is a diagrammatic perspective view of a single pedestal desk provided with a right-hand L-extension or return in accordance with this invention;

FIG. 14 is a fragmental exploded perspective view illustrating the application of the L-return to the panel leg and desk top adjacent same; and

FIG. 15 is a fragmental perspective view illustrating the manner of securing the L-return flush back plate to the lower portion of the panel leg adjacent same.

However, it is to be understood that the specific drawing illustrations provided are supplied primarily to comply with the requirements of the Patent Code, and that the invention may have other specific embodiments which are intended to be covered by the appended claims.

GENERAL DESCRIPTION

Reference numeral **10** of FIG. **1** generally indicates a table arranged in accordance with this invention and comprising a pair of torsionally rigid panel legs **12** and **14**, a back plate **16** that may be non-rigid in nature from a torsional standpoint, and a torsionally rigid table top **18** that is shown in phantom only.

The basic arrangement of the panel legs **12** and **14** is illustrated in the showing of FIG. **3** wherein it will be seen that each panel leg comprises inner and outer pans **20** and **22**, reinforcing channel members or stiffeners **24, 26** and **28**, vertically disposed mounting members **30** and **32**, and legs **34** and **36**.

Generally speaking, the invention contemplates that the reinforcing channel members or stiffeners **24, 26** and **28**, and the mounting members **30** and **32**, will be fixed to and within the inner pan **20**, as by spot welding the respective members **24, 26** and **28** where indicated at **38** in FIG. **4**, and by spot welding the respective mounting members **30** and **32** where indicated at **40** in FIG. **4**, to form a subassembly **41**. The mounting members each carry an angle bracket **42** that is adapted to be secured to the table top **18**, and an angle bracket **44** that is adapted to be secured to the angle bracket **46** of the respective legs **34** and **36**.

The outer pan **22** is bonded to the subassembly **41** to form a panel construction **48**, in accordance with this invention, by employing a suitable adhesive in a relatively narrow band between the respective members **24, 26** and **28** and the pan **22**. One suitable adhesive is the two-part room temperature curing adhesive EC-2158 made by 3M Company, and it is preferred that the bonding band between the parts indicated be about 1 inch wide and 5–10 one thousandth inch in thickness.

As indicated in the drawings, the pans in panel **48** are spaced from each other about the margin of the panel,

but are welded together at spaced points thereabout as at 51 (as by employing TIG welding).

The panel construction 48 after completion has secured thereto the legs 34 and 36, to form the basic panel leg arrangement, by employing the screws 50 and 52 to make the appropriate connection between the respective legs 34 and 36 and the respective mounting members 30 and 32.

The panel leg 14 is made in a similar manner, and the two panel legs 12 and 14 are connected together by back plate 16 employing suitable screws 56 and 58 to secure the respective ends of the back plate 16 to the respective panel legs.

The panel legs 12 and 14 and back plate 16 are then secured to the table top 18 by employing appropriate screws 60 to secure the back plate to the table top, and screws 62 to secure the brackets 42 of the panel legs to the table top 18. It will be noted that the screws 56, 58 and 60 at each end of the table provide a simple but effective three point connection between the panel leg, back plate and table top.

In the embodiment 10A of FIG. 2, the back plate 16 is omitted in favor of a pair of gusset plates 70, with the respective screws 56, 58 and 60 making the same sort of three point connection between the panel legs, gusset plates and table top at each end of the table.

The resulting structure provided by tables 10 and 10A provides a rigid basic furniture foundation framework that may be used as illustrated or augmented by the application thereto of standardized furniture forming components to achieve different types of furniture selections, as suggested hereinafter.

It is to be understood that the tables 10 and 10A that are illustrated are merely examples of the various types of furniture that can be constructed employing the panel legs 12 and/or 14, the back plate 16 or the gusset plates 70, and a suitable top that may be of any conventional construction. For instance, a double pedestal desk 51 (see FIGS. 10 and 11) may be formed by employing panel legs 12 and 14 at either end of the piece of furniture, with a desk pedestal 53 of the type shown in Abrahamson U.S. Pat. No. 3,125,387 also at either end of the piece of furniture and secured to the respective panel legs, and torsionally rigid desk top 18A, which may be of the general type shown in Grube U.S. Pat. No. 2,911,274, channels 55 and 57 of the type shown in Abrahamson U.S. Pat. No. 3,125,387, being applied to the undersurface of the top 18A for securing the pedestals (and a center drawer assembly, if so desired) to the desk top. A back plate 16A that is generally similar to that of FIG. 1 and secured in overlying relation to the pedestals 53 may be employed to complete the desk.

Similarly, panel legs 12 and 14 in shortened form transversely of the table 18 may be employed together with a back plate 16, or a pair of gusset plates 70 in association with a suitable credenza top as the top 18, to provide a credenza construction.

The basic panel leg construction provided by this invention insures that the two legs are securely connected together to act in unison, and that when the panel leg unit is mounted in place, its legs will remain fixed with respect to same. The legs are held firmly against both twisting tendencies and walking tendencies.

The strength of the resulting construction appears to be due to the fact that the pans 20 and 22 are so fastened in place that the strength of the sheets forming the pans becomes available to resist torsional stresses and thus become structural members arranged to act as stressed skins to provide twisting strength to the panel. Furthermore, since the reinforcing and mounting members are welded only to the inner pan 20, the outer pan 22 is free from welding deformations and thus provides an aesthetically attractive outwardly facing surface for the panel leg without having to machine pan 22.

SPECIFIC DESCRIPTION

The pans 20 and 22 are of substantially identical constructions, each being of the dished shape that is indicated. Pan 20 comprises planar wall 80 of generally quadrilateral configuration (rectangular in the illustrated embodiment) and including about its edges the respective top and bottom walls 82 and 84 and the respective side walls 86 and 88. The wall 80 of the inner panel 20 is formed with spaced openings 90 and 92 (see FIG. 4) to receive the respective brackets 42, and spaced openings 94 and 96 to receive the respective mounting screws 56.

The pan 22 similarly comprises wall 100 that has formed about its side edges the top and bottom walls 102 and 104, and side walls 106 and 108. The side walls 86 and 88, 106 and 108 of the respective panels 20 and 22 are notched as at 110 and 112 to receive the respective screws 50.

The reinforcing channel members or stiffeners 24, 26 and 28 preferably have the channel-shaped cross-sectional configurations indicated in FIGS. 3 and 6 wherein it will be noted that the central member 26 is of hat shaped dual external wing flange cross-sectional configuration while the members 24 and 28 are of single external wing flange cross-sectional configuration. Thus, it will be seen that member 24 comprises a web 120 separating the side walls 122 and 124, with the side wall 122 being formed with wing flange 126 projecting externally of member 24 and side wall 124 being formed with regular flange 128 that projects internally of member 24.

Similarly, the member 28 comprises web 130 separating side walls 132 and 134, with the side wall 132 being formed with a external wing flange 136 and side wall 134 being formed with regular or internal flange 138.

Member 26 comprises web 140 separating side walls 142 and 144 each including an external wing flange 146 and 148, respectively.

Prior to application to pan 20, member 24 has applied thereto, as by welding at 151 (see FIG. 4) weld nuts 153 that have their respective threaded openings 155 aligned with suitable holes 157 formed in the flange 128. Similarly, member 28 has applied thereto, as by welding at 159, weld nuts 161 that have their respective threaded openings 163 aligned with suitable holes 165 formed in wall 134.

As indicated in FIG. 4, the members 24 and 28 are fixed to the wall 80 of pan 20 by having their wing flanges 126 and 136 spot welded thereto where indicated at 38. The member 26 is affixed to pan 20 by having its wing flanges 146 and 148 spot welded thereto where indicated at 38. As further indicated by FIG. 4, the members 24, 26 and 28 are disposed in parallel spaced apart relation and extend short of the side walls of the respective pans 20 and 22 to provide a space 149 to permit the respective members 30 and 32 to be re-

ceived between the respective pan side walls and the adjacent ends of the respective members 24, 26 and 28.

As indicated in FIGS. 3, 4 and 5, the mounting members 30 and 32 are of similar right and left hand construction, and each comprise a web 150 separating side walls 152 and 154, with the respective side walls 152 and 154 being flanged as indicated at 156 and 158. The respective angle brackets 42 are applied to the upper ends of the members 30 and 32, as by being welded thereto in any suitable manner. Each bracket 42 comprises angled portions 160 and 162, with the respective portions 160 being affixed in place to the respective webs 150 as by welding, and the respective portions 162 being formed with a suitable opening 164 to receive a mounting screw 62.

The respective members 30 and 32 have affixed thereto at their lower ends the respective angle brackets 44, each of which comprises angled portions 170 and 172, with the respective angle portions 170 being affixed to the respective web portions 150 of the respective members 30 and 32 as by welding. The angle portion 172 on each bracket 44 is formed with a pair of threaded screw receiving openings 174 (see FIG. 5) that receive the respective screws 52. (Alternately weld nuts similar to weld nuts 153 and 161 may be here employed.)

The side walls 154 of the mounting members 30 and 32 each have affixed thereto a weld nut 167 with its threaded opening 171 in alignment with suitable screw receiving openings 169 formed in the respective walls 154, which in turn are to be aligned with the recesses 110 and 112 of the pans when members 30 are mounted in position. The lower side walls 84 and 104 of pans are notched in a manner similar to notches 110 and 112 to accommodate the screws 52 and 58, as indicated at 179 and 180 in FIG. 3. Members 30 and 32 are spot welded to pan 20 as by having their webs spot welded thereto as at 40.

As already indicated, pan 22 is secured to pan 20 by adhering same to stiffeners 24, 26 and 28, and this is done by applying the indicated adhesive along the webs 120, 130 and 140 of these members where indicated at 182 in FIG. 6, and then pressing pan 22 thereagainst to complete panel 48. As true flatness of panel 48 is an essential of this invention, the subassembly 41 and pan 22 are preferably applied to a suitable press for compressing them together under suitable compressive forces. In a commercial embodiment of the invention this is done in a platen press, and the room temperature cure adhesive EC-2158 is employed, which requires the thus assembled parts of panel 48 to be held under pressure from about six to about eight hours.

Legs 34 and 36 are more or less conventional in nature, they being formed from tubing of square cross-sectional configuration and being provided with a suitable adjustable foot 190 at their lower ends. Legs 34 and 36 thus each define planar side walls 192, 194 and 196 and 198, and in the present arrangement, the wall 198 is formed with a key hole slot 200 having its larger portion 202 proportioned to pass the head 203 of the respective screws 50, while the narrow portion 204 of the slot 202 has a width sufficient to freely pass the shank 205 of the respective screws 50 while retaining the respective screw heads 203.

Alternately, a slot extending from the upper ends of the respective leg sides 198 longitudinally of the respective legs to the location of slot portion 204 and having the width of slot portion 204, may be employed for the same purpose.

Legs 34 and 36 below the key hole slot 202 have applied thereto the respective brackets 46 each comprising a leg clip 209 formed with right angled flange 211 (see FIG. 3A) that fits into slot 213 of the respective legs and an opening 210 to receive the screw 52 at each end of the respective panel legs 12 and 14.

After the members 24, 26, 28, 30 and 32 have been affixed to the pan 20 of the respective panel legs 12 and 14, and the pan 22 has in turn been affixed to the respective reinforcing members 24, 26 and 28 in the manner indicated, the legs 34 and 36 are applied to the respective panels 48 (to form the panel legs 12 and 14) by mounting the brackets 46 in place on each leg (as by inserting flange 211 thereof into the leg slot 213 and pivoting same to bring flange 211 against wall 198) and applying the respective screws 50 to the respective panel weld nuts 167; the screws 50 are turned into place sufficiently so that when their heads 203 are passed through the wide portions 202 of the respective key hole slots 200, where slots 200 are used, they will engage the inside surfaces of the respective leg walls 198 if the leg is moved to dispose the screw shanks 205 in the narrow portions 204 of slots 200. It is then merely necessary to move the respective legs 34 and 36 upwardly of the respective panel legs 12 and 14 to dispose the screw shank 205 in the leg slot narrow portion 204, and to bring the bracket arm of bracket 46 having the hole 210 formed therein against the panel leg bottom wall 84 and 104, after which the respective screws 52 are applied through the respective holes 210 and into the aligned holes 174 of the respective brackets 44 to secure the respective legs 34 and 36 to the respective panel legs 12 and 14. The proportioning of parts is preferably such that this brings the tops of the legs 34 and 36 in alignment with the top walls 82 and 102 of the respective pans 20 and 22, and disposes the leg side walls 198 in firm engagement with the pan walls 86, 106 and 88, 108, respectively. Shoulders 215 of clips 209 lock against the wall 198 of the respective legs to provide a light stable attachment, with flange 211 locking against the inside of wall 198.

The extra opening 174 of brackets 44 may be employed to anchor a back plate 16 or other office furniture components to the respective panel legs 12 and 14 (see FIGS. 12 and 15).

Prior to the application of legs 34 and 36 to the respective panel legs, the panel legs may be painted and run through a conventional paint bake cycle for aesthetic purposes. It will be noted that the outwardly facing surface of the respective pans 22 presents a good surface for painting without having to machine same to obtain an unmarred surface.

The back plate 16 is more or less conventional in nature and comprises a rectilinear wall 220 bounded by upper wall 222, side walls 224 and 226, and bottom wall 228. Top wall 222 is formed with appropriate openings 230 to receive the respective screws 60 that secure the back plate to the taple top or the like, while the side walls 226 are formed with suitable openings 231 to receive the respective screws 56 that are applied to the weld nuts 153 of the respective panel legs 12 and 14 that are employed to mount the back plate in place. As indicated in FIG. 1, the weld nuts 153 of the respective panel legs 12 and 14 are disposed in opposed pair

relation to provide an opposed pair of nuts at either side of the table as viewed in FIG. 1. The back plate 16 may be secured to either of these opposed pairs.

The gusset plates 70 in the form of FIG. 2 each comprise a triangular shaped plate construction including upright wall 240, top wall 242 and side wall 244, with the top wall 242 and the side wall 244 being joined by diagonal wall 246. Top wall 242 is formed with opening 230 to receive the screw 60 that is to secure gusset plate 70 to the table top, while the side wall 244 is formed with opening 231 to receive the screw 56 that cooperates with a selected weld nut 153.

Back plate 16 has affixed to its wall 228 a mounting plate 235 (see FIG. 6) formed with a suitable hole 237 to receive the screw 58 that is applied to a selected weld nut 161. Gusset plate 70 is formed with a similar plate 235A that is angled for application to the diagonal wall 246, as indicated in FIG. 2.

It is preferred from the standpoint of strength, fabrication of flat panels, rigidity and impact resistance, that the pans 20 and 22 and stiffeners 24, 26 and 28 be formed from 22 gauge steel sheeting, and that the mounting members 30 and 32 be formed from 16 gauge steel.

As it is considered critical that the respective panel leg units be as flat as possible, it is preferred that after the respective pans 20 have been applied to the subassemblies 41, the resulting panel assembly be applied to a suitable platen press for application thereto of compressive force for the period of cure required by the adhesive employed. Where the indicated adhesive EC-2158 is employed, a 6 to 8 hour cure at room temperature is required, and during this cure the panels should remain under a pressure in the range of from about one to about 10 pounds per square inch (but the application of heat will shorten the cure time proportionately).

Alternately, where a high temperature cure is desired, adhesive EC-2214, amde by 3M Company, is preferred, with the respective panels being applied to a heated platen press under pressure conditions of approximately one to ten pounds per square inch for one minute at 400° F.

It will be apparent that panel legs 12 and 14 are interchangeable, and that the back plate 16 or gusset plates 70, may be applied to either opposed set of weld nuts 153 and 161. Furniture made employing the panel legs and back plates of this invention may be varied as to height, length, and width by varying the dimensions of the panel legs, back plates, and legs 34 and 36 as desired.

It will be seen that panel legs 12 and 14 in effect provide a pair of rigid chassis forming structures that serve as the foundation for selectively forming furniture units by securing thereto or suspending therefrom basic furniture components or subassemblies, such as desk and/or bookcase pedestals, back plates, table tops, L-returns (full height or drop height), and file cabinets, by suitably connecting same employing the screw and nut type connections that have been described, and as indicated more specifically in FIGS. 10 – 15. The panel legs as connected together by a back plate and top on their equivalents serve as the main load resisting structures of the resulting unit, and provide the purchase for securing in place the furniture components or subassemblies that are desired.

FIGS. 10 – 15 illustrate examples of several different office furniture units which include the basic panel leg arrangement of this invention, and are made up from selected standardized and matched components that are arranged to provide maximum flexibility and versatility in the selections permitted, in accordance with the general thesis of said Abrahamson patent.

In the double pedestal desk 51 of FIG. 10, the basic components involved are the panel legs 12 and 14, a desk top 18A, pedestals 53 at the left and right hand sides of the desk, a set of front and rear mounting channels 55 and 57 (see FIG. 11) that are secured to the top 18A by suitable screws (not shown), and to which the forward and rearward ends of the respective pedestals 53 are secured by suitable fasteners such as the "swing nut" fasteners 59 that are shown at 142 in said Abrahamson patent, and a back plate 16A that is secured between the panel legs 12 and 14 and in overlying relation to the pedestals at the rear of the desk.

Operably associated with the specific desk 51 that is illustrated, is a standardized lock filler device or unit 63 of the type described in U.S. Pat. No. 3,521,937 of Bruce O. Buhrmaster and John P. Ericson, granted July 28, 1970, comprising a filler channel or panel 65 provided with a lock indicated at 67 which operates a slide bar 69 that is operably associated with the pedestal drawer locking devices indicated at 71 to simultaneously lock or unlock the drawers 73 that are part of one of the pedestals 53, and the drawers 75 that are part of the other pedestal 53.

In the specific office furniture unit illustrated in FIGS. 10 and 11, the pedestals are notched or recessed across their tops where indicated at 241 and 243 to receive the mounting channels 55 and 57 so that the tops of the pedestals will be substantially flush with the bottom of desk top 18A and with the notches or recesses 241 having a configuration complementing the undersurface of the lock device filler panel member 77, and intention being that when the office furniture unit 51 is assembled, the filler panel member 77 will be resting on the principal surfaces defining the notches or grooves 241, and the upper flange 79 of the filler panel member will be disposed in substantial juxtaposition with the office unit top. It will thus be seen, therefore, that the grooves or notches 241 of the respective pedestals 53 each comprise an upper abutment surface portion 245 against which the attachment flange portion 81 of filler panel 77 rests, and a lower abutment surface portion 247 against which the lower flange portion 83 of filler panel 77 rests.

In the assembled relation, the forward mounting channel 55 rests on top of the mounting flange 81 of filler panel 77. As indicated, the mounting channels 55 and 57 are secured to the respective pedestals by fasteners of the type shown in said Abrahamson patent in which the threaded member associated with same passes through suitable openings 249 formed in the respective pedestals as well as suitable openings 251 formed in the mounting flange 81 of the filler panel member. Openings 251 are suitably spaced lengthwise of the lock filler device 63 to provide the desired selectivity of attaching same to the office furniture unit. Said U.S. Pat. No. 3,521,937 may be referred to for further details concerning lock device 63 and its manner of association with drawing locking arrangements 71.

As part of the assembly operation of desk 51 in accordance with this invention, the angle brackets 42 of

the respective panel legs 12 and 14 are received within the ends of the respective channel members 55 and 57, and are secured to the desk top 18A by suitable screws 62 that pass through appropriately located holes in the respective members 55 and 57. As indicated in FIG. 4, the angle brackets 42 are associated with the respective panel legs 12 and 14 such that their portions 162 are disposed sufficiently below the top walls 82 of the panel leg pans so that the said walls 82 may be placed into engagement with the undersurface of the desk top with the angle brackets 42 located as indicated.

At the outer corners 260 and 262 of the respective pedestals 53, the respective pedestals are affixed to the respective panel legs 12 and 14 by employing the respective angle brackets 264 which are secured to the lower corner portions of the pedestal by suitable screws 266; the angled arm 268 of the respective angle brackets is secured to the respective openings 174 of the respective panel legs by a suitable screw 270, which openings 174 may be either threaded or equipped with a weld nut (as already indicated). This connection to the pedestals is the same at the front corners 260 and rear corners 262 at both ends of the desk.

The back plate 16A is flush mounted with respect to the ends of the panel legs, as distinguished from the recess mount. The back plate 16A includes an upper flange 261 secured to the pedestals in any suitable manner, and that is secured to rear channel 57 at the midlength of the desk by the clip 286 and associated screw devices 59 and 288 that are indicated in FIGS. 12 and 14; flange 261 fits in slot 263 of the respective pedestals. Back plate 16A also includes lower flange 261A that engages under the rear of the respective pedestals and at its ends is anchored to the panel legs 12 and 14 by being interposed between the brackets 264 and the respective pedestals at the pedestal corners 262.

In the showing of FIG. 12, a table 18B of the flush back panel mount type is illustrated, with the showing being of one corner of the table in inverted position. Panel leg 12 has its angle bracket 42 disposed within the adjacent end 280 of mounting channel 282 that is similar to the channels 55 and 57 and is affixed to top 18B by suitable screws (not shown) applied to selected channel holes 284 (bracket 42 also being fixed to top 18B by a suitable screw). The back plate 16B has its upper flange 222B secured to the channel 282 by a suitable clip 286 that is secured to the flange 222B by a suitable screw 288 and to channel 282 by a swing nut type fastener 59. The lower flange 228B of the back plate has an angle bracket 290 affixed thereto by suitable screws 292, with angle bracket 290 being formed with a downwardly indented arm 294 that rests against the underside of panel leg 12 walls 84 in alignment with the adjacent openings 174 of the panel leg to receive suitable screw 296 to fix the back plate 16B in braced relation with the panel leg. The other end of the back plate is secured to the other panel leg (not shown) in a similar manner.

In the showing of FIGS. 13, 14 and 15, single pedestal desk 300 is arranged in the manner described in connection with the showing of FIGS. 10 and 11 except that the left hand pedestal 53A is of the two drawer type and right hand pedestal is omitted, as suggested in the description pertaining to these figures. The L return 302 comprises a panel leg 14C secured to a top 18C and flush mount back plate 16C in the manner suggested by FIG. 12 (see FIG. 14), with pedestal 304 being applied to the top and panel leg 14C in the manner suggested in FIG. 11.

Referring to FIG. 14, the top 18C of L return 302 is secured to the top 18A of the desk 300 by securing a mounting bracket 306 to channel member 55 employing several of the swing nut fasteners 59; mounting bracket 306 is formed to define a depending flange portion 308 formed with holes 310 adapted to receive suitable screws 312 which in turn are received in the respective arms 314 of angle clips 316 that are secured to the respective channel members 55A and 57A of the L return 302.

The back panel 16C of the return L is anchored to the panel leg 14 by the arrangement indicated in FIG. 15, in which a mounting bracket 320 secured to flange 228C of the back plate 16C by suitable screws 322 is formed to include an arm 324, which includes a lateral extension or strap portion 326 formed to receive a suitable screw 328 that is applied to the adjacent opening 174 of panel leg 14.

With respect to the individual panel legs, while the securement of pan 22 to pan 20 by the hereindisclosed adhesive method is preferred, where the outside appearance of pan 22 is not important, pan 22 may be spot welded to stiffeners 24, 26 and 28, but this should be done while holding pan 22 compressed against assembly 48 to achieve the necessary flatness. Likewise, the connection between pans 20 and 22 and members 24, 26 and 28 may be entirely by way of the adhesive connection described in connection with pan 22 where spot welding is to be avoided.

It will thus be seen that the invention provides, in addition to the specific features herein disclosed, a basic way of constructing office furniture in which a foundation framework or chassis is provided that comprises a rigid top structure and a pair of torsion resisting, or torsionally rigid, panel leg structures supporting either end of the top structure that are connected by tie plate means which may be relatively non-rigid in nature from a torsional standpoint. The arrangement is such that these basic parts of this foundation framework or chassis are secured together in a simple but effective manner that comprises employing a pair of screws and cooperating brackets for each panel leg for securing the respective panel legs to either end of the top, and a back panel (of either the flush or the recessed type) or a pair of angle brackets or gusset plates that make a three point screw type connection between the respective panel legs and the top in either end of the top for securing the panel legs against hinging action relative to the top under forces tending to move the framework endwise of same. This basic foundation framework or chassis may be used as such, or augmented by the application to same of standardized furniture forming components of the type hereindisclosed to provide the various types of office equipment herein referred to. The result is that the construction of office furniture is reduced to a minimum number of components that are secured together in a simple but effective manner that permits a wide area of choice as to what the end product may be, but starting from a basic foundation framework or chassis that is common to all the furniture units so constructed.

The foregoing description and the drawings are given merely to explain and illustrate the invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled

in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. In metal office furniture, a foundation framework therefor comprising:

a torsionally rigid top member having oppositely extending ends,

said rigid top member being supported by a pair of torsionally rigid unitary planar panel leg structures disposed in spaced apart, substantially parallel relation,

one of said panel leg structures being adjacent one end of said top member and the other of said panel leg structures being adjacent the other end of said top member,

each of said panel leg structures comprising:

a pair of generally rectilinear support legs on which said framework rests and a quadrilateral panel member disposed between said legs and rigidly connected thereto,

said panel members each defining upper and lower generally rectilinear horizontal side portions and vertically disposed generally rectilinear end portions,

with said legs of each panel member being respectively secured to the respective end portions of same in overlying relation thereto in the plane of the respective panel members,

said panel members each comprising a pair of spaced apart metallic sheets, reinforcing means interposed between said sheets, and means for bonding said sheets and reinforcing means together for making said sheets of the respective panel members resistant to torsional forces applied to same through the legs thereof,

said reinforcing means comprising structural reinforcing metallic channel members and having extended flat areas in face-to-face relation with both said sheets and made fast thereto at such areas by said bonding means, said reinforcing members extending parallel to said side portions of the respective panel members,

said panel members each including adjacent their upper side portions a pair of brackets fixed thereto and spaced apart longitudinally of the respective panel members and each having a portion that is disposed between said panel members which is in substantial abutting relation to said top member,

means for making the respective bracket member portions fast to said top member,

a back plate extending normally of said panel leg structures and said top member,

and screw and nut means for further connecting the respective panel leg structures to said top member utilizing said back plate,

said screw and nut means comprising:

nut means anchored in said reinforcing means adjacent said upper and lower side portions of said panel members,

screw means connecting said back plate to said nut means anchored in the respective panel member reinforcing means,

and screw means connecting said back plate to said top member in bracing relation therewith at a position spaced from the respective panel members and intermediate same to provide a three point tying connection between said back plate and the respective panel leg structures,

whereby said panel member sheets act as stressed skins for resisting torsion applied to the respective panel leg structures by said support legs, and said back plate may be relatively non rigid from a torsional standpoint and yet make said panel leg structures fast against hinging action relative to said top member.

2. The framework set forth in claim 1 wherein:

said back plate is recess mounted between said panel leg structures.

3. The framework set forth in claim 1 wherein:

said back plate is formed with right angle flanging about its perimeter,

said screw means of said screw and nut means being operably associated with said flanging.

4. The foundation framework set forth in claim 1 wherein:

said structural reinforcing member flat areas that are in face-to-face relation with the inwardly facing sheets of said panel members are welded thereto,

and said structural reinforcing member flat areas that are in face-to-face relation with the outwardly facing sheets of said panel members are bonded thereto by an adhesive,

whereby the outwardly facing sheets of each panel member present an outwardly facing surface free of weld distortion.

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