

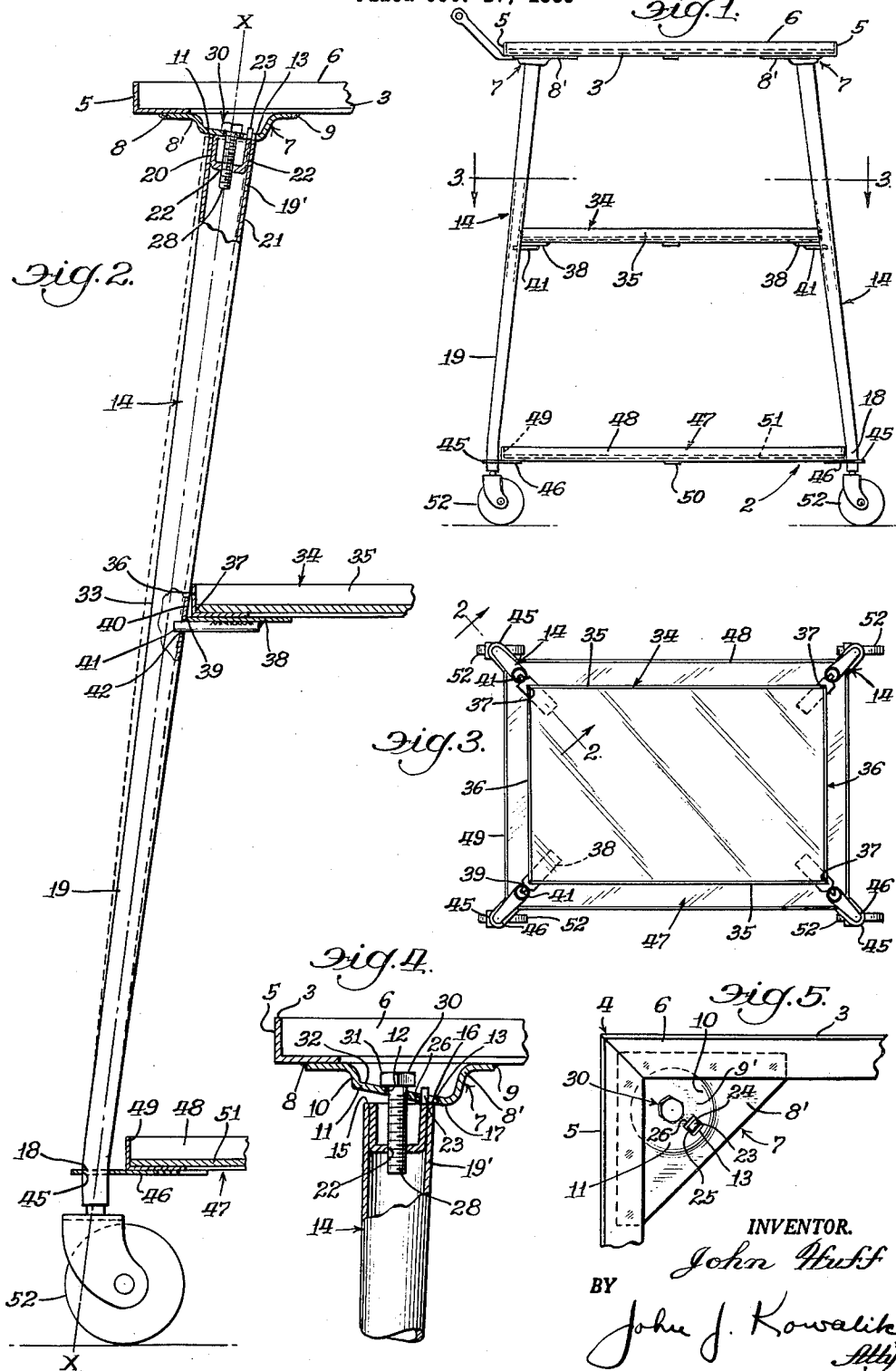
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FURNITURE STRUCTURE WITH INTERDEPENDENTLY CONNECTED PARTS

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FURNITURE STRUCTURE WITH INTERDEPENDENTLY CONNECTED PARTS

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This invention relates to furniture construction and more particularly is directed to a novel structure which obtains exceptional stability and rigidity with the parts interdependently held in tight engagement with each other.

In furniture construction of such items as stands, tables and servettes, it is usually extremely difficult to obtain a tight assembly of the parts unless expensive construction is used which frequently frustrates good, functional and aesthetic designs. Particularly in inexpensive units of this type it is important to obtain a tight assembly so that the parts cooperate to obtain structural rigidity and develop optimum strength.

It is a primary object of this invention to provide a construction which obviates the foregoing difficulties and which obtains a rigid and strong structure.

More specifically the invention comprehends a novel table or cart incorporating a top and intermediate or center and bottom shelves, the shelves being interposed between the legs and the top being supported by the legs which have novel connections with the top such that the legs may be loosely assembled with the shelves and then drawn up against the top while being canted laterally about the intermediate shelf as a fulcrum to obtain a spreading action of the lower ends of the legs which pass through loops or eyes on the corners of the shelf and tightly engage the same.

In extension of the previous object it is a further object to devise the legs in such manner that they afford a connection to the center shelf and their flexibility is enhanced so that they bow about the center shelf.

A still further object of the invention is to devise a novel cart which may be easily and quickly assembled and disassembled without the use of special tools and by relatively inexperienced people.

These and other objects and advantages inherent in and encompassed by the invention will become more readily apparent from the specification and the drawings, wherein:

FIGURE 1 is a side elevational view of a cart unit incorporating the invention.

FIGURE 2 is an enlarged fragmentary sectional view taken substantially on the line 2—2 of FIGURE 3 showing the preassembled position of the leg in dotted lines.

FIGURE 3 is a horizontal sectional view taken in the line 3—3 of FIGURE 1.

FIGURE 4 is an enlarged sectional view of the connection of the leg to the top showing the condition of the parts in preassembled position, and

FIGURE 5 is an enlarged fragmentary plan view of a corner of the unit.

Description of the Invention

Describing the invention in detail and having particular reference to the drawings, there is shown a cart 2, al-

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though the invention is equally applicable to tables, etc. The cart or furniture piece 2 comprises a top 3 which is preferably, though not necessarily, a quadrilateral structure, each corner 4 of which is formed by an end rail 5 and a side rail 6.

A mounting bracket 7 interconnects as by welding at 8 and 9 the end rail 5 to the side rail 6 and comprises a triangular top plate 8' with a depressed socket portion 9' having an annular wall portion 10 and a bottom wall 11 which slopes upwardly and outwardly toward the adjacent corner.

The wall 11 is provided substantially centrally of the socket with an annular opening 12 which is normal to wall 11. Spaced inwardly of opening 12 there is provided an aperture or slot 13 which is elongated radially with respect to opening 12 which is located between the adjacent corner and aperture 13.

A leg 14 is interposed with respect to wall 11 and comprises an upper edge 15 substantially perpendicular to the longitudinal axis $x-x$ of the leg and in the preassembly position bearing on a side inwardly of the axis x as at 16 against the bottom side 17 of the bottom wall 11. The leg 14 is preferably tubular and tapers downwardly and has a vertically bent lower end portion 18 where as the principal leg portion 19 extends diagonally downwardly and outwardly from its connection to the top.

The upper end 19' of the leg 14 is provided with a U-shaped nut 20 which is weld-connected to the sheet metal leg sheath 21 and provides a threaded opening 22 coaxial with axis $x-x$. The nut 20 has its flange 22 formed with an upwardly projecting positioning and preassembly holding lug 23 which projects into the aperture 13 between the sides 24 and 25 thereof and abuts against the inner circumferential edge 26 while the upper edge 15 diverges in an outward direction downwardly from the bottom surface 17 of wall 11.

As best seen in FIGURE 4, the opening 12 is larger in diameter than the shank portion 28 of the bolt 30 which is threaded into the opening 22 and the head 31 is spaced upwardly from the upper surface 32 of wall 11.

The intermediate portion 33 of each leg supports a center or intermediate shelf or tray 34 which is preferably quadrilateral in shape having side rails 35 and interconnecting end rails 36 which form corners 37. Each corner is provided with an outwardly projecting bracket 38 which is contoured to provide an abutment node 39 against the inner side 40 of the leg. Bracket 38 has a pin or lug 41 welded thereto which bisects the associated corner 37 and enters into an opening 42 disposed in the inner side 40 of the leg intermediate its ends. It will be seen that bracket 38 is a flat strap and provides a fulcrum on its node 39 about which the leg 14 is bowed from the dotted position to the solid lines as shown in FIGURE 2. The provision of opening 42 on the inner side of the leg in the location indicated enhances the flexibility of the leg in this region so that all legs bow substantially equally and with approximately the same curvature about shelf 34 as hereinafter explained.

The lower end portion 18 of each leg projects through an opening or eye 45 in a corner bracket 46 of the lower tray or shelf 47 which comprises side and end rails 48 and 49 interconnected quadrilaterally. The side rails 49 may be intermediately interconnected by a bar 50 and

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support a filler slab 51. This same construction is typical of the shelves 3 and 34.

Caster wheel assemblies 52 are mounted upon the lower end portions 18 of the legs.

In assembling of the unit the legs 14 are loosely connected to the top 3 by inserting the lug 23 of each leg into the respective aperture 13 and the bolt 30 is loosely threaded into the opening 22. The legs 14 are thus swingable outwardly and inwardly with respect to the top.

The intermediate tray 34 is then assembled with the legs by inserting pin 41 into the openings 42. Then the bottom tray 47 is assembled with the lower ends of the legs 18 by inserting each leg into the eye 45 of the respective corner bracket 46. This causes the upper ends of the legs to be pulled away from the bottom walls 11 as seen in FIGURE 4 so that they abut the same at 16 in the vicinity of the lugs 23 and the lugs are brought to bear against the inner edges 26 of the respective apertures 13 while the lower ends of the legs are drawn inwardly. Upon all of the parts being assembled the bolts 30 are drawn up which causes the legs to bow about the intermediate tray, which thus forms canting connections with the legs, while coincidentally the lower ends of the legs spread out and the upper ends pivot about their inner edges and the upper edges 15 of the legs engage the bottom surfaces 31 of the bottom walls 11 of the brackets 7. Thus the legs are placed under a bending stress holding all of the parts in tight assembly such that they act in unison to sustain the structure. The tray structure 34 is in compression and the tray structure 47 in tension and thus serve as reaction means.

It will be readily appreciated that a novel and ingenious structure has been developed and that various modifications of the same will now become readily apparent from this disclosure to those skilled in the art within the purview of the appended claims.

I claim:

1. In a furniture unit, the combination of a top, a plurality of legs depending therefrom, reaction means below the top interconnecting the legs, and means connecting each leg to the top and loading the leg in a spreading direction with respect to the other legs and comprising a bracket on the top having a wall with a vertical opening therethrough and presenting an inclined bottom surface, a nut in a leg coaxial therewith, said leg having an upper edge engaging said surface in an area at one side of the longitudinal axis of the leg in the preassembly position of the leg and diverging with its upper edge from said area with respect to said surface, a bolt threaded into the nut coaxial therewith and having a head above said wall and a shank extending through said opening, said bolt adapted to be tightened with the head engaging the wall therebelow and drawing up said leg while coincidentally swinging the leg laterally bringing the upper edge flush against said surface and thus loading said reaction means between said legs, and said leg having an upstanding lug in the region of said area, and said bottom wall having an opening larger than the lug admitting said lug therein and defined in part by an edge surface providing an abutment for said lug in the preassembly position of the leg before the bolt is drawn up to hold the parts together, said lug movable laterally in the opening upon said bolt being drawn up.

2. In a furniture unit, the combination of a top, a plurality of legs depending therefrom, a structure below the top interconnecting the legs, and means connecting each leg to the top and loading the leg in a spreading direction with respect to the other legs and comprising a bracket on the top having a wall with a vertical opening therethrough and presenting an inclined bottom surface, a nut in the leg coaxial therewith, said leg having an upper edge engaging said surface in an area at one side of the longitudinal axis in the preassembly position of the leg and diverging with its upper edge from said

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area with respect to said surface, a bolt threaded into the nut coaxial therewith and having a head above said wall and a shank extending through the opening, said bolt adapted to be tightened with the head engaging the wall therebelow and drawing up said leg while coincidentally swinging the leg laterally bringing the upper edge flush against the surface and thus loading said structure in tension between said legs, and each said leg comprising a lug extending upwardly from the upper edge and said bottom wall providing an aperture receiving the lug, and said lug and aperture disposed inwardly of said axis, and an intermediate structure interposed between the legs, said legs being bowed about said intermediate structure.

3. In a furniture unit, top, bottom, and intermediate generally parallel shelves, a plurality of legs peripherally arranged about said bottom and intermediate shelves and depending from the top, said bottom shelf having peripherally arranged eye brackets admitting respective legs therethrough, said legs having apertures therein in horizontal alignment with the intermediate shelf, said intermediate shelf having means extending into the openings in the legs and providing fulcrums therefor about which the legs are bowed between their upper and lower ends, and connecting means securing the upper ends of the legs to the top, and said connecting means between each leg and top comprising a lug projecting upwardly from the leg, said top including a bracket providing an opening admitting the lug and having an aperture outwardly of the lug, a nut and bolt assembly projecting through the aperture and interconnecting the leg and bracket engaging along surfaces diverging outwardly in the loose position of the nut and bolt assembly.

4. In an article of furniture, a top, a plurality of spaced legs supporting the top, bottom and intermediate vertically spaced structures between the legs, said legs having connections with the top and said bottom structure at points spaced inwardly of the points of connection of the legs with the intermediate structure, and said legs bowed outwardly, and said legs having upper edges and said top having securing means including surfaces engaging said edges at a point in the unstressed condition of the legs, and said securing means connecting each leg individually to the top and adjustable to engage said edges along substantial extent against the respective surfaces.

5. In a self-sustaining, rigidified furniture construction, the combination of a plurality of vertically spaced apart shelf members, a plurality of legs extending from one member to the other members, means providing canting connections between the legs and one of the other members accommodating thereadjacent outward spread of said legs, and connecting means between said legs and said first mentioned one member drawing the ends of the legs thereadjacent inwardly and swinging the legs at their other ends outwardly and tightening their connections with another of said members, each of said connecting means including a bracket having a bolt opening and a lug aperture spaced laterally from the opening, a lug on each leg extending through the associated aperture in engagement with a margin thereof limiting spreading movement of the legs, nut means in each leg, and bolt means extending through each opening into the nut means in the related leg, each said leg and bracket engaging along camming surfaces rocking the leg away from the other legs as the bolts are drawn up.

6. In a self-sustaining, rigidified furniture construction, the combination of a plurality of vertically spaced apart shelf members, a plurality of legs extending from one member to the other member, means providing canting connections between the legs and said other member accommodating outward spread of said legs at their ends adjacent to said one member, and connecting means between said legs and one member drawing said ends thereof inwardly and swinging the legs at their other

ends outwardly tightening their connections with said other member, and each said connecting means including a bracket having a bolt opening and a lug aperture spaced laterally from the opening, a lug on each leg extending through the associated aperture in engagement with a margin thereof limiting spreading movement of the legs, nut means in each leg, and bolt means extending through each opening into the nut in the related leg, each said leg and bracket engaging along camming surfaces rocking the leg to a position spreading its other end as said bolts are drawn up, and each leg having an intermediate flexible section, and means extending between said sections in fulcruming relation thereto bowing the legs outwardly.

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