July 3, 1962 R. VINCENS 3,042,473

METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Fig.1.

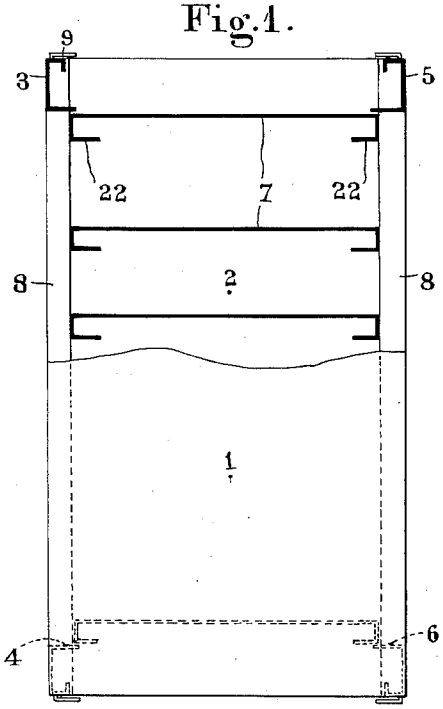


Fig.3.

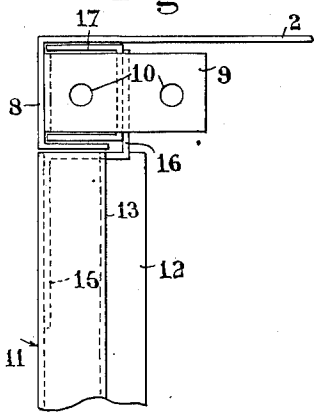


Fig.4.

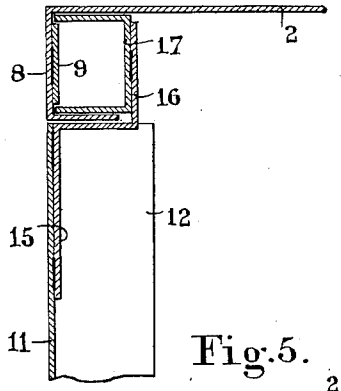


Fig.5.

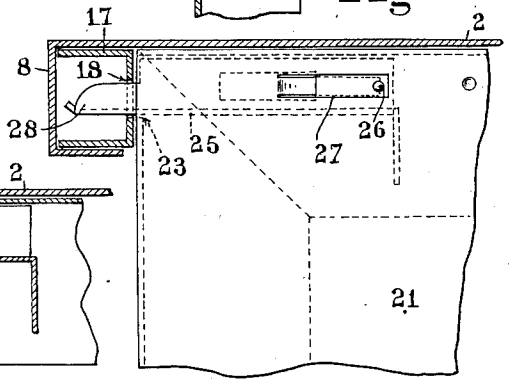
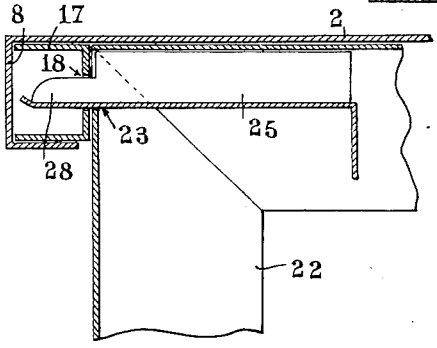


Fig.6.



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METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Fig. 2.

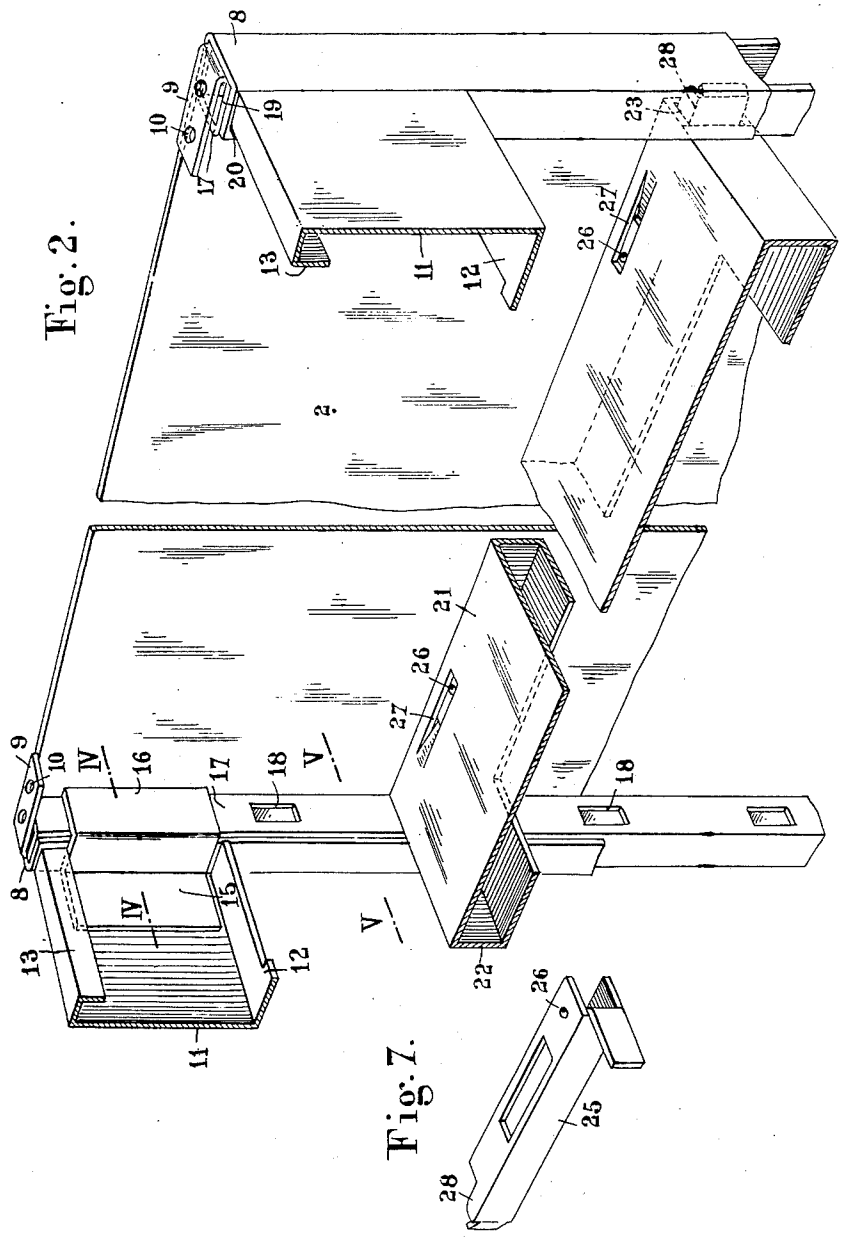


Fig. 7.

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METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Fig. 8.

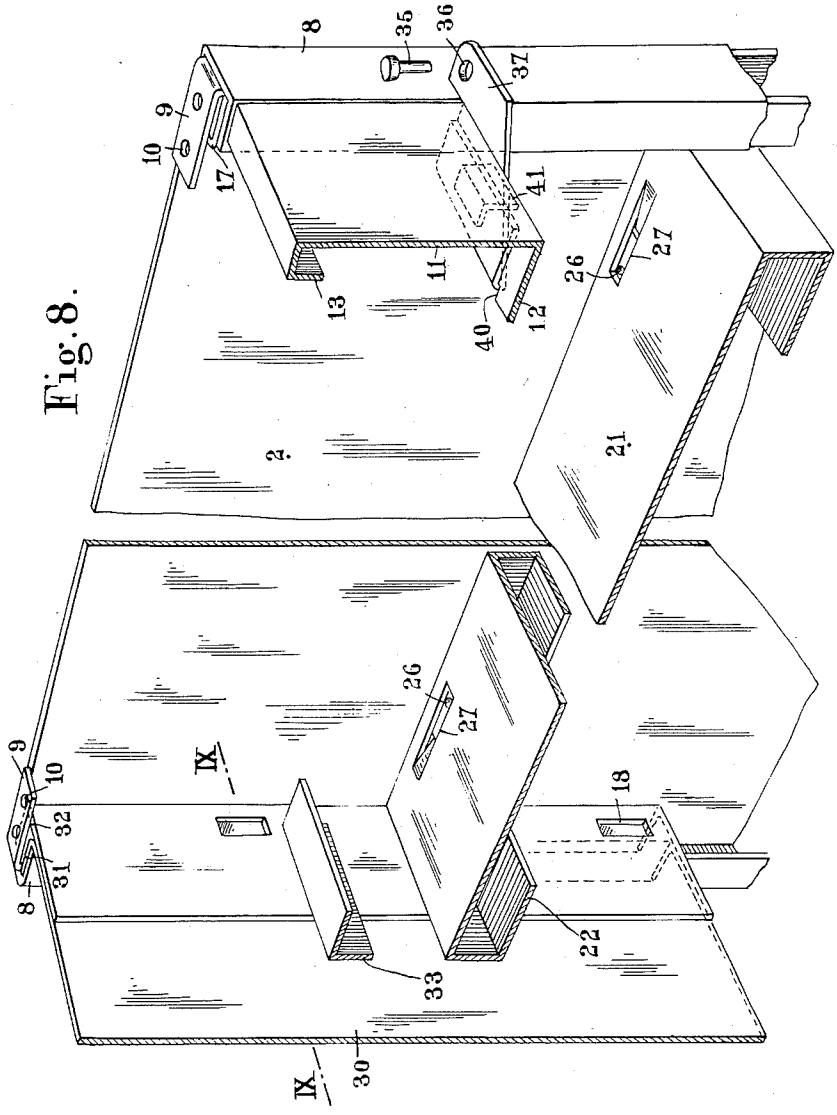


Fig.9.

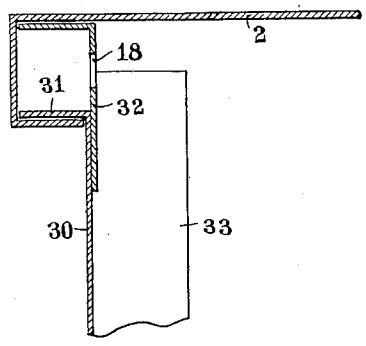


Fig.10.

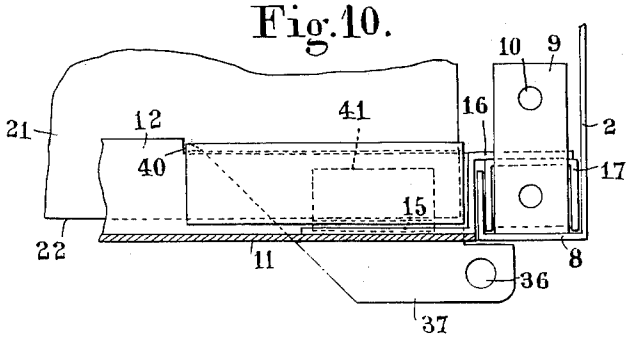


Fig.11.

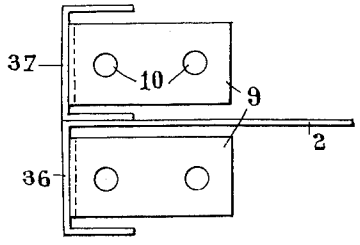


Fig.12.

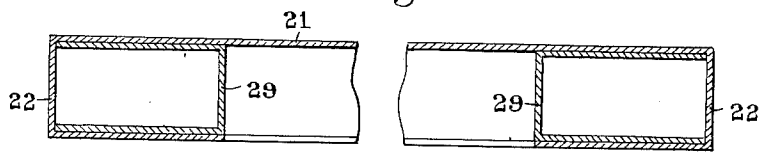


Fig.13.

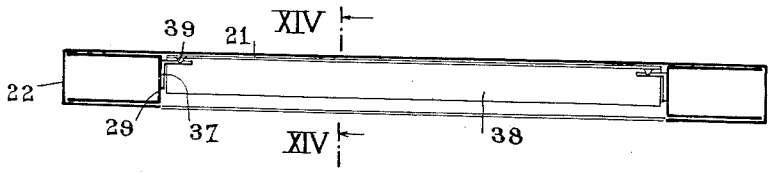
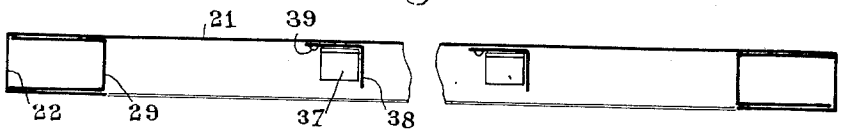


Fig.14.



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METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Fig:16.

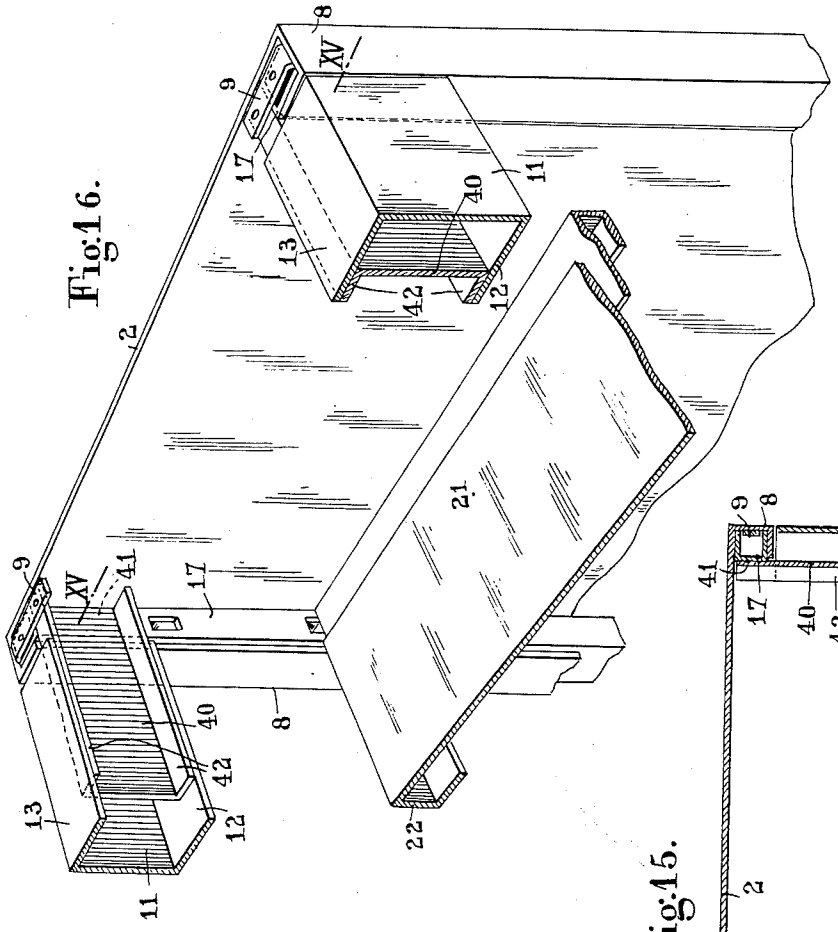


Fig:15.

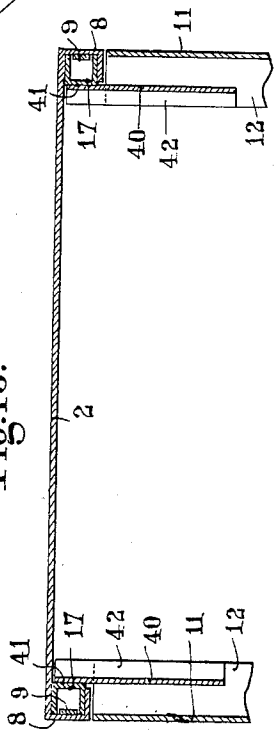
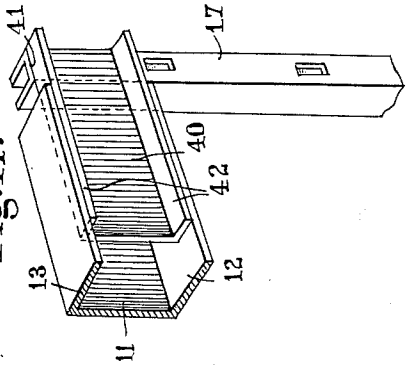


Fig:17.

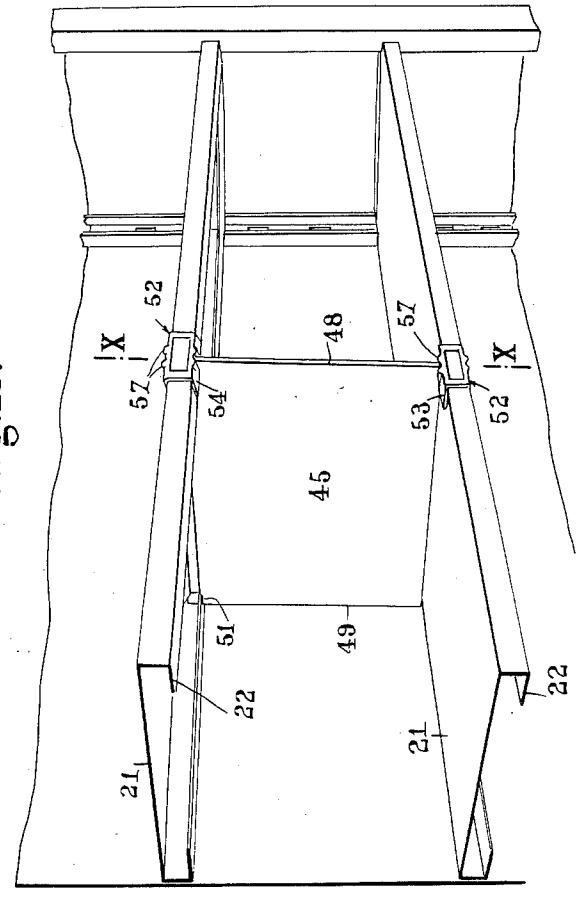


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Fig.18.



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METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Fig. 19.

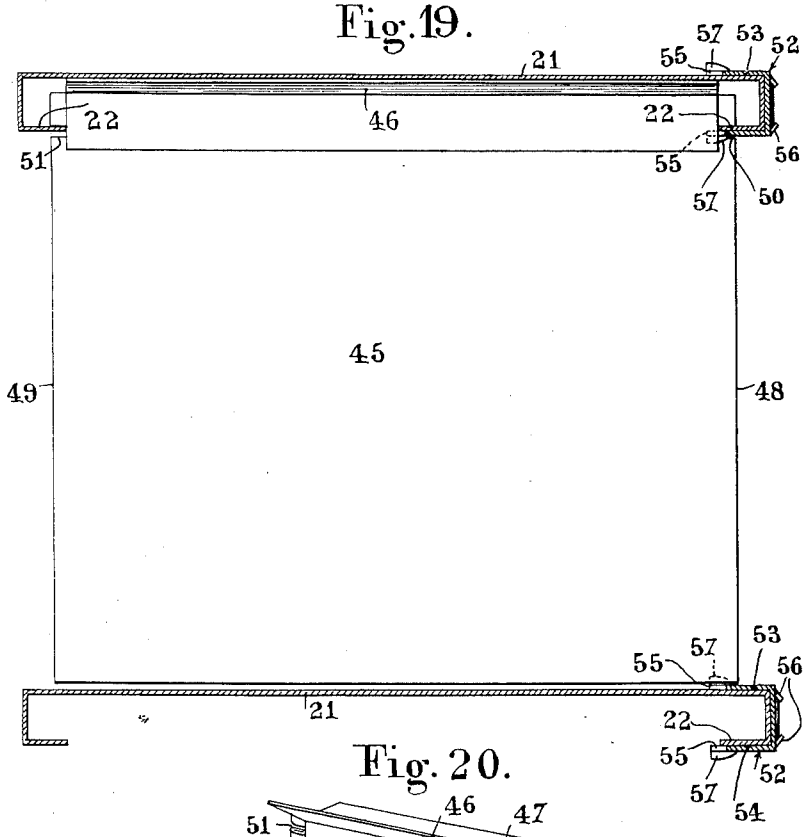


Fig. 20.

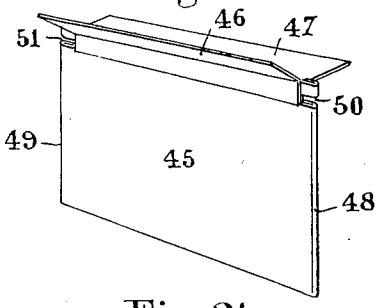
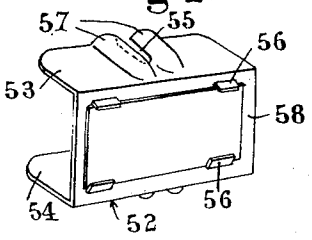


Fig. 21.



United States Patent Office

3,042,473
Patented July 3, 1962

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METAL FURNITURES ADAPTED TO BE DISASSEMBLED

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Filed May 18, 1959, Ser. No. 813,780
Claims priority, application France May 19, 1958
6 Claims. (Cl. 312—257)

Metal furnitures are already known which consist of the arrangement, on panels or frames, of U sections reinforced by other U sections provided with rack means for securing shelves or trays; it has already been proposed to use flat lateral uprights having their vertical edges bent twice to provide U sections having secured therein other U sections constituting rack means. All these known types of metal furnitures are characterized however by the inconvenience that the sections must necessarily be secured to one another and to the panels by welding, bolting or riveting, and that they are unsuitable for rapidly assembling and disassembling the components either for packing the elements under reduced over-all dimensions or assembling or disassembling them without the assistance of skilled hands.

Now it is the object of this invention to provide a number of standard metal elements whereby any unskilled person can erect sets of shelves with or without back-wall, as well as cupboards, chests and the like, with or without doors, multi-tiers, aligned furnitures, etc.

To this end, a typical furniture according to this invention comprises essentially two lateral uprights formed along their edges with a pair of vertical, U-sectioned slideways provided at their top and bottom ends with perpendicular lugs projecting slightly from the slideways in height and depth while leaving a gap between said lugs and the wings of said slideways; horizontal cross members edged with a pair of vertical U sections adapted frictionally to engage the U-sectioned slideways of said uprights, said cross members being bent along their horizontal edges, one of the wings thus formed constituting an abutment member for example for the top and bottom of the furniture, and shelves consisting of metal plates having their edges bent twice at right angles, with or without reinforcement.

The vertical sections rigid with the cross members and engaged along the slideways of said uprights are each perforated vertically to constitute rack members engageable by pawls sliding in the bent edge portions of the shelves.

The cross members of the rear face of the furniture may be replaced by a back-plate consisting of a plate having its vertical edges bent to a U-shaped section and perforated to constitute a rack, said bent edge portions being adapted frictionally to engage the vertical slideways of said uprights; if desired, brackets for supporting the shelves may be provided on the inner face of said back-plate.

Members receiving the door hinge pintles may be engaged on the wings of the bottom and front cross member of the chest or like piece of furniture.

The shelves may be reinforced if desired either by providing U sections shaped and dimensioned for force fitting in the perpendicular edges of said shelves, or by means of brace members.

These shelves are notched at their corners to permit the passage of the aforesaid rack-engaging pawls; adequate means are provided for actuating and guiding said pawls.

The uprights may be edged by paired U sections to constitute slideways with a view to assemble adjacent chests or shelves.

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Thus, a relatively small number of standard elements of reduced over-all dimensions, that is to say, uprights, cross members, back plates, shelves, pawls and hinges are available for any unskilled user who can thus assemble and disassemble a furniture very rapidly without the assistance of any screw-driver or other tool.

The rigidity of the assembly results from the provision of real posts with the U sections fitted in the slideways of the uprights and from the presence of stiffened and reinforced shelves bracing the uprights.

Other features and advantages of this invention will become apparent as the following description proceeds with reference to the accompanying drawings forming part of this specification and illustrating diagrammatically by way of example a few typical forms of embodiment thereof.

In the drawings:

FIGURE 1 is a front elevational view showing a set of shelves, with a broken-away portion;

FIGURE 2 is a fragmentary perspective view showing the same set;

FIGURE 3 is a plane view from above showing one upright element;

FIGURE 4 is a horizontal section taken upon the line IV—IV of FIG. 2;

FIGURE 5 being a section taken upon the line V—V of FIG. 2;

FIGURE 6 is a section taken upon the axis of a locking pawl;

FIGURE 7 is a perspective view showing a locking pawl separately;

FIGURE 8 is a perspective view showing one portion of a cupboard or like piece of furniture provided with a back-wall;

FIGURE 9 is a section taken upon the line IX—IX of FIG. 8;

FIGURE 10 is a plane view showing the hinge of a door mounted on a cupboard;

FIGURE 11 is a plane view from above showing a modified form of embodiment of a double upright;

FIGURE 12 is a cross-sectional view of a reinforced shelf;

FIGURE 13 is a cross-sectional view of a reinforced and braced shelf;

FIGURE 14 is a section taken upon the line XIV—XIV of FIG. 13;

FIGURE 15 is a fragmentary horizontal sectional view taken upon the line XV—XV of FIG. 16;

FIGURES 16 and 17 are fragmentary perspective views showing details of a modified form of embodiment;

FIGURE 18 is a perspective view showing an intermediate shelf structure;

FIGURE 19 is a vertical section taken upon the line X—X of FIG. 18;

FIG. 20 is a perspective view showing an intermediate partition; and

FIGURE 21 is a perspective view showing a fixation clamp.

The essential component elements of the metal shelf structure illustrated by way of example in the drawings are a pair of identical uprights **1**, **2** braced by rear cross members **3**, **4** disposed respectively at the top and bottom of these uprights, and by front cross members **5**, **6** and of shelves **7**.

The uprights consist each of a metal plate, made for example from .003" sheet metal stock, which has its vertical edges bent twice at right angles to constitute slideways **8**; these plates may be perforated or not, or braced and lined or not with any suitable covering material. Secured to the upper and lower ends of each slideway **8**, for example by welding, are perpendicular lugs **9** forming a gap between their edges and the wings of slide-

ways 8 from which they project both in height and in depth; these lugs may be formed with holes 10 for securing legs or extensions thereto, or permitting the assembling of the elements with other or extension elements.

The cross members 3 to 6 consist each of a vertical metal strip 11 having one edge bent at right angles to constitute a wing 12, the opposite edge being bent twice to constitute a U-sectioned portion 13 shallower than wing 12. Secured to the ends of each cross member are lugs 15 bent twice at right angles and in opposite directions, as shown in FIG. 4, the outer wing 16 of each lug 15 having secured thereon, for example by welding, U sections 17 in which apertures 18 are formed, as shown notably in FIGS. 2, 5 and 6. A gap is provided between the edge 19 of these sections and the edge 20 at the end of the cross member, this gap corresponding substantially to the thickness of a sheet metal element; besides, the dimensions of the U sections are slightly inferior to those of the slideways 8.

Under these conditions, these sections 17 may be force fitted in the slideways 8 and caused to abut endwise against the slideways 8. These two U sections thus assembled constitute a polygonal-sectioned, strong post, the cross members 3 to 6 assembling the two uprights at the front and at the rear of the structure, as shown notably in FIGS. 1 to 4.

With this structure a set of shelves can be constructed by simply securing the trays or shelves proper between the lateral uprights.

These shelves consist preferably of metal plates 21 having their edges bent twice at right angles to constitute U sections 22; at their corners these shelves are notched as shown at 23 to permit the passage of pawls 25 (see FIGS. 5 and 6).

These pawls consist each of a sheet metal element having its edges bent at right angles to permit its sliding engagement in the U-sectioned marginal portions of the shelves. Adequate means for guiding these pawls in the shelf channels may be provided for example in the form of a stud 26 solid with the pawl and engaging a slot 27 of the shelf.

These shelves are positioned at the requisite height by engaging the pawls 25, if necessary with the assistance of projections 28, in the holes 18 of racks 17.

These shelves may rest with their lower wings on the wings 12 of the cross members.

If the shelves are to be heavily loaded, they can be stiffened without resorting to the conventional omega-sections; to this end, U sections 29 are engaged in the sections 22 constituting the marginal portions of the shelves. The edges of the thus reinforced shelves constitute a particularly strong peripheral reinforcement and even under extremely heavy loads the sag seldom exceeds ⅛".

Moreover, these reinforced shelves can be braced as shown in FIGS. 13 and 14. In this case, angle members 37 are welded on the transverse sections 29; L-sectioned bracing members 38 have their horizontal wings engaged between the upper wings of angle members 37 and the shelf plate 21, adequate bosses 39 holding them against movement.

If it is desired to provide a back-plate in a cupboard or like furniture, a back-plate 30 having its vertical edges bent at right angles at 31 and provided with a section 32 secured for example by welding and formed with apertures 18 may be substituted for the cross members 11; this back-plate is secured by engaging the sections 32 in the U-sectioned slideways of upright 8, and constitutes a support for the shelves 21 by means of the apertures 18, on the one hand, and of the L sections 33 secured for example by welding in a horizontal position on the inner face of the back-plate for supporting the upper and lower shelves, on the other hand.

This cupboard, set of shelves or like structure may be provided with doors and in this case their hinge pintles 35 engage holes 36 of a metal section 37 bent on itself as shown in FIGS. 8 and 10 and fitting on the wing 12 of cross member 11; this member 37 may be locked in position by adequate means such as a notch 40 formed in the wing 12 of cross member 11, holding it against longitudinal movement, and angle members 41 welded on these members 37 and adapted to prevent their transverse displacement by engaging the edges 22 of shelves 21.

The uprights 1, 2 of these furnitures may comprise symmetrical U sections disposed on either side so that tiers of shelves, or cupboards or chests (see FIG. 11) may be assembled at will.

The upper and lower lugs 9 engaged by the sections of back-plate sections may also serve as a means for securing other pieces of furniture on the upper portion of legs, casters, etc. as well as for top and bottom plates of chests or the like.

As a typical exemplification of a structure according to this invention, a set of shelves may be delivered to the user in the form of a rectangular package of relatively reduced dimensions since it contains only stacked flat elements, that is, the uprights, cross members and shelves of the structure; the user firstly erects the uprights 1, 2 at the proper spacing and in vertical, parallel positions, then he inserts in the slideways 8 provided along the four vertical edges of these uprights the sections 17 and cross members 3, 4, 5 and 6 (FIGS. 1 and 2) until they engage the lugs 9 at the top and bottom of each upright; thus, a rigid frame structure is obtained without resorting to any tool, except a hammer or the like for forcing the sections into the slideways if the clearance is not sufficient. Then, the user fits the shelves or trays 21 by engaging the ends 28 of pawls 25 into the apertures 18 of sections 17. The top and bottom plates (not shown) rest on the wings 12 of the cross members and are engaged between the lugs 9 and the ends of slideways 8.

If a press or cupboard is desired, the user assembles in the same fashion the back plate 30 by engaging the wings 31 and 32 in to the slideways 8 of the rear uprights, and at the front the cross members are mounted as in the case of a set of shelves.

The doors are fitted by simply engaging the hinge pintles 35 into holes 36 formed in the flat members 37 fitted on the outer corner of the wings 12 of cross members 3 to 6.

If uprights formed with a double slideway 36, 37 are used, a plurality of juxtaposed or adjacent set of shelves or cupboards or chests can be erected without difficulty.

According to a modified form of embodiment, the rack-forming sections rigid with the cross members or bracing members may be assembled by using elements other than angle lugs, notably U-shaped metal members having their wings welded to the wings of these cross members and their bottom welded to the bottom of the rack-forming U section.

FIGURES 15 to 17 illustrate this form of modified shelf structure.

In this case the lateral uprights 2 bent twice at right angles along their vertical edges 8 receive U-sections 17 constituting rack means adapted to have welded on their bottoms U-shaped iron lugs 40 rigid with the cross members or bracing members 11; these lugs 40 are welded at 41 on the back face of the rack-forming sections 17 in the U-shaped edge of uprights 2, and their ends are locked in position by lugs 9 rigid with the upper portion of edges 8.

FIGURES 18 to 21 illustrate a typical form of embodiment of a set of shelves constructed according to the teachings of this invention and provided with intermediate partition elements.

Between two successive trays 21 consisting as already set forth of metal plates having their marginal portions 22 bent twice at right angles, intermediate partitions 45 are disposed at the proper spacing. As shown in FIG.

20, these intermediate partitions consist each of a metal plate provided along its upper edge with a pair of semi-rigid angle members 46, 47 forming a wide angle V opening upwards. Cut along the front and rear edges 48, 49 of this intermediate partition are notches 50, 51 located close to the angle members 46, 47 and spaced therefrom by a distance corresponding substantially to the thickness of the U-sectioned edge of the trays.

These intermediate partitions are held against movement by means of clamps 52 consisting of U-shaped sections having their wings 53, 54 notched at 55 for engagement in the aforesaid notches 50, 51 of the trays, these clamps being also formed with bosses 57 adapted to position and support the intermediate partition 45.

The visible face 58 of each clamp 52 may be provided with the conventional lugs 56 permitting the insertion of a tag.

As shown in the drawings, these clamps may be disposed at the top and bottom of each intermediate partition.

These intermediate partitions can be released very simply by removing the clamps and causing the partition to pivot until its notched edges are disengaged from the wings of the trays.

Of course, many modifications and alterations may be brought to the few forms of embodiment shown and described herein, without however departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. A knock-down, readily-assembled, convertible metal cabinet comprising two identical lateral rectangular panels defining the side walls of said cabinet, each panel having two vertical edges bent twice at right angles to form two U-section channels facing each other, two pairs of U-sectioned cross members each comprising an upper cross member and a lower cross member, one of said pairs being at the front of said cabinet and the other of said pairs being at the back of said cabinet, four U-sectioned perforated members constituting rack means, first lugs securing said rack means perpendicularly to the ends of said cross members, the dimensions of said U-sectioned perforated members being slightly smaller than those of said panel channels so as to be adapted to be force-fitted therein, second lugs bent at right angles secured at the top and bottom of said rectangular panels, a plurality of shelves, the edges of said shelves being bent at right angles a first time downwards and another time inwards to form a peripheral channel, and four fasteners mounted in the corners of said peripheral channel for engaging said rack means.

2. Convertible metal cabinet as set forth in claim 1, wherein each of said cross members consists of a strip having two horizontal edges bent at right angles toward said back and a plane rear vertical face facing toward the back, each one of the first lugs provided for securing said cross members consisting of a rectangular strip having a first vertical edge and a second vertical edge, said strip being bent at right angles in the direction of said front to form a first front fold and another fold extending toward the interior of the cabinet, said rectangular strip having a front face facing toward the front of which the portion on one side of said first fold is welded to the rack means and of which the portion beyond said other fold is welded on the rear vertical plane face of a cross member facing toward the back.

3. Convertible metal cabinet as set forth in claim 1, wherein each one of said cross members consists of a rectangular strip having two horizontal edges bent toward the back at right angles, said two edges of said cross members having two inner faces opposite to each other, each one of the first lugs provided for securing said cross members consisting of a rectangular strip having a vertical face facing toward the front and two edges bent at right angles toward the back, said two horizontal edges of said rectangular strip having two oppositely directed outer faces, said rectangular strip defining a crow member being welded at its vertical face facing the front to the rack means at and at the outer faces of its horizontal edges on the inner faces of said horizontal edges of a cross member.

4. Convertible metal cabinet as set forth in claim 1, wherein said cross members welded by said first lugs on said rack means cooperate with an additional panel to define the back of the cabinet.

5. Convertible metal cabinet as set forth in claim 1, wherein said first lugs for securing said cross members on said rack means consist of U-sections.

6. Convertible metal cabinet as set forth in claim 1, wherein said front cross members are rigid with angle members bearing with one end on the portion toward the front of the inwardly bent edge of each lateral panel, said cross members being perforated for receiving door hinge-pins.

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