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ADJUSTABLE SHELVING CONSTRUCTION

Filed Feb. 17, 1945

2 Sheets-Sheet 1

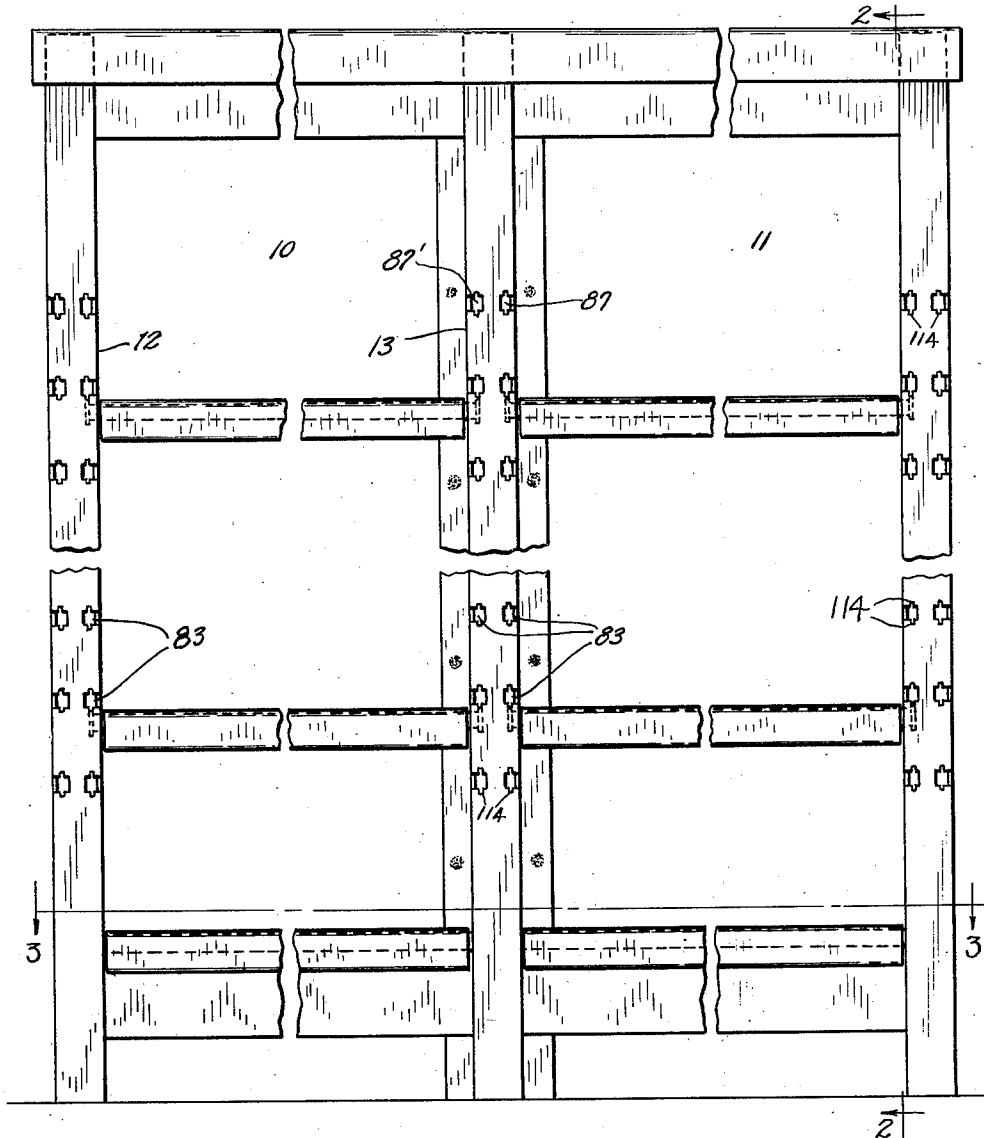


Fig. 1.

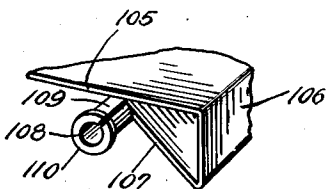


Fig. 7

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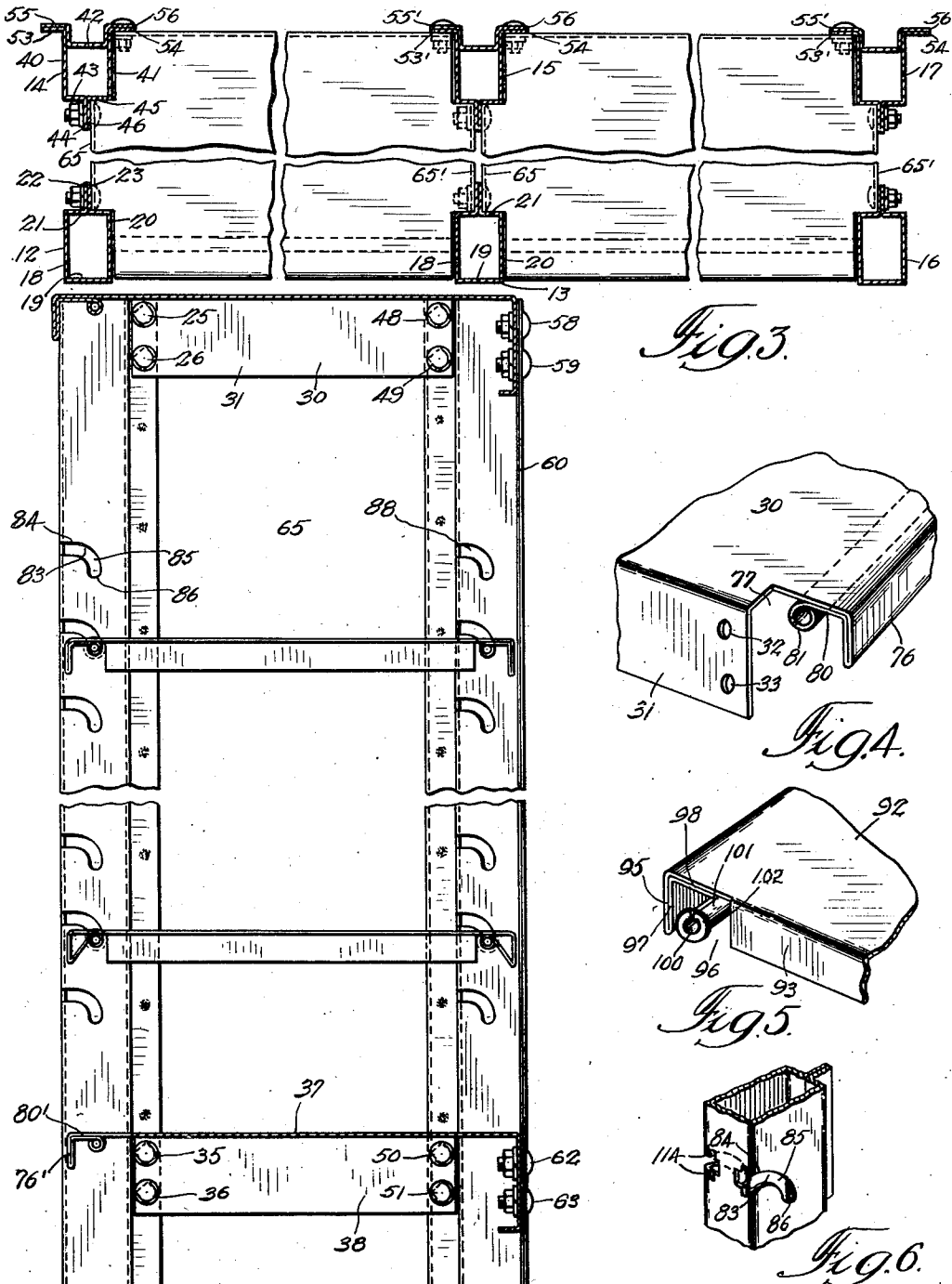


Fig. 1.

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UNITED STATES PATENT OFFICE

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ADJUSTABLE SHELVING CONSTRUCTION

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6 Claims. (Cl. 211—136)

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This invention relates to a cabinet construction and more particularly to a knock-down type of metal cabinet that may be assembled and disassembled with a minimum of bolts.

Metal cabinets of the knock-down type have generally been divided into two types. One type involves a cheap construction generally using stamped sheet metal parts. This type of construction requires a large number of bolts for assembly and cannot be assembled or disassembled without substantial time and expense. The other type of construction involves relatively massive parts inherently expensive to manufacture. This latter type of construction is relatively easy to assemble and disassemble. However, the great weight of the construction, as well as its expense, precludes any extended use thereof.

The invention hereinafter described provides a metal cabinet construction which combines the best features of the above types. Thus, a cabinet embodying this invention is generally simple to manufacture, involves stamping and bending of metal, and does not require expensive dies or heavy and expensive forming operations. The mechanical structure of a cabinet embodying this invention is such as to utilize the metal to its fullest advantage and thus permit lighter gauge metal to be used. Assembly and disassembly of the construction is comparatively simple and requires a minimum of bolts. Furthermore, a finished cabinet is comparatively light in weight.

In order that the invention may be more thoroughly understood, reference will now be made to the drawings wherein Figure 1 is a front elevation of a cabinet embodying this invention. Figure 2 is a sectional view on 2—2 of Figure 1. Figure 3 is a section on 3—3 of Figure 1. Figure 4 is a perspective detail of a top shelf. Figure 5 is a perspective detail of one of the remaining shelves. Figure 6 is a perspective detail of a supporting post. Figure 7 is a perspective detail of a modified shelf construction.

The drawings show two sections of cabinet joined to form a unitary structure. It is understood that the number of sections may be expanded indefinitely. However, for purposes of illustration, two sections are ample. Thus sections 10 and 11 are shown in detail and will now be described. Section 10 has a pair of front posts 12 and 13 and a pair of rear posts 14 and 15. Section 11 utilizes posts 13 and 15 in common with section 10 and, in addition, has front and rear posts 16 and 17 respectively at the end. Inasmuch as all the front posts are similar in con-

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struction and all the rear posts are similar in construction, only one of each will be described in detail.

Thus, referring to post 12, it will be noted that this has sides 18 to 21 inclusive shaped to have a generally rectangular cross section. The rectangular section may be changed to any other desired shape. The entire post is formed of an elongated strip of steel or other material with free edge portions 22 and 23 shaped to abut and form a web. Free edge portions 22 and 23 are immediately adjacent side 21, this side being formed from the two portions of metal.

As is clearly evident in Figure 2, free edge portions 22 and 23 are bolted together at the extreme top and bottom of the post. Thus, at the top, a pair of bolts 25 and 26 together with nuts may be used for retaining the structure rigidly in position. Top plate 30, to be described in detail later, may be provided with depending sides 31 having suitable apertures 32 and 33 therethrough, through which bolts 25 and 26 pass. Bolts 25 and 26 maintain top plate 30 and the top of post 12 rigidly in position.

The bottom of post 12 is similarly provided with bolts 35 and 36 passing through abutting edge portions 22 and 23 and may have bottom shelf 37 bolted thereto. Bottom shelf 37 is generally similar to top 30, and has depending sides 38 suitably apertured through which bolts 35 and 36 may pass for retaining the assembly rigidly together.

Post 14 may be formed of strips of metal 40, 41 and 42 respectively. Strips 40 and 41 are preferably integral. Strip 40 may be bent to have a section as shown in Figure 3 whereby side portion 43 and web 44 are provided. Similarly, strip 41, which is the other half of 40, may have side portion 45 and web portion 46 formed therefrom. Side portions 43 and 45 together form one side of the post, while web portions 44 and 46 have bolts 48 and 49 passing therethrough. Bolts 48 and 49 also engage depending sides 41 of top 30.

At the bottom of the cabinet, abutting sides 44 and 46 have bolts 50 and 51 passing through to engage depending sides 38 of bottom shelf 37.

Strips 40 and 41 have edges 53 and 54 extending toward the rear of the cabinet bent as shown to form a right angle with respect to the main body of each strip. Thus, free edges 53 and 54 generally lie in a plane determining the back of the cabinet. Strip 42 is shaped as shown to provide a generally U section with free edges 55 and 56 overlying edges 53 and 54. Preferably,

abutting edge portions 53 and 55 are spot welded to form a web. The same is true of abutting edge portions 54 and 56. It is preferred to have abutting edge portions 22 and 23 of post 12 spot welded at intervals to provide a rigid post construction. Abutting portions 44 and 46 of post 14 may be handled similarly if desired.

Abutting edges 54 and 56 of post 14 may be apertured near the top of the cabinet and have bolts 58 and 59 pass through. Rear panel 60 may be retained in position by bolts 58 and 59, rear panel 60 having its edge portion lying snugly under edge portion 54. If desired, panel 60 may be on the outside lying along edge portion 56.

Similarly, at the bottom of the cabinet, bolts 62 and 63 pass through abutting edges 54 and 56 and also retain the lower portion of panel 60 in position. It is understood that each of the bolts has suitable nuts and lock washers for maintaining the assembly intact. Side panel 65 may also be retained in position between front post 12 and rear post 15 by engagement with bolts 25, 26, 48 and 49 at the top and 35, 36, 50 and 51 at the bottom.

Post 13 is identical in construction with post 12. Post 15 is practically the same as post 14 with the exception that abutting edge portions 55' and 53' have bolts therethrough at the top and bottom, these bolts corresponding to bolts 58, 59, 62 and 63 in post 14. This is in addition to bolts 58 and 59 passing through abutting edges 54 and 56. Post 17 is the image of post 14 with abutting edges 53' and 55' having bolts passing through at the top and bottom. Free edges 56 and 54 do not have any bolts passing through.

It is clear that the structure so far described, namely front and rear posts and top and bottom shelves, form a rigid skeleton construction. By virtue of this rigid construction, it is possible to utilize the strength of the metal to the fullest extent. Thus, the gauge of metal used may be lighter than would normally be the case.

Top panel 30 has depending sides 31 and depending front and rear portions 75 and 76 respectively. At each corner of the panel or shelf, rectangular cut-out 77 is provided to clear a portion of front and rear posts. By virtue of clearance cut-out 77, sides 31 may come up against the bolt retaining portions of the post. Front face 76 may extend between side 30 of post 12 and side 18 of post 13. The same relationship obtains at the rear post where rear face 77 comes up against the bolt retaining portions of the rear posts along the plane of the rear of the cabinet.

The top panel may be strengthened by having the metal doubled along front portions 76 and along a strip 80 near the front of the top of the panel. The free edge of the metal forming the panel may be rolled to form tube 81 running the width of the cabinet section.

Bottom shelf 37 may be shaped in exactly the same manner as top panel 30 with the exception that portion 80' in shelf 37 is slightly narrower than the corresponding portion 80 in panel 30. Thus, depending front portion 76' of bottom shelf 37 will come inside of the vertical plane determined by front portion 76 of top panel 30. If desired, front portion 76 and 76' of the two panels may lie in the same vertical plane.

In order to accommodate shelving, the front and rear posts are provided with a series of aligned slots, as shown in Figures 1 and 2. Since the slots in the front posts are all the same, a detailed description of one front post only will be given. Thus, post 13 appears in Figure 2. Side

20 of post 13 has a series of spaced slots 83. These slots are aligned vertically and consist of a generally horizontal portion 84 and an arcuate portion 85 terminating at 86. Arcuate portion 85 extends downwardly toward the bottom of the cabinet. It will be noted that slot 83 takes up a substantial portion of side 20 of the post. The exact proportion may vary within wide limits and depends, among other things, on the gauge of metal used, the strength to be retained in the post. Slot 83 has portion 87 extending around to front face 19 of the post toward the center of the post for a short distance, this distance also being determined by various clearance and strength considerations. Slot portion 87 has transverse wings 114 to accommodate the locking ends on the shelf supports.

Side 18 of post 13 has similar slots, so that the slot construction is symmetrical with respect to a center line passing down side 19 of the post. Posts 12 and 16 are similarly slotted. In the case of these posts, where the outer series of slots are not necessary, it is clear that the unused series of slots may be omitted. However, in order to avoid having a large number of differently shaped parts and to avoid having different stamping operations, a uniform post construction is preferred. The distance between adjacent slots in a post may be varied within wide limits, depending upon the desired flexibility of shelf arrangement.

Rear post 15 also has slots 88, these slots being generally similar in shape, disposition, and arrangement to the slots in the front posts. All the rear posts are handled in a similar manner.

Intermediate shelves for cooperation with these slots in the front and rear posts are provided, a detail of such a shelf being shown in Figure 5. Thus, shelf 92 may have depending sides 93 and generally similar front and rear portions 95. Sides 93 do not extend the full width of the shelf, but are cut short to provide clearance space 96 at the four corners of the shelf. In order to increase the rigidity of the shelf, front and rear portions 95 may have the metal thereof doubled over to provide inner layer 97 and layer 98. The free edge of the metal is rolled to form a generally tubular structure 100 with supporting end 101 extending beyond sides 93. The ends are curled at 102 to provide a locking portion. Thus a circular flange is formed at each protruding end portion, their being four for each shelf. The flange portion is so dimensioned as to lock the shelf into the slots against sideward removal. Thus the shelf would tend to lock the four posts against excessive play or movement.

The length of part 101 may be varied within wide limits and will depend in a large measure upon clearances and tolerances. It is clear that the distance of tubular portion 100 back from portion 95 will depend upon the dimensions of the slots in the post. The diameter of tubular portion 100 is such that it will fit snugly into the slots with flares 102 clearing slot wings 114. Obviously, the shelf is suitably dimensioned so that supports 101 fit into a group of locking slots.

In order to install a shelf, supporting tubular portions 101 are inserted into a series of registering slots in the front and rear posts and the shelf pushed rearwardly of the cabinet. Thus, supporting portions 101 will ride along the slots and carry the shelf downwardly and rearwardly to the position shown in Figure 2. In this position, front and rear portions 95 will be disposed as shown, with supporting portions 101 extending inside of the supporting posts.

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Referring to Figure 7, a modified shelf construction is shown wherein metal 105 of the shelf is bent down along the front and rear of the shelf to form sides 106 and then bent rearwardly and upwardly to form slanting panel 107. Panel 107 extends up to the bottom face of metal 105 of the shelf. The precise dimensions and angles are unimportant. The extreme edges of the metal are rolled to form a tubular structure 108 having extensions 109 near each corner of the shelf. The ends of the extensions are curled or flared at 110.

If desired, a shelf may be supported in a tilted position by choosing one pair of slots in the front posts and a different pair of slots in the rear posts. This, of course, is only possible if adjacent slots in one post are spaced sufficiently close so that four supporting portions 101 may simultaneously enter four slots. Thus, the front of the shelf will be horizontal, but at a different level than the rear of the shelf, which will also be horizontal. In this way, the immediate shelves may be tilted either forwardly or rearwardly as the case may be. To remove or change the position of a shelf, it need only be lifted and pulled away.

By virtue of the shelf construction, the strength of the metal is fully utilized so that light gauge metal may be used advantageously.

What is claimed is:

1. In a cabinet construction, a readily removable rectangular shelf comprising a sheet metal shelf cut and rolled to the shape desired, said shelf having two parallel edges curled over to form generally tubular edge portions, the metal forming the tubular edge portions being extended beyond the normal shelf length to form supporting portions.

2. In a metal cabinet construction, a plurality of supporting posts, each post comprising a length of metal shaped to form a hollow post having a cross section forming a substantially closed figure and having a front and oppositely disposed sides adjacent to said front and spaced from each other, at least one series of regularly spaced slots in each post extending from a part of the front of the post around to one side thereof, each slot extending perpendicular to the post length along the front and continuing rearwardly and downwardly at the side of the post, a cabinet section having four corner posts with the four series of slots facing each other, a plurality of rectangular shelves, one shelf being

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adapted to engage four slots of the four posts, each shelf comprising a shelf portion shaped to fit between the posts and having protruding tubular portions engaging the slots in said posts, each shelf being adapted to be disposed perpendicular to the posts and slid backward and downward with the tubular portions engaging the slots to maintain the same in position, each shelf having rolled edge portions extending along the front and rear edges, said rolled edges extending beyond the shelf proper to form the tubular portions.

3. The structure of claim 2 wherein each post has a generally rectangular cross section.

4. In a steel cabinet construction, a readily removable shelf comprising a sheet metal member stamped to the rectangular shape required, said member having a pair of opposing edges curled to form generally tubular portions for increasing the rigidity of said shelf, said tubular portions extending beyond the shelf proper and having flared locking ends.

5. The structure of claim 2 wherein said protruding tubular portions have flared ends for locking in said slots.

6. The structure of claim 2 wherein said posts have a generally rectangular cross-section and wherein said protruding tubular portions have flared ends for locking in said slots.

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