# United States Patent [19]

**Kohl**

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[54] **SHELF CORNER CLAMP**


[75] Inventor: **Carl O. Kohl,** Hammondsport, N.Y.

[73] Assignee: **Mercury Aircraft, Inc.,** Hammondsport, N.Y.



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[52] **U.S. Cl.** ..... **108/144,** 108/156, 248/188

[51] **Int. Cl.** ..... **A47b 9/00**

[58] **Field of Search** ..... 108/144, 106, 156, 155, 108/152; 248/188; 403/231; 211/182



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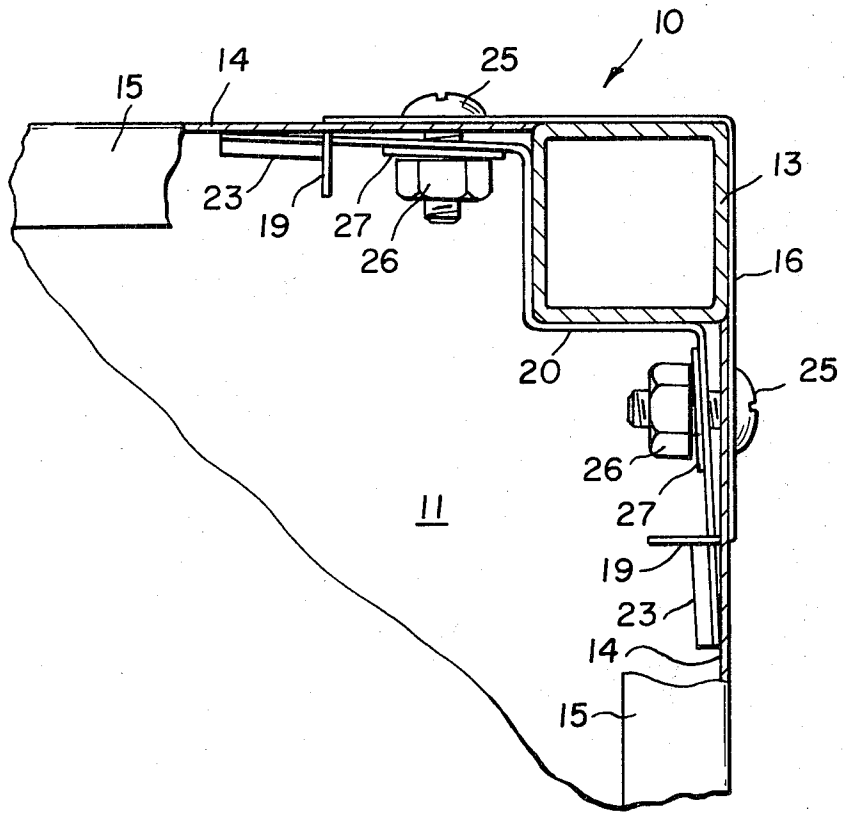
*Primary Examiner*—Paul R. Gilliam
*Assistant Examiner*—Darrell Marquette
*Attorney, Agent, or Firm*—Cumpston, Shaw & Stephens



[57] **ABSTRACT**

A corner clamp secures a shelf adjustably on an upright leg with the leg fitted into a notch in the corner of the shelf and the downward extending flange of the shelf. An outer bracket wraps around the outside of the leg and the shelf flange and has tabs extending inward through the shelf flange, and an inner bracket fits over the inside of the leg, extends along the inside of the shelf flange, and receives the tabs from the outer bracket in slots. Then bolts extending through the inner and outer brackets and the shelf flange draw the parts together, and the inner bracket is shaped to clear the inside of the shelf flange tensioning the parts securely together.


**10 Claims, 6 Drawing Figures**



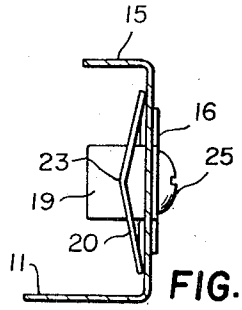



FIG. 3

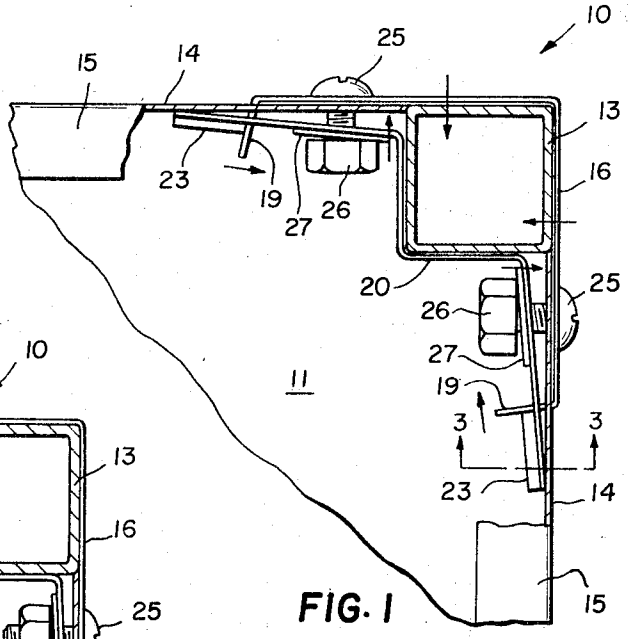



FIG. 1

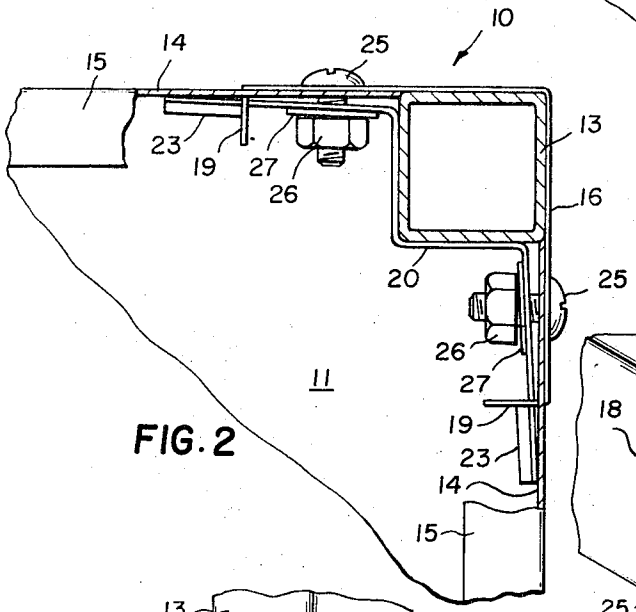



FIG. 2

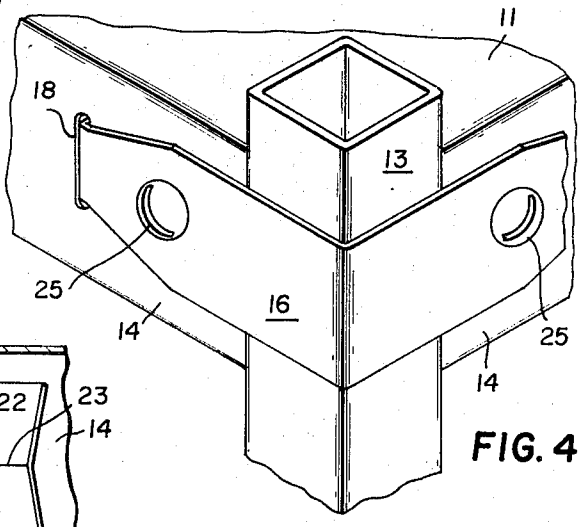



FIG. 4

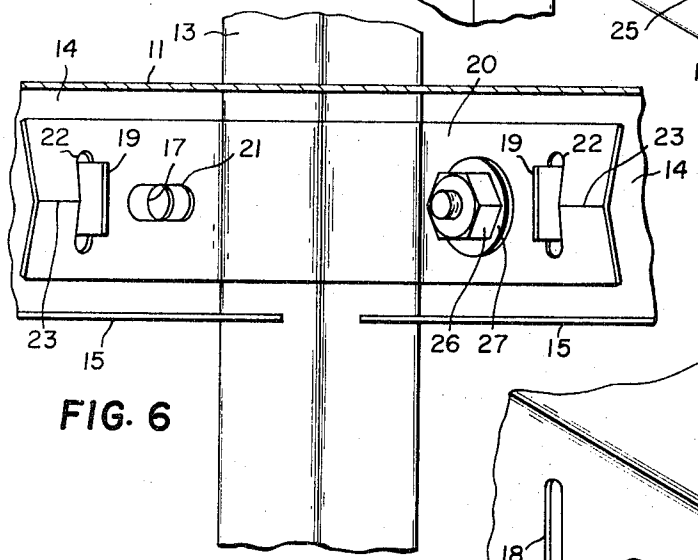



FIG. 6

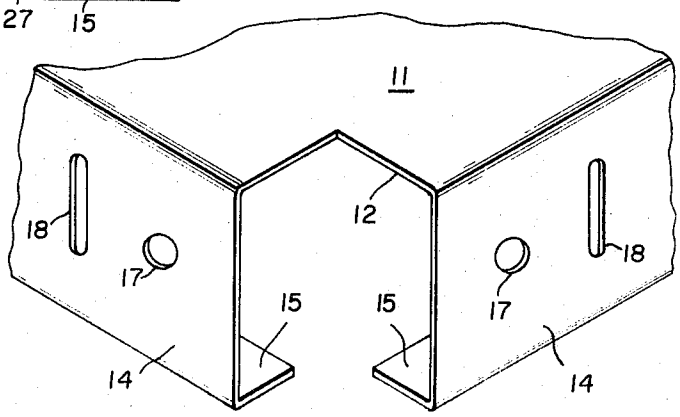



FIG. 5

# SHELF CORNER CLAMP

## THE INVENTIVE IMPROVEMENT

Shelves, countertops, table tops, and similar structures are often clamped or secured to upright legs, and many different clamps and brackets have been suggested for such connections. Clamps for securing such shelving and equivalent structures at variable heights on upright legs are widely demanded for food handling industries, furniture, and industrial uses, especially where vertical adjustability is required.

The invention involves recognition of a simpler and better way of making a shelf corner clamp that is economical, easy to install, simple to adjust vertically, and solid and secure.

## SUMMARY OF THE INVENTION

The inventive shelf corner clamp secures the shelf adjustably to an upright support leg, and the shelf has a downwardly extending flange with the leg being fitted into a notch in the corner of the shelf and the flange and extending above and below the shelf. The flange has bolt holes and tab receiving slots on each side of the corner notch, and the tab receiving slots are further from the corner notch than the bolt holes. An outer bracket is shaped to wrap around the outside of the leg when the leg is in the corner notch and to extend over the outside of the flange beyond the flange bolt holes and to the tab receiving slots. The outer bracket has bolt holes registered with the flange bolt holes and has tabs extending inward through the tab receiving slots in the flange. An inner bracket is shaped to fit over a portion of the inside of the leg when the leg is in the corner notch, and the inner bracket extends along the inside of the flange beyond the flange bolt holes and beyond the tab receiving slots. The inner bracket has bolt holes registered with the flange bolt holes and the outer bracket bolt holes and has slots receiving the tabs of the outer bracket. A pair of bolts extend through the bolt holes in the flange in the inner and outer brackets for drawing the parts together, and the inner bracket is shaped to have a clearance from the inside of the flange in the region of each of the bolts so that tightening the bolts draws the inner and outer brackets and the leg and the shelf securely together.

## DRAWINGS

FIGS. 1 and 2 are partially cut-away, bottom views of a preferred embodiment of the inventive corner clamp respectively showing the clamp loosely assembled and tightened.

FIG. 3 is a fragmentary cross-sectional view of the clamp of FIG. 1 taken along the line 3 — 3 thereof;

FIG. 4 is a perspective view of the corner clamp of FIG. 1;

FIG. 5 is a perspective view of the notched shelf corner for receiving the inventive clamp; and

FIG. 6 is an elevational view from inside a shelf assembly having the inventive corner clamp with one of the bolts removed.

## DETAILED DESCRIPTION

All the drawings are directed to the same preferred embodiment of the inventive corner clamp **10** as applied to a shelf **11** having a corner notch **12** receiving an upright leg **13**. Shelf **12** has a downwardly extending



flange **14** that is cut-away at corner notch **12** to receive leg **13**, and the bottom of flange **14** has an inturned edge **15** that is shown as cut-away in the bottom views of FIGS. 1 and 2 for illustration of the invention. Shelf **11** is vertically adjustable on legs **13** and can be raised or lowered when clamp **10** is loosened and can be secured at any desired elevation by tightening clamp **10**. Shelf **11** and leg **13** can be formed of stainless steel, other metals, and other materials, and can have shapes other than those illustrated. Also, clamp **10** can be applied not only to shelving, but to countertops, table tops, and equivalent structures mounted on vertical support legs.

Clamp **10** includes an outer bracket **16** that has a right angle or generally L-shape for wrapping around the outside of leg **13** and extending across the outside of flange **12**. Bracket **16** is shaped to fit closely around the outside of leg **13**, and can have different shapes for different cross-sectional shapes of leg **13** - such as a curving corner shape to fit a circular cross-sectional shaped leg, or a multiangled corner to fit a leg having more than four sides. Flange **14** has bolt holes **17** and tab receiving slots **18** with tab slots **18** spaced farther from corner notch **12** than bolt holes **17**. Outer bracket **16** extends over bolt holes **17** and reaches to tab slots **18**, and bracket **16** has end tabs **19** extending inward through tab slots **18** in flanges **14**. Tabs **19** preferably bend inward from the main body of outer bracket **16** at an angle slightly larger than 90° as best shown in FIG. **1**.

An inner bracket **20** has an approximately W-shape as illustrated to fit over a portion of the inside of leg **13** and extend along the inside of flange **14** beyond bolt holes **17** and tab slots **18**. Inner bracket **20** has bolt holes **21** registering with bolt holes **17** in flange **14**, and has tab receiving slots **22** registering with tab receiving slots **18** in flange **14**. Bolt holes **21** are preferably oblong as best shown in FIG. **6** to allow transverse movement of inner bracket **21** relative to flange **14**, and bolt holes in outer bracket **16** preferably have a larger diameter than bolt holes **17** to allow some transverse movement of outer bracket **16** relative to flange **14**.

In the region of tab receiving slot **22** in inner bracket **20** near the free ends of bracket **20**, bracket **20** is preferably crowned or bent into a ridge **23** that engages the central region of tabs **19** at a distance from flange **14** as best shown in FIG. **3**. Bracket **20** can have shapes other than a W-shape to fit different shapes of legs **13**. For example, the central section of bracket **20** can be bent in an arc to fit a circular leg or bent into several angles to fit a leg having more than four sides. Bracket **20** is shaped to have a clearance from flange **14** in the region of bolts **25**, nuts **26**, and washers **27**, that hold clamp **10** in a corner assembly.

Clamp **10** is shown loosely assembled in FIG. **1** and tightened to secure shelf **11** firmly in place in FIG. **2**, and the differences between FIGS. **1** and **2** are slightly exaggerated to illustrate how clamp **10** operates. When bolts **25** are tightened, inner bracket **20** is drawn toward flanges **14** to reduce the clearance between bracket **20** and flange **14** in the region of bolts **25**. This draws the free ends of inner bracket **20** toward corner notch **12** as bracket **20** bends under the tension applied by bolts **25**. The slight inward motion of the free ends of inner bracket **20** is applied to tabs **19** where the ridges or crowns **23** of bracket **20** engage tabs **19**. This

bends tabs **19** slightly toward a 90° angle with the main body of outer bracket **16** and pulls bracket **16** inward tightly against leg **13** and flange **14** by effectively shortening the leg length of outer bracket **16** as tabs **19** are bent inward. The drawing in of outer bracket **16** forces leg **13** tightly into notch **12** while inner bracket **20** simultaneously grips the inside of leg **13** as the clearances between bracket **20** and flange **14** is reduced under the tension applied by bolts **25.** Thus, in addition to trapping leg **13** tightly between inner bracket **20** and outer bracket **16,** outer bracket **16** is drawn tightly inward toward flange **14** for lodging leg **13** tightly and securely in corner notch **12.** Clamp **12** is then securely locked in place and shelf **11** is clamped tightly on leg **13** for a solid connection that is not wobbly or loose, and can support a heavy weight without sliding downward on leg **13.**

Clamp **10** is easily loosened for vertical adjustment of shelf **11** by loosening bolts **25** which preferably have slotted heads for easy external access. Also, a simple tightening of bolts **25** fastens shelf **11** securely in place at any desired elevation. The inventive corner clamp **10** not only provides excellent security and rigidity, but also draws leg **13** firmly into corner notch **12,** and does so with two simple brackets and bolts that are economically made, installed, and adjusted. Hence, the inventive corner clamp **10** is at least as strong and secure as any prior art corner clamp while improving on economy and ease of installation and adjustment.

Persons wishing to practice the invention should remember that other embodiments and variations can be adapted to particular circumstances. Even though one point of view is necessarily chosen in describing and defining the invention, this should not inhibit broader or related embodiments going beyond the semantic orientation of this application but falling within the spirit of the invention. For example, those skilled in the art will appreciate the different materials and constructions possible in fitting the inventive corner clamp to various leg and shelf type constructions.

I claim:

**1.** A shelf corner clamp for securing a shelf adjustably to an upright support leg, said shelf having a downward extending flange and said leg being fitted into a notch in said corner of said shelf and said flange and extending above and below said shelf, said shelf corner clamp comprising:

a. said flange having a bolt hole and a tab receiving slot on each side of said corner notch, said tab receiving slots being further from said corner notch then said bolt holes;

b. an outer bracket shaped to wrap around the outside of said leg when said leg is in said corner notch and to extend over the outside of said flange beyond said flange bolt holes and to said tab receiving slots;

c. said outer bracket having bolt holes registered with said flange bolt holes;

d. said outer bracket having tabs extending inward through said tab receiving slots in said flange;

e. an inner bracket shaped to fit over a portion of the inside of said leg when said leg is in said corner notch and to extend along the inside of said flange beyond said flange bolt holes and beyond said tab receiving slots;

f. said inner bracket having bolt holes registered with said flange bolt holes and said outer bracket bolt holes;

g. said inner bracket having tab receiving slots registered with said tab receiving slots in said flange;

h. said tabs of said outer bracket extending through said tab receiving slots of said inner bracket;

i. a pair of bolts extending through said bolt holes in said outer bracket, said flange, and said inner bracket for drawing said outer bracket and said inner bracket toward respective outer and inner sides of said flange; and

j. said inner bracket being shaped to have a clearance from said inside of said flange in the region of each of said bolts so that tightening said bolts draws said inner and outer brackets, and said leg and said shelf securely together.

**2.** The shelf corner clamp of claim **1** wherein said bolt holes in said outer bracket are shaped to allow transverse movement of said outer bracket relative to said flange.

**3.** The shelf corner clamp of claim **2** wherein said outer bracket bolt holes have a larger diameter than said flange bolt holes.

**4.** The shelf corner clamp of claim **1** wherein said bolt holes in said inner bracket are shaped to allow transverse movement of said inner bracket relative to said flange.

**5.** The shelf corner clamp of claim **4** wherein said inner bracket bolt holes are oblong in the direction of extension of said inner bracket and said flange.

**6.** The shelf corner clamp of claim **1** wherein said leg is square in cross-section, said outer bracket is L-shaped, and said inner bracket is W-shaped.

**7.** The shelf corner clamp of claim **1** wherein the outer edges of said tab receiving slots in said inner bracket are shaped to engage the central regions of said tabs at a distance from said inside of said flange.

**8.** The shelf corner clamp of claim **1** wherein said tabs on said outer bracket bend inward toward said inner bracket at angles of more than 90° relative to said outer bracket so that tightening of said bolts makes said inner bracket urge said tabs toward said corner notch to draw said outer bracket inward against said leg and said flange.

**9.** The shelf corner clamp of claim **8** wherein the outer edges of said tab receiving slots in said inner bracket are shaped to engage the central regions of said tabs at a distance from said inside of said flange.

**10.** The corner shelf clamp of claim **9** wherein said leg is square in cross-section, said outer bracket is L-shaped, said inner bracket is W-shaped, and said bolt holes in said outer bracket and said inner bracket are shaped to allow transverse movement of said outer bracket and said inner bracket relative to said flange.

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