June 2, 1964

H. F. KNAPE ETAL

3,135,491

BOLTLESS BRACKET

Filed Dec. 28, 1961

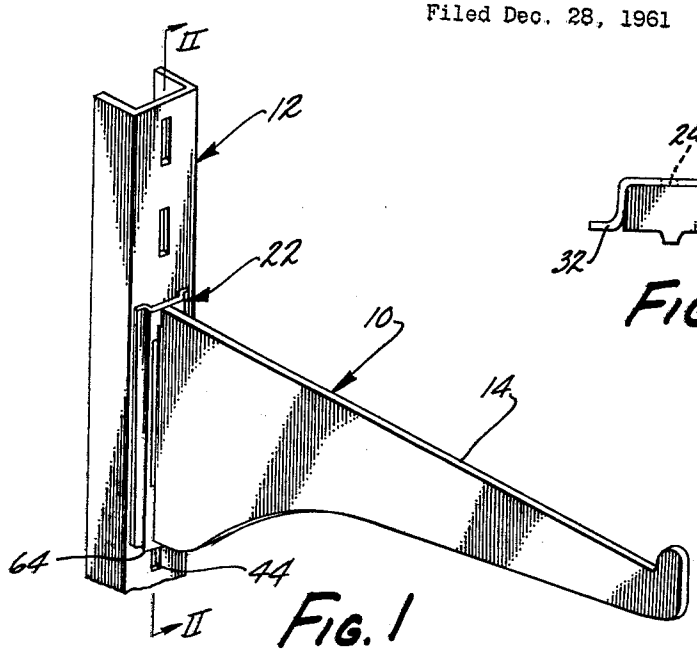


FIG. 1

FIG. 4

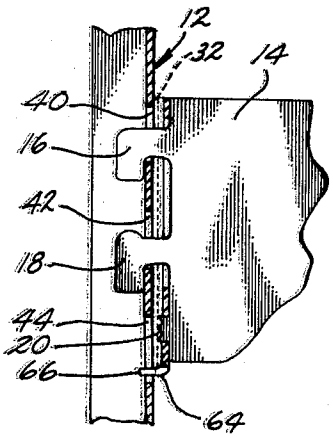


FIG. 2

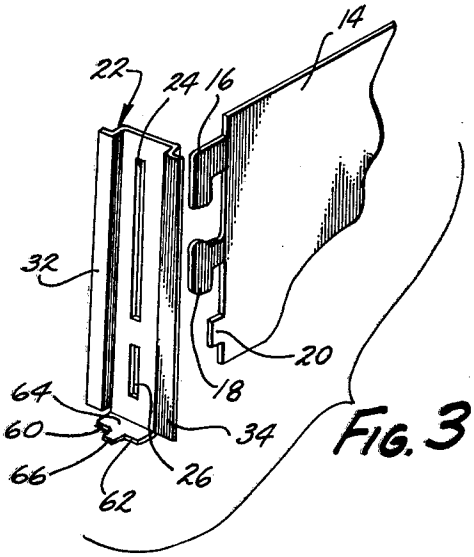


FIG. 3

INVENTORS
HERBERT F. KNAPE
PHILLIP M. GEREN
BY Price & Heneveld
ATTORNEYS

United States Patent Office 3,135,491 Patented June 2, 1964

3,135,491

BOLTLESS BRACKET

Herbert F. Knape, Grand Rapids, and Phillip M. Geren, Comstock Park, Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich., a corporation of Michigan

Filed Dec. 28, 1961, Ser. No. 162,772
4 Claims. (Cl. 248—243)

This invention relates to a boltless bracket, and more particularly to boltless brackets connectable to a slotted vertical support, and relates to the attachment clip for such brackets.

Boltless brackets achieving sliding connection to a vertical support by hooking tabs over the edges of spaced vertical slots in the support require additional adjacent contacting means to form an optimum tight and sturdy grip. One such contacting means comprises a pair of slightly resilient laterally positioned, vertically oriented flanges on opposite sides of the bracket tabs to yieldingly contact the front of the vertical support adjacent the slots when the tabs are hooked. Even with these resilient flanges, however, it has been found that the connection becomes sloppy with use and sometimes fails because the lower portions of the flanges slowly become permanently deformed thereby allowing the entire bracket to sag. When this sagging begins, the flange-deforming forces materially increase to cause the sagging process to accelerate with the result that a shearing action occurs on the slots and hooking tabs.

It is an object of this invention to provide a novel boltless bracket achieving a tight gripping connection capable of withstanding heavy loads over an extended period of time without sloppiness, or slot or tab shearing. The bracket is capable of supporting greater loads than conventional brackets of comparable size and yet tightly grip the vertical support in a sturdy fashion.

It is another object of this invention to provide an attachment clip capable of connection to a bracket to provide greatly increased useful life and support strength to the bracket. The clip is relatively inexpensive to manufacture. It does not hinder the simple attachment characteristics of boltless brackets. It achieves the improved results mentioned above with only a relatively simple, but significant change in structure.

Other objects and advantages will be apparent upon studying the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of the novel bracket and clip as attached to a slotted vertical support;

FIG. 2 is a side elevational, sectional fragmentary view of the bracket and support taken on plane II—II in FIG. 1;

FIG. 3 is an exploded perspective, fragmentary view of the bracket clip and a portion of the bracket arm; and

FIG. 4 is a top plan view of the novel clip.

Basically, the inventive bracket includes an arm having tabs at one end to interfit with slots in a vertical support, and a pair of shoulders on a bracing tongue protruding from the base of the bracket toward the vertical support to abut the support. The tongue is preferably an integral part of a clip secured to the end of the bracket arm and astraddle the hooking tabs. The tongue preferably includes a centrally positioned aligning finger between the contacting shoulders and adapted to fit in one of the vertical support slots. The clip preferably also includes a pair of slightly resilient flanges to help provide a tight sliding grip between the bracket and vertical support.

Referring now to the drawings, the novel bracket **10**, shown attached to vertical support **12**, includes cantilever support arm **14** and clip **22**. The arm has a plurality

of integral hooking tabs **16** and **18** extending from one end thereof. Also extending from the same end of the cantilever support arm **14** is a connecting tab **20**. To assemble arm **14** to clip **22** tabs **16** and **18** are inserted through elongated slot **24** and connecting tab **20** is inserted through slot **26**. The end of the tab **20** is then deformed as shown in FIG. 2 to retain the clip on the support arm.

The cross section of the clip resembles a hat since it includes a pair of laterally positioned flanges **32** and **34**.

The flanges have a limited resiliency to springingly contact the front surface of the vertical support **12** when the tabs **16** and **18** are hooked through slots **40** and **42** as in FIG. 2. This provides a tightly gripping relationship. The flanges are also preferably slightly concave a few thousandths of an inch from top to bottom to provide a more effective gripping relationship. When the bracket is pressed downwardly to hook the tabs the slightly concave and resilient flanges are deformed a limited amount. Simultaneously, shoulders **60** and **62** of integral tongue **64** at the base of the clip **22** protrude toward the vertical support and abut the front surface of the vertical supports adjacent slot **44**. Central finger **66** fits into slot **44** to align the clip and thus the bracket. The contact of shoulders **60** and **62** causes an even tighter fit, and more important, creates a rigid support at the base of the clip and bracket. This forestalls deformation of the tabs and shearing action between the tabs and slots. It also prevents the lower portions of the resilient flanges from being permanently deformed. The connection thus does not become sloppy and weak. It has been found that the useful life of the bracket utilizing this novel shoulder support is greatly extended and that the bracket can support substantially greater loads than conventional brackets.

Certain minor modifications of the apparatus disclosed may occur to those in the art upon studying the foregoing dtscription. Such modifications are deemed to be part of this invention when within the inventive principles set forth above. Thus the invention is not to be limited to that form depicted, but only by the scope of the claims and the reasonably equivalent structures thereto.

We claim:

1. A boltless bracket comprising: a cantilever support arm; spaced hooking tabs at one end of said support arm adapted to interfit with spaced slots of a vertical support; lateral support means operatively connected to and extending from both sides of said arm adjacent said tabs and adapted to engage a vertical support when said hooked tabs are interfitted with spaced slots of the vertical support to provide lateral stability to said arm; and a bracing tongue operatively connected to the lower end of said arm at said one end, said tongue being spaced below the lower most tab at a spacing approximately equal to the normal spacing between said tabs, and protruding away from said end in the same direction as said tabs and adapted to contact the vertical support when said tabs are interfitted with the slots thereof; and said tongue including a centrally positioned finger adapted to align said bracket with one of the spaced slots in the vertical support.

2. A boltless bracket comprising: a cantilever support arm; hooking tabs at one end of said support arm adapted to interfit with slots of a vertical support; a clip on said support arm adjacent said tabs; said clip having a pair of laterally extending flanges having limited resiliency to snug the connection between said tabs and the slotted vertical support; and the base of said clip having an integral tongue extending away from said end in the direction of said tabs; said tongue including a centrally located finger adapted to align said clip with a vertical support slot, and a pair of shoulders adjacent said finger

and adapted to abut the vertical support adjacent the slots when said bracket is connected thereto.

3. A clip for attachment on the end of a bracket having hook-shaped locking tabs thereon for insertion into slots of a vertical support, comprising: an elongated element having a generally hat-shaped cross sectional configuration; slot means through the crown of said hat-shaped element for receiving the locking tabs of the bracket; a pair of laterally extending, slightly resilient flanges on opposite sides of said crown for contact with the vertical support; and a pair of shoulders extending from and integral with the base of said clip at a position substantially below said slot means, and in a plane normal to the longitudinal axis of said resilient flanges and generally co-planar with said contacting flanges to abut the vertical support; and an aligning finger between said shoulders adapted to fit in one of the slots to vertically align the clip and thus the bracket

4. A clip for attachment on the end of a bracket having hook-shaped locking tabs thereon for insertion into slots of a vertical support, comprising: an elongated element having a generally hat-shaped cross sectional configuration; slot means through the crown of said hat-shaped element for receiving the locking tabs of the bracket; a pair of laterally extending, slightly resilient flanges on opposite sides of said crown for contact with the vertical support; said flanges being slightly concave from top to bottom; a pair of shoulders extending from and integral with the base of said clip and generally co-planar with said contacting flanges to abut the vertical support; and an aligning finger between said shoulders adapted to fit in one of the slots to vertically align the clip and thus the bracket.

References Cited in the file of this patent

UNITED STATES PATENTS

977,609	Freeman	Dec. 6, 1910
1,233,215	Gates	July 10, 1917
1,732,731	Samuels	Oct. 22, 1929
1,853,018	Knape	Apr. 5, 1932
1,983,470	Knape	Dec. 4, 1934

FOREIGN PATENTS

544,693	Canada	Aug. 13, 1957
797,496	Great Britain	July 2, 1958