

[54] CONSTRUCTION BRACKET

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[58] Field of Search..... 248/300, 205 R; 249/189,
249/193, 194, 196, 216, 219 R; 182/82, 87;
52/753 Y, 752, 758 G

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[57] ABSTRACT

A bracket and method for the erection of scaffolding, bracing and the like. The bracket has a support structure that extends to an apertured tongue, which is insertable into a construction form. A fastener is then inserted into the aperture of the tongue to hold the bracket in place.

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8 Claims, 5 Drawing Figures

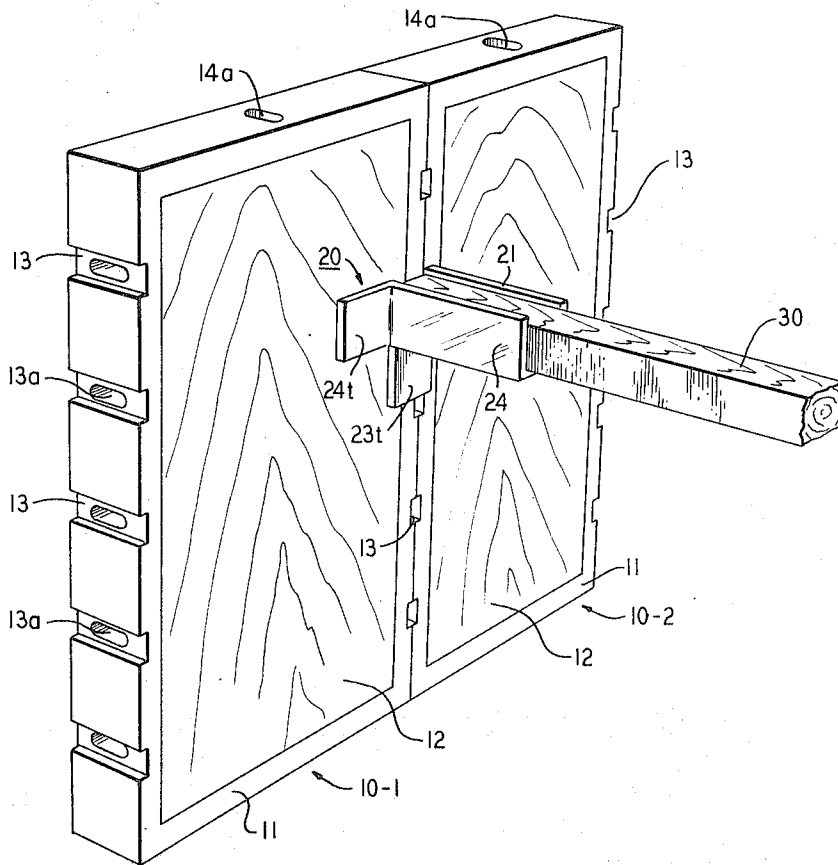


FIG. 1

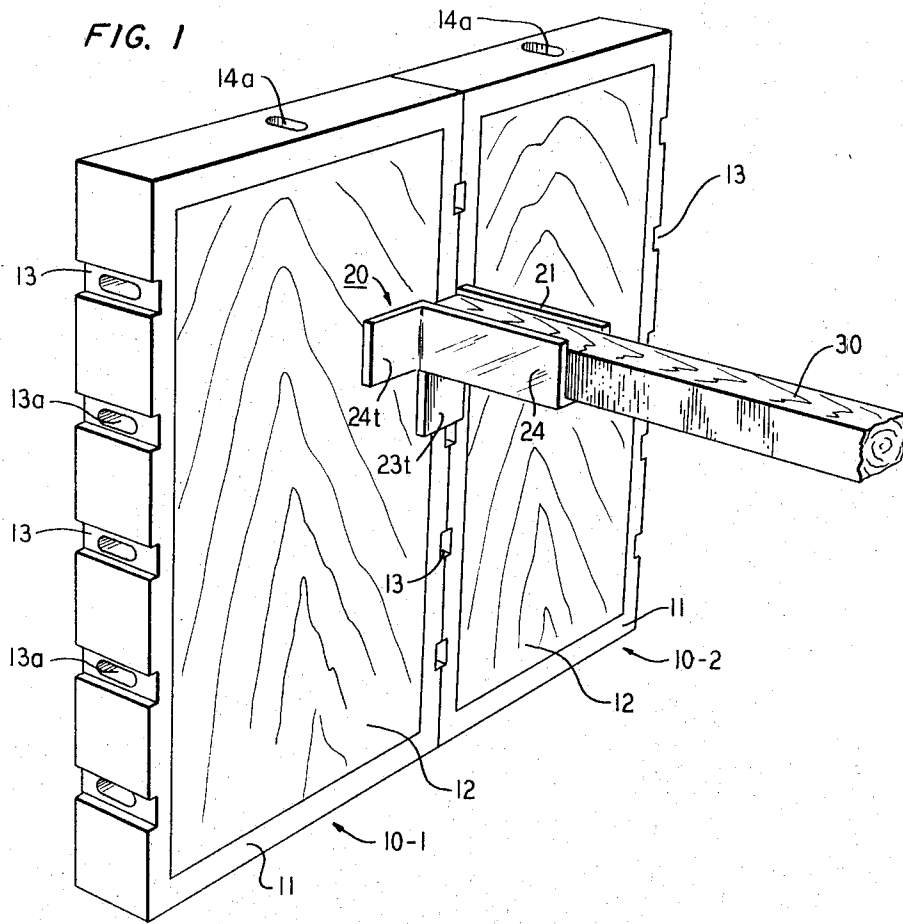


FIG. 2

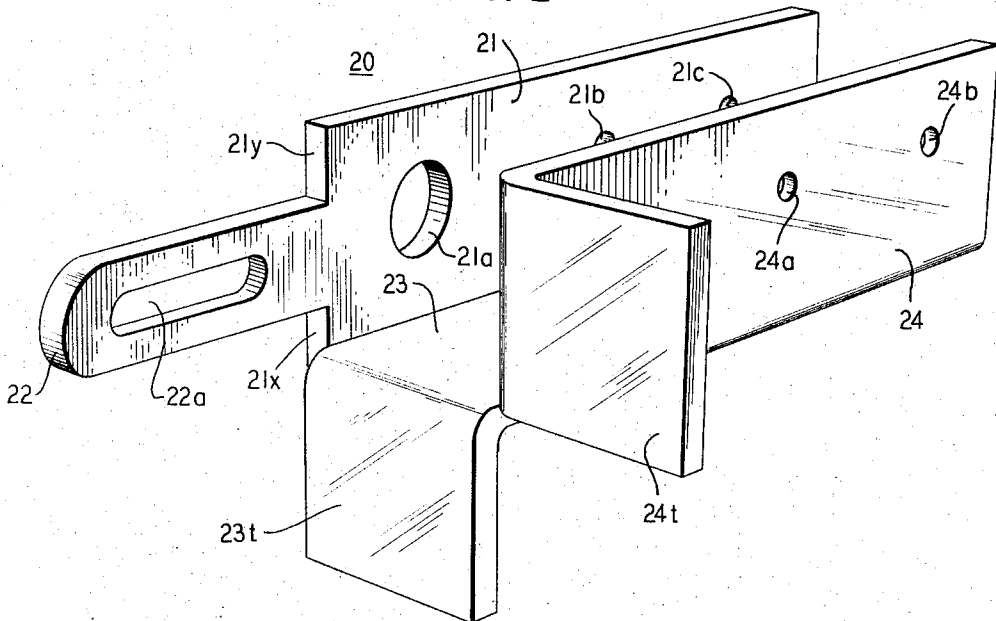


FIG. 3

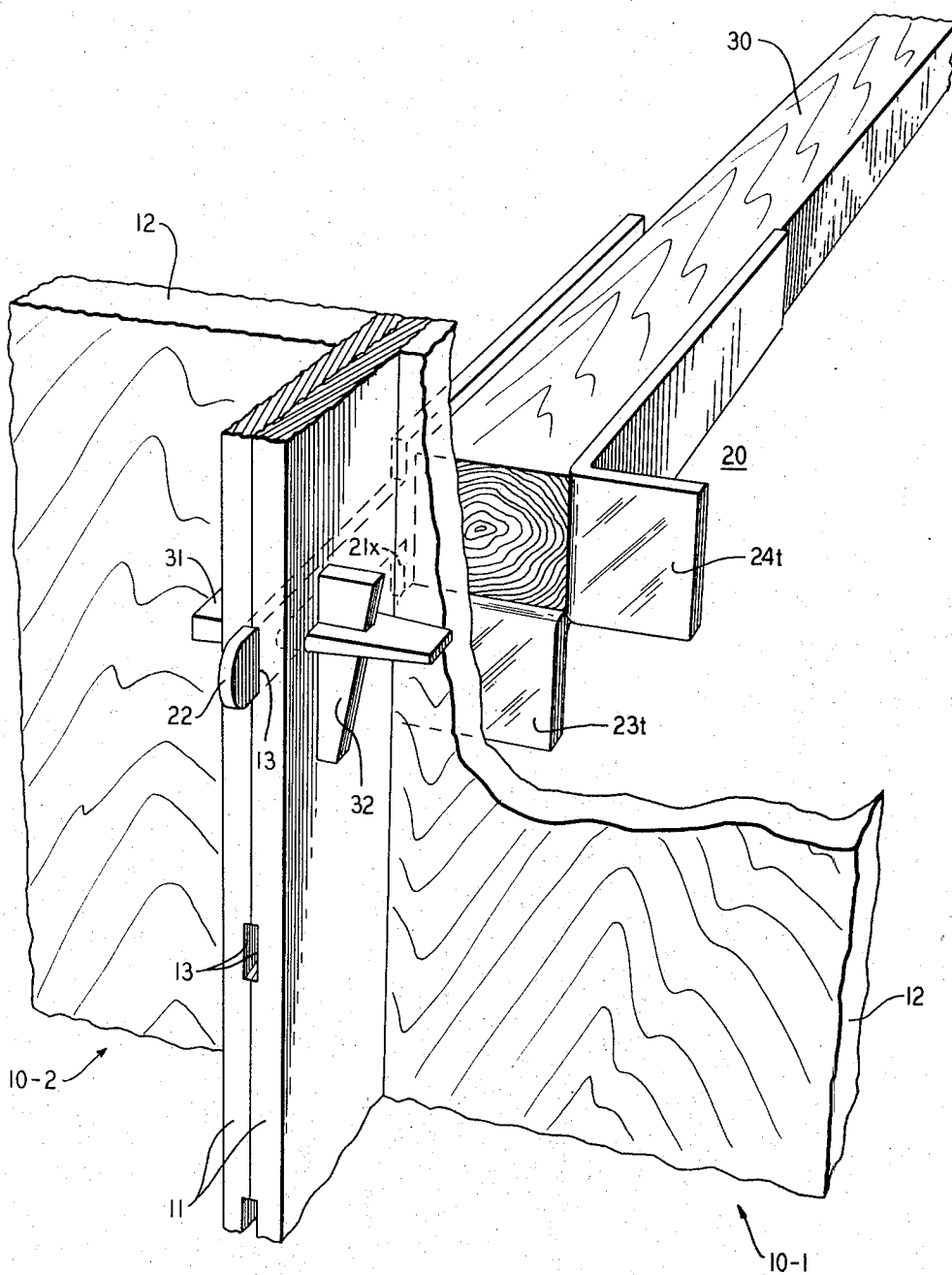


FIG. 4

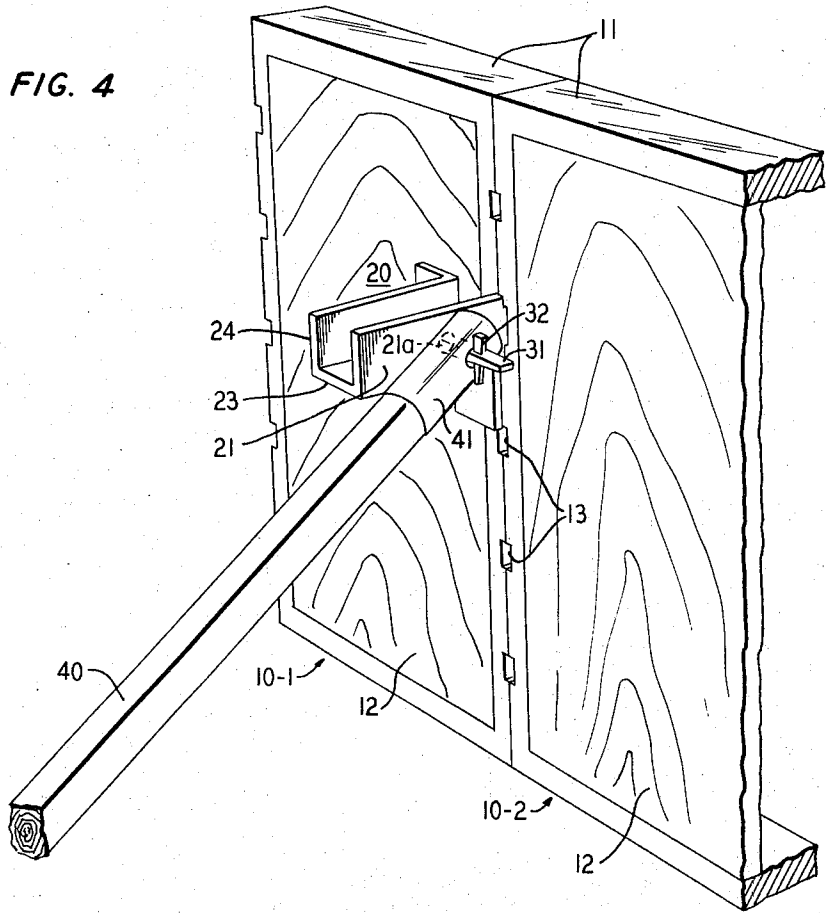
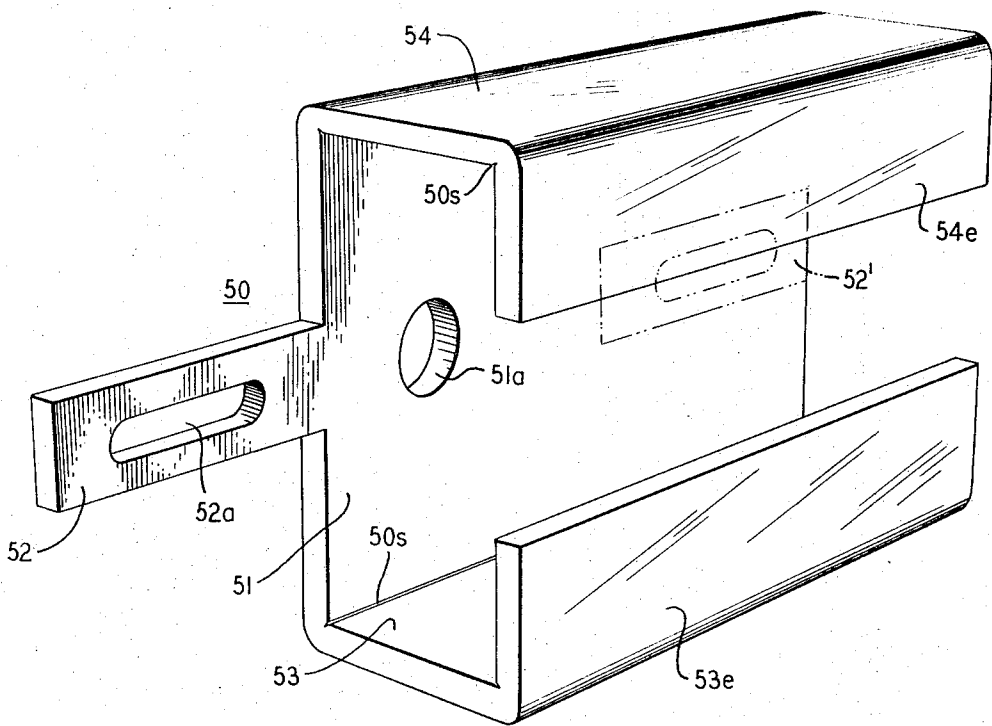


FIG. 5



CONSTRUCTION BRACKET

BACKGROUND OF THE INVENTION

This invention relates to a bracket for supporting constructional elements and, more particularly, to a bracket for the temporary support of such elements with respect to reusable construction forms.

Reusable forms are widely employed in the construction industry for economy and efficiency in the erection of structures. The forms are modular units which are combinable to the extent necessary to define a desired structural surface. The typical reusable construction form has a vertical frame that is closed on one side by a panel face and is open on the other side. The frame is generally made of metal for durability, but its panel face is typically of wood for reduced weight. In use of the forms, the frames are temporarily connected from their open sides by fasteners and the wooden panel faces define the desired structural surface.

For example, in the case of reinforced concrete structures, reusable construction forms are pinned together to establish one surface of a wall. Where the forms are subject to adverse wind effects, it is customary practice to brace them at their open sides. When this proves insufficient, additional bracing is employed at the panel side of the forms. The additional bracing is commonly provided by nailing cleats to the wooden panel faces and then attaching braces to the cleats. The use of cleats and their nailing to the panel faces is not only time consuming, it has a tendency to damage the panels, requiring their eventual replacement.

Once the forms have been assembled for one surface of the structure, steel rods are set to provide the desired reinforcement. Where the structure is large, it is necessary to erect temporary scaffolding for iron workers who set the reinforcing rods. This kind of scaffolding commonly employs cleats that are nailed to the surfaces of the panels. Again, the use of cleats is wasteful of time and materials, of uncertain supportive effect, and tends to damage the forms.

After the iron work is completed, the scaffolding is disassembled and forms for the opposite surface of the structure are erected. The opposed sets of forms are then tied together using lengths of wire with looped ends. The tied wires typically extend between oppositely-positioned frames through pre-existing channels in the walls of the frames and are fastened from the back sides of the forms. Concrete is poured between the tied sets of forms, which are disassembled when the concrete has hardened.

Accordingly, it is an object of the invention to realize a construction bracket that can be used to simplify the erection of constructional elements. A related object is to simplify the erection of scaffolding, bracing and the like.

Another object of the invention is to achieve a construction bracket, and a technique for use of the bracket, that facilitates the erection of such elements as scaffolding, bracing and the like with respect to reusable construction forms. A related object is to eliminate the need for nailed cleats in the temporary erection of constructional elements with respect to reusable construction forms. Another related object is to avoid damage to reusable construction forms in the erection of scaffolding, bracing and the like.

A further object of the invention is to realize a multipurpose construction bracket.

SUMMARY OF THE INVENTION

In accomplishing the foregoing and related objects, the invention provides a construction bracket in which a support structure has an apertured tongue that extends from the structure and is adapted to be temporarily affixed to a constructional member, such as a construction form.

In accordance with one aspect of the invention, the tongue of the bracket is inserted into a preformed channel of a construction form.

In accordance with another aspect of the invention, the channel of the construction form is positioned at an edge of its frame and the tongue of the bracket is affixed in the channel by a fastener of the kind that is customary used to hold adjoining construction forms together. The tongue may be integral with the bracket or it may be a supplemental member.

In accordance with still another aspect of the invention, the bracket includes an aperture in its support structure to permit the temporary pinning of a constructional member, such as a wind brace, to the bracket.

In accordance with a further aspect of the invention, the tongue of the support structure extends from a first support member and a second support member has a major portion perpendicular to the first member. This permits scaffolding, for example, to be supported by the bracket. Where a third support member is positioned opposite the first support member and has a major portion perpendicular to the second support member, the structural portion of the bracket is U-shaped and the support of scaffolding is facilitated. Alternatively, the third support member may be positioned opposite the second member with an overhang to achieve the desired bracket for the support of scaffolding.

In accordance with a still further aspect of the invention, the bracket includes tabs that extend at right angles from the various support members. This helps to stabilize the construction bracket with respect to the construction forms with which it is used.

BRIEF DESCRIPTION OF THE DRAWINGS

Other aspects of the invention will become apparent after considering several illustrative embodiments taken in conjunction with the drawings in which:

FIG. 1 is a perspective view of a construction bracket in accordance with the invention being used with an illustrative set of construction forms;

FIG. 2 is a perspective view of the construction bracket of FIG. 1;

FIG. 3 is a perspective view showing the attachment of the construction bracket of FIG. 2 to the construction forms of FIG. 1;

FIG. 4 is a partial perspective view showing a construction bracket in accordance with the invention being used for bracing; and

FIG. 5 is a perspective view of a further embodiment of the invention.

DETAILED DESCRIPTION

Turning to the drawings, FIG. 1 shows a pair of construction forms 10-1 and 10-2 illustratively fastened together to establish a portion of a structural surface. Each of the forms 10-1 and 10-2 has a frame 11 with a panel face 12 on one side. The opposite side is open

to allow access to the frames 11 from the rear. The forms 10-1 and 10-2 generally have steel frames for durability, but their panel faces are typically of wood to limit weight. The vertical walls of the frames include edge channels 13 with apertures 13a. When the forms adjoin each other, as shown in FIG. 1, closed channels are produced. These receive the looped ends of wire ties which extend between opposite wall surfaces. The ties are held in place by fasteners inserted from the rear of the forms through the apertures 13a and the loops of the ties. The fasteners inserted into the channel apertures 13a are also used to fasten adjoining forms to each other horizontally. Additional apertures 14a are included on the horizontal walls of the frames to permit the forms to be fastened together vertically.

A construction bracket 20 in accordance with the invention is adapted to have its tongue (not visible in FIG. 1) inserted into one of the channels 13 and held in position by fasteners of the kind commonly used to hold adjoining forms together. The bracket 20 is shown illustratively supporting a scaffold plank 30. This eliminates the need for the support of scaffolding by nailing cleats to the faces of the forms 10-1 and 10-2. The portions of the bracket 20, visible in FIG. 1, are the first support member 21 which abuts the line of separation between adjoining forms 10-1 and 10-2; an oppositely-positioned support member 24 and its tab 24t; and a tab 23t of another support member (not visible in FIG. 1). The tabs 23t and 24t serve to distribute the forces applied to the bracket by the scaffold plank 30 against the panel faces of the forms.

Details of the construction bracket 20 of FIG. 1 are set forth in FIG. 2. The first support member 21 of the bracket 20 is a paralleled-sided plate. Extending from the support member 21 is a tongue 22 with sides that are coplanar with the sides of the support member 21. However, the width of the tongue 22 is less than that of the support member 21, and the tongue 22 includes an elongated aperture 22a. At the point of transition between the tongue 22 and the support member 21, the latter has a lower shoulder 21x and an upper shoulder 21y.

At one edge of the support member 21, and disposed at a right angle, is a second support member 23. An extension 23t of the second support member 23 is bent outwardly at a generally right angle to form a tab. Completing the construction bracket 20 of FIG. 2 is a third support member 24 which is disposed at a generally right angle with respect to the second support member 23. Like the second support member 23, the third support member 24 has an extension 24t that is bent outwardly at a generally right angle to provide a second tab.

The effect on the tabs 23t and 24t is illustrated in FIG. 1. As downward force is applied to the bracket, for example, by weight applied to the plank 30, that force is in part distributed to the faces of the construction forms through the tabs 23t and 24t.

To simplify fabrication of the bracket 20 of FIG. 2, the tabs 23t and 24t are desirably of the same length as the tongue 22. Accordingly, the bracket 20 can be produced from a single sheet of metal by stamping to provide the tongue 22 and its elongated aperture 22a. At the same time, score lines (not shown) may be included to facilitate the bending of the second and third support members 23 and 24 into the generally U-shaped configuration of FIG. 2 as desired. Additional score lines (not

shown) facilitate the bending of the tabs 23t and 24t. The resulting construction bracket is particularly suitable for the erection of scaffolding.

Further, the first support member 21 of the bracket 20 includes an aperture 21a for pinning a brace to it. The way in which the pinning takes place is discussed below in conjunction with FIG. 4. Other apertures 21b and 21c in the first support member 21 are included to permit the plank 30 of FIG. 1, for example, to be nailed to the bracket 20. A complementary set of nailing apertures 24a and 24b is included in the third support member 24. As a result, the plank 30 can be nailed to the bracket 20 at either the first support member 21 or the third support member 24, and through the opposite support member.

The mode of attachment of the particular bracket 20 in FIG. 2, to the forms 10-1 and 10-2 of FIG. 1 is illustrated in the partial perspective view of FIG. 3, where a portion of the form 10-1 has been broken away to reveal the attachment details. The bracket 20 is inserted by way of its tongue 22 into a closed channel formed by complementary open channels 13 in the vertical walls of adjoining frames. As indicated in FIG. 1, each channel 13 includes an elongated aperture 13a. To secure the bracket 20 to the forms 10-1 and 10-2, a flattened wedge-shaped pin 31 with a cross section similar to that of the apertures 13a is inserted through the adjoining vertical walls of the frames. The enlarged head of the wedge limits the extent to which the pin 31 can be inserted. Its tip includes an aperture similar to that of the channels for receiving a second pin 32 that holds the first pin 31 in position. While not shown in FIG. 3, a reinforcement member may extend between the vertical walls of the frame near each edge channel 13 and include apertures for receiving the tips of pins such as the second pin 32.

For convenience, the pins 31 and 32 are interchangeable and are generally used in holding the forms together and in fastening the metal ties that extend between walls.

To the extent that there is an imprecise fit between the tongue 22 and the pair of adjoining channels into which the tongue is inserted, the flattened form of the pin 31 tends to limit any shearing effect due to any downward force exerted by plank 30. Any shearing tendency is believed to be further limited by the presence of the shoulder 21x of the first support member 21 and the tabs 23t and 24t of the second and third support members 23 and 24.

When the tip of the tongue 22 protrudes beyond the adjoining channels 13 as shown in FIG. 3, the location of the support bracket in the opposite panel face is clearly apparent.

An adaptation of the bracket 20 for use with a wind brace is illustrated in FIG. 4. The bracket 20 is inserted by its tongue, as in the case of FIG. 1, into one of the closed channels formed between adjoining forms 10-1 and 10-2. However, instead of having the bracket support scaffolding in its U-shaped support structure formed by members 21, 23 and 24, a brace 40 is pinned to the first support member 21 at the aperture 21a of FIG. 2. Pinning is achieved using the same kinds of pins as are used in FIG. 3, namely, a horizontally-positioned pin 31 and a vertically-positioned pin 32. Unlike the aperture 22a in the tongue 22 of FIG. 2, the aperture 21a in the support member 21 is round. This facilitates insertion of the flattened pin 31, which can thus have

its tip inserted into the aperture 21a at any number of angles between the vertical support members 21 and 24. The pin 31 is prevented from falling through the aperture 21a by virtue of its enlarged head.

Once the pin 31 is inserted into the aperture 21a, an apertured head 41 of the brace 40 is positioned against the support member 21 so that the pin extends through it. The brace is then held in position by inserting the second pin 32 into the first pin 31 as in FIG. 3.

As a result, the bracket 20 allows the brace 40 to be used in bracing the forms from the front without requiring cleats to be nailed into the panel faces or otherwise interfering with them.

An alternative bracket 50 in accordance with the invention is shown in FIG. 5. In this embodiment a tongue 52 with an elongated aperture 52a projects outwardly from a main support member 21. Unlike the bracket 20 of FIG. 2, the bracket 50 of FIG. 5 is U-shaped with respect to the main support member 51 that includes the tongue 52. Oppositely-positioned support members 53 and 54 have their major portions perpendicular to the main support member 51. They additionally have respective overhang extensions 53e and 54e that provide side support for any scaffolding plank inserted into the bracket 50. Because of the upper member 54, a plank supported by the bracket 50 cannot be accidentally dislodged by an upward thrust. Where desired, nailing apertures (not shown) may be provided in the overhangs 53s and 54s and in the main support member 51.

As in the case of the bracket 20 in FIG. 2, the bracket 50 of FIG. 5 includes an aperture 51a for the attachment of an auxiliary member, such as a wind brace. Since the side of the bracket 50 opposite the aperture 51a is open, the insertion of a pin, such as the pin 31 of FIG. 4, is facilitated. The pinning of a wind brace, for example, to the bracket 50 is otherwise effected in the manner shown in FIG. 4.

In order to expedite the manufacture of the bracket 50, it may originate as one of the succession of blanks stamped from a metallic strip of material, with the tongue 52 of each succeeding blank being stamped from the main support member 51 of the preceding blank. In that event the bracket 50 in FIG. 5 omits that part of the main support member 51 indicated by the dashed-line rectangle 52', which then forms the tongue of a succeeding bracket (not shown). The bending of the bracket 50 into the desired configuration is facilitated by the use of score lines 50s that are stamped into the blanks at the time they are formed.

While various aspects of the invention have been illustrated by the foregoing and related embodiments, it

is to be understood that changes in components, including the substitution of equivalents, for what has been shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A construction bracket comprising a support structure including a support member adapted to receive and support another member, a tongue extending from said support member and having an aperture therein, said tongue being dimensioned to be received by a construction form in a channel having a fastener receiving opening therein, and the aperture of said tongue being positioned to be aligned with the fastener receiving opening of said channel.

2. A construction bracket as defined in claim 1 wherein said tongue is integral with said structure.

3. A construction bracket as defined in claim 1 further including an aperture in said support member for the temporary pinning of another structural member thereto.

4. A construction bracket as defined in claim 1 wherein said support structure includes a second support member having a major portion perpendicular to the first mentioned support member

5. A construction bracket as defined in claim 4 further including a third support member, opposite the first support member, having a major portion perpendicular to said second support member.

6. A construction bracket as defined in claim 5 further including a first tab that extends at a right angle from said second support member for the distribution of force from said bracket to said constructional member and a second tab that extends at a right angle from said third support member for the further distribution of force from said bracket to said constructional member.

7. A construction bracket as defined in claim 4 further including a third support member, opposite the second support member, having a major portion perpendicular to said first support member.

8. A construction bracket as defined in claim 7 further including an aperture in said support structure for the pinning of a structural member thereto.

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